

ECMA-376, 4th Edition

**Office Open XML File Formats — Fundamentals
and Markup Language Reference**

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Foreword

Changes from the 3rd edition were made to align this 4th edition Standard with ISO/IEC 29500:2012. Both this 4th edition and ISO/IEC 29500:2012 refer to the 1st edition. As such, this 4th edition does not cancel or replace the 1st edition. This 4th edition does, however, cancel and replace the 3rd edition.

Some important differences between ECMA-376:2012 and ECMA-376:2006 are given in Annex I.

ECMA-376 consists of the following parts:

- *Part 1: Fundamentals and Markup Language Reference*
- *Part 2: Open Packaging Conventions*
- *Part 3: Markup Compatibility and Extensibility*
- *Part 4: Transitional Migration Features*

Annexes A, G and H form a normative part of this Part of ECMA-376. Annexes B–F and I–N are for information only.

This Part of ECMA-376 includes five annexes (Annex A, Annex B, Annex F, Annex G, and Annex H) that refer to data files provided in electronic form.

The document representation formats defined by this Part are different from the formats defined in the corresponding Part of ECMA-376:2006. Some of the differences are reflected in schema changes, as shown in Annex M of this Part.

Introduction

ECMA-376 specifies a family of XML schemas, collectively called *Office Open XML*, which define the XML vocabularies for word-processing, spreadsheet, and presentation documents, as well as the packaging of documents that conform to these schemas.

The goal is to enable the implementation of the Office Open XML formats by the widest set of tools and platforms, fostering interoperability across office productivity applications and line-of-business systems, as well as to support and strengthen document archival and preservation, all in a way that is fully compatible with the existing corpus of Microsoft Office documents.

The following organizations have participated in the creation of ECMA-376 and their contributions are gratefully acknowledged:

Apple, Barclays Capital, BP, The British Library, Essilor, Intel, Microsoft, NextPage, Novell, Statoil, Toshiba, and the United States Library of Congress

1. Scope

ECMA-376 defines a set of XML vocabularies for representing word-processing documents, spreadsheets and presentations. On the one hand, the goal of ECMA-376 is to be capable of faithfully representing the pre-existing corpus of word-processing documents, spreadsheets and presentations that had been produced by the Microsoft Office applications (from Microsoft Office 97 to Microsoft Office 2008, inclusive) at the date of the creation of ECMA-376. It also specifies requirements for Office Open XML consumers and producers. On the other hand, the goal is to facilitate extensibility and interoperability by enabling implementations by multiple vendors and on multiple platforms.

This Part of ECMA-376 specifies concepts for documents and applications of both strict and transitional conformance.

2. Conformance

2.1 Document Conformance

A document of conformance class Office Open XML Strict shall be a package of conformance class OPC, as specified in ECMA-376-2, for which all the following shall hold:

- The document obeys all constraints specified in this Part of ECMA-376
- The document is of category Wordprocessing, Spreadsheet, or Presentation, as defined in §4
- For each OPC Part of the document of the types listed in §11.3, §12.3, §13.3, §14.2 or §15.2, all the following shall hold:
 - i. The part is of conformance class MCE, as specified in ECMA-376-3
 - ii. After the removal of any extensions using the mechanisms in ECMA-376-3, the part is valid against the strict W3C XML Schema (Appendix A)

This Part of ECMA-376 uses the following further terms to refer to documents of conformance class Office Open XML Strict:

- *WML Strict*, if the document is of category Wordprocessing
- *SML Strict*, if the document is of category Spreadsheet
- *PML Strict*, if the document is of category Presentation

2.2 Application Conformance

Application conformance incorporates both syntax and semantics:

- A conforming consumer shall not reject any conforming documents of at least one document conformance class.
- A conforming producer shall be able to produce conforming documents of at least one document conformance class.
- A conforming application shall treat the information in Office Open XML documents in a manner consistent with the semantic definitions given in ECMA-376. An application's intended behavior need not require that application to process all of the information in an Office Open XML document. However, the information that it does process shall be processed in a manner that is consistent with the semantic definitions given in ECMA-376.

[Note: This note illustrates the third bullet above. Conforming applications might serve various functions. Examples include a viewer, an editor, and a back-end processor. Here is an illustration of how the third bullet applies to each of those examples:

- If a conforming viewer supports a given feature, then when it displays information using that feature, it respects the semantics of that feature as described in the Standard.

- If a conforming editor supports a given feature, then when it provides its user with an interface for manipulating information using that feature, it respects the semantics of that feature as described in the Standard.
- If a conforming back-end processor supports a given feature, then when that processor transforms or assembles information involving that feature, that processor respects the semantics of that feature as described in the Standard.

end note]

This Part of ECMA-376 defines the following application conformance classes:

- *WML Strict*, if the application is a conforming application that is a consumer or producer of documents having conformance class WML Strict.
- *SML Strict*, if the application is a conforming application that is a consumer or producer of documents having conformance class SML Strict.
- *PML Strict*, if the application is a conforming application that is a consumer or producer of documents having conformance class PML Strict.

Conformance can also involve the use of application descriptions; see §2.3 for details.

2.3 Application Descriptions

An application can be defined as conforming to zero or more *application descriptions* in a particular conformance class.

The application descriptions defined within ECMA-376 are:

- Base
- Full

[*Note:* These application descriptions should not be taken as limiting the ability of an application provider to create innovative applications. They are intended as a mechanism for labelling applications rather than for restricting their capabilities. The intention is to promote interoperability between different applications that share the same conformance class. Application descriptions are orthogonal to the conformance of the documents produced by those applications. For example, a tool used for automated translation of documents might have an application description of “Base” but will still produce fully conformant documents. *end note]*

The application descriptions are determined in terms of an application’s semantic understanding of particular features. *Semantic understanding* is to be interpreted in that an application shall treat the information in Office Open XML documents in a manner consistent with the semantic definitions given in ECMA-376.

Each application description is identified by a URI.

The application descriptions are defined in the following subclauses.

2.3.1 Base Application Description

Description URI: <http://purl.oclc.org/ooxml/descriptions/base>

An application conforming to this description has a semantic understanding of at least one feature within its conformance class.

[*Note*: In addition, applications that include a user interface are strongly recommended to support all accessibility features appropriate to that user interface. *end note*]

2.3.2 Full Application Description

Description URI: <http://purl.oclc.org/ooxml/descriptions/full>

An application conforming to this description has a semantic understanding of every feature within its conformance class.

2.3.3 Additional Application Descriptions

It is expected that additional application descriptions will be defined within the maintenance process for ECMA-376. It is also expected that third parties might define their own application descriptions; for example to inform their procurement decisions, or to deal with domains such as accessibility.

[*Note*: A possible application description would be a “standard” application description for a wordprocessing application. This could be created by taking the intersection of the features available in common wordprocessing applications such as Word 2000, OpenOffice 2, WordPerfect, and iWork Pages. In addition, it could define formats such as specific image and video formats required to be supported to conform to the description. Similar descriptions could be created for spreadsheet applications and presentation applications. Such a description would promote interoperability between applications implementing OOXML. It would also promote interoperability between applications implementing OOXML and applications implementing other document formats such as ISO/IEC 26300. *end note*]

Application descriptions are not required to be strict subsets of each other. An application can simultaneously conform to multiple application descriptions.

Any such newly created description shall enumerate the features that are required for conformance to it. Such a description should provide a machine-processable schema, preferably using a standard such as ISO/IEC 19757.

[*Note*: If the application conforming to a description is a document consumer, it should be able to consume any document that respects such a schema associated with the description. If the application is a document producer, any document produced by that application should respect the schema of the description. *end note*]

Any such description should be identified using a URI, in a similar manner to the names used for application descriptions within ECMA-376.

[*Note*: For the convenience of users of the description, it is recommended that creators of a description should make a human- or machine-readable form of that description available at a URL corresponding to the description URI. *end note*]

2.3.4 Representation of Application Descriptions within Documents

An application description is related to applications, rather than to document conformance. Therefore, there is no normative mechanism for representing an application description within a document.

[*Note*: It is recommended that implementers wishing to represent an application description within a document use the standard metadata mechanism for Office Open XML. *end note*]

2.4 Interoperability Guidelines

[*Guidance*: The following interoperability guidelines incorporate semantics.]

For the guidelines to be meaningful, a software application should be accompanied by documentation that describes what subset of ECMA-376 it supports. The documentation should highlight any behaviors that would, without that documentation, appear to violate the semantics of document XML elements. Together, the application and documentation should satisfy the following conditions.

1. The application need not implement operations on all XML elements defined in ECMA-376. However, if it does implement an operation on a given XML element, then that operation should use semantics for that XML element that are consistent with ECMA-376.
2. If the application moves, adds, modifies, or removes XML element instances with the effect of altering document semantics, it should declare the behavior in its documentation.

The following scenarios illustrate these guidelines.

- A presentation editor that interprets the preset shape geometry “rect” as an ellipse does not observe the first guideline because it implements “rect” but with incorrect semantics.
- A batch spreadsheet processor that saves only computed values even if the originally consumed cells contain formulas, might satisfy the first condition, but does not observe the second because the editability of the formulas is part of the cells’ semantics. To observe the second guideline, its documentation should describe the behavior.
- A batch tool that reads a word-processing document and reverses the order of text characters in every paragraph with “Title” style before saving it can be conforming even though ECMA-376 does not recommend this behavior. This tool’s behavior would be to transform the title “Office Open XML” into “LMX nepO eciffO”. Its documentation should declare its effect on such paragraphs.

The normative requirements in §2.1 imply that a conforming producer shall not write unescaped non-XML characters. As an implementation guideline, a conforming producer additionally should not write escaped non-XML characters. Doing so damages interoperability with existing XML-based standards such as SOAP and RDF. For example, implementers could either refuse to create documents including such characters, or warn users that including such characters compromises the re-usability of their documents. *end guidance*]

3. Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ANSI X3.4-1986, *American Standard Code for Information Interchange (ASCII)*

Bureau of Standards, Metrology and Inspection of the Ministry of Economic Affairs, *CNS 7648: Data Elements and Interchange Formats — Information Interchange — Representation of Dates and Times*

Calendar Reform Committee, *Indian Ephemeris and Nautical Almanac*. 1957

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IANA. *MIME Media Types*. Internet Assigned Numbers Authority. <http://www.iana.org/assignments/media-types/>

IEC 60559:1989, *Binary Floating-Point Arithmetic for Microprocessor Systems*

ISO/IEC 2382-1:1993, *Information technology — Vocabulary — Part 1: Fundamental terms*

ISO 8601:2004, *Data elements and interchange formats — Information interchange — Representation of dates and times*

ISO/IEC 8859-1:1998, *Information technology — 8-bit single-byte coded graphic character sets — Part 1: Latin alphabet No. 1* (referred to in ECMA-376 as the ANSI character set)

ISO/IEC 9075-1, *Information technology — Database languages — SQL — Part 1: Framework (SQL/Framework)*

ISO/IEC 10118-3:2004, *Information technology — Security techniques — Hash-functions — Part 3: Dedicated hash-functions*.

ISO/IEC 10646, *Information technology — Universal Coded Character Set (UCS)*.

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- National Measurement Regulations 1999*, Commonwealth of Australia
<http://www.comlaw.gov.au/Details/F2011C00445>
- NIST Guide to SI Units*, <http://physics.nist.gov/Pubs/SP811/appenB9.html>
- QuickTime File Format Specification* (2007-09-04 version)
<http://developer.apple.com/standards/classicquicktime.html>
- Resource Description Framework (RDF)*, <http://www.w3.org/RDF/>
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<http://www.w3.org/TR/2006/REC-xml-20060816/> [Implementers should be aware that a further correction of the normative reference to XML to refer to the 5th Edition will be necessary when the related Reference

Specifications to which this International Standard also makes normative reference and which also depend upon XML, such as XSLT, XML Namespaces and XML Base, are all aligned with the 5th Edition.]

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XML Schema Part 2: Datatypes (Second Edition), W3C Recommendation 28 October 2004, <http://www.w3.org/TR/xmlschema-2/>

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4. Terms and Definitions

For the purposes of this document, the following terms and definitions apply. Other terms are defined where they appear in *italic* typeface, on the left side of a syntax rule, or within subclauses of language-specific grammars (§17.16 and §18.17). Terms explicitly defined in this Part of ECMA-376 are not to be presumed to refer implicitly to similar terms defined elsewhere. [*Note: This Part uses OPC-related terms, which are defined in ECMA-376-2. end note*]

application — A consumer or producer.

behavior — External appearance or action.

behavior, implementation-defined — Unspecified behavior where each implementation is expected to document that behavior, which would thereby promote predictability and reproducibility within any given implementation. (This term is sometimes called “application-defined behavior”.)

behavior, locale-specific — Behavior that depends on local conventions of nationality, culture, and language.

behavior, unspecified — Behavior where ECMA-376 makes no recommendations. (This term is sometimes called “application-dependent behavior”.) [*Note: To add an extension, an implementer must use the extensibility mechanisms described by ECMA-376 rather than trying to do so by giving meaning to otherwise unspecified behavior. end note*]

byte — A sequence of 8 bits treated as a unit.

comment — A note that an author or reviewer attaches to content in a document. Although a consumer might chose to display comments, they are not considered part of the body of the document. A comment might include the text of the note, the comment author's name and initials, and date of creation, among other things.

consumer — A piece of software or a device that reads packages through a package implementer. A consumer is often designed to consume packages only for a specific physical package format.

content type — Describes the content stored in a part. Content types define a media type, a subtype, and an optional set of parameters, as defined in RFC 2616.

document category — One of the three categories of Office Open XML documents: Wordprocessing, Spreadsheet, and Presentation, defined as follows:

- A document whose package-relationship item contains a relationship to a Main Document part (§11.3.10) is a document of category Wordprocessing.

- A document whose package-relationship item contains a relationship to a Workbook part (§12.3.23) is a document of category Spreadsheet.
- A document whose package-relationship item contains a relationship to a Presentation part (§13.3.6) is a document of category Presentation.

An Office Open XML document can contain one or more embedded Office Open XML packages (§15.2.11) with each embedded package having any of the three document categories. However, the presence of these embedded packages does not change the category of the document.

DrawingML — A set of conventions for specifying the location and appearance of drawing elements in an Office Open XML document.

extension — Any XML element, XML attribute, relationship, or part not explicitly included in ECMA-376, but that uses the extensibility mechanisms described by ECMA-376.

id — In some XML-related technologies, the term *id* implies use of the xsd:ID data type. In this international standard, this term is used to refer to a variety of different identification schemes. See *unique identifier*.

MDX — A multi-dimensional expression language, passed to an OLAP provider. The method of interpreting of this is defined by the server-side OLAP provider implementation.

Office Open XML document — A rendition of a data stream formatted using the wordprocessing, spreadsheet, or presentation ML and its related MLs as described in ECMA-376-1 and ECMA-376-4. Such a document is represented as a package as described in ECMA-376-2.

OLAP — A type of online analytical processing database which uses a multi-dimensional data model.

OLE — OLE in this context does not refer to any specific technology; instead, it refers to the generalized abstraction of embedding and linking objects within a document.

package — A ZIP archive that conforms to the Open Packaging Conventions specification defined in ECMA-376-2.

package, embedded — A package that has been stored as the target of an Embedded Package relationship (§15.2.11) in an Office Open XML document

PresentationML — A set of conventions for representing an Office Open XML document of category Presentation.

producer — A piece of software or a device that writes packages through a package implementer. A producer is often designed to produce packages according to a particular physical package format specification.

relationship — The kind of connection between a source part and a target part in a package. Relationships make the connections between parts directly discoverable without looking at the content in the parts, and without altering the parts themselves. (See also Package Relationships.)

relationships part — A part containing an XML representation of relationships.

relationship, explicit — A relationship in which a resource is referenced from a source part's XML using the Id attribute of a Relationship tag.

relationship, implicit — A relationship that is not explicit.

SpreadsheetML — A set of conventions for representing an Office Open XML document of category Spreadsheet.

unique identifier — In some XML-related technologies, the term *unique identifier* implies use of the xsd:ID data type. In this international standard, this term is used to refer to a variety of different identification schemes. See *id*.

WordprocessingML — A set of conventions for representing an Office Open XML document of category Wordprocessing.

5. Notational Conventions

The following typographical conventions are used in ECMA-376:

- The first occurrence of a new term is written in italics. [*Example*: The text in ECMA-376 is divided into *normative* and *informative* categories. *end example*]
- In each definition of a term in §4 (Terms and Definitions), the term is written in bold. [*Example*: **behavior** — External appearance or action. *end example*]
- The tag name of an XML element is written using a distinct style and typeface. [*Example*: The bookmarkStart and bookmarkEnd elements specify ... *end example*]
- The name of an XML attribute is written using a distinct style and typeface. [*Example*: The dropCap attribute specifies ... *end example*]
- The value of an XML attribute is written using a constant-width style. [*Example*: The attribute value of auto specifies ... *end example*]
- The qualified or unqualified name of a simple type, complex type, or base datatype is written using a distinct style and typeface. [*Example*: The possible values for this attribute are defined by the ST_HexColor simple type. *end example*]

When assigned namespaces are used in examples, they are included at the beginning of the example, but with the specific namespace replaced with ellipsis ("...") for brevity.

6. Acronyms and Abbreviations

This clause is informative

The following acronyms and abbreviations are used throughout ECMA-376:

IEC — the International Electrotechnical Commission

ISO — the International Organization for Standardization

W3C — World Wide Web Consortium

End of informative text

7. General Description

This Part of ECMA-376 is divided into the following subdivisions:

1. Front matter (clauses 1–7);
2. Overview (clause 8);
3. Package Part Structure (clauses 9–16);
4. Reference Material (clauses 17–23);
5. Annexes

Examples are provided to illustrate possible forms of the constructions described. References are used to refer to related clauses. Notes are provided to give advice or guidance to implementers or programmers. Rationale provides explanatory material as to why something is or is not in ECMA-376. Annexes provide additional information or summarize the information contained in ECMA-376.

Clauses 1–5, 7, 9–15, 17–23, Annex A, Annex F, and Annex G form the normative part of this Part of ECMA-376; the Introduction, clauses 6, 8, and 16, Annex B–Annex E, Annex H–Annex M, as well as notes, examples, rationale, guidance, and the index, are informative.

Except for whole clauses or annexes that are identified as being informative, informative text that is contained within normative text is indicated in the following ways:

1. [*Example*: code fragment, possibly with some narrative ... *end example*]
2. [*Note*: narrative ... *end note*]
3. [*Rationale*: narrative ... *end rationale*]
4. [*Guidance*: narrative ... *end guidance*]

In addition to the declarations in the “General Description”, each annex that is informative, also contains the following text at the beginning of the annex: **"This annex is informative."**

8. Overview

This clause is informative.

This clause contains an overview of Office Open XML.

8.1 Content Overview

This standard contains predominantly the following three types of information:

1. Normative W3C XML Schemas, informative RELAX NG schemas and an associated validation procedure for validating document syntax against those schemas (Annex A and Annex B)
2. Descriptions of XML element semantics. The semantics of an XML element refers to its intended interpretation by a human being (chiefly in §11, §12, §13, and §14)
3. Additional syntax constraints in written form

8.2 Packages and Parts

An Office Open XML document is represented as a series of related *parts* that are stored in a container called a *package*. Information about the *relationships* between a package and its parts is stored in the package's *package-relationship ZIP item*. Information about the *relationships* between two parts is stored in the *part-relationship ZIP item* for the source part. A package is an ordinary ZIP archive, which contains that package's content-type item, relationship items, and parts. (Packages are discussed further in ECMA-376-2.)

A WordprocessingML document contains a part for the body of the text; it might also contain a part for an image referenced by that text, and parts defining document characteristics, styles, and fonts. A SpreadsheetML document contains a separate part for each worksheet; it might also contain parts for images. A PresentationML document contains a separate part for each slide.

8.3 Consumers and Producers

A tool that can read and understand a package is called a *consumer*, while one that can create a package is called a *producer*. An application can be a consumer, a producer, or both. For example, when a word processor creates a new document, it acts as a producer. When it is used to open an existing document for reading or search purposes, it acts as a consumer. When it is used to open an existing document, edit it, and save the result, it acts as both consumer and producer. Similar scenarios exist for spreadsheet and presentation applications.

8.4 WordprocessingML

This subclause introduces the overall form of a WordprocessingML package, and identifies some of its main components. (See Annex L for a more detailed introduction.)

A WordprocessingML package has a relationship of type `officeDocument`, which specifies the location of the main part in the package. For a WordprocessingML document, that part contains the main text of the document.

A WordprocessingML package's main part starts with a word processing root element. That element contains a *body*, which, in turn, contains one or more *paragraphs* (as well as tables, pictures, and the like). A paragraph contains one or more runs, where a *run* is a container for one or more pieces of *text* having the same set of properties. Like many elements that defined a logical piece of a word processing document, each run and paragraph can have associated with it a set of *properties*. For example, a run might have the property *bold*, which indicates that run's text is to be displayed in a bold typeface.

A WordprocessingML document is organized into *sections*, and the layout of a page on which the text appears within a section is controlled by that section's properties. For example, each section can have its own *headers* and *footers*.

One relationship from the document part specifies the document's styles. A *style* defines a text display format. A style can have properties, which can be applied to individual paragraphs or runs. Styles make runs more compact by reducing the number of repeated definitions and properties, and the amount of work required to make changes to the document's appearance. With styles, the appearance of all the pieces of text that share a common style can be changed in one place, in that style's definition.

A series of paragraphs can have *numbering* applied to them via a numbering definition instance or a numbering style.

Data in a WordprocessingML document can be organized in a *table*, a two-dimensional grid of *cells* organized into *rows* and *columns*. Cells and whole tables can have associated properties. A cell can contain text and paragraphs, for example.

Text within a WordprocessingML document can be determined dynamically via the use of *fields*. Fields consist of *field instructions* (the text that dictates the field's dynamic behavior) and the *field result* (the text resulting from the dynamic calculation of the field instructions). For example, page numbers are represented as fields. A *hyperlink* consists of two pieces of information: the hyperlink itself—the text the user clicks—and the target for the link. Potential targets include external files, e-mail addresses, web sites, and bookmarks within the document itself.

A WordprocessingML document can also contain *custom markup*, user-defined semantics applied to arbitrary document content.

A WordprocessingML document is not stored as one large body in a single part; instead, the elements that implement certain groupings of functionality are stored in separate parts. For example, all footnotes in a document are stored in one footnote part, while each section can have up to three different header parts and three different footer parts, to support headers and footers on odd-numbered pages, even-numbered pages, and the first page.

8.5 SpreadsheetML

This subclause introduces the overall form of a SpreadsheetML package, and identifies some of its main components. (See Annex L for a more detailed introduction.)

A SpreadsheetML package has a relationship of type `officeDocument`, which specifies the location of the main part in the package. For a SpreadsheetML document, that part contains the workbook definition.

A SpreadsheetML package's main part starts with a spreadsheet root element. That element is a *workbook*, which refers to one or more *worksheets*, which, in turn, contain the data. A worksheet is a two-dimensional grid of *cells* that are organized into *rows* and *columns*.

The cell is the primary place in which data is stored and operated on. A cell can have a number of characteristics, such as numeric, text, date, or time *formatting*; *alignment*; *font*; *color*; and a *border*. Each cell is identified by a *cell reference*, a combination of its column and row headings.

Each horizontal set of cells in a worksheet is called a *row*, and each row has a heading numbered sequentially, starting at 1. Each vertical set of cells in a worksheet is called a *column*, and each column has an alphabetic heading named sequentially from A–Z, then AA–AZ, BA–BZ, and so on.

Instead of data, a cell can contain a *formula*, which is a recipe for calculating a value. Some formulas—called *functions*—are predefined, while others are user-defined. Examples of predefined formulas are AVERAGE, MAX, MIN, and SUM. A function takes one or more arguments on which it operates, producing a result. For example, in the formula SUM(B1:B4), there is one argument, B1:B4, which is the range of cells B1–B4, inclusive.

Other features that a SpreadsheetML document can contain include the following: *comments*, *hyperlinks*, *images*, and sorted and filtered *tables*.

A SpreadsheetML document is not stored as one large body in a single part; instead, the elements that implement certain groupings of functionality are stored in separate parts. For example, all the data for a worksheet is stored in that worksheet's part, all string literals from all worksheets are stored in a single shared string part, and each worksheet having comments has its own comments part.

8.6 PresentationML

This subclause introduces the overall form of a PresentationML package, and identifies some of its main components. (See Annex L for a more detailed introduction.)

A PresentationML package has a relationship of type `officeDocument`, which specifies the location of the main part in the package. For a PresentationML document, that part contains the presentation definition.

A PresentationML package's main part starts with a presentation root element. That element contains a *presentation*, which, in turn, refers to a *slide list*, a *slide master list*, a *notes master list*, and a *handout master list*. The slide list refers to all of the slides in the presentation; the slide master list refers to all of the slide masters used in the presentation; the notes master contains information about the formatting of notes pages; and the handout master describes how a handout looks.

A *handout* is a printed set of slides that can be handed out to an *audience* for future reference.

As well as text and graphics, each slide can contain *comments* and *notes*, can have a *layout*, and can be part of one or more *custom presentations*. (A comment is an annotation intended for the person maintaining the presentation slide deck. A note is a reminder or piece of text intended for the presenter or the audience.)

Other features that a PresentationML document can contain include the following: *animation*, *audio*, *video*, and *transitions* between slides.

A PresentationML document is not stored as one large body in a single part; instead, the elements that implement certain groupings of functionality are stored in separate parts. For example, all comments in a document are stored in one comment part while each slide has its own part.

8.7 Supporting MLs

This subclause introduces the set of markup languages used across package categories. (See Annex L for a more detailed introduction.)

The three markup languages described above define the structure of a package that is either a document (WordprocessingML), a spreadsheet (SpreadsheetML), or a presentation (PresentationML). However, there is also a set of shared markup languages used for common elements such as charts, diagrams, and drawing objects. These MLs are discussed below.

8.7.1 DrawingML

DrawingML specifies the location and appearance of drawing elements in a package. For example, these elements could be, but are not limited to, shapes, pictures, and tables. The root element of a DrawingML XML fragment specifies the presence of a drawing at this location in the document.

A *shape* is a geometric object such as a circle, square, or rectangle; a *picture* is an image presented inside the document; and a *table* is a two-dimensional grid of *cells* organized into *rows* and *columns*. Cells and whole tables can have associated properties. A cell can contain text, for example.

DrawingML also specifies the location and appearance of charts in a package. The root element of a chart part is chart, and specifies the appearance of the chart at this location in the document.

In addition, DrawingML specifies package-wide appearance characteristics, such as the package's theme. The *theme* of a document specifies the *color scheme*, *fonts*, and *effects*, which can be referenced by parts of the document—such as text, drawings, charts, and diagrams—in order to create a consistent visual presentation.

A *chart* is a presentation of data in a graphical fashion, such as a pie chart, bar chart, line chart, in order to make trends and exceptions in the data more visually apparent.

DrawingML also specifies the location and appearance of diagrams in a document. Together, the following four parts define a diagram:

- The *data* part (§14.2.4) specifies individual items of information presented in the diagram. Typically, each piece is a simple line of text, but depending on the diagram, an item of data might also be an image.
- The *layout* part (§14.2.5) specifies how the data and shapes are laid out to create the resulting diagram.
- The *colors* part (§14.2.3) specifies the color which is applied to each individual shape in the diagram.
- The *styles* part (§14.2.6) defines how each individual shape in the diagram maps to the document's theme.

8.7.2 Custom XML Data Properties

Custom XML Data properties allow the ability to store arbitrary XML in a package, along with schema information used by that XML.

8.7.3 File Properties

The *core file properties* of a package enable users to discover, get, and set common sets of properties from within that package, regardless of whether it's a WordprocessingML, SpreadsheetML, or PresentationML package, or another use of OPC. Such properties include creator name, creation date, title, and description.

Extended file properties are specific to Office Open XML packages. For example, for a WordprocessingML package, these properties include the number of characters, words, lines, paragraphs, and pages in the document. For a SpreadsheetML package, these properties include worksheet titles. For a PresentationML package, these properties include presentation format, the number of slides, the number of notes, and whether or not any slides are hidden.

Custom file properties are defined by the user. Examples include the name of the client for whom the document was prepared, a date/time on which some event happened, a document number, or some Boolean status flag. Each custom file property has a value, and that value has a data type.

8.7.4 Math

Math is used, mainly in documents, to specify the structure and appearance of equations. The outermost root element can be either oMath or oMathPara, the latter being a math paragraph with one or more equations where each equation is specified using a single oMath element

8.7.5 Bibliography

Bibliography specifies the structure for all references stored within a document, for use in citations or a bibliography.

End of informative text.

9. Packages

An Office Open XML document is stored as a package, whose format is defined by ISO/IE 29500-2. This subclause contains information regarding Office Open XML's use of OPC.

Throughout ECMA-376, the Open Packaging Conventions are referred to by their abbreviated name, OPC.

9.1 Office Open XML's Use of OPC

While the OPC specification is designed for the representation of Office Open XML documents, it could also support a much broader range of applications. Clarifications to the use of OPC are discussed in the following subordinate subclauses. Any requirement not mentioned here is inherited from the OPC specification.

9.1.1 Part Addressing

Parts in an Office Open XML package targeted by relationships are addressed in relationship markup through part names. External document resources targeted by a relationship can be addressed using both relative and absolute references.

9.1.2 Fragments

Fragment identifiers are supported as part of all Office Open XML external relationship targets and some Office Open XML internal relationship targets.

9.1.3 Physical Packages

Each Office Open XML document is implemented as a ZIP archive.

9.1.4 Unknown Parts

With the exception of relationship parts, all other parts in an Office Open XML document that are not the target of an implicit or explicit relationship are considered *unknown parts*. Unknown parts shall be ignored on document consumption and can, but need not, be discarded on production.

9.1.5 Trash Items

Trash items represent parts that have been discarded or are no longer in use. Trash items shall not conform to OPC part naming guidelines as defined in ECMA-376-2 and shall not be associated with a content type. All trash items shall follow the naming scheme: [trash]/HHHH.dat where H represents a hexadecimal digit.

[*Example:* A package has two parts that must be updated in-place but both parts have grown beyond their growth hints. The newer updated parts are added as new ZIP items while the original parts are renamed to:

```
[trash]/0000.dat
[trash]/0001.dat
```

end example]

9.1.6 Invalid Parts

ZIP archive items that do not conform to OPC part naming guidelines or are not associated with a content type shall not be allowed in an Office Open XML document, with the exception of items specifically defined by ECMA-376-2 and trash items.

9.1.7 Unknown Relationships

All relationships not defined within ECMA-376 are considered *unknown relationships*. Unknown relationships are permitted within an Office Open XML document provided that they conform to relationship markup guidelines as defined by the OPC specification. Specifically:

- Conforming consumers shall not fail to load a document containing unknown relationships.
- Conforming producers that are also consumers can, but are not required to, roundtrip and preserve unknown relationships and their target parts.

It is a requirement of ECMA-376 that dynamic extension mechanisms, such as scripting languages and macro mechanisms, shall use, for the executable parts, the correct content types, and shall not use any of the content types already defined in ECMA-376.

[*Guidance*: This subclause defines the general behavior for the consumption of unknown relationships. A conforming producer that wishes to store custom business data in an Office Open XML document should use instead the known relationship type for Custom XML Data Storage parts, as defined in §15.2.4. *end guidance*]

9.1.8 Interleaving

Interleaving as defined in ECMA-376-2 shall not be used for Office Open XML documents.

9.2 Relationships in Office Open XML

In OPC, relationships describe references from parts to other internal resources in the package or to external resources. They represent the type of connection between a source part and a target resource, and make the connection directly discoverable without looking at the part contents, so they are quick to resolve.

The same ZIP item can be the target of multiple relationships. [*Note*: Having multiple paths to a target can make access to that target more convenient. *end note*]

Office Open XML imposes constraints on relationships, described in subsequent clauses of this Part of ECMA-376. Relationships in Office Open XML are either explicit or implicit.

For an explicit relationship, a resource is referenced from a source part's XML using the Id attribute of a Relationship tag. [*Example*: A document part can have a relationship to a hyperlink only if that hyperlink's Relationship element's Id attribute value is referenced explicitly by the document part's XML. *end example*]
 [*Note*: Because this mechanism is used generically across multiple XML elements, explicit relationships can be extracted from an Office Open XML document without prior knowledge of tag semantics. *end note*]. Certain

relationships shall be *explicit*. All other relationships are *implicit*. [Note: The syntax for specifying an implicit relationship varies based on the content model of the XML element which is the source of the relationship. *end note*]. Relationships that are required or permitted, and restrictions on those relationships are described in §10–15 of this Part of ECMA-376.

[Example: Consider a WordprocessingML document that contains the following footnote sentence fragment, "... produced by Ecma¹ (<http://www.ecma-international.org/>).", which contains a footnote and a hyperlink to a web site. The relationship from a source to a footnote is implicit while that to a hyperlink is explicit.

The Main Document part's relationship file contains the following:

```
<Relationships ...>
  <Relationship Id="rId5" Type=".../footnotes"
    Target="footnotes.xml"/>
  <Relationship Id="rId7" Type=".../hyperlink"
    Target="http://www.ecma-international.org/" TargetMode="External"/>
</Relationships>
```

All footnotes for a WordprocessingML document are contained in the same Footnotes part. Let's look at how the Main Document refers to the footnote. At the point at which the footnote reference is inserted, the following XML is present:

```
<w:r>
  <w:footnoteReference w:id="2"/>
</w:r>
```

The `w:id="2"` refers to the footnote with `id=2` in the Footnotes part, the relevant piece of which is:

```
<w:footnote w:id="2">
  ...
  Ecma is an international standards development organization (SDO).
  ...
</w:footnote>
```

In the case of the hyperlink, the main document part makes an explicit reference to this relationship when it refers to the hyperlink, by using the following:

```
<w:hyperlink r:id="rId7" w:history="1">
  ...
</w:hyperlink>
```

The important distinction here is that there is no explicit reference to a relationship ID designating the Footnotes part. The reference to the footnote with `id=2` is "understood" to be in the Footnotes part that must always exist if there are any footnotes in the document. *end example*]

[*Example:* The following figure shows how the source, relationship item, and the target relate to each other for implicit and explicit relationships, respectively. The target does not have to be a file, however.

The dots correspond to attributes of relevant elements. Where one attribute refers to a piece in another part, this is indicated by arrows. Solid arrows indicate that the value of the source directly corresponds to the value at the target (for instance, `id=rId4` in the source part corresponds to `id=rId4` in the relationship item).

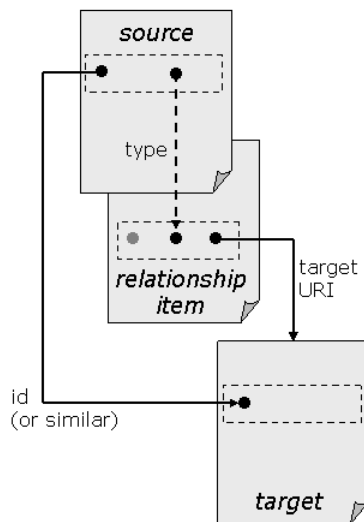
Dotted arrows indicate that the value of the source only implicit corresponds to the value of the target (for instance, "footnoteReference" in the source indicates the relationship type "footnotes" in the relationship item).

The main difference between the two types of relationship is that for implicit relationships, the id of the reference refers to an element with the same id in the target part, whereas for explicit relationships, the id refers to a relationship with the same id in the relationship item.

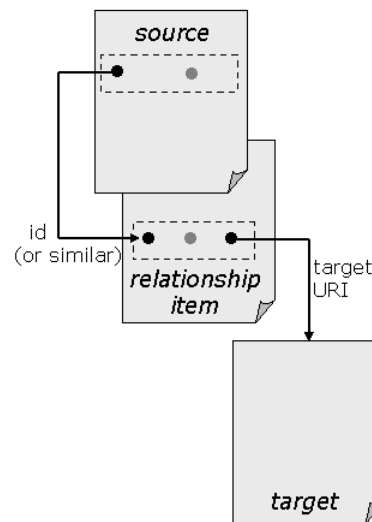
Both relationship types use the target URI of the relationship in the relationship item to locate the target.

For explicit relationships, the id in the source XML maps directly to the id of a relationship item with a direct explicit reference to the target. For implicit relationships, the relationship item is implied by the containing tag (e.g., footnote) and the id in the source XML is used to locate the correct element within the implied target.

Implicit relationship

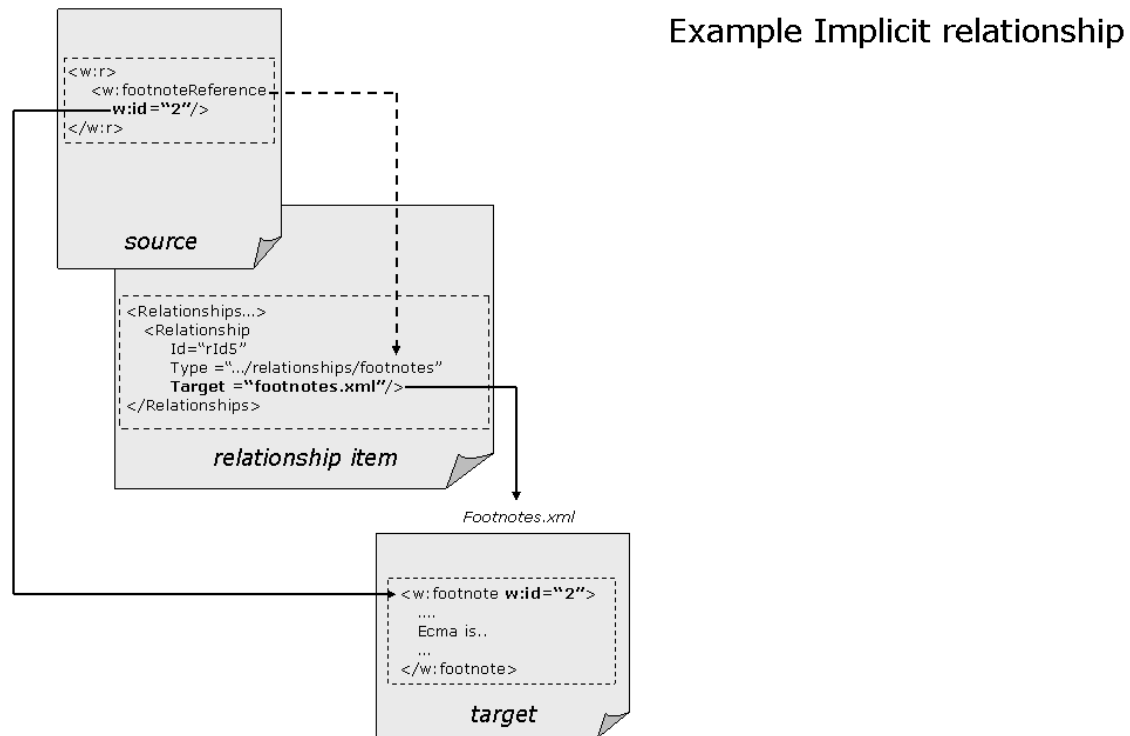


Explicit relationship



end example]

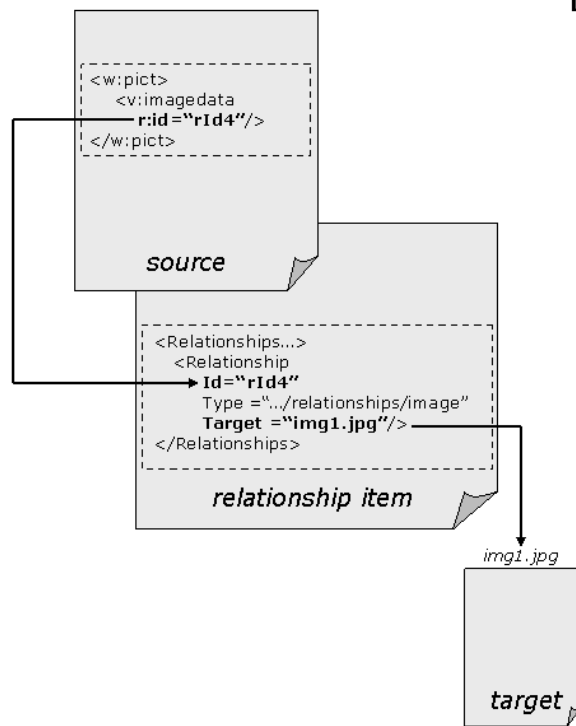
[Example: The following figure shows the implicit relationship for the footnote example described earlier.



end example]

[Example: The following figure shows an explicit relationship.

Example Explicit relationship



end example]

10. Markup Compatibility and Extensibility

Office Open XML documents are designed to allow for innovation by extending their capabilities via a scheme defined by Part 3. This subclause contains information regarding Office Open XML's use of the Markup Compatibility constructs.

10.1 Constraints on Office Open XML's Use of Markup Compatibility and Extensibility

While the Markup Compatibility and Extensibility specification is designed for and used by Office Open XML documents, it could also be used to support a much broader range of applications. As a result, the use of some Markup Compatibility and Extensibility features is restricted within Office Open XML documents. These additional requirements are discussed in the following subordinate subclauses. Unless explicitly specified below, all normative requirements of the Markup Compatibility and Extensibility specification apply to Office Open XML documents.

10.1.1 PreserveElements and PreserveAttributes

The PreserveElements and PreserveAttributes elements, as defined in Part 3, allow a markup language to specify the conditions under which extensions should be round-tripped, even when their contents are edited. Within the context of the markup languages explicitly defined by ECMA-376, no such conditions are specified, and therefore applications are not obliged to support these hints at any point in an Office Open XML document. Instead, the well-defined extensibility constructs defined below should be used.

All other constructs defined in Part 3 shall be supported.

10.1.2 Office Open XML Native Extensibility Constructs

Clause 12 of Part 3 specifies the ability for a markup language to define additional constructs for extensibility of a specific markup language. Within the context of Office Open XML documents, the extLst element(s) defined in individual markup languages shall allow the round-tripping of all unknown content regardless of the state of the PreserveElements and PreserveAttributes elements. See the reference material in §17–23 for additional information on the XML elements that allow the use of the extLst construct.

11. WordprocessingML

This clause contains specifications for relationship items and parts that are specific to WordprocessingML. Parts that can occur in a WordprocessingML document, but are not WordprocessingML-specific, are specified in §15.2. Unless stated explicitly, all references to relationship items, content-type items, and parts in this clause refer to WordprocessingML ZIP items.

11.1 Glossary of WordprocessingML-Specific Terms

The following terms are used in the context of a WordprocessingML document:

document setting — A document-level property that affects the handling of a given document, and influences the appearance and behavior of the current document, as well as the stored document-level state.

document building block — A reusable element in a template. [*Note*: Such elements include boilerplate text, cover pages, equations, footers, headers, tables, text boxes, and watermarks. *end note*]

glossary document — An additional WordprocessingML document story used to store reusable fragments of rich WordprocessingML content. It is called the glossary document as this story contains one or more fragments that can be indexed and extracted by name, like items in a glossary.

master document — A document that is the parent of one or more subdocuments. [*Note*: A master document can be used to manage a multipart document, such as a book having several chapters. In such as case, the master document might contain the cover page, front matter, table of contents, and cross-reference index, while each chapter and appendix resides in its own subdocument. *end note*]

section — A portion of a document in which certain page formatting options can be set. [*Note*: A new section is created to change such properties as line numbering, number of columns, or headers and footers. *end note*]

subdocument — A piece of a master document. [*Note*: A chapter or appendix might be a subdocument in a book. *end note*]

supplementary document storage location — A part within a WordprocessingML document in which fragments of WordprocessingML content can be stored separate from the printed page. See also **glossary document**

template — A document that is a pattern for creating other documents. A template can contain text, formatting, and graphics, among other things, such that documents based on it automatically have access to these elements.

11.2 Package Structure

A WordprocessingML package shall contain a package-relationship item and a content-type item. The package-relationship item shall have implicit relationships with targets of the following type:

- One Main Document part (§11.3.10)

The package-relationship item is permitted to have implicit relationships with targets of the following type:

- Digital Signature Origin (§15.2.7)
- File Property parts (§15.2.12) (Application-Defined File Properties, Core File Properties, and Custom File Properties), as appropriate.
- Thumbnail (§15.2.16).

The required and optional relationships between parts are defined in §16.1 and its subordinate clauses.

[*Example:* The following package represents the minimal conformant WordprocessingML package as defined by ECMA-376:

First, the content type for relationship parts and the Main Document part (the only required part) must be defined (physically located at `/[Content_Types].xml` in the package):

```
<Types xmlns="http://schemas.openxmlformats.org/package/2006/content-types">
  <Default Extension="rels"
    ContentType="application/vnd.openxmlformats-
      package.relationships+xml"/>
  <Override PartName="/document.xml"
    ContentType="application/vnd.openxmlformats-
      officedocument.wordprocessingml.document.main+xml"/>
</Types>
```

Next, the single required relationship (the package-level relationship to the Main Document part) must be defined (physically located at `/_rels/.rels` in the package):

```
<Relationships xmlns="...">
  <Relationship Id="rId1"

Type="http://purl.oclc.org/ooxml/officeDocument/relationships/officeDocument"
  Target="document.xml"/>
</Relationships>
```

Finally, the minimum content for the Main Document part must be defined (physically located at `/document.xml` in the package):

```
<w:document xmlns:w="...">
  <w:body>
    <w:p/>
  </w:body>
</w:document>
```

end example]

[*Example:* Consider a WordprocessingML document that is an early draft of ECMA-376. Here's an example of the hierarchical folder structure that might be used for the ZIP items in the package for that document. As shown, one part, Main Document (stored in the ZIP item /word/document.xml), has its own relationship item:

/[Content_Types].xml	<i>Content-type item</i>
/_rels/.rels	<i>Package-relationship item</i>
/docProps/app.xml	<i>Application-Defined File Properties part</i>
/docProps/core.xml	<i>Core File Properties part</i>
/word/document.xml	<i>Main Document part</i>
/word/_rels/document.xml.rels	<i>Part-relationship item</i>
/word/comments.xml	<i>Comment part</i>
/word/endnotes.xml	<i>Endnotes part</i>
/word/fontTable.xml	<i>Font Table part</i>
/word/footer1.xml	<i>Footer parts</i>
/word/footer2.xml	
/word/footer3.xml	<i>Footnotes part</i>
/word/footer4.xml	
/word/footnotes.xml	<i>Header parts</i>
/word/header1.xml	
/word/header2.xml	
/word/header3.xml	
/word/header4.xml	
/word/header5.xml	
/word/header6.xml	<i>Numbering Definitions part</i>
/word/numbering.xml	
/word/settings.xml	
/word/styles.xml	
/word/theme/theme1.xml	<i>Theme part</i>

The package-relationship item contains the following:

```
<Relationships xmlns="...">
  <Relationship Id="rId3"
    Type="http://.../extended-properties" Target="docProps/app.xml"/>
  <Relationship Id="rId2"
    Type="http://.../core-properties" Target="docProps/core.xml"/>
  <Relationship Id="rId1"
    Type="http://.../officeDocument" Target="word/document.xml"/>
</Relationships>
```

end example]

11.3 Part Summary

The subclauses subordinate to this one describe in detail each of the part types specific to WordprocessingML.

[*Note:* For convenience, information from those subclauses is summarized in the following table:

Part	Relationship Target of	Root Element	Ref.
Alternative Format Import	Comments, Endnotes, Footer, Footnotes, Header, or Main Document	Not applicable	§11.3.1
Comments	Glossary Document or Main Document	comments	§11.3.2
Document Settings	Glossary Document or Main Document	settings	§11.3.3
Endnotes	Glossary Document or Main Document	endnotes	§11.3.4
Font Table	Glossary Document or Main Document	fonts	§11.3.5
Footer	Glossary Document or Main Document	fttr	§11.3.6
Footnotes	Glossary Document or Main Document	footnotes	§11.3.7
Glossary Document	Main Document	glossaryDocument	§11.3.8
Header	Glossary Document or Main Document	hdr	§11.3.9
Main Document	WordprocessingML package	document	§11.3.10
Numbering Definitions	Glossary Document or Main Document	numbering	§11.3.11
Style Definitions	Glossary Document or Main Document	styles	§11.3.12
Web Settings	Glossary Document or Main Document	webSettings	§11.3.13

end note]

11.3.1 Alternative Format Import Part

Content Type:	<p>Any text-based content, support for which is application-defined. [<i>Note:</i> Some examples of formats which might be supported include:</p> <ul style="list-style-type: none"> • Text = text/plain • HTML = text/html • WordprocessingML = application/vnd.openxmlformats-officedocument.wordprocessingml.document • XHTML = application/xhtml+xml
---------------	--

	<i>end note</i>
Root Namespace:	not applicable
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/aFChunk

An alternative format import part allows content specified in an alternate format specified above to be embedded directly in a WordprocessingML document in order to allow that content to be migrated to the WordprocessingML format.

Any document part that permits a `p` element can also contain an `altChunk` element, whose `id` attribute refers to a relationship. That relationship shall target a part within the package, which contains the content to be imported into this WordprocessingML document.

A package is permitted to contain zero or more Alternative Format Import parts, each of which shall have a corresponding alternate format file that is the target of an explicit relationship from a Comments (§11.3.2), Endnotes (§11.3.4), Footer (§11.3.6), Footnotes (§11.3.7), Header (§11.3.9), or Main Document (§11.3.10) part. This relationship shall be explicitly referenced using its relationship ID in the source part using the appropriate XML syntax (i.e., in the `id` attribute on the `altChunk` element), and the presence of this relationship without such a reference shall be considered non-conformant.

ECMA-376 does not specify how one might create a WordprocessingML package that contains Alternative Format Import relationships and `altChunk` elements.

The following requirements are applied to applications with respect to this part:

- An application that is solely a conforming consumer shall not reject documents containing one or more instances of this part
- An application that is both a conforming consumer and producer shall not reject documents containing instances of this part and shall convert/remove any instances of this part before acting as producer.
- An application that is solely a conforming producer shall not create a WordprocessingML package that contains Alternative Format Import relationships and elements.

[*Note*: The Alternative Format Import machinery provides a one-time conversion facility. A producer could have an extension that allows it to generate a package containing these relationships and elements, yet when run in conforming mode, does not do so. *end note*]

[*Example*: The following Main Document part-relationship item contains a relationship to an Alternative Format Import part:


```

<Relationships xmlns="...">
  <Relationship Id="rId5"
    Type="http://.../aFChunk" Target="Demo.html"
    TargetMode="Internal"/>
</Relationships>

```

The Main Document part contains the following XML fragment:

```

<w:body>
  ...
  <w:p/>
  <w:altChunk r:id="rId5"/>
  <w:p/>
  ...
</w:body>

```

which results in the entire contents of Demo.html being converted and brought into the document at that point (assuming that the content type of Demo.html is supported by the application consuming this WordprocessingML file). *end example*]

An Alternative Format Import part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

An Alternative Format Import part shall not have any explicit or implicit relationships to parts defined by ECMA-376.

A producer that wants interoperability should use one of the following standard formats:

- HTML - application/text/html
- TEXT - application/text/plain (UTF-16)

11.3.2 Comments Part

Content Type:	application/vnd.openxmlformats-officedocument.wordprocessingml.comments+xml
Root Namespace:	http://purl.oclc.org/ooxml/wordprocessingml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/comments

An instance of this part type contains the information about each comment in the document.

A package shall contain no more than two Comments parts. If it exists, one instance of that part shall be the target of an implicit relationship from the Main Document (§11.3.10) part, and the other shall be the target of an implicit relationship from the Glossary Document (§11.3.8) part.

[*Example:* The following Main Document part-relationship item contains a relationship to the Contents part, which is stored as the ZIP item comment.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId93"
    Type="http://.../comments" Target="comments.xml"/>
</Relationships>
```

end example]

The root element for a Comment part shall be comments.

[*Example:*

```
<w:comments ... >
  <w:comment>
    ...
  </w:comment>
  ...
</w:comments>
```

end example]

The XML markup for a comment in a Main Document part uses the commentReference element.

[*Example:* Consider the case in which the Main Document part contains the text "... in the Standard.", and there is an comment inserted immediately after the period:

```
<w:p ...>
  ...
  <w:r>
    <w:t>... in the Standard.</w:t>
  </w:r>
  <w:r>
    <w:commentReference w:id="1"/>
  </w:r>
</w:p>
```

end example]

Each comment has a corresponding comment element in the Comments part, which contains the text of the comment.

[*Example:* The text of the comment is "This is my comment.":

```

<w:comments xmlns:w="..."
  <w:comment w:id="1">
    <w:p>
      <w:r>
        <w:t>This is my comment.</w:t>
      </w:r>
    </w:p>
  </w:comment>
</w:comments>

```

end example]

A Comments part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Comments part is permitted to contain explicit relationships to the following parts defined by ECMA-376:

- Alternative Format Import (§11.3.1)
- Chart (§14.2.1)
- Content Part (§15.2.4)
- Diagrams: Diagram Colors (§14.2.3), Diagram Data (§14.2.4), Diagram Layout Definition (§14.2.5) and Diagram Styles (§14.2.6)
- Embedded Control Persistence (§15.2.9)
- Embedded Object (§15.2.10)
- Embedded Package (§15.2.11)
- Hyperlinks (§15.3)
- Images (§15.2.14)
- Video (§15.2.17)

A Comments part shall not have any implicit or explicit relationships to any other part defined by ECMA-376.

11.3.3 Document Settings Part

Content Type:	application/vnd.openxmlformats-officedocument.wordprocessingml.settings+xml
Root Namespace:	http://purl.oclc.org/ooxml/wordprocessingml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/settings

An instance of this part type contains all the document's properties.

A package shall contain no more than two Document Settings parts. If it exists, one instance of that part shall be the target of an implicit relationship from the Main Document (§11.3.10) part, and the other shall be the target of an implicit relationship from the Glossary Document (§11.3.8) part.

[*Example:* The following Main Document part-relationship item contains a relationship to a Document Settings part, which is stored in the ZIP item documentProperties1.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId4"
    Type="http://.../settings" Target="settings.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be settings.

[*Example:*

```
<w:settings ... >
  ...
  <w:defaultTabStop w:val="360"/>
  <w:footnotePr>
    ...
  </w:footnotePr>
  <w:endnotePr>
    ...
  </w:endnotePr>
  <w:rsids>
    ...
  </w:rsids>
  ...
</w:settings>
```

end example]

A Document Settings part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Document Settings part is permitted to contain explicit relationships to the following parts defined by ECMA-376:

- Document Template (§11.4)
- Mail Merge Data Source (§11.7)
- Mail Merge Header Data Source (§11.8)
- XSL Transformation (§11.9)

A Document Settings part shall not have any implicit or explicit relationships to any other part defined by ECMA-376.

11.3.4 Endnotes Part

Content Type:	application/vnd.openxmlformats-officedocument.wordprocessingml.endnotes+xml
Root Namespace:	http://purl.oclc.org/ooxml/wordprocessingml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/endnotes

An instance of this part type contains all the endnotes for the document.

A package shall contain no more than two Endnotes parts. If it exists, one instance of that part shall be the target of an implicit relationship from the Main Document (§11.3.10) part, and the other shall be the target of an implicit relationship from the Glossary Document (§11.3.8) part.

[*Example:* The following Main Document part-relationship item contains a relationship to the Endnotes part, which is stored as the ZIP item endnotes.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId6"
    Type="http://.../endnotes" Target="endnotes.xml"/>
</Relationships>
```

end example]

The root element for an Endnotes part shall be endnotes.

[*Example:*

```
<w:endnotes xmlns:w="..." ...>
  <w:endnote ...>
    ...
  </w:endnote>
  <w:endnote ...>
    ...
  </w:endnote>
</w:endnotes>
```

end example]

The XML markup for an endnote in a Main Document part uses the endnoteReference element.

[*Example:* Consider the case in which the Main Document part contains the text "... in the Standard.", and there is an endnote inserted immediately after the period:

```

<w:p ...>
  ...
  <w:r>
    <w:t>... in the Standard.</w:t>
  </w:r>
  <w:r>
    <w:rPr>
      <w:rStyle w:val="EndnoteReference"/>
    </w:rPr>
    <w:endnoteReference w:id="5"/>
  </w:r>
</w:p>

```

end example]

Each endnote has a corresponding endnote element in the Endnotes part, which contains the text of the endnote, and the endnoteRef element.

[*Example:* The text of the endnote is "This can be downloaded from <http://www.aabbcc.com/index.html>." where "<http://www.aabbcc.com/index.html>" is marked as a hyperlink:

```

<w:endnotes xmlns:w="...">
  <w:endnote w:id="5">
    <w:p>
      <w:r>
        <w:rPr>
          <w:rStyle w:val="EndnoteReference"/>
        </w:rPr>
        <w:endnoteRef/>
      </w:r>
      <w:r>
        <w:t xml:space="preserve"> This can be downloaded from </w:t>
      </w:r>
      <w:hyperlink r:id="rId2">
        <w:r>
          <w:rPr>
            <w:rStyle w:val="Hyperlink"/>
          </w:rPr>
          <w:t>http://www.aabbcc.com/index.html</w:t>
        </w:r>
      </w:hyperlink>
    </w:p>
  </w:endnote>
</w:endnotes>

```

```

    <w:r>
      <w:t>.</w:t>
    </w:p>
  </w:endnote>
</w:endnotes>

```

end example]

An Endnotes part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

An Endnotes part is permitted to contain explicit relationships to the following parts defined by ECMA-376:

- Alternative Format Import (§11.3.1)
- Chart (§14.2.1)
- Content Part (§15.2.4)
- Diagrams: Diagram Colors (§14.2.3), Diagram Data (§14.2.4), Diagram Layout Definition (§14.2.5) and Diagram Styles (§14.2.6)
- Embedded Control Persistence (§15.2.9)
- Embedded Object (§15.2.10)
- Embedded Package (§15.2.11)
- Hyperlinks (§15.3)
- Images (§15.2.14)
- Video (§15.2.17)

An Endnotes part shall not have any implicit or explicit relationships to any other part defined by ECMA-376.

11.3.5 Font Table Part

Content Type:	application/vnd.openxmlformats-officedocument.wordprocessingml.fontTable+xml
Root Namespace:	http://purl.oclc.org/ooxml/wordprocessingml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/fontTable

An instance of this part type contains information about each of the fonts used by content in the document. When a consumer reads a WordprocessingML document, it shall use this information to determine which fonts to use to display the document when the specified fonts are not available on the consumer's system.

A package shall contain no more than two Font Table parts. If it exists, one instance of that part shall be the target of an implicit relationship in the part-relationship item for the Main Document (§11.3.10) part, and the other instance shall be the target of an implicit relationship from the Glossary Document (§11.3.8) part.

[Example: The following Main Document part-relationship item contains a relationship to the Font Table part, which is stored as the ZIP item fontTable.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../fontTable" Target="fontTable.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be fonts.

[Example:

```
<w:fonts ... >
  <w:font w:name="Calibri">
    <w:panose1 w:val="020F0502020204030204"/>
    <w:charset w:val="00"/>
    <w:family w:val="swiss"/>
    <w:pitch w:val="variable"/>
    <w:sig w:usb0="A00002EF" w:usb1="4000207B" w:usb2="00000000"
      w:usb3="00000000" w:csb0="0000009F" w:csb1="00000000"/>
  </w:font>
</w:fonts>
```

end example]

A Font Table part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Font Table part is permitted to contain explicit relationships to the following parts defined by ECMA-376:

- Fonts (§15.2.13)

A Font Table part shall not have any implicit or explicit relationships to any other part defined by ECMA-376.

11.3.6 Footer Part

Content Type:	application/vnd.openxmlformats-officedocument.wordprocessingml.footer+xml
Root Namespace:	http://purl.oclc.org/ooxml/wordprocessingml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/footer

An instance of this part type contains the information about a footer displayed for one or more sections.

A package is permitted to contain zero or one Footer part for each kind of footer (first page, odd page, or even page) in each section of the document. Each Footer part shall be the target of an explicit relationship in the part-relationship item for the Main Document (§11.3.10) part, or the Glossary Document (§11.3.8) part.

[*Example:* The Main Document part-relationship item contains one relationship, for the odd footer part, which is stored as the ZIP item footer3.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId91"
    Type="http://.../footer" Target="footer3.xml"/>
</Relationships>
```

end example]

The root element for a Footer part shall be ftr.

[*Example:*

```
<w:ftr xmlns:w="..." ...>
...
</w:ftr>
```

end example]

The XML markup for a footer in a section of a Main Document part involves the footerReference element in that section's sectPr element which explicitly references the relationship for the header.

[*Example:* Consider the case in which a section in the Main Document part contains odd and even headers, and an odd footer:

```
<w:document xmlns:w="...">
...
<w:sectPr>
  <w:footerReference w:val="rId89" w:type="default"/>
  <w:footerReference w:val="rId90" w:type="even"/>
  <w:footerReference w:val="rId91" w:type="first"/>
  <w:type w:val="oddPage"/>
  <w:pgSz w:w="11909" w:h="16834" w:code="9"/>
  <w:pgMar w:top="1440" w:right="1152" w:bottom="1440"
    w:left="1152" w:header="720" w:footer="720" w:gutter="0"/>
  <w:lnNumType w:countBy="1"/>
  <w:pgNumType w:numFmt="lowerRoman"/>
  <w:cols w:space="720"/>
</w:sectPr>
</w:document>
```

end example]

Each footer has a corresponding ftr element in a Footer part, which contains the text of the footer.

[*Example:* Here is the odd footer corresponding to the example above. It has the page number centered and displayed using lowercase Roman numerals (as set by the pgNumType element above):

```
<w:ftr xmlns:w="...">
  <w:p>
    <w:pPr>
      <w:pStyle w:val="Centered"/>
    </w:pPr>
    <w:fldSimple w:instr="PAGE">
      <w:r>
        <w:rPr>
          <w:noProof/>
        </w:rPr>
        <w:t>i</w:t>
      </w:r>
    </w:fldSimple>
  </w:p>
</w:ftr>
```

end example]

A Footer part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Footer part is permitted to have explicit relationships to the following parts defined by ECMA-376:

- Alternative Format Import (§11.3.1)
- Chart (§14.2.1)
- Content Part (§15.2.4)
- Diagrams: Diagram Colors (§14.2.3), Diagram Data (§14.2.4), Diagram Layout Definition (§14.2.5) and Diagram Styles (§14.2.6)
- Embedded Control Persistence (§15.2.9)
- Embedded Object (§15.2.10)
- Embedded Package (§15.2.11)
- Hyperlinks (§15.3)
- Images (§15.2.14)
- Video (§15.2.17)

A Footer part shall not have any implicit or explicit relationships to any other part defined by ECMA-376.

11.3.7 Footnotes Part

Content Type:	application/vnd.openxmlformats-officedocument.wordprocessingml.footnotes+xml
Root Namespace:	http://purl.oclc.org/ooxml/wordprocessingml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/footnotes

An instance of this part type contains all the footnotes for the document.

A package shall contain no more than two Footnotes parts. If it exists, one instance of that part shall be the target of an implicit relationship from the Main Document (§11.3.10) part, and the other shall be the target of an implicit relationship from the Glossary Document (§11.3.8) part.

[*Example:* The Main Document part-relationship item contains a relationship to the Footnotes part, which is stored as the ZIP item footnotes.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId5"
    Type="http://.../footnotes" Target="footnotes.xml"/>
</Relationships>
```

end example]

The root element for a Footnotes part shall be footnotes.

[*Example:*

```
<w:footnotes xmlns:w="..." ...>
  <w:footnote ...>
    ...
  </w:footnote>
  <w:footnote ...>
    ...
  </w:footnote>
</w:footnotes>
```

end example]

The XML markup for a footnote in a Main Document part involves the footnoteReference element.

[*Example:* Consider the case in which the Main Document part contains the text "... in the Standard.", and there is a footnote inserted immediately after the period:

```

<w:p ...>
  ...
  <w:r>
    <w:t>... in the Standard.</w:t>
  </w:r>
  <w:r>
    <w:rPr>
      <w:rStyle w:val="FootnoteReference"/>
    </w:rPr>
    <w:footnoteReference w:id="5"/>
  </w:r>
</w:p>

```

end example]

Each footnote has a corresponding footnote element in the Footnotes part, which contains the text of the footnote and the footnoteRef element.

[*Example:* The text of the footnote is "This can be downloaded from <http://www.aabbcc.com/index.html>." where "<http://www.aabbcc.com/index.html>" is marked as a hyperlink:

```

<w:footnotes xmlns:w="..."
  <w:footnote w:id="5">
    <w:p>
      <w:r>
        <w:rPr>
          <w:rStyle w:val="FootnoteReference"/>
        </w:rPr>
        <w:footnoteRef/>
      </w:r>
      <w:r>
        <w:t xml:space="preserve">This can be downloaded from </w:t>
      </w:r>
      <w:hyperlink r:id="rId2" w:history="1">
        <w:r>
          <w:rPr>
            <w:rStyle w:val="Hyperlink"/>
          </w:rPr>
          <w:t>http://www.aabbcc.com/index.html</w:t>
        </w:r>
      </w:hyperlink>
    </w:p>
  </w:footnote>
</w:footnotes>

```

```

    <w:r>
      <w:t>.</w:t>
    </w:r>
  </w:p>
</w:footnote>
</w:footnotes>

```

end example]

A Footnotes part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Footnotes part is permitted to have explicit relationships to the following parts defined by ECMA-376:

- Alternative Format Import (§11.3.1)
- Chart (§14.2.1)
- Content Part (§15.2.4)
- Diagrams: Diagram Colors (§14.2.3), Diagram Data (§14.2.4), Diagram Layout Definition (§14.2.5) and Diagram Styles (§14.2.6)
- Embedded Control Persistence (§15.2.9)
- Embedded Object (§15.2.10)
- Embedded Package (§15.2.11)
- Hyperlinks (§15.3)
- Images (§15.2.14)
- Video (§15.2.17)

A Footer part shall not have any implicit or explicit relationships to any other part defined by ECMA-376.

11.3.8 Glossary Document Part

Content Type:	application/vnd.openxmlformats-officedocument.wordprocessingml.document.glossary+xml
Root Namespace:	http://purl.oclc.org/ooxml/wordprocessingml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/glossaryDocument

An instance of this part type is a supplementary document storage location which stores the definition and content for content that shall be carried with the document for future insertion and/or use, but which shall not be visible within the contents of the main document story. *[Example: A legal contract template might include one or more optional clauses that shall not appear in the document until those clauses are inserted explicitly via a user action. To store these optional clauses until they are inserted, their contents are placed in the glossary document part. end example]*

[*Note:* This part is intended for storage of optional "document fragments" which are often used to perform document assembly. The use of the word *glossary* is a reference to the fact that each of these entries was historically referenced by its first word in legacy word processing applications, like definitions of terms in a traditional glossary. *end note*]

The root element for a part of this content type shall be `glossaryDocument`.

[*Example:* The following part contains two building blocks. The first block is named "rainbow colors", belongs to a category called "Misc", belongs to a gallery called "docParts", and contains the text "The colors ... and violet." The details of the second block have been omitted:

```
<w:glossaryDocument xmlns:w="..." >
  <w:docParts>
    <w:docPart>
      <w:docPartPr>
        <w:name w:val="rainbow colors"/>
        <w:style w:val="Normal"/>
        <w:category>
          <w:name w:val="Misc"/>
          <w:gallery w:val="docParts"/>
        </w:category>
      </w:docPartPr>
      <w:docPartBody>
        <w:p>
          <w:r>
            <w:t>The colors of the rainbow are red, orange, yellow,
              green, blue, indigo, and violet.</w:t>
          </w:r>
        </w:p>
      </w:docPartBody>
    </w:docPart>
    <w:docPart>
      ...
    </w:docPart>
  </w:docParts>
</w:glossaryDocument>
```

end example]

A package shall contain at most one Glossary Document part, and that part shall be the target of an implicit relationship from the Main Document (§11.3.10) part.

[*Example:* The following Main Document part-relationship item contains a relationship to a Glossary Document part, which is stored in the ZIP item `glossary/document.xml`:

```
<Relationships xmlns="...">
  <Relationship Id="rId4"
    Type="http://.../glossaryDocument" Target="glossary/document.xml"/>
</Relationships>
```

end example]

A Glossary Document part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Glossary Document part is permitted to have implicit relationships to the following parts defined by ECMA-376:

- Comments (§11.3.2)
- Document Settings (§11.3.3)
- Endnotes (§11.3.4)
- Font Table (§11.3.5)
- Footnotes (§11.3.7)
- Numbering Definitions (§11.3.11)
- Style Definitions (§11.3.11)

A Glossary Document part is permitted to have explicit relationships to the following parts defined by ECMA-376:

- Alternative Format Import (§11.3.1)
- Chart (§14.2.1)
- Content Part (§15.2.4)
- Diagrams: Diagram Colors (§14.2.3), Diagram Data (§14.2.4), Diagram Layout Definition (§14.2.5) and Diagram Styles (§14.2.6)
- Embedded Control Persistence (§15.2.9)
- Embedded Object (§15.2.10)
- Embedded Package (§15.2.11)
- Footer (§11.3.6)
- Header (§11.3.9)
- Hyperlinks (§15.3)
- Images (§15.2.14)
- Printer Settings (§15.2.15)
- Video (§15.2.17)

A Glossary Document part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

11.3.9 Header Part

Content Type:	application/vnd.openxmlformats-officedocument.wordprocessingml.header+xml
Root Namespace:	http://purl.oclc.org/ooxml/wordprocessingml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/header

An instance of this part type contains the information about a header displayed for one or more sections.

A package shall contain zero or one Header part for each kind of header (first page, odd page, or even page) in each section of the document. Each Header part shall be the target of an explicit relationship from the Main Document (§11.3.10) part or the Glossary Document (§11.3.8) part.

[*Example:* The Main Document part-relationship item contains two relationships: one for the even header part (which is stored as the ZIP item header2.xml) and one for the odd header part (which is stored as the ZIP item header3.xml):

```
<Relationships xmlns="...">
  <Relationship Id="rId89" Type="http://.../header" Target="header2.xml"/>
  <Relationship Id="rId90" Type="http://.../header" Target="header3.xml"/>
</Relationships>
```

end example]

The root element for a Header part shall be `hdr`.

[*Example:*

```
<w:hdr xmlns:w="..." ...>
  ...
</w:hdr>
```

end example]

The XML markup for a header in a section of a Main Document part involves the `headerReference` element in that section's `sectPr` element.

[*Example:* Consider the case in which a section in the Main Document part contains odd and even headers, and an odd footer:


```

<w:body>
...
<w:sectPr w:rsidR="00363F31" w:rsidSect="008D4B40">
  <w:headerReference w:val="rId89" w:type="default"/>
  <w:headerReference w:val="rId90" w:type="even"/>
  <w:headerReference w:val="rId91" w:type="first"/>
  <w:type w:val="oddPage"/>
  <w:pgSz w:w="11909" w:h="16834" w:code="9"/>
  <w:pgMar w:top="1440" w:right="1152" w:bottom="1440"
    w:left="1152" w:header="720" w:footer="720" w:gutter="0"/>
  <w:lnNumType w:countBy="1"/>
  <w:pgNumType w:fmt="lowerRoman"/>
  <w:cols w:space="720"/>
</w:sectPr>
</w:body>

```

end example]

Each header has a corresponding `hdr` element in a Header part, which contains the text of the header.

[*Example:* Here is the even header corresponding to the examples above:

```

<w:hdr xmlns:w="...">
  <w:p>
    <w:pPr>
      <w:pStyle w:val="Header"/>
    </w:pPr>
    <w:r>
      <w:t>My Test Document</w:t>
    </w:r>
  </w:p>
</w:hdr>

```

Here is the odd header corresponding to the examples above:

```
<w:hdr xmlns:w="...">
  <w:p>
    <w:pPr>
      <w:pStyle w:val="Header"/>
    </w:pPr>
    <w:r>
      <w:tab/>
      <w:t>Table of Contents</w:t>
    </w:r>
  </w:p>
</w:hdr>
```

end example]

A Header part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Header part is permitted to have explicit relationships to the following parts defined by ECMA-376:

- Alternative Format Import (§11.3.1)
- Chart (§14.2.1)
- Content Part (§15.2.4)
- Diagrams: Diagram Colors (§14.2.3), Diagram Data (§14.2.4), Diagram Layout Definition (§14.2.5) and Diagram Styles (§14.2.6)
- Embedded Control Persistence (§15.2.9)
- Embedded Object (§15.2.10)
- Embedded Package (§15.2.11)
- Hyperlinks (§15.3).
- Images (§15.2.14)
- Video (§15.2.17)

A Header part shall not have any implicit or explicit relationships to other parts defined by ECMA-376.

11.3.10 Main Document Part

Content Type(s):	application/vnd.openxmlformats-officedocument.wordprocessingml.document.main+xml application/vnd.openxmlformats-officedocument.wordprocessingml.template.main+xml
Root Namespace:	http://purl.oclc.org/ooxml/wordprocessingml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/officeDocument

An instance of this part type contains the body of the document.

A package shall contain a Main Document part (§11.3.10) part. The Main Document part shall be the target of a relationship in the package-relationship item.

The root element for a part of this content type shall be document.

[*Example:* Given the following package-relationship item excerpt:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../officeDocument" Target="word/document.xml"/>
</Relationships>
```

/word/document.xml" contains the following:

```
<w:document ...>
  <w:body>
    ...
  </w:body>
</w:document>
```

end example]

A Main Document part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Main Document part is permitted to have implicit relationships to the following parts defined by ECMA-376:

- Additional Characteristics (§15.2.1)
- Bibliography (§15.2.3)
- Comments (§11.3.2)
- Custom XML Data Storage (§15.2.4)
- Document Settings (§11.3.3)
- Endnotes (§11.3.4)
- Font Table (§11.3.5)
- Footnotes (§11.3.7)
- Glossary Document (§11.3.8)
- Numbering Definitions (§11.3.11)
- Style Definitions (§11.3.12)
- Theme (§14.2.7)
- Thumbnail (§15.2.16)

A Main Document part is permitted to contain explicit relationships to the following parts defined by ECMA-376:

- Alternative Format Import (§11.3.1)
- Chart (§14.2.1)

- Content Part (§15.2.4)
- Diagrams: Diagram Colors (§14.2.3), Diagram Data (§14.2.4), Diagram Layout Definition (§14.2.5) and Diagram Styles (§14.2.6)
- Embedded Control Persistence (§15.2.9)
- Embedded Object (§15.2.10)
- Embedded Package (§15.2.11)
- Footer (§11.3.6)
- Header (§11.3.9)
- Hyperlinks (§15.3)
- Images (§15.2.14)
- Printer Settings (§15.2.15)
- Subdocument (§11.6)
- Video (§15.2.17)

A Main Document shall not have implicit or explicit relationships to any other part defined by ECMA-376.

11.3.11 Numbering Definitions Part

Content Type:	application/vnd.openxmlformats-officedocument.wordprocessingml.numbering+xml
Root Namespace:	http://purl.oclc.org/ooxml/wordprocessingml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/numbering

An instance of this part type contains a definition for the structure of each unique numbering definition in this document.

[*Example:* If a set of paragraphs are added to a document which have a circle bullet at the first level, a square bullet at the second level, and a checkmark bullet at the third level, such as the following:

- First level
 - Second level
 - ✓ Third level

The numbering definition part contains the definition for each of these levels (their bullet style, indent, etc.) even if the second and third levels are not actually used in the document *end example*]

A package shall contain no more than two Numbering Definitions parts. If they exist, one instance of that part shall be the target of an implicit relationship from the Main Document (§11.3.10) part, and the other shall be the target of an implicit relationship from the Glossary Document (§11.3.8) part.

[*Example:*

```

<Relationships xmlns="...">
  <Relationship Id="rId2"
    Type="http://.../numbering" Target="numbering.xml"/>
</Relationships>

```

end example]

The XML markup for a list usage involves a reference to a numbering definition via the child elements of the numPr element.

[Example: Here we have a paragraph set using the style Text, followed by a list of things which have the paragraph style ListBullet, followed by another paragraph set using the style Text:

```

<w:p>
  <w:pPr>
    <w:pStyle w:val="Text"/>
  </w:pPr>
  <w:r>
    <w:t>The kinds of fruit needed are:</w:t>
  </w:r>
</w:p>
<w:p>
  <w:pPr>
    <w:pStyle w:val="ListBullet"/>
    <w:numPr>
      <w:ilvl w:val="0" />
      <w:numId w:val="5" />
    </w:numPr>
  </w:pPr>
  <w:r>
    <w:t>Apples</w:t>
  </w:r>
</w:p>

```

```

<w:p>
  <w:pPr>
    <w:pStyle w:val="ListBullet"/>
    <w:numPr>
      <w:ilvl w:val="0" />
      <w:numId w:val="5" />
    </w:numPr>
  </w:pPr>
  <w:r>
    <w:t>Oranges</w:t>
  </w:r>
</w:p>
<w:p>
  <w:pPr>
    <w:pStyle w:val="Text"/>
  </w:pPr>
  <w:r>
    <w:t>Other items may be needed too.</w:t>
  </w:r>
</w:p>

```

end example]

The root element for a Numbering Definition part shall be numbering, with each numbering definition being defined by an abstractNum element.

[Example:

```

<w:numbering xmlns:w="...">
  <w:abstractNum w:numId="11">
    <w:nsid w:val="394E2425"/>
    <w:multilevelType w:val="hybridMultilevel"/>
    <w:tmpl w:val="F628E89A"/>
    <w:lvl w:ilvl="0" w:tplc="151C4798">
      <w:start w:val="1"/>
      <w:numFmt w:val="bullet"/>
      <w:pStyle w:val="ListBullet"/>
      <w:lvlText w:val="..."/>
      <w:lvlJc w:val="start"/>
    <w:pPr>
      <w:tabs>
        <w:tab w:val="num" w:pos="720"/>
      </w:tabs>
      <w:ind w:start="720" w:hanging="360"/>
    </w:pPr>
  </w:abstractNum>
</w:numbering>

```

```

    <w:rPr>
      <w:rFonts w:ascii="Symbol" w:hAnsi="Symbol" w:hint="default"/>
    </w:rPr>
  </w:lvl>
  ...
</w:abstractNum>
</w:numbering>

```

end example]

A Numbering Definitions part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Numbering Definitions part is permitted to contain explicit relationships to the following parts defined by ECMA-376:

- Images (§15.2.14)

A Numbering Definitions part shall not have any implicit or explicit relationships to any other part defined by ECMA-376.

11.3.12 Style Definitions Part

Content Type:	application/vnd.openxmlformats-officedocument.wordprocessingml.styles+xml
Root Namespace:	http://purl.oclc.org/ooxml/wordprocessingml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/styles

An instance of this part type contains the definition for a set of styles used by this document.

A package shall contain at most two Style Definitions parts. One instance of that part shall be the target of an implicit relationship from the Main Document (§11.3.10) part, and the other shall be the target of an implicit relationship in from the Glossary Document (§11.3.8) part.

[Example:

```

<Relationships xmlns="...">
  <Relationship Id="rId3"
    Type="http://.../styles" Target="styles.xml"/>
</Relationships>

```

end example]

The root element for a Styles Definition part shall be styles, which is a container for one or more style elements.

[Example: Here is the style ListBullet (which is used in a Main Document Part in §11.3.10):

```
<w:styles xmlns:w="..." ... xml:space="preserve">
  <w:style w:type="paragraph" w:styleId="ListBullet">
    <w:name w:val="List Bullet"/>
    <w:basedOn w:val="Text"/>
    <w:autoRedefine/>
    <w:rsid w:val="00081289"/>
    <w:pPr>
      <w:pStyle w:val="ListBullet"/>
      <w:numPr>
        <w:numId w:val="1"/>
      </w:numPr>
      <w:tabs>
        <w:tab w:val="clear" w:pos="360"/>
      </w:tabs>
      <w:ind w:start="648"/>
    </w:pPr>
  </w:style>
</w:styles>
```

end example]

A Style Definitions part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Style Definitions part shall not have implicit or explicit relationships to any part defined by ECMA-376.

11.3.13 Web Settings Part

Content Type:	application/vnd.openxmlformats-officedocument.wordprocessingml.webSettings+xml
Root Namespace:	http://purl.oclc.org/ooxml/wordprocessingml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/webSettings

An instance of this part type contains the definition for web-specific settings used by this document.

A package shall contain at most two Web Settings parts. One instance of that part shall be the target of an implicit relationship from the Main Document (§11.3.10) part, and the other shall be the target of an implicit relationship from the Glossary Document (§11.3.8) part.

[Example:


```
<Relationships xmlns="...">
  <Relationship Id="rId3"
    Type="http://.../webSettings" Target="webSettings.xml"/>
</Relationships>
```

end example]

The root element for a Web Settings part shall be webSettings.

[Example:

```
<w:webSettings ...>
  <w:frameset>
    ...
    <w:frame>
      <w:sz w:val="216" />
      <w:name w:val="Frame2" />
      <w:sourceFileName r:id="rId1" />
    </w:frame>
    <w:frame>
      <w:name w:val="Frame1" />
      <w:sourceFileName r:id="rId2" />
    </w:frame>
  </w:frameset>
</w:webSettings>
```

end example]

A Web Settings part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Web Settings part is permitted to contain explicit relationships to the following parts defined by ECMA-376:

- Frameset (§11.5)

A Web Settings part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

11.4 Document Template

Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/attachedTemplate
----------------------	---

A *document template* can be represented by an instance of a WordprocessingML package, and contains styles, numbering definitions, and so on that are made available when documents based on that template are edited. A WordprocessingML document can refer to another document as its document template, by having a Document

Settings part (§11.3.3) that contains an explicit relationship to the file location of the necessary document template using the id attribute on the attachedTemplate element.

[Example: Consider a document specifying a document template located at c:\template.docx:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../attachedTemplate" Target="file:///c:\template.docx"
    TargetMode="External"/>
</Relationships>
```

The document's Document Settings part contains an attachedTemplate element that explicitly references this relationship:

```
<w:settings ... >
  <w:attachedTemplate r:id="rId1"/>
</w:settings>
```

end example]

11.5 Framesets

Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/frame
----------------------	---

A *frameset* is a WordprocessingML document which specifies the location and placement of other WordprocessingML documents (which, when used in this context, are referred to as *frames*). A frameset shall be represented by an instance of a WordprocessingML document with a Web Settings part (§11.3.13) whose relationship item targets each of that frameset's frames.

[Example: Consider a frameset document having two frames. The frameset's Web Settings part-relationships item contains the following, in which frame1.docx and frame2.docx are packages containing the corresponding frames:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../frame" Target="frame1.docx" TargetMode="External"/>
  <Relationship Id="rId2"
    Type="http://.../frame" Target="frame2.docx" TargetMode="External"/>
</Relationships>
```

The frameset document's Web Settings part contains a frameset element that references its frames:

```

<w:webSettings ...>
  <w:frameset>
    ...
    <w:frame>
      <w:sz w:val="216" />
      <w:name w:val="Frame2" />
      <w:sourceFileName r:id="rId1" />
    </w:frame>
    <w:frame>
      <w:name w:val="Frame1" />
      <w:sourceFileName r:id="rId2" />
    </w:frame>
  </w:frameset>
</w:webSettings>

```

end example]

A frame shall be represented by an instance of a WordprocessingML package.

A frame shall be located external to the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be External).

11.6 Master Documents and Subdocuments

Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/subDocument
----------------------	---

A master document shall be represented by an instance of a WordprocessingML document whose Main Document (§11.3.10) part targets each of that master document's subdocuments.

[*Rationale*: Sometimes, it is convenient to deal with a document as a collection of pieces, especially when those pieces might be edited by different authors in a collaborative group. Perhaps it simply makes sense to think about a book as a collection of chapters rather than as one big document. The breaking-up of a document into such pieces can be achieved by having a master document with one or more subdocuments. *end rationale*]

[*Example*: Consider a master document, whose three subdocuments are called Start, Middle, and End, respectively. Master's Main Document part has a corresponding relationships part that contains the following, in which Start.docx, Middle.docx, and End.docx are packages containing the corresponding subdocuments:

```

<Relationships xmlns="...">
  <Relationship Id="rId5"
    Type="http://.../subDocument"
    Target="Start.docx" TargetMode="External"/>

```

```
<Relationship Id="rId6"
  Type="http://.../SubDocument"
  Target="Middle.docx" TargetMode="External"/>
<Relationship Id="rId7"
  Type="http://.../SubDocument"
  Target="End.docx" TargetMode="External"/>
</Relationships>
```

The master document's Main Document part contains subDoc elements that reference its subdocuments:

```
<w:document xmlns:r="..." xmlns:w="..." ...>
  <w:body>
    <w:p ...>
      <w:pPr>
        ...
      </w:pPr>
    </w:p>
    <w:subDoc r:id="rId5"/>
    ...
    <w:subDoc r:id="rId6"/>
    ...
    <w:subDoc r:id="rId7"/>
    ...
  </w:body>
</w:document>
```

end example]

A subdocument shall be represented by an instance of a WordprocessingML package.

A subdocument shall be located external to the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be External).

11.7 Mail Merge Data Source

Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/mailMergeSource
----------------------	---

A document that stores information about a mail merge operation is permitted to contain a Document Settings part (§11.3.3) whose relationship item targets the file location of the necessary data source using this relationship.

[Example: Consider a document specifying a mail merge whose data source is located at <http://www.openxmlformats.org/data.txt>:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../mailMergeSource"
    Target="http://www.openxmlformats.org/data.txt"
    TargetMode="External"/>
</Relationships>
```

The document's Document Settings part contains a `dataSource` element that explicitly references this relationship:

```
<w:settings ...>
  <w:mailMerge>
    ...
    <w:dataSource r:id="rId1" />
    ...
  </w:mailMerge>
</w:settings>
```

end example]

A mail merge data source shall be located external to the package containing the relationships part (expressed syntactically, the `TargetMode` attribute of the `Relationship` element shall be `External`).

11.8 Mail Merge Header Data Source

Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/mailMergeHeaderSource
----------------------	---

A document that stores information about a mail merge operation is permitted to contain a Document Settings part (§11.3.3) whose relationship item targets the file location of the necessary header data source using this relationship.

[*Example:* Consider a document specifying a mail merge whose header data source is located at `http://www.openxmlformats.org/header.txt`:

```
<Relationships xmlns="...">
  <Relationship Id="rId2"
    Type="http://.../mailMergeHeaderSource"
    Target="http://www.openxmlformats.org/header.txt"
    TargetMode="External"/>
</Relationships>
```

The document's Document Settings part contains a `headerSource` element that explicitly references this relationship:

```

<w:settings ...>
  <w:mailMerge>
    ...
    <w:headerSource r:id="rId2" />
    ...
  </w:mailMerge>
</w:settings>

```

end example]

A mail merge header data source shall be located external to the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be External).

11.9 XSL Transformation

Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/transform
----------------------	---

A document can store information about an XSL Transformation which might be applied when the document is output as a single file (e.g. as XML or HTML). That information is stored in a Document Settings part (§11.3.3) whose part relationship item contains an explicit relationship to the file location of the XSL Transformation using this relationship. [Note: A full description of how this relationship is used (in conjunction with the saveThroughXslt element) is provided in §17.15.1.76. *end note*]

[Example: Consider a document specifying an XSL Transformation located at <http://www.openxmlformats.org/test.xsl>:

```

<Relationships xmlns="...">
  <Relationship Id="rId8" Type="http://.../transform"
    Target="http://www.openxmlformats.org/test.xsl"
    TargetMode="External"/>
</Relationships>

```

The document's Document Settings part contains a saveThroughXslt element that explicitly references this relationship:

```

<w:settings ...>
  ...
  <w:saveThroughXslt r:id="rId8" />
  ...
</w:settings>

```

end example]

An XSL transformation shall be located external to the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be External).

12. SpreadsheetML

This clause contains specifications for relationship items and parts that are specific to SpreadsheetML. Parts that can occur in a SpreadsheetML document, but are not SpreadsheetML-specific, are specified in §15.2. Unless stated explicitly, all references to relationship items, content-type items, and parts in this clause refer to SpreadsheetML ZIP items.

12.1 Glossary of SpreadsheetML-Specific Terms

The following terms are used in the context of a SpreadsheetML document:

cell — The location at the intersection of a row and column, in which numeric or textual data or a formula is stored. A cell can have a number of characteristics, such as numeric or text formatting, alignment, font, color, and border.

cell reference — An individual cell's designation using a combination of its column and row headings, as in A13, H19, and BX1200. A **relative cell reference** in a formula automatically changes when the formula is copied down a column or across a row. An **absolute cell reference** is fixed. Absolute references don't change when a formula is copied from one cell to another. A **mixed cell reference** has either an absolute column and a relative row, or an absolute row and a relative column.

chart — A graphical representation of data, as in a bar, column, line, pie chart, for example.

column — Any vertical set of cells in a worksheet. Each column has an alphabetic heading. Columns are named sequentially, going from A–Z, then AA–AZ, BA–BZ, and so on.

connection — The means by which external data—that is, data stored outside of a workbook (in a database or on a Web server, for example)—can be imported into a worksheet.

formula — A recipe for calculating a value. Some formulas are predefined; others are user-defined.

function — A predefined formula, such as AVERAGE, MAX, MIN, and SUM. A function takes one or more arguments on which it operates, producing a result. [*Note: In the formula =SUM(B1:B4), there is one argument, B1:B4, which is the range of cells B1–B4, inclusive. end note*]

pivot table — A kind of table that is used to manage and analyze related data that is stored elsewhere.

row — Any horizontal set of cells in a worksheet. Each row has a numeric heading. Rows are numbered sequentially, starting at 1.

table — A rectangular-shaped set of related rows and columns that can be sorted, filtered, and totaled as a group. Rows in a table can be hidden by applying **autofilters** to one or more columns.

workbook — A collection of worksheets.

worksheet — A two-dimensional grid of cells that are organized into rows and columns.

12.2 Package Structure

A SpreadsheetML package shall contain a package-relationship item and a content-type item. The package-relationship item shall have implicit relationships with targets of the following type:

- One Workbook part (12.3.23).

The package-relationship item is permitted to have implicit relationships with targets of the following type:

- Digital Signature Origin (§15.2.7)
- File Property parts (§15.2.12) (Application-Defined File Properties, Core File Properties, and Custom File Properties), as appropriate.
- Thumbnail (§15.2.16).

The required and optional relationships between parts are defined in §12.3 and its subordinate clauses.

[*Example:* The following package represents the minimal conformant SpreadsheetML package as defined by ECMA-376:

First, the content types for relationship parts, the Workbook part, and at least one Sheet part must be defined (physically located at `/[Content_Types].xml` in the package):

```
<Types xmlns="...">
  <Default Extension="rels"
    ContentType="application/vnd.openxmlformats-package.relationships+xml"
  />
  <Override PartName="/workbook.xml"
    ContentType="application/vnd.openxmlformats-officedocument.
      spreadsheetml.sheet.main+xml" />
  <Override PartName="/sheet1.xml"
    ContentType="application/vnd.openxmlformats-
      officedocument.spreadsheetml.worksheet+xml" />
</Types>
```

Next, the required package-level relationship to the Workbook part must be defined (physically located at `/_rels/.rels` in the package):

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type=http://purl.oclc.org/ooxml/officeDocument/relationships/officeDocument"
    Target="workbook.xml" />
</Relationships>
```

Next, the minimum content for the Workbook part must be defined (physically located at /workbook.xml in the package):

```
<workbook xmlns="..." xmlns:r="...">
  <sheets>
    <sheet name="1" sheetId="1" r:id="rId1" />
  </sheets>
</workbook>
```

Next, the required workbook-level relationship to the single Sheet part must be defined, (physically located at /_rels/workbook.xml.rels in the package):

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://purl.oclc.org/ooxml/officeDocument/relationships/worksheet"
    Target="sheet1.xml" />
</Relationships>
```

Finally, the minimum content for a single Sheet part must be defined (physically located at /sheet1.xml in the package):

```
<worksheet xmlns="..." xmlns:r="...">
  <sheetData />
</worksheet>
```

end example]

[*Example:* Consider a SpreadsheetML document that contains a workbook having three worksheets. Here's an example of the hierarchical folder structure that might be used for the ZIP items in the package for that document. As shown, one part, Workbook (stored in the ZIP item /xl/workbook.xml), has its own relationship item:

/_rels/.rels	<i>Package-relationship item</i>
/[Content_Types].xml	<i>Content-type item</i>
/docProps/app.xml	<i>Application-Defined File Properties part</i>
/docProps/core.xml	<i>Core File Properties part</i>
/xl/workbook.xml	<i>Workbook part</i>
/xl/_rels/workbook.xml.rels	<i>Part-relationship item</i>
/xl/calcChain.xml	<i>Calculation Chain part</i>
/xl/sharedStrings.xml	<i>Shared String Table part</i>
/xl/styles.xml	<i>Styles part</i>
/xl/volatileDependencies.xml	<i>Volatile Dependencies part</i>
/xl/theme/theme1.xml	<i>Theme part</i>
/xl/worksheets/sheet1.xml	<i>Worksheet parts</i>
/xl/worksheets/sheet2.xml	
/xl/worksheets/sheet3.xml	

The package-relationship item contains the following:

```
<Relationships xmlns="...">
  <Relationship Id="rId3"
    Type="http://.../extended-properties" Target="docProps/app.xml"/>
  <Relationship Id="rId2"
    Type="http://.../core-properties" Target="docProps/core.xml"/>
  <Relationship Id="rId1"
    Type="http://.../officeDocument" Target="xl/workbook.xml"/>
</Relationships>
```

end example]

12.3 Part Summary

The subclauses subordinate to this one describe in detail each of the part types specific to SpreadsheetML.

[*Note:* For convenience, information from those subclauses is summarized in the following table:

Part	Relationship Target of	Root Element	Ref.
Calculation Chain	Workbook	calcChain	§12.3.1
Chartsheet	Workbook	chartsheet	§12.3.2
Comments	Dialogsheet, Worksheet	comments	§12.3.3
Connections	Workbook	connections	§12.3.4
Custom Property	Workbook	Not applicable	§12.3.5
Custom XML Mappings	Workbook	MapInfo	§12.3.6
Dialogsheet	Workbook	dialogsheet	§12.3.7
Drawings	Chartsheet, Worksheet	wsDr	§12.3.8
External Workbook References	Workbook	externalLink	§12.3.9
Metadata	Workbook	metadata	§12.3.10
Pivot Table	Worksheet	pivotTableDefinition	§12.3.11
Pivot Table Cache Definition	Pivot Table, Workbook	pivotCacheDefinition	§12.3.12
Pivot Table Cache Records	Pivot Table Cache Definition	pivotCacheRecords	§12.3.13
Query Table	Worksheet	queryTable	§12.3.14
Shared String Table	Workbook	sst	§12.3.15
Shared Workbook Revision Headers	Workbook	headers	§12.3.16
Shared Workbook	Shared Workbook	revisions	§12.3.17

Part	Relationship Target of	Root Element	Ref.
Revision Log	Revision Headers		
Shared Workbook User Data	Workbook	users	§12.3.18
Single Cell Table Definitions	Dialogsheet, Worksheet	singleXmlCells	§12.3.19
Styles	Workbook	styleSheet	§12.3.20
Table Definition	Dialogsheet, Worksheet	table	§12.3.21
Volatile Dependencies	Workbook	volTypes	§12.3.22
Workbook	SpreadsheetML package	workbook	§12.3.23
Worksheet	Workbook	worksheet	§12.3.24

end note]

12.3.1 Calculation Chain Part

Content Type:	application/vnd.openxmlformats-officedocument.spreadsheetml.calcChain+xml
Root Namespace:	http://purl.oclc.org/ooxml/spreadsheetml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/calcChain

An instance of this part type contains an ordered set of references to all cells in all worksheets in the workbook whose value is calculated from any formula. The ordering allows inter-related cell formulas to be calculated in the correct order when a worksheet is loaded for use.

A package shall contain no more than one Calculation Chain part. If it exists, that part shall be the target of an implicit relationship from the Workbook part (§12.3.23).

[*Example:* The following Workbook part-relationship item contains a relationship to the Calculation Chain part, which is stored in the ZIP item calcChain.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId7"
    Type="http://.../calcChain" Target="calcChain.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be calcChain.

[*Example:* Cells D8, E8, and F8 each contain a value that is the result of calculations that shall be performed in the order E8, D8, F8:

```
<calcChain xmlns="...">
  <c r="E8" i="1"/>
  <c r="D8"/>
  <c r="F8" s="1"/>
</calcChain>
```

end example]

A Calculation Chain part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Calculation Chain part shall not have implicit or explicit relationships to any part defined by ECMA-376.

12.3.2 Chartsheet Part

Content Type:	application/vnd.openxmlformats-officedocument.spreadsheetml.chartsheet+xml
Root Namespace:	http://purl.oclc.org/ooxml/spreadsheetml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/chartsheet

An instance of this part type represents a chart that is stored in its own sheet.

A package is permitted to contain zero or more Chartsheet parts. Each such part shall be the target of an explicit relationship from the Workbook part (§12.3.23).

[*Example:* The following Workbook part-relationship item contains three relationships to Chartsheet parts, which are stored in the ZIP items chartsheets/sheet*N*.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId2"
    Type="http://.../chartsheet" Target="chartsheets/sheet1.xml"/>
  <Relationship Id="rId5"
    Type="http://.../chartsheet" Target="chartsheets/sheet2.xml"/>
  <Relationship Id="rId6"
    Type="http://.../chartsheet" Target="chartsheets/sheet3.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be chartsheet.

[*Example:* sheet1.xml refers to a drawing that is the target of a relationship in the Chartsheet part's relationship item:

```
<chartsheet xmlns:r="..." ...>
  <sheetViews>
    <sheetView scale="64"/>
  </sheetViews>
  <drawing r:id="rId1"/>
</chartsheet>
```

end example]

A Chartsheet part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Chartsheet part is permitted to have implicit relationships to the following parts defined by ECMA-376:

- Printer Settings (§15.2.15)

A Chartsheet part is permitted to have explicit relationships to the following parts defined by ECMA-376:

- Drawings (§12.3.8)

A Chartsheet part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

12.3.3 Comments Part

Content Type:	application/vnd.openxmlformats-officedocument.spreadsheetml.comments+xml
Root Namespace:	http://purl.oclc.org/ooxml/spreadsheetml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/comments

An instance of this part type contains all the comments for a given worksheet, as well as the names of the authors of those comments.

A package shall contain exactly one Comments part for each worksheet that contains one or more comments. If a Comments part exists, it shall be the target of an implicit relationship from the Workbook part (§12.3.23).

[*Example:* The following Worksheet part-relationship item contains a relationship to the Comments part, which is stored in the ZIP item comments2.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId2"
    Type="http://.../comments" Target="../comments2.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be comments.

[*Example:* This Comments part results from a workbook that has one or more comments from each of two people: James Jones and Mary Smith:

```
<comments xmlns:st="..." >
  <authors>
    <author>James Jones</author>
    <author>Mary Smith</author>
  </authors>
  <commentList>
    <comment r="C7" authorId="0">
      <text>
        <st:r>
          <st:rPr>
            ...
          </st:rPr>
          <st:t>James Jones:</st:t>
        </st:r>
        <st:r>
          <st:rPr>
            ...
          </st:rPr>
          <st:t>Check that this date is correct.</st:t>
        </st:r>
      </text>
    </comment>
    <comment r="E7" authorId="1">
      ...
    </comment>
  </commentList>
</comments>
```

end example]

A Comments part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Comments part shall not implicit or explicit relationships to any part defined by ECMA-376.

12.3.4 Connections Part

Content Type:	application/vnd.openxmlformats-officedocument.spreadsheetml.connections+xml
Root Namespace:	http://purl.oclc.org/ooxml/spreadsheetml/main

Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/connections
----------------------	---

An instance of this part type describes all of the connections currently established for a workbook.

A package shall contain no more than one Connections part, and that part shall be the target of an implicit relationship from the Workbook part (§12.3.23).

[*Example:* The following Workbook part-relationship item contains a relationship to the Connections part, which is stored in the ZIP item connections.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId5"
    Type="http://.../connections" Target="connections.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be connections.

[*Example:* A workbook has three connections, two from one worksheet, and one from another. connections.xml defines these three connections:

```
<connections ...>
  <connection id="1" odcFile="..." keepAlive="1" name="..." type="5"
    refreshedVersion="2" background="1" saveData="1">
    <dbPr connection="Provider=MSDASQL.1;Persist Security Info=True;Data
Source=dBASE Files;Extended Properties=&quot;DSN=dBASE Files;DBQ=E:\MY
DOCUMENTS;DefaultDir=E:\MY
DOCUMENTS;DriverId=533;MaxBufferSize=2048;PageTimeout=5;&quot;;Initial
Catalog=E:\MY DOCUMENTS" command="`E:\MY DOCUMENTS\`ADDRESS`" commandType="3"/>
  </connection>
  <connection id="2" ...>
    <dbPr ... />
  </connection>
  <connection id="3" ...>
    <dbPr ... />
  </connection>
</connections>
```

end example]

A Connections part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Connections part shall not have implicit or explicit relationships to any part defined by ECMA-376..

12.3.5 Custom Property Part

Content Type:	Any content, support for which is application-defined. [Note: Some examples of formats which might be supported include: <ul style="list-style-type: none">• application/vnd.openxmlformats-officedocument.spreadsheetml.customProperty• application/xml <i>end note</i>]
Root Namespace:	Not applicable
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/customProperty

This part supports the storage of user-defined data.

[Note: It is recommended that a Custom Property Part contain XML content for improved interoperability; however, there is no requirement on the format of the content contained in a Custom Property Part. *end note*]

A package is permitted to contain zero or more Custom Property parts, and each such part shall be the target of an implicit relationship from the Worksheet (§12.3.24) part.

[Example: The following Worksheet part-relationship item contains a relationship to the Custom Property part, which is stored in the ZIP item CustomProperty.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId7"
    Type="http://.../customProperty" Target="CustomProperty.xml"/>
</Relationships>
```

where the contents of CustomProperty.xml contain the following XML

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<CustomApplicationData xmlns="...">
  <CustomProperty name="PropertyName" value="PropertyValue" />
</CustomApplicationData>
```

end example]

A Custom Property part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Custom Property part shall not have implicit or explicit relationships to any part defined by ECMA-376.

12.3.6 Custom XML Mappings Part

Content Type:	application/xml
Root Namespace:	http://purl.oclc.org/ooxml/spreadsheetml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/xmlMaps

An instance of this part type contains a schema for an XML file, and information on the behavior that is used when allowing this custom XML schema to be mapped into the spreadsheet.

A package shall contain no more than one Custom XML Mappings part, and that part shall be the target of an implicit relationship from the Workbook part (§12.3.23). The Worksheet part into which this data is imported shall also have a relationship file that targets one or more Table Definition (§12.3.21) parts and/or one or more Single Cell Table Definitions (§12.3.19) parts.

[*Example:* The following Workbook part-relationship item contains a relationship to the Custom XML Mappings part, which is stored in the ZIP item xmlMaps.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId9"
    Type="http://.../xmlMaps" Target="xmlMaps.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be MapInfo.

[*Example:* xmlMaps.xml contains the following:

```
<mapInfo SelectionNamespaces="">
  <Schema ID="Schema1">
    <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema">
      <xsd:element nillable="true" name="names">
        <xsd:complexType>
          <xsd:sequence minOccurs="0">
            <xsd:element minOccurs="0" maxOccurs="unbounded"
              nillable="true" name="name" form="unqualified">
```

```

    <xsd:complexType>
      <xsd:sequence minOccurs="0">
        <xsd:element minOccurs="0" nillable="true"
          type="xsd:string" name="firstname"
          form="unqualified"/>
        <xsd:element minOccurs="0" nillable="true"
          type="xsd:string" name="initial"
          form="unqualified"/>
        <xsd:element minOccurs="0" nillable="true"
          type="xsd:string" name="lastName"
          form="unqualified"/>
      </xsd:sequence>
    </xsd:complexType>
  </xsd:element>
</xsd:sequence>
</xsd:complexType>
</xsd:element>
</xsd:schema>
</Schema>
<Map ID="1" Name="names_Map" RootElement="names" SchemaID="Schema1"
  ShowImportExportValidationErrors="false" AutoFit="true"
  Append="false"
  PreserveSortAFLayout="true" PreserveFormat="true">
  <DataBinding FileBinding="Test.xml" DataBindingLoadMode="1"/>
</Map>
</mapInfo>

```

end example]

A Custom XML Mappings part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Custom XML Mappings part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

12.3.7 Dialogsheet Part

Content Type:	application/vnd.openxmlformats-officedocument.spreadsheetml.dialogsheet+xml
Root Namespace:	http://purl.oclc.org/ooxml/spreadsheetml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/dialogsheet

An instance of this part type contains information about a legacy custom dialog box for a user form.

A package is permitted to contain one or more Dialogsheet parts, and each such part shall be the target of an explicit relationship from the Workbook part (§12.3.23).

[*Example:* The following Workbook part-relationship item contains relationships to a Dialogsheet part, which is stored in the ZIP item dialogsheets/sheet1.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId2"
    Type="http://.../dialogsheet" Target="dialogsheets/sheet1.xml"/>
</Relationships>
```

The Workbook part contains the following:

```
<workbook xmlns:r="..." ...>
  ...
  <sheets>
    ...
    <sheet name="Dialog1" sheetId="4" r:id="rId2"/>
  </sheets>
  ...
</workbook>
```

end example]

The root element for a part of this content type shall be dialogsheet.

[*Example:* sheet1.xml contains the following:

```
<dialogsheet xmlns:r="..." ...>
  <sheetPr>
    <pageSetUpPr/>
  </sheetPr>
  <sheetViews>
    ...
  </sheetViews>
  ...
  <legacyDrawing r:id="rId1"/>
</dialogsheet>
```

end example]

A Dialogsheet part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Dialogsheet part is permitted to have implicit relationships to the following parts defined by ECMA-376:

- Printer Settings (§15.2.15)

A Dialogsheet part is permitted to have explicit relationships to the following parts defined by ECMA-376:

- Embedded Control Persistence (§15.2.9)
- Drawings (§12.3.8)
- Embedded Object (§15.2.10)

A Dialogsheet part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

12.3.8 Drawings Part

Content Type:	application/vnd.openxmlformats-officedocument.drawing+xml
Root Namespace:	http://purl.oclc.org/ooxml/drawingml/spreadsheetDrawing
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/drawing

An instance of this part type contains the presentation and layout information for one or more drawing elements that are present on this worksheet.

A package is permitted to contain one or more Drawings parts, and each such part shall be the target of an explicit relationship from a Worksheet part (§12.3.24), or a Chartsheet part (§12.3.2). There shall be only one Drawings part per worksheet or chartsheet.

[*Example:* The following Chartsheet part-relationship item contains a relationship to a Drawings part, which is stored in the ZIP item ../drawings/drawing1.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../drawing" Target="../drawings/drawing1.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be wsDr.

[*Example:* drawing1.xml refers to a chart that is the target of a relationship in the Drawing part's relationship item:

```
<xdr:wsDr xmlns:xdr="..." xmlns:a="...">
  <xdr:absoluteAnchor>
    <xdr:pos x="1518046" y="-1443632"/>
    <xdr:extents cx="8587382" cy="5848945"/>
    <xdr:graphicFrame macro="">
      <xdr:nvGraphicFramePr>
        <xdr:cNvPr id="24" name="Chart 24" descr=""/>
        <xdr:cNvGraphicFramePr/>
      </xdr:nvGraphicFramePr>
      <xdr:xfrm>
        <a:off x="0" y="0"/>
        <a:ext cx="0" cy="0"/>
      </xdr:xfrm>
      <a:graphic>
        <a:graphicData uri="http://.../chart">
          <a:chart relId="rId1"/>
        </a:graphicData>
      </a:graphic>
    </xdr:graphicFrame>
    <xdr:clientData/>
  </xdr:absoluteAnchor>
</xdr:wsDr>
```

end example]

A Drawings part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Drawings part is permitted to have explicit relationships to the following parts defined by ECMA-376:

- Chart (§14.2.1)
- Content Part (§15.2.4)
- Diagrams: Diagram Colors (§14.2.3), Diagram Data (§14.2.4), Diagram Layout Definition (§14.2.5) and Diagram Styles (§14.2.6)
- Hyperlinks (§15.3)
- Images (§15.2.14)

A Drawings part shall not have any implicit or explicit relationships to any other part defined by ECMA-376.

12.3.9 External Workbook References Part

Content Type:	application/vnd.openxmlformats-officedocument.spreadsheetml.externalLink+xml
Root Namespace:	http://purl.oclc.org/ooxml/spreadsheetml/main

Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/externalLink
----------------------	---

An instance of this part specifies information about data referenced in other SpreadsheetML packages.

[*Example:* Consider two workbooks, wb1 and wb2, stored in packages called wb1.xlsx and wb2.xlsx, respectively. The value of a cell on a worksheet in wb1 can be computed using the value of one or more cells in wb2. This is done by having wb1 contain an external reference to wb2. *end example*]

A package is permitted to contain one or more External Workbook References parts, and those parts shall be the target of an explicit relationship in the Workbook part (§12.3.23).

[*Example:* A Workbook part for wb1 contains the following, which indicates that somewhere in its three worksheets, an external reference is made to a target specified in relationship id rId4 of the part's relationship item:

```
<workbook xmlns:r="..." />
...
<sheets>
  <sheet name="Sheet1" sheetId="1" r:id="rId1" />
  <sheet name="Sheet2" sheetId="2" r:id="rId2" />
  <sheet name="Sheet3" sheetId="3" r:id="rId3" />
</sheets>
...
<externalReferences>
  <externalReference r:id="rId4" />
</externalReferences>
...
</workbook>
```

That part's relationship item contains the following:

```
<Relationships xmlns="...">
  <Relationship Id="rId4"
    Type="http://.../externalLink"
    Target="externalReferences/externalReference1.xml" />
</Relationships>
```

end example]

The root element for a part of this content type shall be externalLink.

[*Example:* externalReference1.xml contains:

```
<externalLink xmlns:r="..." r:id="rId1">
  <externalBook>
    <sheetNames>
      <sheetName val="Sheet1"/>
      <sheetName val="Sheet2"/>
      <sheetName val="Sheet3"/>
    </sheetNames>
    <sheetDataSet>
      <sheetData sheetId="0">
        <row r="7">
          <cell r="C8">
            <v>0</v>
          </cell>
        </row>
      </sheetData>
      <sheetData sheetId="1"/>
      <sheetData sheetId="2"/>
    </sheetDataSet>
  </externalBook>
</externalLink>
```

This part's relationship item contains the following:

```
<Relationships ...>
  <Relationship Id="rId1"
    Type=".../externalReference"
    Target="wb2.xlsx" TargetMode="External"/>
</Relationships>
```

where *wb2.xlsx* is the workbook in which one or more cells' values are used in calculating the values of a cell in workbook *wb1*. *end example*]

An External Workbook References part shall be located within the package containing the relationships part (expressed syntactically, the *TargetMode* attribute of the *Relationship* element shall be *Internal*).

An External Workbook References part shall specify an explicit relationship to one or more External Workbooks (§12.4).

An External Workbook References part shall not have any implicit or explicit relationships to other parts defined by ECMA-376.

12.3.10 Metadata Part

Content Type:	application/vnd.openxmlformats-officedocument.spreadsheetml.sheetMetadata+xml
Root	http://purl.oclc.org/ooxml/spreadsheetml/main

Namespace:	
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/sheetMetadata

An instance of this part type contains information relating to a cell whose value is related to one or more other cells via OnLine Analytical Processing (OLAP) technology.

A package shall contain no more than one Cell Metadata part, and that part shall be the target of an implicit relationship from the Workbook part (§12.3.23).

[*Example:* The following Workbook part-relationship item contains a relationship to the Metadata part, which is stored in the ZIP item metadata.xml. Cell B3 contains the formula CUBEMEMBER ("externalData", "[Account].[All Account]"):

```
<Relationships xmlns="...">
  <Relationship Id="rId10"
    Type="http://.../sheetMetadata" Target="metadata.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be metadata.

[*Example:* metadata.xml contains the following:

```
<metadata ...>
  <metadataTypes count="1">
    <metadataType name="XLMDX" minSupportedVersion="120000" copy="1"
      pasteAll="1" pasteValues="1" merge="1" splitFirst="1" rowColShift="1"
      clearFormats="1" clearComments="1" assign="1" coerce="1"/>
  </metadataTypes>
  <metadataStrings count="2">
    <s v="externalData"/>
    <s v="[Account].[All Account]"/>
  </metadataStrings>
  <mdxMetadata count="1">
    <m n="0" f="m">
      <t c="1">
        <n v="1"/>
      </t>
    </m>
  </mdxMetadata>
```

```

<valueMetadata count="1">
  <b>
    <r t="1" v="0"/>
  </b>
</valueMetadata>
</metadata>

```

The corresponding Connections part contains the following:

```

<connections ...>
  <connection id="1" odcFile="..." keepAlive="1" name="externalData"
    description="..." type="5" refreshedVersion="3" background="1">
    <dbPr connection="Provider=MSOLAP.2;..." command="Budget" commandType="1"/>
    <olapPr sendLocale="1" rowDrillCount="1000" serverFill="1"
      serverNumberFormat="1" serverFont="1" serverFontColor="1"/>
  </connection>
</connections>

```

The corresponding Volatile Dependencies part contains the following:

```

<volTypes ...">
  <volType type="cubeFunctions">
    <main first="externalData">
      <tp t="e">
        <v>#N/A</v>
        <stp>1</stp>
        <r r="B3" s="1"/>
      </tp>
    </main>
  </volType>
</volTypes>

```

The corresponding Pivot Table Cache Definition part contains the following:

```

<pivotCacheDefinition ... saveData="0" refreshedBy="..."
  refreshedDateIso="2005-11-28T16:55:44" backgroundQuery="1" createdVersion="3"
  refreshedVersion="3" recordCount="0">
  <cacheSource type="external" connectionID="1"/>
  <cacheFields count="0"/>
  <cacheHierarchies count="6">
    ...
  </cacheHierarchies>

```

```

<kpis count="0"/>
<tupleCache>
  <queryCache count="3">
    <query mdx="[product].[category]"/>
    <query mdx=""/>
    <query mdx="[Account].[All Account]">
      <tpls c="1">
        <tpl hier="0" item="4294967295"/>
      </tpls>
    </query>
  </queryCache>
</tupleCache>
</pivotCacheDefinition>

```

end example]

A Metadata part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Metadata part shall not have implicit or explicit relationships to any part defined by ECMA-376.

12.3.11 Pivot Table Part

Content Type:	application/vnd.openxmlformats-officedocument.spreadsheetml.pivotTable+xml
Root Namespace:	http://purl.oclc.org/ooxml/spreadsheetml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/pivotTable

An instance of this part type contains a pivot table definition.

A package shall contain exactly one Pivot Table part per pivot table, and each such part shall be the target of an implicit relationship in the relationship part for the Worksheet part (§12.3.24) that corresponds to the worksheet containing the pivot table.

[*Example:* The following Worksheet part-relationship item contains a relationship to two Pivot Table parts, which are stored in the ZIP items ../pivotTables/pivotTableN.xml:

```

<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../pivotTable" Target="../pivotTables/pivotTable1.xml"/>
  <Relationship Id="rId2"
    Type="http://.../pivotTable" Target="../pivotTables/pivotTable2.xml"/>
</Relationships>

```

end example]

The root element for a part of this content type shall be `pivotTableDefinition`.

[Example: `pivotTable1.xml` contains the following:

```
<pivotTableDefinition ... cache="4" applyNumberFormats="0" applyBorderFormats="0"
  applyFontFormats="0" applyPatternFormats="0" applyAlignmentFormats="0"
  applyWidthHeightFormats="1" dataCaption="Data" updatedVersion="3"
  minRefreshableVersion="3" useAutoFormatting="1" itemPrintTitles="1"
  createdVersion="3" indent="0" outline="1" outlineData="1">
  <location ref="H4:H5" firstHeaderRow="1" firstDataRow="1" firstDataCol="0"/>
  <pivotFields count="1">
    <pivotField dataField="1" numFmtId="0" outline="1"
      subtotalTop="1" showAll="0" measureFilter="0" sortType="manual"/>
  </pivotFields>
  <rowItems count="1">
    <i t="data"/>
  </rowItems>
  <colItems count="1">
    <i t="data"/>
  </colItems>
  <dataFields count="1">
    <dataField name="Sum of 1000" fld="0" subtotal="average"
      baseField="0" baseItem="0" numFmtId="0"/>
  </dataFields>
  <tableStyle name="TableStyle2" showRowHeaders="1" showColHeaders="1"
    showRowStripes="1" showColStripes="1"/>
</pivotTableDefinition>
```

end example]

A Pivot Table part shall be located within the package containing the relationships part (expressed syntactically, the `TargetMode` attribute of the `Relationship` element shall be `Internal`).

A Pivot Table part is permitted to have implicit relationships to the following parts defined by ECMA-376:

- Pivot Table Cache Definition (§12.3.12).

A Pivot Table part shall not have any implicit or explicit relationships to other parts defined by ECMA-376.

12.3.12 Pivot Table Cache Definition Part

Content Type:	application/vnd.openxmlformats-officedocument.spreadsheetml.pivotCacheDefinition+xml
Root Namespace:	http://purl.oclc.org/ooxml/spreadsheetml/main

Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/pivotCacheDefinition
----------------------	---

An instance of this part type contains a cache definition for a pivot table.

A package shall contain exactly one Pivot Table Cache Definition part per pivot table, and each such part shall be the target of an implicit relationship from a Pivot Table (§12.3.11) part as well as an explicit relationship from a Workbook (§12.3.23) part.

[*Example:* The following Pivot Table part-relationship item contains a relationship to the Pivot Table Cache Definition part, which is stored in the ZIP item ../pivotCache/pivotCacheDefinition2.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type=http://.../pivotCacheDefinition
    Target="../pivotCache/pivotCacheDefinition2.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be pivotCacheDefinition.

[*Example:* pivotCacheDefinition2.xml contains the following:

```
<pivotCacheDefinition ... r:id="rId1" refreshedBy="John Jones"
  refreshedDateIso="2005-11-18T16:47:49" createdVersion="3"
  refreshedVersion="3" recordCount="11">
  <cacheSource type="worksheet">
    <worksheet range="C4:C15" sheet="Sheet1"/>
  </cacheSource>
  <cacheFields count="1">
    <cacheField name="1000">
      <sharedItems containsSemiMixedTypes="0" containsString="0"
        containsNumber="1" containsInteger="1" minValue="234
        maxValue="2543"/>
    </cacheField>
  </cacheFields>
</pivotCacheDefinition>
```

end example]

A Pivot Table Cache Definition part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Pivot Table Cache Definition part is permitted to have an explicit relationship to the following part defined by ECMA-376:

- Pivot Table Cache Records (§12.3.13).

A Pivot Table Cache Definition part shall not have any implicit or explicit relationships to other parts defined by ECMA-376.

12.3.13 Pivot Table Cache Records Part

Content Type:	application/vnd.openxmlformats-officedocument.spreadsheetml.pivotCacheRecords+xml
Root Namespace:	http://purl.oclc.org/ooxml/spreadsheetml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/pivotCacheRecords

An instance of this part type contains the cache records for a pivot table.

A package shall contain zero or one Pivot Table Cache Records part per pivot table, and each such part shall be the target of an explicit relationship in the Pivot Table Cache Definition (§12.3.12) part for the corresponding pivot table.

[Example: The following Pivot Table Cache Definition part-relationship item contains a relationship to the Pivot Table Cache Records part, which is stored in the ZIP item pivotCacheRecords2.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../pivotCacheRecords" Target="pivotCacheRecords2.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be pivotCacheRecords.

[Example: pivotCacheRecords2.xml contains the following:

```
<pivotCacheRecords ... count="11">
  <r>
    <n v="1234"/>
  </r>
  ...
  <r>
    <n v="876"/>
  </r>
</pivotCacheRecords>
```

end example]

A Pivot Table Cache Records part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Pivot Table Cache Records part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

12.3.14 Query Table Part

Content Type:	application/vnd.openxmlformats-officedocument.spreadsheetml.queryTable+xml
Root Namespace:	http://purl.oclc.org/ooxml/spreadsheetml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/queryTable

An instance of this part type contains information that describes how the source table is connected to an external data source, and defines the properties that is used when this table is refreshed from that source.

A package is permitted to contain one Query Table part per table, and each of those parts shall be the target of an implicit relationship from the corresponding Table Definitions (§12.3.21) part.

[*Example:* The following Table part-relationship item contains a relationship to the Query Table part corresponding to the connections details for that table. These parts are stored in the ZIP items `../queryTables/queryTable1.xml`:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://../queryTable"
    Target="../queryTables/queryTable1.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be queryTable.

[*Example:* queryTable2.xml deals with a connection to a database file having the seven fields shown:

```
<queryTable ... name="+Connect to New Data Source_1"
  growShrinkType="insertDelete" connectionId="2" autoFormatId="16"
  applyNumberFormats="0" applyBorderFormats="0" applyFontFormats="1"
  applyPatternFormats="1" applyAlignmentFormats="0"
  applyWidthHeightFormats="0">
```

```
<queryTableRefresh nextId="8">
  <queryTableFields count="7">
    <queryTableField id="1" name="ACCOUNT"/>
    <queryTableField id="2" name="CHECKNUM"/>
    <queryTableField id="3" name="DATE"/>
    <queryTableField id="4" name="AMOUNT"/>
    <queryTableField id="5" name="PAYEE"/>
    <queryTableField id="6" name="CHARGECODE"/>
    <queryTableField id="7" name="DESCRIPT"/>
  </queryTableFields>
</queryTableRefresh>
</queryTable>
```

end example]

A Query Table part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Query Table part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

12.3.15 Shared String Table Part

Content Type:	application/vnd.openxmlformats-officedocument.spreadsheetml.sharedStrings+xml
Root Namespace:	http://purl.oclc.org/ooxml/spreadsheetml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/sharedStrings

An instance of this part type contains one occurrence of each unique string that occurs on all worksheets in a workbook.

A package shall contain exactly one Shared String Table part, and that part shall be the target of an implicit relationship from the Workbook part (§12.3.23).

[Example: The following Workbook part-relationship item contains a relationship to the Shared String Table part, which is stored in the ZIP item sharedStrings.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId6"
    Type="http://.../sharedStrings" Target="sharedStrings.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be sst.

[Example: Here are three of the six strings used in the worksheets:

```
<sst xmlns:st="..." ... totalCount="6" uniqueCount="6">
  <sstItem>
    <t>Expenses Log</t>
  </sstItem>
  <sstItem>
    <t>Period Start</t>
  </sstItem>
  <sstItem>
    <t>Period End</t>
  </sstItem>
  ...
</sst>
```

end example]

A Shared String Table part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Shared String Table part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

12.3.16 Shared Workbook Revision Headers Part

Content Type:	application/vnd.openxmlformats-officedocument.spreadsheetml.revisionHeaders+xml
Root Namespace:	http://purl.oclc.org/ooxml/spreadsheetml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/revisionHeaders

An instance of this part type contains information about each of the editing sessions performed on the parent workbook at the worksheet level (worksheets added and rearranged in each session).

A package shall contain at most one Shared Workbook Revision Headers part. If it exists, that part shall be the target of an implicit relationship from the Workbook (§12.3.23) part.

[Example: The following Workbook part-relationship item contains a relationship to the Shared Workbook Revision Headers part, which is stored in the ZIP item handout revisions/revisionHeaders.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId9"
    Type="http://.../revisionHeaders"
    Target="revisions/revisionHeaders.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be headers.

[*Example:* revisionHeaders.xml contains the following:

```
<headers xmlns:r="..." guid="{233BEE23-EB5C-4542-905D-0230EFFED88B}"
  diskRevisions="1" revisionId="4" version="3">
  <header guid="..." dateTime="..." maxSheetId="4" userName="..." r:id="rId1">
    <sheetIdMap count="3">
      ...
    </sheetIdMap>
  </header>
  ...
  <header guid="..." dateTime="..." maxSheetId="4" userName="..." r:id="rId3">
    <sheetIdMap count="3">
      ...
    </sheetIdMap>
  </header>
</headers>
```

end example]

A Shared Workbook Revision Headers part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Shared Workbook Revision Headers part is permitted to have explicit relationships to the following parts defined by ECMA-376:

- Shared Workbook Revision Log (§12.3.17)

A Shared Workbook Revision Headers part shall not have any implicit or explicit relationships to other parts defined by ECMA-376.

12.3.17 Shared Workbook Revision Log Part

Content Type:	application/vnd.openxmlformats-officedocument.spreadsheetml.revisionLog+xml
Root Namespace:	http://purl.oclc.org/ooxml/spreadsheetml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/revisionLog

An instance of this part type contains information about edits performed on individual cells in the parent workbook’s worksheets in each editing session.

A package shall contain one Shared Workbook Revision Log part for each session's set of changes, and those parts shall be the target of an explicit relationship from the Shared Workbook Revision Headers (§12.3.16) part.

[*Example:* The following Shared Workbook Revision Headers part-relationship item contains a number of relationships to Shared Workbook Revision Log parts, which are stored in the ZIP item revisionLogN.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../revisionLog" Target="revisionLog1.xml"/>
  ...
  <Relationship Id="rId6"
    Type="http://.../revisionLog" Target="revisionLog6.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be revisions.

[*Example:* revisionLog2.xml contains the following:

```
<revisions xmlns:xs="..." ...>
  <rfmt sheetId="1" sqref="B4:B15">
    <dxfs>
      <xs:fill>
        <xs:pattern patternType="solid">
          <xs:fgColor type="icv" val="64"/>
          <xs:bgColor type="rgb" val="4278252287"/>
        </xs:pattern>
      </xs:fill>
    </dxfs>
  </rfmt>
  <rcv guid="{CBCE5672-5A4D-48C9-A120-F72804F8CF64}" action="delete"/>
  <rcv guid="{CBCE5672-5A4D-48C9-A120-F72804F8CF64}" action="add"/>
</revisions>
```

end example]

A Shared Workbook Revision Log part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Shared Workbook Revision Log part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

12.3.18 Shared Workbook User Data Part

Content Type:	application/vnd.openxmlformats-officedocument.spreadsheetml.userNames+xml
---------------	---

Root Namespace:	http://purl.oclc.org/ooxml/spreadsheetml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/usernames

An instance of this part type contains a list of all the users that are sharing the parent workbook.

A package shall contain at most one Shared Workbook User Data part, and that part shall be the target of an implicit relationship in the Workbook (§12.3.23) part.

[*Example:* The following Workbook part-relationship item contains a relationship to the Shared Workbook User Data part, which is stored in the ZIP item revisions/userNames.xml:

```
<Relationships xmlns="...">
  Relationship Id="rId8"
    Type="http://.../usernames" Target="revisions/userNames.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be users.

[*Example:* usernames.xml shows that there are two users sharing this workbook:

```
<users ... count="2">
  <usrinfo guid="{B5A024F7-40BE-4A48-9B6D-B1655241C84D}"
    name="Mary Jones" id="-264292310" dateTime="2005-11-18T18:53:16"/>
  <usrinfo .../>
</users>
```

end example]

A Shared Workbook User Data part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Shared Workbook User Data part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

12.3.19 Single Cell Table Definitions Part

Content Type:	application/vnd.openxmlformats-officedocument.spreadsheetml.tableSingleCells+xml
Root Namespace:	http://purl.oclc.org/ooxml/spreadsheetml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/tableSingleCells

An instance of this part type contains information on how to map non-repeating elements from a custom XML file into cells in a worksheet. [*Note: Repeating custom XML elements are mapped using a Table (§12.3.21). end note*]

A package shall contain at most one Single Cell Table Definitions part per worksheet, and that part shall be the target of an implicit relationship from a Worksheet (§12.3.24) part. A Single Cell Table Definitions part can describe one or more single cell table definitions for any given worksheet.

[*Example: The following Worksheet part-relationship item contains a relationship to the Single Cell Table Definitions part, which is stored in the ZIP item ../tables/tableSingleCells1.xml:*

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://../tableSingleCells"
    Target="../tables/tableSingleCells1.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be singleXmlCells.

[*Example: A worksheet contains two single cell table definitions; e.g., ../tables/tableSingleCells1.xml contains the following, where the elements id and count are nested inside element names:*

```
<singleXmlCells ...>
  <singleCell id="1" name="Table1" displayName="Table1" ref="B4">
    <cellPr id="1" uniqueName="id">
      <xmlPr mapId="1" xpath="/names/id" xmlDataType="string"/>
    </cellPr>
  </singleCell>
  <singleCell id="2" name="Table2" displayName="Table2" ref="B7">
    <cellPr id="1" uniqueName="count">
      <xmlPr mapId="1" xpath="/names/count" xmlDataType="integer"/>
    </cellPr>
  </singleCell>
</singleXmlCells>
```

end example]

A Single Cell Table Definitions part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Single Cell Table Definitions part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

12.3.20 Styles Part

Content Type:	application/vnd.openxmlformats-officedocument.spreadsheetml.styles+xml
Root Namespace:	http://purl.oclc.org/ooxml/spreadsheetml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/styles

An instance of this part type contains all the characteristics for all the cells in the workbook. Such information includes numeric and text formatting, alignment, font, color, and border.

A package shall contain no more than one Styles part, and that part shall be the target of an implicit relationship from the Workbook (§12.3.23) part.

[*Example:* The following Workbook part-relationship item contains a relationship to the Styles part, which is stored in the ZIP item styles.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId5"
    Type="http://.../styles" Target="styles.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be styleSheet.

[*Example:*

```
<styleSheet xmlns="...">
  <numFmts count="5">
    <numFmt numFmtId="164" formatCode="&quot;$&quot;;#,##0.00"/>
    <numFmt numFmtId="165"
      formatCode="&quot;Yes&quot;;&quot;Yes&quot;;&quot;No&quot;"/>
    <numFmt numFmtId="166"
      formatCode="&quot;True&quot;;&quot;True&quot;;&quot;False&quot;"/>
    <numFmt numFmtId="167"
      formatCode="&quot;On&quot;;&quot;On&quot;;&quot;Off&quot;"/>
    <numFmt numFmtId="168"
      formatCode="[$€-2]\ #,##0.00_);[Red]\([$€-2]\ #,##0.00\)/>
  </numFmts>
  <fonts count="5">
    ...
  </fonts>
```

```

<fills count="4">
  ...
</fills>
<borders count="1">
  ...
</borders>
...
<colors>
  ...
</colors>
</styleSheet>

```

end example]

A Styles part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Styles part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

12.3.21 Table Definition Part

Content Type:	application/vnd.openxmlformats-officedocument.spreadsheetml.table+xml
Root Namespace:	http://purl.oclc.org/ooxml/spreadsheetml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/table

An instance of this part type contains a description of a single table and its autofilter information. (The data for the table is stored in the corresponding Worksheet part.)

A package shall contain one Table Definition part per table, and each such part shall be the target of an implicit relationship from the Worksheet (§12.3.24) part that corresponds to the worksheet containing that table.

[*Example:* The following Worksheet part-relationship item contains relationships to two Table Definition parts, which are stored in the ZIP items ../tables/tableN.xml:

```

<Relationships xmlns="...">
  <Relationship Id="rId2"
    Type="http://.../table" Target="../tables/table1.xml"/>
  <Relationship Id="rId3"
    Type="http://.../table" Target="../tables/table2.xml"/>
</Relationships>

```

end example]

The root element for a part of this content type shall be table.

[Example: table2.xml describes a table that spans a 2-column range of cells, F2:G19:

```
<table xmlns:af="..." ... id="2" name="Table2" displayName="Table2" ref="F2:G19"
  totalsRowShown="0" headerRowDxfId="7">
  <autoFilter ref="F2:G19"/>
  <tableColumns count="2">
    <tableColumn id="1" name="Salesman" dataDxfId="9" totalsRowDxfId="6"/>
    <tableColumn id="2" name="Units" dataDxfId="8" totalsRowDxfId="5"/>
  </tableColumns>
  <tableStyle name="TableStyle2" showFirstColumn="0" showLastColumn="0"
    showRowStripes="1" showColumnStripes="1"/>
</table>
```

When the filter "Salesman equal to Smith" is applied, the autoFilter element in table2.xml is extended, as follows:

```
<autoFilter ref="F2:G19">
  <af:filterColumn colId="0">
    <af:filters>
      <af:filter val="Smith"/>
    </af:filters>
  </af:filterColumn>
</autoFilter>
```

end example]

A Table Definition part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Table Definition part is permitted to explicit relationships to the following parts defined by ECMA-376:

- Query Table (§12.3.14)

A Table Definition part shall not have any implicit or explicit relationships to any other part defined by ECMA-376.

12.3.22 Volatile Dependencies Part

Content Type:	application/vnd.openxmlformats-officedocument.spreadsheetml.volatileDependencies+xml
Root Namespace:	http://purl.oclc.org/ooxml/spreadsheetml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/volatileDependencies

An instance of this part type contains information involving real-time data formulas in a workbook. Real-time data formulas return values that change over time — often every few seconds — and require connectivity to programs outside of the workbook to retrieve their data. In cases where those programs are not available, real-time data formulas can use the information stored in the Volatile Dependencies part to calculate results, rather than generate errors. More information on real-time data functions can be found in §18.17.7.284 and §18.17.7.65 through §18.17.7.71.

A package shall contain exactly one Volatile Dependencies part, and that part shall be the target of an implicit relationship from the Workbook (§12.3.23) part.

[*Example:* The following Workbook part-relationship item contains a relationship to the Volatile Dependencies part, which is stored in the ZIP item volatileDependencies.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId8"
    Type="http://.../volatileDependencies"
    Target="volatileDependencies.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be volTypes.

[*Example:*

```
<volTypes xmlns="..."/>
```

end example]

A Volatile Dependencies part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Volatile Dependencies part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

12.3.23 Workbook Part

Content Type(s):	application/vnd.openxmlformats-officedocument.spreadsheetml.sheet.main+xml application/vnd.openxmlformats-officedocument.spreadsheetml.template.main+xml
Root Namespace:	http://purl.oclc.org/ooxml/spreadsheetml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/officeDocument

An instance of this part type contains workbook data and references to all of its worksheets.

A package shall contain exactly one Workbook part, and that part shall be the target of a relationship in the package-relationship item.

[*Example:* The following SpreadsheetML package-relationship item contains a relationship to the Workbook part, which is stored in the ZIP item xl/workbook.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../officeDocument" Target="xl/workbook.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be workbook.

[*Example:* This workbook has three worksheets, named January, February, and March:

```
<workbook xmlns="..." xmlns:r="...">
  <fileVersion lastEdited="4" lowestEdited="4" rupBuild="3417"/>
  <bookViews>
    <workbookView xWindow="240" yWindow="15" windowWidth="8505"
      windowHeight="6240"/>
  </bookViews>
  <sheets>
    <sheet name="January" sheetId="1" r:id="rId1"/>
    <sheet name="February" sheetId="2" r:id="rId2"/>
    <sheet name="March" sheetId="3" r:id="rId3"/>
  </sheets>
  <workbookPr showObjects="all"/>
  <webPublishing codePage="1252"/>
  <calcPr calcId="122211" fullCalcOnLoad="1"/>
</workbook>
```

end example]

A Workbook part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Workbook part is permitted to have implicit relationships to the following parts defined by ECMA-376:

- Additional Characteristics (§15.2.1)
- Bibliography (§15.2.3)
- Calculation Chain (§12.3.1)
- Cell Metadata (§12.3.10)
- Connections (§12.3.4)
- Custom XML Mappings (§12.3.6)

- Custom XML Data Storage (§15.2.4)
- Shared String Table (§12.3.15)
- Shared Workbook Revision Headers (§12.3.16)
- Shared Workbook User Data (§12.3.18)
- Styles (§12.3.20)
- Theme (§14.2.7)
- Thumbnail (§15.2.16)
- Volatile Dependencies (§12.3.22)

A Workbook part is permitted to have explicit relationships to the following parts defined by ECMA-376:

- Chartsheet (§12.3.2)
- Dialogsheet (§12.3.7)
- External Workbook References (§12.3.8)
- Pivot Table Cache Definition (§12.3.12)
- Worksheet (§12.3.24)

A Workbook part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

12.3.24 Worksheet Part

Content Type:	application/vnd.openxmlformats-officedocument.spreadsheetml.worksheet+xml
Root Namespace:	http://purl.oclc.org/ooxml/spreadsheetml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/worksheet

An instance of this part type contains all the data, formulas, and characteristics associated with a given worksheet.

A package shall contain exactly one Worksheet part per worksheet, and those parts shall be the target of an explicit relationship from the Workbook (§12.3.23) part. Specifically, the id attribute on the sheet element shall reference the desired worksheet part.

[*Example:* The following Workbook part-relationship item contains three relationships to Worksheet parts, which are stored in the ZIP items worksheets/sheet*N*.xml:

```

<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../worksheet" Target="worksheets/sheet1.xml"/>
  <Relationship Id="rId2"
    Type="http://.../worksheet" Target="worksheets/sheet2.xml"/>
  <Relationship Id="rId3"
    Type="http://.../worksheet" Target="worksheets/sheet3.xml"/>
</Relationships>

```

end example]

The root element for a part of this content type shall be worksheet.

[*Example:* This worksheet, has cells in the range B1 to F8. Row 8 contains three cells whose values are calculated using the following formulas: D8=SUM(D5:D7), E8=SUM(E5:E7), and F8= D8-E8:

```

<worksheet xmlns="..." ...>
  <sheetPr/>
  <dimension range="B1:F8"/>
  ...
  <sheetData>
    <row r="1" spans="2:6" ht="360">
      <c r="B1" s="1" t="s">
        <v>0</v>
      </c>
    </row>
    ...
    <row r="8" spans="2:6" ht="360">
      <c r="D8" s="5">
        <f>SUM(D5:D7)</f>
        <v>2280.5299999999997</v>
      </c>
      <c r="E8" s="5">
        <f>SUM(E5:E7)</f>
        <v>1251.31</v>
      </c>
      <c r="F8" s="6">
        <f>D8-E8</f>
        <v>1029.2199999999998</v>
      </c>
    </row>
  </sheetData>
  ...
</worksheet>

```

end example]

A Worksheet part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Worksheet part is permitted to have implicit relationships to the following parts defined by ECMA-376:

- Comments (§12.3.3)
- Pivot Table Definitions (§12.3.11)
- Printer Settings (§15.2.15)
- Query Table Part (§12.3.14)
- Single Cell Table Definitions (§12.3.19)
- Table Definition (§12.3.21)

A Worksheet part is permitted to contain explicit relationships to the following parts defined by ECMA-376:

- Drawings (§12.3.8)
- Embedded Control Persistence (§15.2.9)
- Embedded Object (§15.2.10)
- Embedded Package (§15.2.11)
- Hyperlinks (§15.3)
- Images (§15.2.14)

A Worksheet part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

12.4 External Workbooks

Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/externalLinkPath
----------------------	---

An *external workbook* is a SpreadsheetML package whose contents are being referenced by the current SpreadsheetML package. When a package refers to external workbooks, it shall store the location of those workbooks using this relationship.

A package is permitted to contain one or more External Workbook relationships, and those relationships shall be an explicit relationship from the External Workbook References (§12.3.9) part.

[*Example:* An External Workbook References part, which references the package c:\sourceData.xlsx would have an External Workbook relationship, which points at that file:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../externalLinkPath"
    Target="c:\sourceData.xlsx" TargetMode="External"/>
</Relationships>
```

end example]

A external workbook shall be located external to the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be External).

13. PresentationML

This clause contains specifications for relationship items and parts that are specific to PresentationML. Parts that can occur in a PresentationML document, but are not PresentationML-specific, are specified in §15.2. Unless stated explicitly, all references to relationship items, content-type items, and parts in this clause refer to PresentationML ZIP items.

13.1 Glossary of PresentationML-Specific Terms

The following terms are used in the context of a PresentationML document:

handout — A printed set of slides that can be handed out to an audience for future reference.

note — A slide annotation, reminder, or piece of text intended for the presenter or the audience.

presentation — A collection of slides intended to be viewed by an audience.

slide — A frame containing one or more pieces of text and/or images.

slide layout — The organization of elements on a slide.

13.2 Package Structure

A PresentationML package shall contain a package-relationship item and a content-type item. The package-relationship item shall have implicit relationships with targets of the following type:

- One Presentation part (§13.3.6).

The package-relationship item is permitted to have implicit relationships with targets of the following type:

- Digital Signature Origin (§15.2.7)
- File Property parts (§15.2.12) (Application-Defined File Properties, Core File Properties, and Custom File Properties), as appropriate.
- Thumbnail (§15.2.16).

The required and optional relationships between parts are defined in §13.3 and its subordinate clauses.

[*Example:* The following package represents the minimal conformant PresentationML package as defined by ECMA-376:

First, the content type for relationship parts and the Main Presentation part (the only required part) must be defined (physically located at `/[Content_Types].xml` in the package):

```

<Types xmlns="...">
  <Default Extension="rels"
    ContentType="application/vnd.openxmlformats-
      package.relationships+xml"/>
  <Override PartName="/presentation.xml"
    ContentType="application/vnd.openxmlformats-
      officedocument.presentationml.presentation.main+xml"/>
</Types>

```

Next, the single required relationship (the package-level relationship to the Main Presentation part) must be defined (physically located at `/_rels/.rels` in the package):

```

<Relationships xmlns="...">
  <Relationship Id="rId1"

Type="http://purl.oclc.org/ooxml/officeDocument/relationships/officeDocument"
  Target="presentation.xml"/>
</Relationships>

```

Finally, the minimum content for the Main Presentation part must be defined (physically located at `/presentation.xml` in the package):

```

<p:presentation xmlns:p="...">
  <p:notesSz cx="913607" cy="913607"/>
</p:presentation>

```

end example]

[*Example:* Consider a simple PresentationML document containing two slides, which both use an image as a template. Here's an example of the hierarchical folder structure that might be used for the ZIP items in the package for that document. As shown, a number of parts have their own relationship items:

<code>/_rels/.rels</code>	<i>Package-relationship item</i>
<code>/[Content_Types].xml</code>	<i>Content-type item</i>
<code>/docProps/app.xml</code>	<i>Application-Defined File Properties</i>
<i>part</i>	
<code>/docProps/core.xml</code>	<i>Core File Properties part</i>
<code>/docProps/custom.xml</code>	<i>Custom File Properties part</i>
<code>/docProps/thumbnail.wmf</code>	<i>Package thumbnail image</i>
<code>/ppt/presentation.xml</code>	<i>Presentation part</i>
<code>/ppt/_rels/presentation.xml.rels</code>	<i>Part-relationship item</i>
<code>/ppt/presProps.xml</code>	<i>Presentation Properties part</i>
<code>/ppt/tableStyles.xml</code>	<i>Table Styles part</i>
<code>/ppt/viewProps.xml</code>	<i>View Properties part</i>

/ppt/handoutMasters/handoutMaster1.xml	<i>Handout Master part</i>
/ppt/handoutMasters/_rels/handoutMaster1.xml.rels	<i>Part-relationship item</i>
/ppt/media/image1.jpeg	<i>Slide template image</i>
/ppt/notesMasters/notesMaster1.xml	<i>Notes Master part</i>
/ppt/notesMasters/_rels/notesMaster1.xml.rels	<i>Part-relationship item</i>
/ppt/notesSlides/notesSlide1.xml	<i>Notes Slide parts</i>
/ppt/notesSlides/notesSlide2.xml	
/ppt/notesSlides/_rels/notesSlide1.xml.rels	<i>Part-relationship items</i>
/ppt/notesSlides/_rels/notesSlide2.xml.rels	
/ppt/slideLayouts/slideLayout1.xml	<i>Slide Layout parts 1-6</i>
/ppt/slideLayouts/slideLayout2.xml	
/ppt/slideLayouts/slideLayout3.xml	
/ppt/slideLayouts/slideLayout4.xml	
/ppt/slideLayouts/slideLayout5.xml	
/ppt/slideLayouts/slideLayout6.xml	
/ppt/slideLayouts/_rels/slideLayout1.xml.rels	<i>Part-relationship items</i>
/ppt/slideLayouts/_rels/slideLayout2.xml.rels	
/ppt/slideLayouts/_rels/slideLayout3.xml.rels	
/ppt/slideLayouts/_rels/slideLayout4.xml.rels	
/ppt/slideLayouts/_rels/slideLayout5.xml.rels	
/ppt/slideLayouts/_rels/slideLayout6.xml.rels	
/ppt/slideMasters/slideMaster1.xml	<i>Slide Master part</i>
/ppt/slideMasters/_rels/slideMaster1.xml.rels	<i>Part-relationship item</i>
/ppt/slides/slide1.xml	<i>Slide parts</i>
/ppt/slides/slide2.xml	
/ppt/slides/_rels/slide1.xml.rels	<i>Part-relationship items</i>
/ppt/slides/_rels/slide2.xml.rels	
/ppt/theme/theme1.xml	<i>Theme parts</i>
/ppt/theme/theme2.xml	
/ppt/theme/theme3.xml	

```

/ppt/theme/themeOverride1.xml
/ppt/theme/themeOverride2.xml
/ppt/theme/themeOverride3.xml
/ppt/theme/themeOverride4.xml
/ppt/theme/themeOverride5.xml
/ppt/theme/themeOverride6.xml
/ppt/theme/themeOverride7.xml
/ppt/theme/themeOverride8.xml
/ppt/theme/themeOverride9.xml
/ppt/theme/themeOverride10.xml

```

Theme Override parts

The package-relationship item contains the following:

```

<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../officeDocument" Target="ppt/presentation.xml"/>
  <Relationship Id="rId3"
    Type="http://.../core-properties" Target="docProps/core.xml"/>
  <Relationship Id="rId2"
    Type="http://.../thumbnail" Target="docProps/thumbnail.wmf"/>
  <Relationship Id="rId4"
    Type="http://.../extended-properties" Target="docProps/app.xml"/>
</Relationships>

```

end example]

13.3 Part Summary

The subclauses subordinate to this one describe in detail each of the part types specific to PresentationML.

[Note: For convenience, information from those subclauses is summarized in the following table:

Part	Relationship Target of	Root Element	Ref.
Comment Authors	Presentation	cmAuthorLst	§13.3.1
Comments	Slide	cmLst	§13.3.2
Handout Master	Presentation	handoutMaster	§13.3.3
Notes Master	Notes Slide, Presentation	notesMaster	§13.3.4
Notes Slide	Slide	notes	§13.3.5
Presentation	PresentationML package	presentation	§13.3.6
Presentation Properties	Presentation	presentationPr	§13.3.7
Slide	Presentation	sld	§13.3.8
Slide Layout	Slide Master, Notes Slide,	sldLayout	§13.3.9

Part	Relationship Target of	Root Element	Ref.
	Presentation, Slide, Slide Master		
Slide Master	Presentation, Slide Layout	sldMaster	§13.3.10
Slide Synchronization Data	Slide	sldSyncPr	§13.3.11
User-Defined Tags	Presentation, Slide	tagLst	§13.3.12
View Properties	Presentation	viewPr	§13.3.13

end note]

13.3.1 Comment Authors Part

Content Type:	application/vnd.openxmlformats-officedocument.presentationml.commentAuthors+xml
Root Namespace:	http://purl.oclc.org/ooxml/presentationml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/commentAuthors

An instance of this part type contains information about each author who has added a comment to the document. That information includes the author's name, initials, a unique author-ID, a last-comment-index-used count, and a display color. (The color can be used when displaying comments to distinguish comments from different authors.)

A package shall contain at most one Comment Authors part. If it exists, that part shall be the target of an implicit relationship from the Presentation (§13.3.6) part.

[*Example:* The following Presentation part relationship item contains a relationship to the Comment Authors part, which is stored in the ZIP item commentAuthors.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId8"
    Type="http://.../commentAuthors" Target="commentAuthors.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be cmAuthorLst.

[*Example:* Two people have authored comments in this document: Mary Smith and Peter Jones. Her initials are "mas", her author-ID is 0, and her comments' display color index is 0. Since Mary's last-comment-index-used value is 3, the next comment-index to be used for her is 4. His initials are "pjj", his author-ID is 1, and his comments' display color index is 1. Since Peter's last-comment-index-used value is 1, the next comment-index to be used for him is 2:

```
<p:cmAuthorLst xmlns:p="..." ...>
  <p:cmAuthor id="0" name="Mary Smith" initials="mas" lastIdx="3"
    clrIdx="0"/>
  <p:cmAuthor id="1" name="Peter Jones" initials="pjj" lastIdx="1"
    clrIdx="1"/>
</p:cmAuthorLst>
```

end example]

A Comment Authors part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Comment Authors part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

13.3.2 Comments Part

Content Type:	application/vnd.openxmlformats-officedocument.presentationml.comments+xml
Root Namespace:	http://purl.oclc.org/ooxml/presentationml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/comments

An instance of this part type contains the comments for a single slide. Each comment is tied to its author via an author-ID. Each comment's index number and author-ID combination are unique.

A package shall contain one Comments part for each slide containing one or more comments, and each of those parts shall be the target of an implicit relationship from its corresponding Slide (§13.3.8) part.

[*Example:* The following Slide part-relationship item contains a relationship to a Comments part, which is stored in the ZIP item ../comments/comment2.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId4"
    Type="http://../comments"
    Target="../comments/comment2.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be cmLst .

[*Example:* The Comments part contains three comments, two created by one author, and one created by another, all at the dates and times shown. The index numbers are assigned on a per-author basis, starting at 1 for an author's first comment:

```

<p:cmLst xmlns:p="..." ...>
  <p:cm authorId="0" dt="2005-11-13T17:00:22.071" idx="1">
    <p:pos x="4486" y="1342"/>
    <p:text>Comment text goes here.</p:text>
  </p:cm>
  <p:cm authorId="0" dt="2005-11-13T17:00:34.849" idx="2">
    <p:pos x="3607" y="1867"/>
    <p:text>Another comment's text goes here.</p:text>
  </p:cm>
  <p:cm authorId="1" dt="2005-11-15T00:06:46.919" idx="1">
    <p:pos x="1493" y="2927"/>
    <p:text>comment ...</p:text>
  </p:cm>
</p:cmLst>

```

end example]

A Comments part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Comments part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

13.3.3 Handout Master Part

Content Type:	application/vnd.openxmlformats-officedocument.presentationml.handoutMaster+xml
Root Namespace:	http://purl.oclc.org/ooxml/presentationml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/handoutMaster

An instance of this part type contains the look, position, and size of the slides, notes, header and footer text, date, or page number on the presentation's handout.

A package shall contain at most one Handout Master part, and it shall be the target of an explicit relationship from the Presentation (§13.3.6) part.

[Example: The following Presentation part-relationship item contains a relationship to the Handout Master part, which is stored in the ZIP item handoutMasters/handoutMaster1.xml:

```

<Relationships xmlns="...">
  <Relationship Id="rId5"
    Type="http://.../handoutMaster"
    Target="handoutMasters/handoutMaster1.xml"/>
</Relationships>

```

end example]

The root element for a part of this content type shall be `handoutMaster`.

[*Example:*

```
<p:handoutMaster xmlns:p="...">
  <p:cSld name="">
    ...
  </p:cSld>
  <p:clrMap ... />
</p:handoutMaster>
```

end example]

A Handout Master part shall be located within the package containing the relationships part (expressed syntactically, the `TargetMode` attribute of the `Relationship` element shall be `Internal`).

A Handout Master part is permitted to have implicit relationships to the following parts defined by ECMA-376:

- Additional Characteristics (§15.2.1)
- Bibliography (§15.2.3)
- Custom XML Data Storage (§15.2.4)
- Theme (§14.2.7)
- Thumbnail (§15.2.16)

A Handout Master part is permitted to have explicit relationships to the following parts defined by ECMA-376:

- Audio (§15.2.2)
- Chart (§14.2.1)
- Content Part (§15.2.4)
- Diagrams: Diagram Colors (§14.2.3), Diagram Data (§14.2.4), Diagram Layout Definition (§14.2.5) and Diagram Styles (§14.2.6)
- Embedded Control Persistence (§15.2.9)
- Embedded Object (§15.2.10)
- Embedded Package (§15.2.11)
- Hyperlink (§15.3)
- Image (§15.2.14)
- Video (§15.2.15)

A Handout Master part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

13.3.4 Notes Master Part

Content Type:	application/vnd.openxmlformats-officedocument.presentationml.notesMaster+xml
---------------	--

Root Namespace:	http://purl.oclc.org/ooxml/presentationml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/notesMaster

An instance of this part type contains information about the content and formatting of all notes pages.

A package shall contain at most one Notes Master part, and that part shall be the target of an implicit relationship from the Notes Slide (§13.3.5) part, as well as an explicit relationship from the Presentation (§13.3.6) part.

[*Example:* The following Presentation part-relationship item contains a relationship to the Notes Master part, which is stored in the ZIP item notesMasters/notesMaster1.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId4"
    Type="http://.../notesMaster" Target="notesMasters/notesMaster1.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be notesMaster.

[*Example:*

```
<p:notesMaster xmlns:p="...">
  <p:cSld name="">
    ...
  </p:cSld>
  <p:clrMap ... />
</p:notesMaster>
```

end example]

A Notes Master part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Notes Master part is permitted to have implicit relationships to the following parts defined by ECMA-376:

- Additional Characteristics (§15.2.1)
- Bibliography (§15.2.3)
- Custom XML Data Storage (§15.2.4)
- Theme (§14.2.7)
- Thumbnail (§15.2.16)

A Notes Master part is permitted to have explicit relationships to the following parts defined by ECMA-376:

- Audio (§15.2.2)
- Chart (§14.2.1)
- Content Part (§15.2.4)
- Diagrams: Diagram Colors (§14.2.3), Diagram Data (§14.2.4), Diagram Layout Definition (§14.2.5) and Diagram Styles (§14.2.6)
- Embedded Control Persistence (§15.2.9)
- Embedded Object (§15.2.10)
- Embedded Package (§15.2.11)
- Hyperlink (§15.3).
- Image (§15.2.14)
- Video (§15.2.15)

The Notes Master part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

13.3.5 Notes Slide Part

Content Type:	application/vnd.openxmlformats-officedocument.presentationml.notesSlide+xml
Root Namespace:	http://purl.oclc.org/ooxml/presentationml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/notesSlide

An instance of this part type contains the notes for a single slide.

A package shall contain one Notes Slide part for each slide that contains notes. If they exist, those parts shall each be the target of an implicit relationship from the Slide (§13.3.8) part.

[*Example:* The following Slide part-relationship item contains a relationship to a Notes Slide part, which is stored in the ZIP item `../notesSlides/notesSlide1.xml`:

```
<Relationships xmlns="...">
  <Relationship Id="rId3"
    Type="http://../notesSlide" Target="../notesSlides/notesSlide1.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be notes.

[*Example:*


```

<p:notes xmlns:p="...">
  <p:cSld name="">
    ...
  </p:cSld>
  <p:clrMapOvr>
    <a:masterClrMapping/>
  </p:clrMapOvr>
</p:notes>

```

end example]

A Notes Slide part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Notes Slide part is permitted to have implicit relationships to the following parts defined by ECMA-376:

- Additional Characteristics (§15.2.1)
- Bibliography (§15.2.3)
- Custom XML Data Storage (§15.2.4)
- Notes Master (§13.3.4)
- Theme Override (§14.2.8)
- Thumbnail (§15.2.16)

A Notes Slide part is permitted to have explicit relationships to the following parts defined by ECMA-376:

- Audio (§15.2.2)
- Chart (§14.2.1)
- Content Part (§15.2.4)
- Diagrams: Diagram Colors (§14.2.3), Diagram Data (§14.2.4), Diagram Layout Definition (§14.2.5) and Diagram Styles (§14.2.6)
- Embedded Control Persistence (§15.2.9)
- Embedded Object (§15.2.10)
- Embedded Package (§15.2.11)
- Hyperlink (§15.3).
- Image (§15.2.14)
- Video (§15.2.15)

The Notes Slide part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

13.3.6 Presentation Part

Content Type:	application/vnd.openxmlformats-officedocument.presentationml.presentation.main+xml application/vnd.openxmlformats-officedocument.presentationml.slideshow.main+xml application/vnd.openxmlformats-officedocument.presentationml.template.main+xml
---------------	---

Root Namespace:	http://purl.oclc.org/ooxml/presentationml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/officeDocument

An instance of this part type contains the definition for a slide presentation.

A package shall contain exactly one Presentation part, and that part shall be the target of a relationship in the package-relationship item.

[*Example:* The following PresentationML's package-relationship item contains a relationship to the Presentation part, which is stored in the ZIP item ppt/presentation.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../officeDocument" Target="ppt/presentation.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be presentation.

[*Example:* This presentation contains two slides:

```
<p:presentation xmlns:p="..." ... >
  <p:sldMasterIdLst>
    <p:sldMasterId
      xmlns:rel="http://.../relationships" rel:id="rId1"/>
  </p:sldMasterIdLst>
  <p:notesMasterIdLst>
    <p:notesMasterId
      xmlns:rel="http://.../relationships" rel:id="rId4"/>
  </p:notesMasterIdLst>
  <p:handoutMasterIdLst>
    <p:handoutMasterId
      xmlns:rel="http://.../relationships" rel:id="rId5"/>
  </p:handoutMasterIdLst>
  <p:sldIdLst>
    <p:sldId id="267"
      xmlns:rel="http://.../relationships" rel:id="rId2"/>
    <p:sldId id="256"
      xmlns:rel="http://.../relationships" rel:id="rId3"/>
  </p:sldIdLst>
```

```

    <p:sldSz cx="9144000" cy="6858000"/>
    <p:notesSz cx="6858000" cy="9144000"/>
  </p:presentation>

```

end example]

A Presentation part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Presentation part is permitted to have implicit relationships to the following parts defined by ECMA-376:

- Additional Characteristics (§15.2.1)
- Comment Authors (§13.3.1)
- Bibliography (§15.2.3)
- Custom XML Data Storage (§15.2.4)
- Font (§15.2.13)
- Presentation Properties (§13.3.7)
- Table Styles (§14.2.9)
- Theme (§14.2.7)
- Thumbnail (§15.2.16)
- View Properties (§13.3.13).

A Presentation part is permitted to have explicit relationships to the following parts defined by ECMA-376:

- Notes Master (§13.3.4)
- Handout Master (§13.3.3)
- Slide (§13.3.8)
- Slide Master (§13.3.10)
- User Defined Tags (§13.3.12)

13.3.7 Presentation Properties Part

Content Type:	application/vnd.openxmlformats-officedocument.presentationml.presProps+xml
Root Namespace:	http://purl.oclc.org/ooxml/presentationml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/presProps

An instance of this part type contains all the presentation's properties.

A package shall contain exactly one Presentation Properties part, and that part shall be the target of an implicit relationship from the Presentation (§13.3.6) part.

[*Example:* The following Presentation part-relationship item contains a relationship to the Presentation Properties part, which is stored in the ZIP item presProps.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId6"
    Type="http://.../presProps" Target="presProps.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be presentationPr.

[*Example:*

```
<p:presentationPr xmlns:p="..." ...>
  <p:clrMru>
    ...
  </p:clrMru>
  ...
</p:presentationPr>
```

end example]

A Presentation Properties part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Presentation Properties part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

13.3.8 Slide Part

Content Type:	application/vnd.openxmlformats-officedocument.presentationml.slide+xml
Root Namespace:	http://purl.oclc.org/ooxml/presentationml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/slide

A Slide part contains the contents of a single slide.

A package shall contain one Slide part per slide, and each of those parts shall be the target of an explicit relationship from the Presentation (§13.3.6) part.

[*Example:* Consider a PresentationML document having two slides. The corresponding Presentation part-relationship item contains two relationships to Slide parts, which are stored in the ZIP items slides/slide1.xml and slides/slide2.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId2"
    Type="http://.../slide" Target="slides/slide1.xml"/>
  <Relationship Id="rId3"
    Type="http://.../slide" Target="slides/slide2.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be sld.

[Example: slides/slide1.xml contains:

```
<p:sld xmlns:p="...">
  <p:cSld name="">
    ...
  </p:cSld>
  <p:clrMapOvr>
    ...
  </p:clrMapOvr>
  <p:timing>
    <p:tnLst>
      <p:par>
        <p:cTn id="1" dur="indefinite" restart="never" nodeType="tmRoot"/>
      </p:par>
    </p:tnLst>
  </p:timing>
</p:sld>
```

end example]

A Slide part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Slide part is permitted to have implicit relationships to the following parts defined by ECMA-376:

- Additional Characteristics (§15.2.1)
- Bibliography (§15.2.3)
- Comments (§13.3.2)
- Custom XML Data Storage (§15.2.4)
- Notes Slide (§13.3.5)
- Theme Override (§14.2.8)
- Thumbnail (§15.2.16)
- Slide Layout (§13.3.9)
- Slide Synchronization Data (§13.3.11)

A Slide part is permitted to have explicit relationships to the following parts defined by ECMA-376:

- Audio (§15.2.2)
- Chart (§14.2.1)
- Content Part (§15.2.4)
- Diagrams: Diagram Colors (§14.2.3), Diagram Data (§14.2.4), Diagram Layout Definition (§14.2.5) and Diagram Styles (§14.2.6)
- Embedded Control Persistence (§15.2.9)
- Embedded Object (§15.2.10)
- Embedded Package (§15.2.11)
- Hyperlink (§15.3).
- Image (§15.2.14)
- User Defined Tags (§13.3.12)
- Video (§15.2.15)

A Slide part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

13.3.9 Slide Layout Part

Content Type:	application/vnd.openxmlformats-officedocument.presentationml.slideLayout+xml
Root Namespace:	http://purl.oclc.org/ooxml/presentationml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/slideLayout

An instance of this part type contains the definition for a slide layout template for this presentation. This template defines the default appearance and positioning of drawing objects on this slide type when it is created.

A package shall contain one or more Slide Layout parts, and each of those parts shall be the target of an explicit relationship in the Slide Master (§13.3.10) part, as well as an implicit relationship from each of the Slide (§13.3.8) parts associated with this slide layout.

[*Example:* The following Slide Master part-relationship item contains relationships to several Slide Layout parts, which are stored in the ZIP items ../slideLayouts/slideLayoutN.xml:

```

<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../slideLayout"
    Target="../../slideLayouts/slideLayout1.xml"/>
  <Relationship Id="rId2"
    Type="http://.../slideLayout"
    Target="../../slideLayouts/slideLayout2.xml"/>
  <Relationship Id="rId3"
    Type="http://.../slideLayout"
    Target="../../slideLayouts/slideLayout3.xml"/>
</Relationships>

```

end example]

The root element for a part of this content type shall be sldLayout.

[Example:

```

<p:sldLayout xmlns:p="..." matchingName="" type="title" preserve="1">
  <p:cSld name="Title Slide">
    ...
  </p:cSld>
  <p:clrMapOvr>
    <a:masterClrMapping/>
  </p:clrMapOvr>
  <p:timing/>
</p:sldLayout>
</p:sldMaster>

```

end example]

A Slide Layout part is permitted to have implicit relationships to the following parts defined by ECMA-376:

- Additional Characteristics (§15.2.1)
- Bibliography (§15.2.3)
- Custom XML Data Storage (§15.2.4)
- Slide Master (§13.3.10)
- Theme Override (§14.2.8)
- Thumbnail (§15.2.16)

A Slide Layout part is permitted to have explicit relationships to the following parts defined by ECMA-376:

- Audio (§15.2.2)
- Chart (§14.2.1)
- Content Part (§15.2.4)

- Diagrams: Diagram Colors (§14.2.3), Diagram Data (§14.2.4), Diagram Layout Definition (§14.2.5) and Diagram Styles (§14.2.6)
- Embedded Control Persistence (§15.2.9)
- Embedded Object (§15.2.10)
- Embedded Package (§15.2.11)
- Hyperlink (§15.3).
- Image (§15.2.14)
- Video (§15.2.15)

A Slide Layout part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

13.3.10 Slide Master Part

Content Type:	application/vnd.openxmlformats-officedocument.presentationml.slideMaster+xml
Root Namespace:	http://purl.oclc.org/ooxml/presentationml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/slideMaster

An instance of this part type contains the master definition of formatting, text, and objects that appear on each slide in the presentation that is derived from this slide master.

A package shall contain one or more Slide Master parts, each of which shall be the target of an explicit relationship from the Presentation (§13.3.6) part, as well as an implicit relationship from any Slide Layout (§13.3.9) part where that slide layout is defined based on this slide master. Each can optionally be the target of a relationship in a Slide Layout (§13.3.9) part as well.

[*Example:* The following Presentation part-relationship item contains a relationship to the Slide Master part, which is stored in the ZIP item slideMasters/slideMaster1.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../slideMaster" Target="slideMasters/slideMaster1.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be sldMaster.

[*Example:*


```

<p:sldMaster xmlns:p="...">
  <p:cSld name="">
    ...
  </p:cSld>
  <p:clrMap ... />
</p:sldMaster>

```

end example]

A Slide Master part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Slide Master part is permitted to have implicit relationships to the following parts defined by ECMA-376:

- Additional Characteristics (§15.2.1)
- Bibliography (§15.2.3)
- Custom XML Data Storage (§15.2.4)
- Theme (§14.2.7)
- Thumbnail (§15.2.16)

A Slide Master part is permitted to have explicit relationships to the following parts defined by ECMA-376:

- Audio (§15.2.2)
- Chart (§14.2.1)
- Content Part (§15.2.4)
- Diagrams: Diagram Colors (§14.2.3), Diagram Data (§14.2.4), Diagram Layout Definition (§14.2.5) and Diagram Styles (§14.2.6)
- Embedded Control Persistence (§15.2.9)
- Embedded Object (§15.2.10)
- Embedded Package (§15.2.11)
- Hyperlink (§15.3).
- Image (§15.2.14)
- Slide Layout (§13.3.9)
- Video (§15.2.15)

A Slide Master part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

13.3.11 Slide Synchronization Data Part

Content Type:	application/vnd.openxmlformats-officedocument.presentationml.slideUpdateInfo+xml
Root Namespace:	http://purl.oclc.org/ooxml/presentationml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/slideUpdateInfo

An instance of this part type contains properties specifying the current state of a slide that is being synchronized with a version of that slide stored on a central server.

A package shall contain zero or one Slide Synchronization Data part for each slide stored in the presentation, and that part shall be the target of an implicit relationship from the corresponding Slide (§13.3.8) part.

[*Example:* The following Slide part-relationship item contains a relationship to the Slide Synchronization Data part, which is stored in the ZIP item slideUpdateInfo/slideUpdateInfo1.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId1" Type="http://.../slideUpdateInfo"
    Target="slideUpdateInfo/slideUpdateInfo1.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be sldSyncPr.

[*Example:*

```
<p:sldSyncPr xmlns:p="..." serverSldId="1"
  serverSldModifiedTime="2006-08-12T01:31:08"
  clientInsertedTime="2006-08-12T01:34:11.227" />
```

end example]

A Slide Synchronization Data part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Slide Synchronization Data part is permitted to have implicit relationships to the following parts defined by ECMA-376:

- Slide Synchronization Server Location (§13.4)

A Slide Synchronization Data part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

13.3.12 User Defined Tags Part

Content Type:	application/vnd.openxmlformats-officedocument.presentationml.tags+xml
Root Namespace:	http://purl.oclc.org/ooxml/presentationml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/tags

An instance of this part type contains a set of user-defined properties for an object in a presentation (each property consisting of a name/value pair).

A package shall contain zero or more User Defined Tags parts, each as the target of an explicit relationship from the corresponding Presentation (§13.3.6) or Slide (§13.3.8) part.

[Example: The following Slide part-relationship item contains a relationship to the User Defined Tags part, which is stored in the ZIP item tags/tag1.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId1" Type="http://.../tag"
    Target="tags/tag1.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be tagLst.

[Example:

```
<p:tagLst xmlns:p="..." >
  <p:tag name="testTagName" val="testTagValue" />
</p:tagLst>
```

end example]

A User Defined Tags part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A User Defined Tags part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

13.3.13 View Properties Part

Content Type:	application/vnd.openxmlformats-officedocument.presentationml.viewProps+xml
Root Namespace:	http://purl.oclc.org/ooxml/presentationml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/viewProps

An instance of this part type contains display properties for this presentation.

A package shall contain zero or one View Properties part, and if it exists, that part shall be the target of an implicit relationship from the Presentation (§13.3.6) part.

[Example: The following Presentation part-relationship item contains a relationship to the View Properties part, which is stored in the ZIP item viewProps.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId7"
    Type="http://.../viewProps" Target="viewProps.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be viewPr.

[Example:

```
<p:viewPr xmlns:p="..." ...>
  <p:normalViewPr showOutlineIcons="0">
    ...
  </p:normalViewPr>
  <p:slideViewPr>
    ...
  </p:slideViewPr>
  <p:outlineViewPr>
    ...
  </p:outlineViewPr>
  <p:notesTextViewPr>
    ...
  </p:notesTextViewPr>
  <p:gridSpacing cx="78028800" cy="78028800"/>
</p:viewPr>
```

end example]

A View Properties part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A View Properties part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

13.4 HTML Publish Location

Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/htmlPubSaveAs
----------------------	---

When a presentation specifies an external location to which an optional copy might be pushed in the HTML format, this relationship shall be used to target the location where the HTML copy of the presentation is published.

A package shall contain one HTML Publish Location relationship for each slide linked with an HTML publish location, and that relationships shall be an explicit relationship from the corresponding Presentation Properties (§13.3.7) part.

[*Example:* A Presentation Properties part, which stores an HTML Publish Location of <http://www.openxmlformats.org/test.htm> contains the following relationship in that part's relationship part:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../htmlPubSaveAs"
    Target="http://www.openxmlformats.org/test.htm" type="External"/>
</Relationships>
```

end example]

An HTML publish location shall be located external to the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be External).

13.5 Slide Synchronization Server Location

Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/slideUpdateUrl
----------------------	---

When a slide is being synchronized with a copy stored on a remote server, this relationship shall be used to target the location where the server copy of the slide is stored.

A package shall contain one Slide Synchronization Server Location relationship for each slide linked with server data, and that relationships shall be an implicit relationship from the corresponding Slide Synchronization Data (§13.3.11) part.

[*Example:* A Slide Synchronization Data part that stores information about a slide that is synchronized with a server located at <http://www.openxmlformats.org/slides/> contains the following relationship in that part's relationship part item:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../slideupdateUrl"
    Target="http://www.openxmlformats.org/slides/" type="External"/>
</Relationships>
```

end example]

A slide synchronization server location shall be located external to the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be External).

14. DrawingML

The relationship items and parts defined in this clause are used by one or more of WordprocessingML (§11), SpreadsheetML (§12), and PresentationML (§13) environments.

14.1 Glossary of DrawingML-Specific Terms

diagram — A picture or graphical representation that is displayed using a related set of color, data, layout, and style parts. Examples of diagram types are cycle, organization chart, pyramid, target, and Venn.

14.2 Part Summary

The subclauses subordinate to this one describe in detail each of the part types specific to DrawingML.

[Note: For convenience, information from those subclauses is summarized in the following table:

Part	Relationship Target of	Root Element	Ref.
Chart	WordprocessingML: Main Document SpreadsheetML: Drawings PresentationML: Handout Master, Notes Master, Notes Slide, Slide Layout, Slide Master, Slide All: Chart Drawing	chartSpace	§14.2.1
Chart Drawing	All: Chart	userShapes	§14.2.2
Diagram Colors	WordprocessingML: Main Document SpreadsheetML: Drawings PresentationML: Handout Master, Notes Master, Notes Slide, Slide Layout, Slide Master, Slide	colorsDef	§14.2.3
Diagram Data	WordprocessingML: Main Document SpreadsheetML: Drawings PresentationML: Handout Master, Notes Master, Notes Slide, Slide Layout, Slide Master, Slide	dataModel	§14.2.4
Diagram Layout Definition	WordprocessingML: Main Document SpreadsheetML: Drawings PresentationML: Handout Master, Notes Master, Notes Slide, Slide Layout, Slide Master, Slide	layoutDef	§14.2.5

Part	Relationship Target of	Root Element	Ref.
Diagram Style	WordprocessingML: Main Document SpreadsheetML: Drawings PresentationML: Handout Master, Notes Master, Notes Slide, Slide Layout, Slide Master, Slide	styleDef	§14.2.6
Theme	WordprocessingML: Main Document SpreadsheetML: Workbook PresentationML: Handout Master, Notes Master, Presentation, Slide Master	theme	§14.2.7
Theme Override	PresentationML: Notes Slide, Slide, Slide Layout	themeOverride	§14.2.8
Table Styles	PresentationML: Presentation	tblStyleLst	§14.2.9

end note]

14.2.1 Chart Part

Content Type:	application/vnd.openxmlformats-officedocument.drawingml.chart+xml
Root Namespace:	http://purl.oclc.org/ooxml/drawingml/chart
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/chart

An instance of this part type describes a chart.

A package shall contain a Chart part for each chart in the document. In a WordprocessingML document, each such part shall be the target of an explicit relationship in a Main Document (§11.3.10) part. In a SpreadsheetML document, each such part shall be the target of an explicit relationship in a Drawings (§12.3.8) part. In a PresentationML document, each such part shall be the target of an explicit relationship in a Handout Master (§13.3.3), Notes Master (§13.3.4), Notes Slide (§13.3.5), Slide (§13.3.8), Slide Layout (§13.3.9), or Slide Master (§13.3.10) part. This part is permitted to also be the target of an explicit relationship in a Chart Drawing (§14.2.2) part, if the chart that points at this Chart Drawing part is the target of a relationship from a Chartsheet part. In other words, the only time a chart can embed another chart is if the parent chart is part of a chartsheet.

[*Example:* The following Main Document part-relationship item contains relationships to two Chart parts, which are stored in the ZIP items ../charts/chartN.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId4"
    Type="http://.../chart" Target="charts/chart1.xml"/>
  <Relationship Id="rId5"
    Type="http://.../chart" Target="charts/chart2.xml"/>
</Relationships>
```

The following Drawings part-relationship item contains a relationship to a Chart part, which is stored in the ZIP item ../charts/chart1.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../relationships/chart" Target="../charts/chart1.xml"/>
</Relationships>
```

The following Slide part-relationship item contains relationships to two Chart parts, which are stored in the ZIP items ../charts/chartN.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId4"
    Type="http://.../chart" Target="../charts/chart1.xml"/>
  <Relationship Id="rId5"
    Type="http://.../chart" Target="../charts/chart2.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be chartSpace.

[Example: chart1.xml contains the following clustered bar chart:

```
<c:chartSpace ...>
  <c:chart>
    <c:title>
      ...
    </c:title>
    <c:plotArea>
      <c:layout>
        ...
      </c:layout>
      <c:barChart>
        ...
      </c:barChart>
    </c:plotArea>
```



```

        <c:legend>
        ...
    </c:legend>
</c:chart>
...
</c:chartSpace>

```

end example]

For WordprocessingML and PresentationML documents, the data for a chart is not stored in the Chart part directly. Instead, it shall be stored in an embedded SpreadsheetML package (§12.2) targeted by an Embedded Package (§15.2.11) part specified by that Chart part. For SpreadsheetML documents, the data for a chart is stored directly in the Drawing's parent worksheet; no embedded SpreadsheetML package shall be used.

A Chart part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Chart part is permitted to have explicit relationships to the following parts defined by ECMA-376:

- Chart Drawing (§14.2.2)
- Embedded Package (§15.2.11)

A Chart part shall not have any implicit or explicit relationships to any other part defined by ECMA-376.

14.2.2 Chart Drawing Part

Content Type:	application/vnd.openxmlformats-officedocument.drawingml.chartshapes+xml
Root Namespace:	http://purl.oclc.org/ooxml/drawingml/chart
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/chartUserShapes

An instance of this part type contains all basic drawing elements (shapes) which are explicitly associated with this chart. These drawing elements are automatically moved with the chart when it is moved and resized when the chart is resized.

A package is permitted to contain one Chart Drawing part per chart part, and each such part shall be the target of an explicit relationship from a Chart (§14.2.1) part.

[Example: The following Chart part-relationship item contains a relationship to a Chart Drawing part, which is stored in the ZIP item ../drawings/drawing1.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId2"
    Type="http://.../chartUserShapes" Target="../drawings/drawing1.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be userShapes.

[Example:

```
<c:userShapes xmlns:cdr="..." xmlns:c="...">
  <cdr:relSizeAnchor>
    ...
  </cdr:relSizeAnchor>
</c:userShapes>
```

end example]

A Chart Drawing part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Chart Drawing part is permitted to have explicit relationships to the following parts defined by ECMA-376:

- Chart (§14.2.1)

A Chart Drawing part shall not have any implicit or explicit relationships to any other part defined by ECMA-376.

14.2.3 Diagram Colors Part

Content Type:	application/vnd.openxmlformats-officedocument.drawingml.diagramColors+xml
Root Namespace:	http://purl.oclc.org/ooxml/drawingml/diagram
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/diagramColors

An instance of this part type contains color information for a diagram.

A package shall contain exactly one Diagram Colors part per diagram. Each Diagram Colors part shall be the target of an explicit relationship in a WordprocessingML Main Document (§11.3.10), SpreadsheetML Drawings (§12.3.8), or PresentationML Slide (§13.3.8) part.

[Example: The following SpreadsheetML Drawings part-relationship item contains a relationship to two Diagram Colors parts, which are stored in the ZIP items ../graphics/colorsN.xml.

```

<Relationships xmlns="...">
  <Relationship Id="rId4"
    Type="http://.../diagramColors" Target="../graphics/colors1.xml"/>
  <Relationship Id="rId8"
    Type="http://.../diagramColors" Target="../graphics/colors2.xml"/>
</Relationships>

```

end example]

The root element for a part of this content type shall be colorsDef.

[Example: colors1.xml contains the following:

```

<cs:colorsDef xmlns:cs="..." uniqueId="..." minVer="12.0">
  <cs:title lang="" val="Primary Accent 2"/>
  <cs:desc lang="" val="Primary Accent 2"/>
  <cs:catLst>
    <cs:cat type="accent1" pri="11200"/>
  </cs:catLst>
  <cs:styleLbl ...>
    ...
  </cs:styleLbl>
  ...
  <cs:styleLbl ...>
    ...
  </cs:styleLbl>
</cs:colorsDef>

```

end example]

A Diagram Colors part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Diagram Colors part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

14.2.4 Diagram Data Part

Content Type:	application/vnd.openxmlformats-officedocument.drawingml.diagramData+xml
Root Namespace:	http://purl.oclc.org/ooxml/drawingml/diagram
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/diagramData

An instance of this part type contains the semantic data for a diagram.

A package shall contain exactly one Diagram Data part per diagram. Each Diagram Data part shall be the target of an explicit relationship in a WordprocessingML Main Document (§11.3.10); a SpreadsheetML Drawings part (§12.3.8); or a PresentationML Handout Master (§13.3.3), Notes Master (§13.3.4), Notes Slide (§13.3.5), Slide (§13.3.8), Slide Layout (§13.3.9), or Slide Master (§13.3.10) part.

[*Example:* The following SpreadsheetML Drawings part-relationship item contains a relationship to two Diagram Data parts, which are stored in the ZIP items ../graphics/dataN.xml.

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../diagramData" Target="../graphics/data1.xml"/>
  <Relationship Id="rId5"
    Type="http://.../diagramData" Target="../graphics/data2.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be dataModel.

[*Example:* data1.xml contains the following:

```
<dm:dataModel xmlns:dm="...">
  <dm:ptLst>
    ...
  </dm:ptLst>
  <dm:cxnLst>
    ...
  </dm:cxnLst>
  <dm:bg/>
  <dm:whole/>
</dm:dataModel>
```

end example]

A Diagram Data part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Diagram Data part is permitted to have explicit relationships to the following parts defined by ECMA-376:

- Image (§15.2.14)

A Diagram Data part shall not have any implicit or explicit relationships to other parts defined by ECMA-376.

14.2.5 Diagram Layout Definition Part

Content Type:	application/vnd.openxmlformats-officedocument.drawingml.diagramLayout+xml
Root	http://purl.oclc.org/ooxml/drawingml/diagram

Namespace:	
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/diagramLayout

An instance of this part type is a template that describes how diagram-related data is mapped to a shape.

A package shall contain exactly one Diagram Layout Definition part per diagram. Each Layout Definition part shall be the target of an explicit relationship from a WordprocessingML Main Document (§11.3.10); a SpreadsheetML Drawings part (§12.3.8); or a PresentationML Handout Master (§13.3.3), Notes Master (§13.3.4), Notes Slide (§13.3.5), Slide (§13.3.8), Slide Layout (§13.3.9), or Slide Master (§13.3.10) part. If a document contains multiple diagrams having the same graphic layout definition, each of those diagrams shall have its own copy of that Diagram Layout Definition part.

[*Example:* The following SpreadsheetML Drawings part-relationship item contains a relationship to two Diagram Layout Definition parts, which are stored in the ZIP items ../graphics/layoutN.xml.

```
<Relationships xmlns="...">
  <Relationship Id="rId2"
    Type="http://.../diagramLayout" Target="../graphics/layout1.xml"/>
  <Relationship Id="rId6"
    Type="http://.../diagramLayout" Target="../graphics/layout2.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be layoutDef.

[*Example:* layout1.xml contains the following:

```
<lo:layoutDef xmlns:lo="..." uniqueId="...2" minVer="12.0" defStyle="">
  <lo:title lang="" val="Hierarchy 2"/>
  <lo:desc lang="" val=""/>
  <lo:catLst>
    <lo:cat type="hierarchy" pri="2000"/>
  </lo:catLst>
  <lo:sampData>
    ...
  </lo:sampData>
  <lo:styleData>
    ...
  </lo:styleData>
  <lo:clrData>
    ...
  </lo:clrData>
```

```
<lo:layoutNode name="Name0" styleLbl="" moveWith="">
  ...
</lo:layoutNode>
</lo:layoutDef>
```

end example]

A Diagram Layout Definition part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Diagram Layout Definition part is permitted to have explicit relationships to the following parts and items defined by ECMA-376:

- Image (§15.2.14)

A Diagram Layout Definition part shall not have any implicit or explicit relationships to other parts defined by ECMA-376.

14.2.6 Diagram Style Part

Content Type:	application/vnd.openxmlformats-officedocument.drawingml.diagramStyle+xml
Root Namespace:	http://purl.oclc.org/ooxml/drawingml/diagram
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/diagramQuickStyle

An instance of this part type maps diagram semantic information to a document's theme.

A package shall contain exactly one Diagram Style part per diagram. Each Style part shall be the target of an explicit relationship from a WordprocessingML Main Document (§11.3.10); a SpreadsheetML Drawings part (§12.3.8); or a PresentationML Handout Master (§13.3.3), Notes Master (§13.3.4), Notes Slide (§13.3.5), Slide (§13.3.8), Slide Layout (§13.3.9), or Slide Master (§13.3.10) part.

[*Example:* The following SpreadsheetML Drawings part-relationship item contains a relationship to two Diagram Style parts, which are stored in the ZIP items ../graphics/quickStyleN.xml.

```
<Relationships xmlns="...">
  <Relationship Id="rId3"
    Type="http://.../diagramQuickStyle"
    Target="../graphics/quickStyle1.xml"/>
  <Relationship Id="rId7"
    Type="http://.../diagramQuickStyle"
    Target="../graphics/quickStyle2.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be styleDef.

[Example: quickStyle1.xml contains the following:

```
<qs:styleDef xmlns:qs="" uniqueId="" minVer="12.0">
  <qs:title lang="" val="Style 2"/>
  <qs:desc lang="" val="Style 2"/>
  <qs:catLst>
    <qs:cat type="simple" pri="10200"/>
  </qs:catLst>
  <qs:scene3d>
    ...
  </qs:scene3d>
  <qs:style>
    ...
  </qs:style>
  <qs:styleLbl name="">
    ...
  </qs:styleLbl>
  ...
  <qs:styleLbl name="">
    ...
  </qs:styleLbl>
</qs:styleDef>
```

end example]

A Diagram Style part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Diagram Style part shall not have implicit or explicit relationships to other parts defined by ECMA-376.

14.2.7 Theme Part

Content Type:	application/vnd.openxmlformats-officedocument.theme+xml
Root Namespace:	http://purl.oclc.org/ooxml/drawingml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/theme

An instance of this part type contains information about a document's *theme*, which is a combination of *color scheme*, *font scheme*, and *format scheme* (the latter also being referred to as *effects*). For a WordprocessingML document, the choice of theme affects the color and style of headings, among other things. For a

SpreadsheetML document, the choice of theme affects the color and style of cell contents and charts, among other things. For a PresentationML document, the choice of theme affects the formatting of slides, handouts, and notes via the associated master, among other things.

A WordprocessingML or SpreadsheetML package shall contain zero or one Theme part, which shall be the target of an implicit relationship in a Main Document (§11.3.10) or Workbook (§12.3.23) part. A PresentationML package shall contain zero or one Theme part per Handout Master (§13.3.3), Notes Master (§13.3.4), Slide Master (§13.3.10) or Presentation (§13.3.6) part via an implicit relationship.

[*Example:* The following WordprocessingML Main Document part-relationship item contains a relationship to the Theme part, which is stored in the ZIP item theme/theme1.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId4"
    Type="http://.../theme" Target="theme/theme1.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be theme.

[*Example:* theme1.xml contains the following, where the name attributes of the clrScheme, fontScheme, and fmtScheme elements correspond to the document's color scheme, font scheme, and format scheme, respectively:

```
<a:theme xmlns:a="...">
  <a:themeElements>
    <a:clrScheme name="...">
      ...
    </a:clrScheme>
    <a:fontScheme name="...">
      ...
    </a:fontScheme>
    <a:fmtScheme name="...">
      ...
    </a:fmtScheme>
  </a:themeElements>
  <a:objectDefaults/>
</a:theme>
```

end example]

A Theme part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Theme part is permitted to contain explicit relationships to the following parts defined by ECMA-376:

- Image (§15.2.14)

A Theme part shall not have any implicit or explicit relationships to other parts defined by ECMA-376.

14.2.8 Theme Override Part

Content Type:	application/vnd.openxmlformats-officedocument.themeOverride+xml
Root Namespace:	http://purl.oclc.org/ooxml/drawingml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/themeOverride

An instance of this part type contains information about an object's *theme override*, which are overrides to the *color scheme*, *font scheme*, and *format scheme* (the latter also being referred to as *effects*) for a particular slide, notes slide, or handout.

A PresentationML package shall contain zero or one Theme Override part per Notes Slide (§13.3.5), Slide (§13.3.8), or Slide Layout (§13.3.9) part via an implicit relationship.

[*Example:* The following WordprocessingML Main Document part-relationship item contains a relationship to the Theme part, which is stored in the ZIP item theme/theme1.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../themeOverride" Target="theme/themeoverride1.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be `ossOverride`.

[*Example:*

```
<a:ossOverride xmlns:a="..." >
  ...
</a:ossOverride>
```

end example]

A Theme Override part shall be located within the package containing the relationships part (expressed syntactically, the `TargetMode` attribute of the `Relationship` element shall be `Internal`).

A Theme Override part shall not contain implicit or explicit relationships to other parts defined by ECMA-376.

14.2.9 Table Styles Part

Content Type:	application/vnd.openxmlformats-officedocument.presentationml.tableStyles+xml
Root Namespace:	http://purl.oclc.org/ooxml/drawingml/main
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/tableStyles

An instance of this part type contains information about the table styles used by tables in this presentation. A table style defines characteristics such as row and column colors, heading row colors, and text.

A PresentationML package shall contain no more than one Table Styles part per Presentation (§13.3.6) part via an implicit relationship.

[Example: The following Presentation part-relationship item contains a relationship to a Table Styles part, which is stored in the ZIP item tableStyles.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../tableStyles" Target="tableStyles.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be tblStyleLst.

[Example: tablestyles.xml contains the following:

```
<a:tblStyleLst xmlns:a="...">
  <a:tblStyle>
    ...
  </a:tblStyle>
</a:tblStyleLst>
```

end example]

A Table Styles part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Table Styles part shall not contain implicit or explicit relationships to other parts defined by ECMA-376.

15. Shared

The relationship items and parts defined in this clause are used by one or more of WordprocessingML (§11), SpreadsheetML (§12), and PresentationML (§13) environments.

15.1 Glossary of Shared Terms

array — An array of mathematical elements (“e”) stacked vertically in a single math zone.

build down — The process of converting mathematical text from an implementation’s professional form to an implementation’s built-down form.

build up — The process of converting mathematical text from an implementation’s built-down form to an implementation’s professional form.

built-down form — An implementation-specific linear format that may or may not include additional rich formatting in addition to another plain-text linear format (such as TeX) or the linear format defined in Unicode Technical Note 28.

built-up form — See professional form.

control — A region of active content within an Office Open XML document.

display equation — An equation that is in display mode, and thus is part of a display math zone. (Alternative names for display equation are: “display expression”, “display formula”, and “display math”.)

display mode — When mathematical text (i.e., text in one or more oMath blocks) is contained in a display math zone (i.e., an oMathPara block), the mathematical text represented in the oMath block(s) is in *display mode*.

equation array — An array of equations. See array.

inline equation — An equation that is in an inline math zone. (Alternative names for inline equation are: “inline expression”, “inline formula”, and simply “inline math”.)

instance of mathematical text — A single continuous combination of mathematical text represented by a single oMath block and the OMML elements within that oMath block.

linear format — An implementation-specific plain-text 1-dimensional representation of mathematical text.

math accent — A character that is specified as acceptable for use as an accent character by ECMA-376.

math alphanumerics — Characters with specific math styles, as defined in the Unicode Standard 5.0.

math paragraph — One or more oMath elements (instances of mathematical text) that are in display mode.

math zone — An isolated region of text within which mathematical text is used and outside of which mathematical text is not used.

mathematical text — Any text meant to convey mathematical meaning through OMML.

n-ary operator — An operator that involves n terms when expanded. For instance, the following example uses the Unicode (ISO 10646) summation sign (U+2211) which has the official name “N-ARY SUMMATION”.

$$\sum_{j=1}^n a_j \equiv a_1 + a_2 + \cdots + a_n$$

oMath container — An oMath block that is part of a display math zone but is not itself a math zone.

OMML — Office Math Markup Language, a Shared ML of ECMA-376.

professional form — Implementation-specific 2-D representation of mathematical text. (Also referred to as "built-up form".)

15.2 Part Summary

The subclauses subordinate to this one describe in detail each of the shared part types.

[Note: For convenience, information from those subclauses is summarized in the following table:

Part	Relationship Target of	Root Element	Ref.
Additional Characteristics	Numerous PresentationML, SpreadsheetML, and WordprocessingML parts	Characteristics	§15.2.1
Audio	Numerous PresentationML, SpreadsheetML, and WordprocessingML parts	Not applicable	§15.2.2
Bibliography	Numerous PresentationML, SpreadsheetML, and WordprocessingML parts	Sources	§15.2.3
Custom XML Data Storage	Numerous PresentationML, SpreadsheetML, and WordprocessingML parts	Not applicable	§15.2.4
Custom XML Data Storage Properties	Custom XML Data Storage	datastoreItem	§15.2.6
Digital Signature Origin	WordprocessingML, SpreadsheetML, or PresentationML package	Not applicable	§15.2.7
Digital Signature XML Signature	Digital Signature Origin	Signature	§15.2.8
Embedded Control	Numerous PresentationML,	Not applicable	§15.2.9

Part	Relationship Target of	Root Element	Ref.
Persistence	SpreadsheetML, and WordprocessingML parts		
Embedded Object	Numerous PresentationML, SpreadsheetML, and WordprocessingML parts	Not applicable	§15.2.10
Embedded Package	Numerous PresentationML, SpreadsheetML, and WordprocessingML parts	Not applicable	§15.2.11
File Properties, Extended	WordprocessingML, SpreadsheetML, or PresentationML package	Properties	§ 15.2.12.3
File Properties, Core	WordprocessingML, SpreadsheetML, or PresentationML package	coreProperties	§15.2.12.1
File Properties, Custom	WordprocessingML, SpreadsheetML, or PresentationML package	properties	§15.2.12.2
Font	WordprocessingML Font Table part, PresentationML Presentation part	Not applicable	§15.2.13
Image	Numerous PresentationML, SpreadsheetML, and WordprocessingML parts	Not applicable	§15.2.14
Printer Settings	SpreadsheetML Chartsheet, Dialogsheet, Worksheet parts, WordprocessingML Main Document or Glossary Document parts	Not applicable	§15.2.15
Thumbnail	WordprocessingML, SpreadsheetML, or PresentationML package	Not applicable	§15.2.16
Video part	Numerous PresentationML and WordprocessingML parts	Not applicable	§15.2.17

end note]

15.2.1 Additional Characteristics Part

Content Type:	application/xml
Root Namespace:	http://schemas.openxmlformats.org/officeDocument/2006/additionalCharacteristics
Source Relationship:	http://schemas.openxmlformats.org/officeDocument/2006/relationships/customXml

An instance of this part type contains information about additional characteristics of the producer that generated the document, when those characteristics cannot be specified using elements defined by ECMA-376. [Note: The contents of this part are purely informational, and do not place any requirements on subsequent consumption of the document. They are, however, intended to provide detailed information about the capabilities of the document's producer, allowing those capabilities to be factored in during subsequent processing. For example, an application which supports 100,000 spreadsheet columns might choose to limit its output to 10,000 columns when presented with a document whose characteristics indicate that it was produced by an application with that limitation, in order prevent the introduction of content which is unsupported by the original producer (as that application might be used in the future to process this document). This markup is provided by ECMA-376 in order to provide an interoperable way of storing this information. *end note*]

A package is permitted to contain zero or one Additional Characteristics parts, and each such part shall be the target of an implicit relationship from a Main Document (§11.3.10) part in a WordprocessingML package; a Workbook (§12.3.23) part in a SpreadsheetML package; or a Handout Master (§13.3.3) , Notes Master (§13.3.4), Notes Slide (§13.3.5), Presentation (§13.3.6), Slide (§13.3.8), Slide Layout (§13.3.9), or Slide Master (§13.3.10) part in a PresentationML package.

[Example: The following Main Document part-relationship item contains a relationship to an Additional Characteristics part, which is stored in the ZIP item ../customXML/item2.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../customXmlData" Target="../customXML/item2.xml"/>
</Relationships>
```

end example]

An Additional Characteristics part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

An Additional Characteristics part is permitted to have implicit relationships to the following parts defined by ECMA-376:

- Custom XML Data Storage Properties (§15.2.6)

An Additional Characteristics part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

15.2.2 Audio Part

Content Type:	Any supported audio type.	
	[Note: Some example content types are:	
	audio/aiff	http://developer.apple.com/documentation/QuickTime/INMAC/SOUN

		D/imsoundmgr.30.htm
	audio/midi	http://www.midi.org/about-midi/specinfo.shtml
	audio/ogg	http://xiph.org/vorbis/doc/Vorbis_I_spec.html
	audio/mpeg	ISO/IEC 11172-3
	<i>end note]</i>	
Root Namespace:	not applicable	
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/audio	

An instance of this part type contains an audio file.

A PresentationML package is permitted to contain zero or more Sound parts, each of which shall be the target of a relationship in a Handout Master (§13.3.3), Notes Slide (§13.3.5), Notes Master (§13.3.4), Slide (§13.3.8), Slide Layout (§13.3.9), or Slide Master (§13.3.10) part-relationship item. *[Example:* The following Slide part-relationship item contains a relationship to a Sound part, which is stored as the file E:\Beethoven's Symphony No. 9.wma:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../audio/x-ms-wma"
    Target="file:///E:/Beethoven's%20Symphony%20No.%209.wma"
    TargetMode="External"/>
</Relationships>
```

end example]

An Audio part can be located within or external to the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element can be Internal or External).

An Audio part is not stored as XML; instead, it involves a relationship target that is an audio clip.

An Audio part shall not have implicit or explicit relationships to other parts defined by ECMA-376.

A producer that wants interoperability should use the following standard format:

- audio/mpeg ISO/IEC 11172-3

15.2.3 Bibliography Part

Content Type:	application/xml
Root Namespace:	http://purl.oclc.org/ooxml/officeDocument/bibliography

Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/customXml
----------------------	---

An instance of this part type contains bibliographic data for the current package.

A package is permitted to contain zero or one Bibliography part, and each such part shall be the target of an implicit relationship in a Main Document (§11.3.10) part in a WordprocessingML package; a Workbook (§12.3.23) part in a SpreadsheetML package; or a Handout Master (§13.3.3), Notes Master (§13.3.4), Notes Slide (§13.3.5), Slide (§13.3.8), Slide Layout (§13.3.9), or Slide Master (§13.3.10) part in a PresentationML package.

[*Example:* The following Main Document part-relationship item contains a relationship to a Bibliography part, which is stored in the ZIP item ../customXML/bib1.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../customXml" Target="../customXML/bib1.xml"/>
</Relationships>
```

end example]

A Bibliography part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Bibliography part is permitted to have implicit relationships to the following parts defined by ECMA-376:

- Custom XML Data Storage Properties (§15.2.6)

A Bibliography part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

15.2.4 Content Part

Content Type:	Any supported XML content. [<i>Note:</i> Some example content types are: <table border="1"> <tr> <td>image/svg+xml</td><td>http://www.w3.org/TR/SVG11/</td></tr> <tr> <td>application/smil</td><td>http://www.w3.org/TR/REC-smil/</td></tr> <tr> <td>text/xml</td><td>http://www.w3.org/TR/MathML2/</td></tr> </table> <i>end note]</i> If no explicit MIME type exists for a specific XML format, text/xml shall be used. Consumers who read a value of text/xml should determine the contents by the root namespace of the contents of the part.	image/svg+xml	http://www.w3.org/TR/SVG11/	application/smil	http://www.w3.org/TR/REC-smil/	text/xml	http://www.w3.org/TR/MathML2/
image/svg+xml	http://www.w3.org/TR/SVG11/						
application/smil	http://www.w3.org/TR/REC-smil/						
text/xml	http://www.w3.org/TR/MathML2/						
Root Namespace:	Various, as defined by the content type used.						

	<i>[Example: MathML has a root namespace of http://www.w3.org/1998/Math/MathML. end example]</i>
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/customXml

An instance of this part type can contain XML markup of a format not defined by ECMA-376.

A package is permitted to contain zero or more Content parts, and each such part shall be the target of an explicit relationship from a Comments (§11.3.2), Endnotes (§11.3.4), Footer (§11.3.6), Footnotes (§11.3.7), Glossary Document (§11.3.8), Header (§11.3.9), or Main Document (§11.3.10) part in a WordprocessingML package; a Drawings (§12.3.8) part in a SpreadsheetML package; or a Handout Master (§13.3.3), Notes Slide (§13.3.5), Notes Master (§13.3.4), Slide (§13.3.8), Slide Layout (§13.3.9), or a Slide Master (§13.3.10) part in a PresentationML package.

[Example: The following Main Document part-relationship item contains a relationship to a Content part containing SVG markup, which is stored in the ZIP item svg1.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../customXml" Target="../customXML/svg1.xml"/>
</Relationships>
```

end example]

A Content part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Content part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

If a producer that wants interoperability supports equations, it should use one of the following standard formats:

- Office Open XML Math (§22.1)
- W3C MathML 2.0

If a producer that wants interoperability supports ink annotations, it should use an ink annotation in this element in the following reference standard format:

- InkML <http://www.w3.org/TR/inkregs>

15.2.5 Custom XML Data Storage Part

Content Type:	application/xml
Root Namespace:	any XML allowed

Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/customXml
----------------------	---

An instance of this part type can contain arbitrary XML. As such, an instance of this part can be used to roundtrip arbitrary custom XML data with this package.

A package is permitted to contain one or more Custom XML Data Storage parts, and each such part shall be the target of an implicit relationship in a Main Document (§11.3.10) part in a WordprocessingML package; a Workbook (§12.3.23) part in a SpreadsheetML package; or a Handout Master (§13.3.3) , Notes Master (§13.3.4), Notes Slide (§13.3.5), Presentation (§13.3.6), Slide (§13.3.8), Slide Layout (§13.3.9), or Slide Master (§13.3.10) part in a PresentationML package.

[Example: The following Main Document part-relationship item contains a relationship to a Custom XML Data Storage part, which is stored in the ZIP item ../customXML/item1.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../customXmlData" Target="../customXML/item1.xml"/>
</Relationships>
```

end example]

A Custom XML Data Storage part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Custom XML Data Storage part is permitted to have implicit relationships to the following parts defined by ECMA-376:

- Custom XML Data Storage Properties (§15.2.6)

A Custom XML Data Storage part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

15.2.6 Custom XML Data Storage Properties Part

Content Type:	application/vnd.openxmlformats-officedocument.customXmlProperties+xml
Root Namespace:	http://purl.oclc.org/ooxml/officeDocument/customXmlDataProps
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/customXmlProps

An instance of this part type contains the set of properties which are specified for this custom XML data. These properties consist of a unique ID for the storage, as well as information on the set of XML schemas used by this custom XML data storage.

A package is permitted to contain zero or more Custom XML Data Storage Properties parts, and each such part shall be the target of an implicit relationship from a Custom XML Data Storage (§15.2.4) part.

[*Example:* The following Custom XML Data Storage part-relationship item contains a relationship to a Custom XML Data Storage Properties part, which is stored in the ZIP item itemProps1.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../customXmlProps" Target="itemProps1.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be dataStoreItem.

[*Example:*

```
<ds:dataStoreItem ds:itemID="{D85...53A}" xmlns:ds="..." /> \
```

end example]

A Custom XML Data Storage Properties part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Custom XML Data Storage Properties part shall not have implicit or explicit relationships to other parts defined by ECMA-376.

15.2.7 Digital Signature Origin Part

This part is defined in §13.2.1, “Digital Signature Origin Part”, of ECMA-376-2.

15.2.8 Digital Signature XML Signature Part

The part is defined in §13.2.2, “Digital Signature XML Signature Part”, of ECMA-376-2.

15.2.9 Embedded Control Persistence Part

Content Type:	Any supported control type. [<i>Note:</i> There are a number of possible control types. One example of a potential control type would be an Active X control, which would use the following content type: application/vnd.ms-office.activeX+xml. <i>end note</i>]
Root Namespace:	not applicable
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/control

An instance of this part contains information about an embedded control in the package. This information is provided by the specified control when asked to persist. [*Example:* An application might utilize the embedded object server technology KParts or Bonobo to store an embedded object using this part. *end example*]

A package is permitted to contain one or more Embedded Control Persistence parts, and each such part shall be the target of an explicit relationship in an Endnotes (§11.3.4), Footer (§11.3.6), Footnotes (§11.3.7), Header (§11.3.9), or Main Document (§11.3.10) part-relationship item in a WordprocessingML package; a Worksheet part (§12.3.24) in a SpreadsheetML package; or a Handout Master (§13.3.3), Notes Slide (§13.3.5), Notes Master (§13.3.4), Slide (§13.3.8), Slide Layout (§13.3.9), Slide Master (§13.3.10) part-relationship item in a PresentationML package.

The content type of this part shall determine the format and contents of the embedded control.

[*Example:* The following example shows the persistence that could be used for an embedded control which is a Java applet within a WordprocessingML document (the drawing object which provides a static image representation of the control, used when the Java applet itself is unavailable, has been omitted for brevity):

```
<w:p>
  <w:r w:rsidR="005810E1">
    <w:object w:dxaOrig="1440" w:dyaOrig="1440">
      <w:drawing>
        ...
      </w:drawing>
      <w:control r:id="rId5" w:name="CommandButton1" w:shapeid="1027" />
    </w:object>
  </w:r>
</w:p>
```

The relationship type for rId5 is:

<http://purl.oclc.org/ooxml/officeDocument/relationships/control>

The XML content of the part referenced by rId5 could be:

```
<applet xlink:href="../../../Program%20Files/Application" xlink:type="simple"
xlink:show="embed" xlink:actuate="onLoad" code="CalculateApplet.class" may-
script="false"/>
```

end example]

[*Example:* The following example shows the persistence that could be used for an embedded control which is an ActiveX control within a WordprocessingML document (the drawing object which provides a static image representation of the control, used when the ActiveX control itself is unavailable, has been omitted for brevity):

```
<w:p>
  <w:r w:rsidR="005810E1">
    <w:object w:dxaOrig="1440" w:dyaOrig="1440">
```

```

    <w:drawing>
      ...
    </w:drawing>
    <w:control r:id="rId5" w:name="CommandButton1" w:shapeid="1027" />
  </w:object>
</w:r>
</w:p>

```

The relationship type for rId5 is:

<http://purl.oclc.org/ooxml/officeDocument/relationships/control>

The content type of the part referenced by rId5 could be: `application/vnd.ms-office.activeX+xml`

The XML content of the part referenced by rId5 could be:

```

<ax:ocx ax:classid="{D7053240-CE69-11CD-A777-00DD01143C57}"
  ax:persistence="persistPropertyBag"
  xmlns:ax="http://schemas.microsoft.com/office/2006/activeX">
  <ax:ocxPr ax:name="Caption" ax:value="CommandButton1" />
  <ax:ocxPr ax:name="Size" ax:value="2540;847" />
  <ax:ocxPr ax:name="FontName" ax:value="Calibri" />
  <ax:ocxPr ax:name="FontHeight" ax:value="225" />
  <ax:ocxPr ax:name="FontCharSet" ax:value="0" />
  <ax:ocxPr ax:name="FontPitchAndFamily" ax:value="2" />
  <ax:ocxPr ax:name="ParagraphAlign" ax:value="3" />
</ax:ocx>

```

end example]

An Embedded Control Persistence part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

An Embedded Control Persistence part shall not have any implicit or explicit relationships to other parts defined by ECMA-376.

15.2.10 Embedded Object Part

Content Type:	Any content type is allowed
Root Namespace:	not applicable
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/oleObject

An instance of this part type can contain an embedded object produced by any embedded object server.

A package is permitted to contain zero or more Embedded Object parts, and each such part shall be the target of an explicit relationship from a Comments (§11.3.2), Endnotes (§11.3.4), Footer (§11.3.6), Footnotes (§11.3.7), Header (§11.3.9), or Main Document (§11.3.10) part in a WordprocessingML package; a Worksheet part (§12.3.24) in a SpreadsheetML package; or a Handout Master (§13.3.3), Notes Slide (§13.3.5), Notes Master (§13.3.4), Slide (§13.3.8), Slide Layout (§13.3.9), Slide Master (§13.3.10) part in a PresentationML package.

A WordprocessingML document package is permitted to contain zero or more Embedded Object parts, each of which shall be the target of a relationship in a Main Document part-relationship item. Each Embedded Object part shall have an associated image, which appears in the document as a placeholder for the corresponding embedded object.

[*Example:* Consider the case in which a WordprocessingML document has embedded in it one video object and one audio object. The following Main Document part-relationship item contains relationships to two Embedded parts (one each for the video and audio), which are stored in the ZIP items `embeddings/embeddedObjectN.bin`:

```
<Relationships xmlns="...">
  <Relationship Id="rId5"
    Type="http://.../oleObject" Target="embeddings/embeddedObject1.bin"/>
  <Relationship Id="rId7"
    Type="http://.../oleObject" Target="embeddings/embeddedObject2.bin"/>
  <Relationship Id="rId4"
    Type="http://.../image" Target="media/image1.png"/>
  <Relationship Id="rId6"
    Type="http://.../image" Target="media/image2.png"/>
</Relationships>
```

example]

A SpreadsheetML document package is permitted to contain zero or more Embedded Object parts, each of which shall be the target of a relationship in a Worksheet part-relationship item.

[*Example:* Consider the case in which a SpreadsheetML document has embedded in it one video object and one audio object on one worksheet, and another audio object embedded in another worksheet. The following Worksheet Document part-relationship item contains relationships to two Embedded Object parts (one each for the video and audio), which are stored in the ZIP items `../embeddings/embeddedObjectN.bin`:

```
<Relationships xmlns="...">
  <Relationship Id="rId2"
    Type="http://.../oleObject" Target="../embeddings/embeddedObject1.bin"/>
  <Relationship Id="rId3"
    Type="http://.../oleObject" Target="../embeddings/embeddedObject2.bin"/>
</Relationships>
```

end example]

A PresentationML document package is permitted to contain zero or more Embedded Object parts, each of which shall be the target of a relationship in a Slide part-relationship item.

[*Example:* Consider the case in which a PresentationML document has embedded in it one video object and one audio object on one slide, and another audio object embedded on another slide. The following Slide part-relationship item contains relationships to two Embedded Object parts (one each for the video and audio), which are stored in the ZIP items `../embeddings/embeddedObjectN.bin`:

```
<Relationships xmlns="...">
  <Relationship Id="rId6"
    Type="http://.../oleObject"
    Target="../embeddings/embeddedObject1.bin"/>
  <Relationship Id="rId7"
    Type="http://.../oleObject"
    Target="../embeddings/embeddedObject2.bin"/>
</Relationships>
```

end example]

An Embedded Object part can be located within or external to the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element can be Internal or External).

An Embedded Object part is permitted to have an explicit relationship to the following parts defined by ECMA-376:

- Hyperlink (§15.3)

An Embedded Object part shall not have any implicit or explicit relationships to other parts defined by ECMA-376.

15.2.11 Embedded Package Part

Content Type:	Any content type is allowed
Root Namespace:	not applicable
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/package

An instance of this part type contains a complete package. For example, a WordprocessingML document might contain a SpreadsheetML or PresentationML document, in which case, the WordprocessingML document package would contain an embedded package part that defined that SpreadsheetML or PresentationML document.

A package is permitted to contain zero or more Embedded Package parts, and each such part shall be the target of an explicit relationship from a Chart (§14.2.1), Comments (§11.3.2), Endnotes (§11.3.4), Footer (§11.3.6), Footnotes (§11.3.7), Header (§11.3.9), or Main Document (§11.3.10) part in a WordprocessingML package; a Chart (§14.2.1), or Worksheet part (§12.3.24) in a SpreadsheetML package; or a Chart (§14.2.1), Handout Master (§13.3.3), Notes Slide (§13.3.5), Notes Master (§13.3.4), Slide (§13.3.8), Slide Layout (§13.3.9), Slide Master (§13.3.10) part in a PresentationML package.

[*Example:* The following Presentation part-relationship item contains relationships to two Embedded Package parts: one is a SpreadsheetML package, which is stored in the ZIP item embeddings/Worksheet1.xlsx, the other is a PresentationML package, which is stored in the ZIP item embeddings/Presentation2.pptx. The image files are used as document display placeholders if the consumer cannot handle the embedded package type:

```
<Relationships xmlns="...">
  <Relationship Id="rId4"
    Type="http://.../image" Target="media/image1.emf"/>
  <Relationship Id="rId5"
    Type="http:package" Target="embeddings/Worksheet1.xlsx"/>
  <Relationship Id="rId6"
    Type="http://.../image" Target="media/image2.emf"/>
  <Relationship Id="rId7"
    Type="http://.../package" Target="embeddings/Presentation2.pptx"/>
</Relationships>
```

end example]

An Embedded Package part can be located within or external to the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element can be Internal or External).

An Embedded Package part is permitted to have an explicit relationship to the following parts defined by ECMA-376:

- Hyperlink (§15.3)

An Embedded Package part shall not have any implicit or explicit relationships to other parts defined by ECMA-376.

15.2.12 File Properties

There are three kinds of file properties: *core*, *custom*, and *extended*. The *core file properties* of a package enable users to discover, get, and set common sets of properties from within that package, regardless of whether it's a WordprocessingML, SpreadsheetML, or PresentationML package. *Extended file properties* are specific to Office Open XML packages, while *custom file properties* are defined by the user, with each custom file property having a name, a value, and a type.

15.2.12.1 Core File Properties Part

This part and the related OPC part is defined in §11, “Core Properties”, of ECMA-376-2.

15.2.12.2 Custom File Properties Part

Content Type:	application/vnd.openxmlformats-officedocument.custom-properties+xml
Root Namespace:	http://purl.oclc.org/ooxml/officeDocument/customProperties
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/customProperties

An instance of this part contains the names of custom file properties that apply to the package, their values, and the types of those values. A custom file property might be the name of the client for whom the document was prepared, a date/time on which some event happened, a document number, or some Boolean status flag.

A package shall contain at most one Custom File Properties part, and that part shall be the target of a relationship in the package-relationship item for the document.

[*Example:* The following PresentationML's package-relationship item contains a relationship to a Custom File Properties part, stored in the ZIP item docProps/custom.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId4"
    Type="http://.../custom-properties" Target="docProps/custom.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be Properties.

[*Example:* Here's some content markup from a WordprocessingML document, which contains four custom properties: Client, having a text value of "ACME Corp."; Document number, having a numeric value of 1543; Recorded date, having a date/time value of 2005-12-01; and Special processing needed, having a Boolean value of false:

```
<Properties ... xmlns:vt="...">
  <property fmtid="{D5C...9AE}" pid="2" name="Client">
    <vt:lpwstr>ACME Corp.</vt:lpwstr>
  </property>
  <property fmtid="{D5C...9AE}" pid="3" name="Document number">
    <vt:i4>1543</vt:i4>
  </property>
```

```
<property fmtid="{D5C...9AE}" pid="4" name="Recorded date">
  <vt:filetime>2005-12-01T05:00:00Z</vt:filetime>
</property>
<property fmtid="{D5C...9AE}" pid="5" name="Special processing needed">
  <vt:bool>>false</vt:bool>
</property>
</Properties>
```

end example]

A Custom File Properties part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Custom File Properties part shall not have implicit or explicit relationships to other parts defined by ECMA-376.

15.2.12.3 Extended File Properties Part

Content Type:	application/vnd.openxmlformats-officedocument.extended-properties+xml
Root Namespace:	http://purl.oclc.org/ooxml/officeDocument/extendedProperties
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/extendedProperties

An instance of this part contains properties specific to an Office Open XML document. [Example: A PresentationML document specifies the number of slides in this presentation when last saved by a producer. *end example]*

A package shall contain at most one Extended File Properties part, and that part shall be the target of a relationship in the package-relationship item for the document.

[Example:

```
<Relationships xmlns="...">
  <Relationship Id="rId4"
    Type="http://.../extended-properties" Target="docProps/app.xml"/>
</Relationships>
```

end example]

The root element for a part of this content type shall be Properties.

[Example: Here's some content markup from a WordprocessingML document:

```

<Properties ...>
  <Template>Normal.dotm</Template>
  <TotalTime>0</TotalTime>
  <Pages>1</Pages>
  <Words>3</Words>
  <Characters>22</Characters>
  <Application>Sample Producer</Application>
  <DocSecurity>0</DocSecurity>
  <Lines>1</Lines>
  <Paragraphs>1</Paragraphs>
  ...
  <AppVersion>12.0000</AppVersion>
</Properties>

```

here's some content markup from a SpreadsheetML document:

```

<Properties ...>
  <Application>Sample Producer</Application>
  <HeadingPairs>
    ...
  </HeadingPairs>
  <TitlesOfParts>
    ...
  </TitlesOfParts>
  <Company>Consultant</Company>
  ...
</Properties>

```

and here's some content markup from a PresentationML document:

```

<Properties ...>
  <Template>ppt_template_sdwest05</Template>
  <TotalTime>3166</TotalTime>
  <Words>37</Words>
  <Application>Sample Producer</Application>
  <PresentationFormat>On-screen Show</PresentationFormat>
  <Paragraphs>15</Paragraphs>
  <Slides>2</Slides>
  <Notes>2</Notes>

```

```

...
<HeadingPairs>
...
</HeadingPairs>
<TitlesOfParts>
...
</TitlesOfParts>
...
</Properties>

```

end example]

A Extended File Properties part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

An Extended File Properties part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

15.2.13 Font Part

Content Type:	application/x-fontdata application/x-font-ttf application/vnd.openxmlformats-officedocument.obfuscatedFont
Root Namespace:	not applicable
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/font

An instance of this part type contains a given font embedded directly into the document. (This is useful when using custom fonts or fonts that are not widely distributed.)

Fonts stored in a Font part can be stored in one of the following formats, identified by the associated content type:

- application/x-fontdata specifies that the font shall be stored in the Embedded OpenType Format of <http://www.w3.org/Submission/2008/SUBM-EOT-20080305>
- application/x-font-ttf specifies that the font shall be stored in a format conforming to Open Font Structure defined in ISO/IEC 14496-22:2008 §3.5. [Note: The TrueType Collection format defined in ISO/IEC 14496-22:2008 §3.6 cannot be used. *end note*]
- application/vnd.openxmlformats-officedocument.obfuscatedFont specifies that the font is obfuscated using the algorithm specified by Font Embedding (§17.8.1). The source font shall be stored in a format conforming to Open Font Structure defined in ISO/IEC 14496-22:2008 §3.5. [Note: The TrueType Collection format defined in ISO/IEC 14496-22:2008 §3.6 cannot be used. *end note*] Only packages of type WordprocessingML are permitted to reference this content type.

If a font is stored in the ISO/IEC 14496-22:2007 format, it shall only be used when stored as an individual font.
 [Note: Font collections should be converted into individual fonts before they are embedded using this part. *end note*]

A package shall contain zero or more Font parts, and for each that exists, that part shall be the target of an explicit relationship in the Font Table (§11.3.5), or Presentation (§13.3.6) part.

A Font part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Font part shall not have implicit or explicit relationships to other parts defined by ECMA-376.

15.2.14 Image Part

Content Type:	Any supported image type. [Note: Some example content types are: <table><tr><td>image/gif</td><td>http://www.w3.org/Graphics/GIF/spec-gif89a.txt</td></tr><tr><td>image/png</td><td>ISO/IEC 15948:2003 http://www.libpng.org/pub/png/spec/</td></tr><tr><td>image/tiff</td><td>http://partners.adobe.com/public/developer/tiff/index.html#spec</td></tr><tr><td>image/pict</td><td>http://developer.apple.com/documentation/mac/QuickDraw/QuickDraw-2.html</td></tr><tr><td>image/jpeg</td><td>http://www.w3.org/Graphics/JPEG/</td></tr></table> <i>end note.</i>]		image/gif	http://www.w3.org/Graphics/GIF/spec-gif89a.txt	image/png	ISO/IEC 15948:2003 http://www.libpng.org/pub/png/spec/	image/tiff	http://partners.adobe.com/public/developer/tiff/index.html#spec	image/pict	http://developer.apple.com/documentation/mac/QuickDraw/QuickDraw-2.html	image/jpeg	http://www.w3.org/Graphics/JPEG/
image/gif	http://www.w3.org/Graphics/GIF/spec-gif89a.txt											
image/png	ISO/IEC 15948:2003 http://www.libpng.org/pub/png/spec/											
image/tiff	http://partners.adobe.com/public/developer/tiff/index.html#spec											
image/pict	http://developer.apple.com/documentation/mac/QuickDraw/QuickDraw-2.html											
image/jpeg	http://www.w3.org/Graphics/JPEG/											
Root Namespace:	Not applicable											
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/image											

An image can be stored in a package as a ZIP item. Image ZIP items shall be identified by an image part relationship and the appropriate content type.

A package is permitted to contain zero or more Image parts, and each such part shall be the target of an explicit relationship from a Comments (§11.3.2), Endnotes (§11.3.4), Footer (§11.3.6), Footnotes (§11.3.7), Header (§11.3.9), Drawing (§12.3.8), or Main Document (§11.3.10) part in a WordprocessingML package or a Handout Master (§13.3.3), Notes Slide (§13.3.5), Notes Master (§13.3.4), Slide (§13.3.8), Slide Layout (§13.3.9), or Slide Master (§13.3.10) part in a PresentationML package.

[Example: The following PresentationML's package-relationship item contains one relationship, for the slide template jpeg image stored in the ZIP item ../media/image1.jpeg:

```
<Relationships xmlns="...">
  <Relationship Id="rId8"
    Type="http://.../image" Target="../media/image1.jpeg"/>
</Relationships>
```

end example]

An Image part can be located within or external to the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element can be Internal or External).

An Image part shall not have implicit or explicit relationships to other parts defined by ECMA-376.

A producer that wants interoperability should use one of the following standard formats:

- image/png ISO/IEC 15948:2003, <http://www.libpng.org/pub/png/spec/>
- image/jpeg, <http://www.w3.org/Graphics/JPEG>

15.2.15 Printer Settings Part

Content Type:	application/vnd.openxmlformats-officedocument.spreadsheetml.printerSettings (in SpreadsheetML documents) application/vnd.openxmlformats-officedocument.wordprocessingml.printerSettings (in WordprocessingML documents) application/vnd.openxmlformats-officedocument.presentationml.printerSettings (in PresentationML documents)
Root Namespace:	not applicable
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/printerSettings

An instance of this part type contains information about the initialization and environment of a printer or a display device. The layout of this information is application-defined.

[*Note:* It is recommended that a Printer Settings Part contain well documented XML content for improved interoperability; however, there is no requirement on the format of the content contained in a Printer Settings Part. *end note*]

[*Example:* An Office Open XML producer on Windows might store the DEVMODE structure defined here: http://msdn.microsoft.com/library/default.asp?url=/library/en-us/gdi/prntspol_8nle.asp, while an application on the Mac OS might choose to store the print record defined here: <http://developer.apple.com/documentation/Printing/index.html>. *end example*]

A SpreadsheetML package is permitted to contain at most one Printer Settings part per Chartsheet, Dialogsheet, or Worksheet part, and that part shall be the target of an implicit relationship from a Chartsheet (§12.3.2), Dialogsheet (§12.3.7), or Worksheet (§12.3.24) part. A WordprocessingML package is permitted to contain zero or more Printer Settings parts, one per sectPr element, each a target of an explicit relationship from a Main Document (§11.3.10) or Glossary Document (§11.3.8) part. A PresentationML package is permitted to contain at most one Printer Settings part, and that part shall be the target of an implicit relationship from a Presentation (§13.3.6) part.

[Example: The following SpreadsheetML Worksheet part-relationship item contains a relationship to a Printer Settings part, which is stored in the ZIP item ../printerSettings/printerSettings1.xml:

```
<Relationships xmlns="...">
  <Relationship Id="rId4"
    Type="http://../printerSettings"
    Target="../printerSettings/printerSettings1.xml"/>
</Relationships>
```

where the contents of PrinterSettings1.xml contains the following XML:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<PrinterSettings xmlns="...">
  <PrinterSetting name="PropertyName" value="PropertyValue" />
</PrinterSettings>
```

end example]

A Printer Settings part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Printer Settings part shall not have implicit or explicit relationships to any other part defined by ECMA-376.

15.2.16 Thumbnail Part

Content Type:	Any supported image type.	
	[Note: Some example content types are:	
	image/gif	http://www.w3.org/Graphics/GIF/spec-gif89a.txt
	image/png	ISO/IEC 15948:2003 http://www.libpng.org/pub/png/spec/
	image/tiff	http://partners.adobe.com/public/developer/tiff/index.html#spec
	image/pict	http://developer.apple.com/documentation/mac/QuickDraw/QuickDraw-2.html
	image/jpeg	http://www.w3.org/Graphics/JPEG/
	end note.]	
Root Namespace:	Not applicable	

Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/metadata/thumbnail
----------------------	---

To help end-users identify parts of a package or the package as a whole, images, called *thumbnails*, can be stored in that package. Each thumbnail image is generated by the package producer and is stored in the package as a ZIP item. There are no limitations on the size or dimensions of the thumbnail produced, and applications are free to scale the images as desired.

Thumbnail ZIP items shall be identified by either a package-relationship item or a part-relationship item. Packages shall not contain more than one thumbnail relationship associated with the package as a whole, or more than one thumbnail relationship per package part.

[*Example:* The following PresentationML's package-relationship item contains one relationship, for the metafile image stored in the ZIP item thumbnail.wmf:

```
<Relationships xmlns="...">
  <Relationship Id="rId2"
    Type="http://.../thumbnail" Target="docProps/thumbnail.wmf"/>
</Relationships>
```

end example]

A Thumbnail part shall be located within the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element shall be Internal).

A Thumbnail part shall not have implicit or explicit relationships to other parts defined by ECMA-376.

15.2.17 Video Part

Content Type:	Any supported video type. [<i>Note:</i> Some example content types are:	
	video/avi	http://www.the-labs.com/Video/odmlff2-avidef.pdf
	video/mpg	ISO/IEC 13818
	video/mpeg	ISO/IEC 13818
	video/ogg	http://www.theora.org/doc/Theora.pdf
	video/quicktime	http://developer.apple.com/documentation/QuickTime/
	video/vc1	http://tools.ietf.org/html/rfc4425
	<i>end note]</i>	
Root Namespace:	not applicable	
Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/video	

An instance of this part type contains a video file.

A PresentationML package is permitted to contain zero or more Video parts, each of which shall be the target of an explicit relationship in a Handout Master (§13.3.3), Notes Slide (§13.3.5), Notes Master (§13.3.4), Slide (§13.3.8), Slide Layout (§13.3.9), or Slide Master (§13.3.10) part. A WordprocessingML package is permitted to contain zero or more Video parts, each of which shall be the target of an explicit relationship from a Comments (§11.3.2), Endnotes (§11.3.4), Footer (§11.3.6), Footnotes (§11.3.7), Header (§11.3.9), or Main Document (§11.3.10) part.

[*Example:* The following Slide part-relationship item contains a relationship to a Video part, which is stored as the file E:\Video demo.avi:

```
<Relationships xmlns="...">
  <Relationship Id="rId2"
    Type="http://.../video"
    Target="file:///E:\Video%20demo.avi" TargetMode="External"/>
</Relationships>
```

end example]

A Video part is not stored as XML; instead, it involves a relationship target that is a video clip.

A Video part can be located within or external to the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element can be Internal or External).

A Video part shall not have implicit or explicit relationships to other parts defined by ECMA-376.

A producer that wants interoperability should use the following standard format:

- video/mpeg ISO/IEC 13818

15.3 Hyperlinks

Source Relationship:	http://purl.oclc.org/ooxml/officeDocument/relationships/hyperlink
----------------------	---

A hyperlink can be stored in a package as a relationship. Hyperlinks shall be identified by containing a target which specifies the destination of the given hyperlink.

[*Example:* The following WordprocessingML Footnote part's relationship part contains one relationship, for the hyperlink <http://schemas.openxmlformats.org/wordprocessingml/>:

```
<Relationships xmlns="...">
  <Relationship Id="rId1"
    Type="http://.../hyperlink"
    Target="http://schemas.openxmlformats.org/wordprocessingml/"
    TargetMode="External"/>
</Relationships>
```

end example]

A hyperlink target can be located within or external to the package containing the relationships part (expressed syntactically, the TargetMode attribute of the Relationship element can be Internal or External).

16. Part Overview

This clause is informative.

For convenience, the following subclauses specify the root elements for each part and, when applicable, link to the appropriate subclause that defines the root element for that part within the package. [Note: The terms part and package, as used here, are defined in ECMA-376-2. *end note*] Note that the contents of some of these parts are not defined in this Part of ECMA-376, in which case, the root element is listed as "Not applicable" and the Reference is "n/a". For those parts where the Root Element is listed as "Not Applicable", a definition of the part's use and how its content shall be structured is defined in this Part 1 of ECMA-376.

16.1 WordprocessingML Summary

Part	Root Element	Ref.
Alternative Format Import	Not applicable	n/a
Comments	comments	§17.13.4.6
Document Settings	settings	§17.15.1.78
Endnotes	endnotes	§17.11.8
Font Table	fonts	§17.8.3.11
Footer	fttr	§17.10.3
Footnotes	footnotes	§17.11.15
Glossary Document	glossaryDocument	§17.12.10
Header	hdr	§17.10.4
Mail Merge Recipient Data	recipients	§17.14.29
Main Document	document	§17.2.3
Numbering Definitions	numbering	§17.9.16
Style Definitions	styles	§17.7.4.18
Web Settings	webSettings	§17.15.2.45

16.2 SpreadsheetML Summary

Part	Root Element	Ref.
Calculation Chain	calcChain	§18.6.2
Chartsheet	chartsheet	§18.3.1.12
Comments	comments	§18.7.6
Connections	connections	§18.13.2
Custom Property	Not applicable	n/a

Part	Root Element	Ref.
Custom XML Mappings	MapInfo	§18.16.3
Dialogsheet	dialogsheets	§18.3.1.34
Drawing	wsDr	§20.5.2.35
External Workbook References	externalLink	§18.14.8
Metadata	metadata	§18.9.8
Pivot Table	pivotTableDefinition	§18.10.1.73
Pivot Table Cache Definition	pivotCacheDefinition	§18.10.1.67
Pivot Table Cache Records	pivotCacheRecords	§18.10.1.68
Query Table	queryTable	§18.12.2
Shared String Table	sst	§18.4.9
Shared Workbook Revision Headers	headers	§18.11.1.1
Shared Workbook Revision Log	revisions	§18.11.1.16
Shared Workbook User Data	users	§18.11.2.2
Single Cell Table Definitions	singleXmlCells	§18.5.2.2
Styles	styleSheet	§18.8.39
Table Definition	table	§18.5.1.2
Volatile Dependencies	volTypes	§18.15.6
Workbook	workbook	§18.2.27
Worksheet	worksheet	§18.3.1.99

16.3 PresentationML Summary

Part	Root Element	Ref.
Comment Authors	cmAuthorLst	§19.4.3
Comments	cmLst	§19.4.4
Handout Master	handoutMaster	§19.3.1.24
Notes Master	notesMaster	§19.3.1.27
Notes Slide	notes	§19.3.1.26
Presentation	presentation	§19.2.1.26
Presentation Properties	presentationPr	§19.2.1.27
Slide	sld	§19.3.1.38
Slide Layout	sldLayout	§19.3.1.39
Slide Master	sldMaster	§19.3.1.42
Slide Synchronization Data	sldSyncPr	§19.6.1
User-Defined Tags	tagLst	§19.3.3.2

Part	Root Element	Ref.
View Properties	viewPr	§19.2.2.18

16.4 DrawingML Summary

Part	Root Element	Ref.
Chart	chartSpace	§21.2.2.29
Chart Drawing	userShapes	§21.2.2.220
Diagram Colors	colorsDef	§21.4.4.3
Diagram Data	dataModel	§21.4.2.10
Diagram Layout Definition	layoutDef	§21.4.2.16
Diagram Style	styleDef	§21.4.5.7
Theme	officeStyleSheet	§20.1.6.9
Theme Override	themeOverride	§20.1.6.12
Table Styles	tblStyleLst	§20.1.4.2.27

16.5 Shared Summary

Part	Root Element	Ref.
Additional Characteristics	additionalCharacteristics	§22.7.2.1
Audio	Not applicable	n/a
Bibliography	Sources	§22.6.2.60
Custom XML Data Storage	Not applicable	n/a
Custom XML Data Storage Properties	datastoreItem	§22.5.2.1
Digital Signature Origin	Not applicable	n/a
Digital Signature XML Signature	Signature	Defined in ECMA-376-2
Embedded Control Persistence	Not applicable	n/a
Embedded Object	Not applicable	n/a
Embedded Package	Not applicable	n/a
File Properties, Core	coreProperties	Defined in ECMA-376-2
File Properties, Custom	Properties	§22.3.2.1
File Properties, Extended	Properties	§22.2.2.21
Font	Not applicable	n/a
Image	Not applicable	n/a
Printer Settings	Not applicable	n/a

Part	Root Element	Ref.
Thumbnail	Not applicable	n/a
Video	Not applicable	n/a

End of informative text.

17. WordprocessingML Reference Material

[Note: For further information on the mapping of elements and attributes to OPC parts, see the Bibliography entry, “Information on elements, attributes, and OPC parts in ECMA-376 (OOXML)”. *end note*]

The subordinate subclauses specify the semantics for the XML markup comprising a WordprocessingML document, as defined by §11 of this Part of ECMA-376.

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End of informative text.

17.2 Main Document Story

As defined in §4, a WordprocessingML document contains the markup for a rendition of an Office Open XML document of category Wordprocessing. Syntactically, the document consists of a compilation of two kinds of information, which are combined to create this rendition:

- Properties [*Example: styles, numbering definitions, etc. end example*]
- Stories [*Example: main document, comments, headers, etc. end example*]

In WordprocessingML, *stories* are unique containers for one or more paragraphs, as defined by the parent elements of the `p` element (§17.3.1.22). Stories contain the document's content. The properties of the document are applied to the contents of each story to create the rendition. Most of the content in a WordprocessingML document is located in the main document story, which is stored inside the `body` element within the Main Document part (§11.3.10).

[*Example: Consider a document with a single paragraph in the main document story. This document would require the following WordprocessingML in its main document part:*

```
<w:document>
  <w:body>
    <w:p/>
  </w:body>
</w:document>
```

The fact that the paragraph is inside the `body` element makes it part of the main document story. *end example*]

17.2.1 background (Document Background)

This element specifies the background for every page of the document containing the `background` element. A document's *background* is the image or fill for the entire page surface, behind all other document content.

The drawing §17.3.3.9 child elements of the `background` element allows any DrawingML effect to be applied to the document's background.

For solid color fill backgrounds, however, the attributes on this element allow the use of any RGB or theme color value (the latter a reference to the document's themes part).

[*Example: Consider a document which utilizes a gradient fill background moving between black and the accent3 theme color, as follows:*



This background would require the following WordprocessingML markup:

```
<w:background w:themeColor="accent3">

  <w:drawing>
    <wp:inline ... >
      <a:graphic>
        <a:graphicData ... >
          ...
        </a:graphicData>
      </a:graphic>
    </wp:inline>
  </w:drawing></w:background>
```

The resulting background consists of a single color fill of the accent3 theme color from the themeColor attribute, layered under a gradientCenter fill. *end example*

Attributes	Description
color (Background Color)	<p>Specifies the color for the background of the document.</p> <p>This value can be defined as either:</p> <ul style="list-style-type: none">A color value using the RGB color model whose red, green, and blue values are written as numbers in the range 0 to 255, hex encoded, and concatenated. [<i>Example</i>: Full intensity red would be 255 red, 0 green, 0 blue, encoded to FF, 00, 00, and concatenated to FF0000. <i>end example</i>]. RGB colors are specified in the sRGB color space.auto to allow a consumer to automatically determine the background color in order to make the document's text readable. [<i>Example</i>: A document with white text and a background color of auto might result in the use of a black background, in order to ensure legibility of the content. <i>end example</i>]

Attributes	Description
	<p>If the background specifies the use of a theme color via the themeColor attribute, this value is ignored. [Note: Applications are discouraged from specifying both the color and themeColor attributes on the same parent element. <i>end note</i>]</p> <p>[Example: Consider a background color with value 2C34FF, as follows:</p> <pre><w:background ... w:color="2C34FF"/></pre> <p>The background color is therefore the color with RGB value 44,52,255 (the decimal decoding of the hex value above). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_HexColor simple type (§17.18.38).</p>
<p>themeColor (Background Theme Color)</p>	<p>Specifies the base theme color used to generate the background color. The background color is the RGB value associated with themeColor as further transformed by themeTint or themeShade (if one is present), else the background color is the RGB value associated with themeColor.</p> <p>The specified theme color is a reference to one of the predefined theme colors, located in the document's Theme part (§14.2.7 and §20.1.6.9), which allows color information to be set centrally in the document.</p> <p>If the color attribute is specified, its value shall be ignored in favor of the color resulting from the use of this attribute with any appropriate themeTint and themeShade attribute value calculations applied.</p> <p>To determine the color to display, the following actions are performed:</p> <ul style="list-style-type: none"> • Using the mapping specified in the ST_ThemeColor simple type (§17.18.97), the appropriate attribute on the clrSchemeMapping element (§17.15.1.20) is read. • Using that value and the mapping specified in the ST_ColorSchemeIndex simple type (§17.18.103), the appropriate element in the document's Theme part is read to get the base theme color. • The specified color is modified based on the presence of the themeTint or themeShade attribute. <p>[Example: Consider a background configured to use the accent5 theme color, resulting in the following WordprocessingML markup:</p> <pre><w:background w:themeColor="accent5" /></pre> <p>If the Settings part contained the following markup:</p> <pre><w:clrSchemeMapping ... w:accent5="accent5"/></pre> <p>and the Theme part contained the following XML markup:</p>

Attributes	Description
	<pre><a:accent5> <a:srgbClr val="BCBCBC"/> </a:accent5></pre> <p>the resulting background color would be BCBCBC. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_ThemeColor simple type (§17.18.97).</p>
themeShade (Background Theme Color Shade)	<p>Specifies the shade value applied to the supplied theme color (if any) for this background. If the themeColor attribute is not specified, this attribute shall not be specified.</p> <p>If the themeShade is supplied, then it is applied to the RGB value of the theme color (from the theme part) to determine the final color applied to this background.</p> <p>The themeShade value is stored as a hex encoding of the shade value (from 0–255) applied to the current background.</p> <p>[<i>Example:</i> Consider a shade of 60% applied to a background in a document. This shade is calculated as follows:</p> $ \begin{aligned} S_{xml} &= 0.6 * 255 \\ &= 153 \\ &= 99(hex) \end{aligned} $ <p>The resulting themeShade value in the file format would be 99. <i>end example</i></p> <p>Given an RGB color defined as three hex values in RRGGBB format, the shade is applied as follows:</p> <ul style="list-style-type: none"> Convert the color to the HSL color format (values from 0 to 1) Modify the luminance factor as follows: $L' = L * \text{Shade}_{\text{percentage}}$ <ul style="list-style-type: none"> Convert the resultant HSL color to RGB <p>[<i>Example:</i> Consider a document with a background using the accent2 theme color, whose RGB value (in RRGGBB hex format) is C0504D.</p> <p>The equivalent HSL color value would be $\left(\frac{1}{360}, 0.48, 0.53\right)$.</p> <p>Applying the shade formula with a shade percentage of 75% to the luminance, we get:</p> $ \begin{aligned} L' &= 0.53 * 0.75 \\ &= 0.39698 \end{aligned} $

Attributes	Description
	<p>Taking the resulting HSL color value of $\left(\frac{1}{360}, 0.48, 0.39698\right)$ and converting back to RGB, we get 943634.</p> <p>This transformed value can be seen in the resulting background's color attribute:</p> <pre><w:background w:color="943634" w:themeColor="accent2" w:themeShade="BF"/></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_UcharHexNumber simple type (§17.18.98).</p>
<p>themeTint (Background Theme Color Tint)</p>	<p>Specifies the tint value applied to the supplied theme color (if any) for this background. If the themeColor attribute is not specified, this attribute shall not be specified.</p> <p>If the themeTint is supplied, then it is applied to the RGB value of the theme color (from the theme part) to determine the final color applied to the document's background.</p> <p>The themeTint value is stored as a hex encoding of the tint value (from 0–255) applied to the current background.</p> <p>[<i>Example:</i> Consider a tint of 60% applied to a background in a document. This tint is calculated as follows:</p> $ \begin{aligned} T_{xml} &= 0.4 * 255 \\ &= 102 \\ &= 66(hex) \end{aligned} $ <p>The resulting themeTint value in the file format would be 66. <i>end example]</i></p> <p>Given an RGB color defined as three hex values in RRGGBB format, the shade is applied as follows:</p> <ul style="list-style-type: none"> • Convert the color to the HSL color format (values from 0 to 1) • Modify the luminance factor as follows: $L' = L * \text{Tint}_{\text{pct}} + (1 - \text{Tint}_{\text{pct}})$ <ul style="list-style-type: none"> • Convert the resultant HSL color to RGB <p>[<i>Example:</i> Consider a document with a background using the accent2 theme color, whose RGB value (in RRGGBB hex format) is 4F81BD.</p> <p>The equivalent HSL color value would be $\left(\frac{213}{360}, 0.45, 0.53\right)$.</p> <p>Applying the tint formula with a tint percentage of 60% to the luminance, we get:</p>

Attributes	Description
	$L' = 0.53 * 0.6 + (1 - .6)$ $= 0.71$ <p>Taking the resulting HSL color value of $\left(\frac{213}{360}, 0.45, 0.71\right)$ and converting back to RGB, we get 95B3D7.</p> <p>This transformed value can be seen in the resulting background's color attribute:</p> <pre><w:background w:color="95B3D7" w:themeColor="accent2" w:themeTint="99"/></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_UcharHexNumber simple type (§17.18.98).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Background](#)) is located in §A.1. *end note]*

17.2.2 body (Document Body)

This element specifies the contents of the body of the document - the main document editing surface.

The document body contains what is referred to as *block-level markup* - markup which can exist as a sibling element to paragraphs in a WordprocessingML document.

[*Example:* Consider a document with a single paragraph in the main document story. This document would require the following WordprocessingML in its main document part:

```
<w:document>
  <w:body>
    <w:p/>
  </w:body>
</w:document>
```

The fact that the paragraph is inside the body element makes it part of the main document story. *end example]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Body](#)) is located in §A.1. *end note]*

17.2.3 document (Document)

This element specifies the contents of a main document part in a WordprocessingML document.

[*Example:* Consider the basic structure of the main document part in a basic WordprocessingML document, as follows:

```
<w:document>
  <w:body>
    <w:p/>
  </w:body>
</w:document>
```

All of the contents of the main document part are contained beneath the document element. *end example*]

Attributes	Description
conformance (Document Conformance Class)	<p>Specifies the conformance class (§2.1) to which the WordprocessingML document conforms.</p> <p>If this attribute is omitted, its default value is <code>transitional</code>.</p> <p>[<i>Example:</i> Consider the following WordprocessingML Main Document part markup:</p> <pre><w:document w:conformance="strict"> ... </w:document></pre> <p>This document has a conformance attribute value of <code>strict</code>, therefore it conforms to the WML Strict conformance class. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_ConformanceClass</code> simple type (§22.9.2.2).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Document](#)) is located in §A.1. *end note*]

17.3 Paragraphs and Rich Formatting

The basis of a WordprocessingML document is its actual text contents. Those text contents can be stored in many contexts (tables, text boxes, etc.), but the most basic form of text contents in WordprocessingML is the paragraph, specified using the `p` element (§17.3.1.22).

Within the paragraph, all rich formatting at the paragraph level is stored within the `pPr` element (§17.3.1.25; §17.3.1.26). [*Note:* Some examples of paragraph properties are alignment, border, hyphenation override, indentation, line spacing, shading, text direction, and widow/orphan control. *end note*]

Within the paragraph, text is grouped into one or more runs, represented by the `r` element (§17.3.2.25), which define a region of text with a common set of properties.

Just as a paragraph can have rich formatting, so too can a run. All of the elements inside an `r` element have their properties controlled by a corresponding optional `rPr` run properties element (§17.7.9.1; §17.3.2.27). [Note: Some examples of run properties are bold, underlined, or visible. *end note*]

Within runs, run content is the set of possible objects and characters which can be displayed in the document.

17.3.1 Paragraphs

The most basic unit of block-level content within a WordprocessingML document, *paragraphs* are stored using the `p` element (§17.3.1.22). A paragraph defines a distinct division of content with a WordprocessingML document which begins on a new line.

[Example: Consider the paragraph fragment "*The quick brown fox jumped ...* " which is centered on a paragraph. The justification property is a paragraph level property, and therefore is expressed on the paragraph properties as follows:

```
<w:p>
  <w:pPr>
    <w:jc w:val="center"/>
    <w:rPr>
      <w:i/>
    </w:rPr>
  </w:pPr>
  <w:r>
    <w:rPr>
      <w:i/>
    </w:rPr>
    <w:t xml:space="preserve">The quick brown fox jumped ... </w:t>
  </w:r>
</w:p>
```

Notice that each run specifies the character formatting information for its contents, and the paragraph specifies the paragraph level formatting (the center-justification). It is also notable that since leading and trailing whitespace is not normally significant in XML; some runs require an attribute specifying that their whitespace is significant via the `xml:space` element. *end example*

A paragraph's properties are specified via the `pPr` element (§17.3.1.25; §17.3.1.26). [Note: Some examples of paragraph properties are alignment, border, hyphenation override, indentation, line spacing, shading, text direction, and widow/orphan control. *end note*]

17.3.1.1 `adjustRightInd` (Automatically Adjust Right Indent When Using Document Grid)

This element specifies whether the right indent shall be automatically adjusted for the given paragraph when a document grid has been defined for the current section using the `docGrid` element (§17.6.5), modifying of the current right indent used on this paragraph.

[*Note*: This setting is used in order to ensure that the line breaking for that paragraph is not determined by the width of the final character on the line. *end note*]

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, its value is assumed to be true.

[*Example*: Consider a paragraph in which the right indent on the current paragraph should not be automatically determined based on the character pitch set in the document grid. This setting would be specified using the following WordprocessingML:

```
<w:p>
  <w:pPr>
    ...
    <w:adjustRightInd w:val="false" />
  </w:pPr>
  ...
</w:p>
```

By explicitly setting the `val` to `false`, this paragraph uses its specified right indent settings regardless of the presence of the document grid for the parent section. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.1.2 autoSpaceDE (Automatically Adjust Spacing of Latin and East Asian Text)

This element specifies whether inter-character spacing shall automatically be adjusted between regions of Latin text and regions of East Asian text in the current paragraph. These regions shall be determined by the Unicode character values of the text content within the paragraph.

[*Note*: This property is used to ensure that the spacing between regions of Latin text and adjoining East Asian text is sufficient on each side such that the Latin text can be easily read within the East Asian text. *end note*]

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, its value is assumed to be true.

[*Example*: Consider a paragraph in which the spacing should not be automatically adjusted based on the presence of Latin and East Asian text. This setting would be specified using the following WordprocessingML:

```
<w:p>
  <w:pPr>
    ...
    <w:autoSpaceDE w:val="false" />
  </w:pPr>
  ...
</w:p>
```

</w:p>

By explicitly setting the `val` to `false`, this paragraph must not automatically adjust the spacing of adjoining Latin and East Asian text. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.1.3 autoSpaceDN (Automatically Adjust Spacing of East Asian Text and Numbers)

This element specifies whether inter-character spacing shall automatically be adjusted between regions of numbers and regions of East Asian text in the current paragraph. These regions shall be determined by the Unicode character values of the text content within the paragraph.

[*Note*: This property is used to ensure that the spacing between regions of numbers and adjoining East Asian text is sufficient on each side such that the numbers can be easily read within the East Asian text. *end note*]

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, its value is assumed to be `true`.

[*Example*: Consider a paragraph in which the spacing should not be automatically adjusted based on the presence of numbers and East Asian text. This setting would be specified using the following WordprocessingML:

```
<w:p>
  <w:pPr>
    ...
    <w:autoSpaceDN w:val="false" />
  </w:pPr>
  ...
</w:p>
```

By explicitly setting the `val` to `false`, this paragraph automatically adjusts the spacing of adjoining numbers and East Asian text. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.1.4 bar (Paragraph Border Between Facing Pages)

This element specifies the border which can be displayed on the inside edge of the paragraph when the parent's section settings specify that the section shall be printed using mirrored margins using the `mirrorMargins` element (§17.15.1.57). [*Note*: This information is present in the WordprocessingML for the purposes of legacy document format compatibility, and it can be removed and/or ignored as required. *end note*]

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then no bar border shall be applied to the current paragraph.

[Example: Consider the following paragraph's WordprocessingML definition for its paragraph borders:

```
<w:p>
  <w:pPr>
    <w:pBdr>
      <w:top w:val="single" w:sz="24" w:space="1" w:color="F2DCDB"
        w:themeColor="accent2" w:themeTint="33" />
      <w:left w:val="single" w:sz="24" w:space="4" w:color="B97034"
        w:themeColor="accent6" w:themeShade="BF" />
      <w:bottom w:val="single" w:sz="24" w:space="1" w:color="F2DCDB"
        w:themeColor="accent2" w:themeTint="33" />
      <w:right w:val="single" w:sz="24" w:space="4" w:color="C3D69B"
        w:themeColor="accent3" w:themeTint="99" />
      <w:bar w:val="single" w:sz="24" w:space="1" w:color="4F81BD"
        w:themeColor="accent1" />
    </w:pBdr>
  </w:pPr>
  <w:r>
    <w:t>Sample paragraph.</w:t>
  </w:r>
</w:p>
```

This paragraph has a single line bar border as defined by the bar element. *end example*]

This element's content model is defined by the common border properties definition in §17.3.4.

17.3.1.5 between (Paragraph Border Between Identical Paragraphs)

This element specifies the border which shall be displayed between each paragraph in a set of paragraphs which have the same set of paragraph border settings.

To determine if any two adjoining paragraphs should have a between border or an individual top and bottom border, the set of borders on the two adjoining paragraphs are compared. If the border information on those two paragraphs is identical for all possible paragraphs borders, then the between border is displayed. Otherwise, each paragraph shall use its bottom and top border, respectively. If this border specifies a space attribute, that value is ignored - this border is always located at the bottom of each paragraph with an identical following paragraph, taking into account any space after the line pitch.

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then no between border shall be applied between identical paragraphs.

[Example: Consider the following two paragraphs' WordprocessingML definition:

```
<w:p>
  <w:pPr>
```

```

    <w:pBdr>
      <w:top w:val="single" w:sz="24" w:space="1" w:color="F2DCDB"
w:themeColor="accent2" w:themeTint="33" />
      <w:left w:val="single" w:sz="24" w:space="4" w:color="B97034"
w:themeColor="accent6" w:themeShade="BF" />
      <w:bottom w:val="single" w:sz="24" w:space="1" w:color="F2DCDB"
w:themeColor="accent2" w:themeTint="33" />
      <w:right w:val="single" w:sz="24" w:space="4" w:color="C3D69B"
w:themeColor="accent3" w:themeTint="99" />
      <w:between w:val="single" w:sz="24" w:space="1" w:color="4F81BD"
w:themeColor="accent1" />
    </w:pBdr>
  </w:pPr>
<w:r>
  <w:t>First paragraph.</w:t>
</w:r>
</w:p>
<w:p>
  <w:pPr>
    <w:pBdr>
      <w:top w:val="single" w:sz="24" w:space="1" w:color="F2DCDB"
w:themeColor="accent2" w:themeTint="33" />
      <w:left w:val="single" w:sz="24" w:space="4" w:color="B97034"
w:themeColor="accent6" w:themeShade="BF" />
      <w:bottom w:val="single" w:sz="24" w:space="0" w:color="F2DCDB"
w:themeColor="accent2" w:themeTint="33" />
      <w:right w:val="single" w:sz="24" w:space="4" w:color="C3D69B"
w:themeColor="accent3" w:themeTint="99" />
      <w:between w:val="single" w:sz="24" w:space="1" w:color="4F81BD"
w:themeColor="accent1" />
    </w:pBdr>
  </w:pPr>
  <w:r>
    <w:t>Second paragraph.</w:t>
  </w:r>
</w:p>

```

Since the bottom paragraph border is different between the two paragraphs (the bottom space value goes from 1 to 0), these paragraphs do not use the between border, and instead paragraph one uses its bottom border, and paragraph two uses its top border. If those values were identical, then paragraph one would have a between border below it, and paragraph two would have no top border. *end example*

This element's content model is defined by the common border properties definition in §17.3.4.

17.3.1.6 `bidi` (Right to Left Paragraph Layout)

This element specifies that this paragraph shall be displayed from right to left. This property only affects the following set of paragraph-level properties:

- `ind` (§17.3.1.12)
- `jc` (§17.3.1.13)
- `tab` (§17.3.1.37)
- `textDirection` (§17.3.1.41)

This setting alone does not affect the ordering of text within the paragraph – see the `rtl` element (§17.3.2.30) for a detailed description.

This element specifies that the base direction of the text within the paragraph is right-to-left (see HL1 in the Unicode Standard Annex #9). See also Part 1, §I.2.

[*Example:* Consider a paragraph with the `bidi` property set as follows:

```
<w:p>
  <w:pPr>
    <w:bidi/>
  </w:pPr>
  ...
</w:p>
```

This paragraph direction is now right to left, which means that all paragraph properties are displayed right to left (e.g. the paragraph marker glyph (if any) is displayed on the right, and indentation for the first line of the paragraph occurs on the right side of the page). *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.1.7 `bottom` (Paragraph Border Below Identical Paragraphs)

This element specifies the border which shall be displayed below a set of paragraphs which have the same paragraph border settings.

To determine if any two adjoining paragraphs shall have an individual top and bottom border or a between border, the set of borders on the two adjoining paragraphs are compared. If the border information on those two paragraphs is different, then the first paragraph shall use its bottom border and the following paragraph shall use its top border. Otherwise, the between border is used. If this border specifies a space attribute, that value determines the space after the bottom of the text (ignoring any space below) which should be left before this border is drawn, specified in points.

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then no between border shall be applied below identical paragraphs.

[Example: Consider the following two paragraphs' WordprocessingML definition:

```
<w:p>
  <w:pPr>
    <w:pBdr>
      <w:top w:val="single" w:sz="24" w:space="1" w:color="F2DCDB"
w:themeColor="accent2" w:themeTint="33" />
      <w:left w:val="single" w:sz="24" w:space="4" w:color="B97034"
w:themeColor="accent6" w:themeShade="BF" />
      <w:bottom w:val="single" w:sz="24" w:space="1" w:color="F2DCDB"
w:themeColor="accent2" w:themeTint="33" />
      <w:right w:val="single" w:sz="24" w:space="4" w:color="C3D69B"
w:themeColor="accent3" w:themeTint="99" />
      <w:between w:val="single" w:sz="24" w:space="1" w:color="4F81BD"
w:themeColor="accent1" />
    </w:pBdr>
  </w:pPr>
  <w:r>
    <w:t>First paragraph.</w:t>
  </w:r>
</w:p>
<w:p>
  <w:pPr>
    <w:pBdr>
      <w:top w:val="single" w:sz="24" w:space="1" w:color="F2DCDB"
w:themeColor="accent2" w:themeTint="33" />
      <w:left w:val="single" w:sz="24" w:space="4" w:color="B97034"
w:themeColor="accent6" w:themeShade="BF" />
      <w:bottom w:val="single" w:sz="24" w:space="0" w:color="F2DCDB"
w:themeColor="accent2" w:themeTint="33" />
      <w:right w:val="single" w:sz="24" w:space="4" w:color="C3D69B"
w:themeColor="accent3" w:themeTint="99" />
      <w:between w:val="single" w:sz="24" w:space="1" w:color="4F81BD"
w:themeColor="accent1" />
    </w:pBdr>
  </w:pPr>
  <w:r>
    <w:t>Second paragraph.</w:t>
  </w:r>
</w:p>
```

Since the paragraph border is different between the two paragraphs (the bottom space value goes from 1 to 0), paragraph one uses its bottom border, which is located one point below the text in that paragraph. *end example]*

This element's content model is defined by the common border properties definition in §17.3.4.

17.3.1.8 cnfStyle (Paragraph Conditional Formatting)

This element specifies the set of conditional table style formatting properties which have been applied to this paragraph, if this paragraph is contained within a table cell. [*Note*: This property is an optimization which can be used by consumers to determine if a given property on a paragraph is the result of the table style properties vs. direct formatting on the paragraph itself. *end note*]

If this property is specified on a paragraph which is not contained within a table cell, then its contents shall be ignored when reading the contents of the document.

[*Example*: Consider a paragraph in the top right corner of a table with a table style applied and where the table is formatted as left to right. This paragraph would need to specify the following WordprocessingML:

```
<w:p>
  <w:pPr>
    <w:cnfStyle w:firstRow="true" w:lastColumn="true"
w:firstRowLastColumn="true" />
    ...
  </w:pPr>
  ...
</w:p>
```

This paragraph specifies that it has the conditional properties from the table style for the first column, first row, and the top right corner of the parent table by setting the appropriate attributes. *end example*]

Attributes	Description
evenHBand (Even Numbered Horizontal Band)	<p>Specifies that the object has inherited the conditional properties applied to the even numbered horizontal bands of the parent object.</p> <p>[<i>Example</i>: Consider a paragraph in the second row of a table with a table style applied, and where the band width is one row. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:evenHBand="true" /> ... </w:pPr> ... </w:p></pre> <p>This paragraph specifies that it has the conditional properties from the table style for the even numbered horizontal bands of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

Attributes	Description
evenVBand (Even Numbered Vertical Band)	<p>Specifies that the object has inherited the conditional properties applied to the even numbered vertical bands of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the second column of a table with a table style applied, and where the band width is one column. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:evenVBand="true" /> ... </w:pPr> ... </w:p></pre> <p>This paragraph specifies that it has the conditional properties from the table style for the even numbered vertical bands of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
firstColumn (First Column)	<p>Specifies that the object has inherited the conditional properties applied to the first column of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the first column of a table with a table style applied. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:firstColumn="true" /> ... </w:pPr> ... </w:p></pre> <p>This paragraph specifies that it has the conditional properties from the table style for the first column of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
firstRow (First Row)	<p>Specifies that the object has inherited the conditional properties applied to the first row of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the top row of a table with a table style applied. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:firstRow="true" /></pre>

Attributes	Description
	<pre> ... </w:pPr> ... </w:p> </pre> <p>This paragraph specifies that it has the conditional properties from the table style for the first row of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
firstRowFirstColumn (First Row and First Column)	<p>Specifies that the object has inherited the conditional properties applied to the cell that is in the first row and first column of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the first row and first column of a table. This paragraph would need to specify the following WordprocessingML:</p> <pre> <w:p> <w:pPr> <w:cnfStyle w:firstRow="true" w:firstColumn="true" w:firstRowFirstColumn="true" /> ... </w:pPr> ... </w:p> </pre> <p>This paragraph specifies that it has the conditional properties from the table style for the cell in the first row and first column of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
firstRowLastColumn (First Row and Last Column)	<p>Specifies that the object has inherited the conditional properties applied to the cell that is in the first row and last column of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the first row and last column of a table. This paragraph would need to specify the following WordprocessingML:</p> <pre> <w:p> <w:pPr> <w:cnfStyle w:firstRow="true" w:lastColumn="true" w:firstRowLastColumn="true" /> ... </w:pPr> ... </w:p> </pre> <p>This paragraph specifies that it has the conditional properties from the table style for the cell in the first row and last column of the parent table. <i>end example</i>]</p>

Attributes	Description
lastColumn (Last Column)	<p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p> <p>Specifies that the object has inherited the conditional properties applied to the last column of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the last column of a table with a table style applied. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:lastColumn="true" /> ... </w:pPr> ... </w:p></pre> <p>This paragraph specifies that it has the conditional properties from the table style for the last column of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
lastRow (Last Row)	<p>Specifies that the object has inherited the conditional properties applied to the last row of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the bottom row of a table with a table style applied. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:lastRow="true" /> ... </w:pPr> ... </w:p></pre> <p>This paragraph specifies that it has the conditional properties from the table style for the last row of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
lastRowFirstColumn (Last Row and First Column)	<p>Specifies that the object has inherited the conditional properties applied to the cell that is in the last row and first column of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the last row and first column of a table. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:lastRow="true" w:firstColumn="true"</pre>

Attributes	Description
	<pre>w:lastRowFirstColumn="true" /> ... </w:pPr> ... </w:p></pre> <p>This paragraph specifies that it has the conditional properties from the table style for the cell in the last row and first column of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
lastRowLastColumn (Last Row and Last Column)	<p>Specifies that the object has inherited the conditional properties applied to the cell that is in the last row and last column of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the last row and last column of a table. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:lastRow="true" w:lastColumn="true" w:lastRowLastColumn="true" /> ... </w:pPr> ... </w:p></pre> <p>This paragraph specifies that it has the conditional properties from the table style for the cell in the last row and last column of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
oddHBand (Odd Numbered Horizontal Band)	<p>Specifies that the object has inherited the conditional properties applied to the odd numbered horizontal bands of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the third row of a table with a table style applied, and where the band width is one column. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:oddHBand="true" /> ... </w:pPr> ... </w:p></pre> <p>This paragraph specifies that it has the conditional properties from the table style for the odd numbered horizontal bands of the parent table. <i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).
oddVBand (Odd Numbered Vertical Band)	<p>Specifies that the object has inherited the conditional properties applied to the odd numbered vertical bands of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the third column of a table with a table style applied, and where the band width is one column. This paragraph would need to specify the following WordprocessingML:</p> <pre> <w:p> <w:pPr> <w:cnfStyle w:oddVBand="true" /> ... </w:pPr> ... </w:p> </pre> <p>This paragraph specifies that it has the conditional properties from the table style for the odd numbered vertical bands of the parent table. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[*Note:* The W3C XML Schema definition of this element's content model (CT_Cnf) is located in §A.1. *end note*]

17.3.1.9 contextualSpacing (Ignore Spacing Above and Below When Using Identical Styles)

This element specifies that any space specified before or after this paragraph, specified using the spacing element (§17.3.1.33), should not be applied when the preceding and following paragraphs are of the same paragraph style, affecting the top and bottom spacing respectively. [*Example:* This value is typically used for paragraphs in lists, in which any space between subsequent list items, even if inherited from another style, is not desirable. *end example*]

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then spacing is not ignored. If it is present, then the spacing above or below on this paragraph is subtracted from the spacing which would have been present if contextual spacing was off, never going below zero.

[*Example:* Consider two paragraphs defined as follows:

```

<w:p>
  <w:pPr>
    <w:pStyle w:val="TestParagraphStyle" />
    <w:spacing w:after="200"/>

```

```

        <w:contextualSpacing/>
    </w:pPr>
    ...
</w:p>
<w:p>
    <w:pPr>
        <w:pStyle w:val="TestParagraphStyle" />
        <w:spacing w:before="240"/>
    </w:pPr>
    ...
</w:p>

```

The first paragraph specifies a spacing after of 10 points, and the second paragraph specifies a spacing before of 12 points, therefore according to the rules on the spacing element, the net paragraph spacing should be 12 points. However, since the first paragraph specifies that its spacing should be omitted between paragraphs of the same style, and the two paragraphs use the same `TestParagraphStyle`, that value is subtracted from the total, therefore the paragraphs are spaced by 2 points. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.1.10 `divId` (Associated HTML div ID)

This element specifies that this paragraph should be located within the specified HTML `div` tag when this document is saved in HTML format. This ID is then used to look up the associated div stored in the `divs` (§17.15.2.8) element. [*Note*: This element is used to preserve the fidelity of existing HTML documents when saved in the WordprocessingML format. *end note*].

If the paragraph does not specify this element, then any `div` referenced by the previous paragraph is closed, and this paragraph shall not belong to any `div` when saved as HTML. If this specified id does not exist in the collection of `divs` the current document, then any `div` referenced by the previous paragraph is closed, and this paragraph shall not belong to any `div` when saved as HTML.

[*Example*: Consider the following WordprocessingML paragraph fragment:

```

<w:p>
    <w:pPr>
        <w:divId w:val="1512645511" />
    </w:pPr>
</w:p>

```

This paragraph specifies that it belongs to the HTML `div` with id 1512645511, stored in the `divs` element. *end example*]

Attributes	Description
val (Decimal)	Specifies that the contents of this attribute contains a decimal number.

Attributes	Description
Number Value)	<p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <pre data-bbox="456 499 837 531"><... w:val="1512645511" /></pre> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_DecimalNumber](#)) is located in §A.1. *end note*]

17.3.1.11 framePr (Text Frame Properties)

This element specifies information about the current paragraph with regard to *text frames*. *Text frames* are paragraphs of text in a document which are positioned in a separate region or frame in the document, and can be positioned with a specific size and position relative to non-frame paragraphs in the current document.

The first piece of information specified by the framePr element is that the current paragraph is actually part of a text frame in the document. This information is specified simply by the presence of the framePr element in paragraph’s properties. If the framePr element is omitted, the paragraph shall not be part of any text frame in the document.

The second piece of information concerns the set of paragraphs which are part of the current text frame in the document. This is determined based on the attributes on the framePr element. If the set of attribute values specified on two adjacent paragraphs is identical, then those two paragraphs shall be considered to be part of the same text frame and rendered within the same frame in the document.

[*Example:* Consider a document in which the following two paragraphs are located adjacent to one another:

```
<w:p>
  <w:pPr>
    <w:framePr w:w="2191" w:h="811" w:hRule="exact" w:hSpace="180"
w:wrap="around" w:vAnchor="text" w:hAnchor="page" w:x="1921"/>
  </w:pPr>
  <w:r>
    <w:t>Paragraph One</w:t>
  </w:r>
```



```

</w:p>
<w:p>
  <w:pPr>
    <w:framePr w:w="2191" w:h="810" w:hRule="exact" w:hSpace="180"
w:wrap="around" w:vAnchor="text" w:hAnchor="page" w:x="1921"/>
  </w:pPr>
  <w:r>
    <w:t>Paragraph Two.</w:t>
  </w:r>
</w:p>

```

These two paragraphs, although each is a part of a text frame due to the presence of the framePr element, are different text frames because of the differing h value - 810 vs. 811. *end example]*

The positioning of the frame relative to the properties stored on its attribute values shall be calculated relative to the next paragraphs in the document which is itself not part of a text frame.

[*Example:* Consider a document in which the following three paragraphs are located adjacent to one another:

```

<w:p>
  <w:pPr>
    <w:framePr w:w="2191" w:h="811" w:hRule="exact" w:hSpace="180"
w:wrap="around" w:vAnchor="text" w:hAnchor="page" w:x="1921"/>
  </w:pPr>
  <w:r>
    <w:t>Paragraph One</w:t>
  </w:r>
</w:p>
<w:p>
  <w:pPr>
    <w:framePr w:w="2191" w:h="811" w:hRule="exact" w:hSpace="180"
w:wrap="around" w:vAnchor="text" w:hAnchor="page" w:x="1921"/>
  </w:pPr>
  <w:r>
    <w:t>Paragraph Two.</w:t>
  </w:r>
</w:p>
<w:p/>

```

The first two paragraphs form a single text frame, which is anchored using its attribute values relative to the first non-frame paragraph following it (the third paragraph in the example). *end example]*

Attributes	Description
anchorLock (Lock	Specifies that the frame shall always remain in the same logical position relative to the

Attributes	Description
Frame Anchor to Paragraph)	<p>non-frame paragraphs which precede and follow it in this document.</p> <p>This means that consumers which modify this document shall ensure that this text frame remains directly above the non-frame paragraph which it is currently above, by adjusting the frame's positioning properties as needed as the paragraph is moved throughout the document rather than moving the frame's logical location within the paragraphs in the document, if that would be more appropriate.</p> <p>If this attribute is omitted, then this frame shall not have a locked anchor position.</p> <p>[<i>Example:</i> Consider the following WordprocessingML paragraph contained in a text frame:</p> <pre> <w:p> <w:pPr> <w:framePr w:w="2419" w:h="2189" w:hRule="exact" w:hSpace="187" w:wrap="around" w:vAnchor="text" w:hAnchor="page" w:x="1643" w:y="73" w:anchorLock="1"/> </w:pPr> <w:r> <w:t>Text Frame Content.</w:t> </w:r> </w:p> </pre> <p>This text frame has a locked anchor using the anchorLock attribute. If the text frame is moved down in the document, the text frame properties must be adjusted to be relative to the parent paragraph's same logical position - the paragraph cannot be relocated in the document, which results in changes to the frame's properties as follows:</p> <pre> <w:p> <w:pPr> <w:framePr w:w="2419" w:h="2189" w:hRule="exact" w:hSpace="187" w:wrap="around" w:vAnchor="text" w:hAnchor="page" w:x="1643" w:y="-5247" w:anchorLock="1"/> </w:pPr> <w:r> <w:t>Text Frame Content.</w:t> </w:r> </w:p> </pre> <p>The non-frame paragraph was relocated 5320 twentieths of a point below its original location in the document, and the frame's vertical positioning properties were adjusted to ensure its logical location within the paragraph ordering was constant while its visual location was changed. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

Attributes	Description
dropCap (Drop Cap Frame)	<p>Specifies that the current frame contains a drop cap to be located at the beginning of the next non-frame paragraph in the document. Its contents shall be used to specify how that drop cap should be positioned relative to that paragraph.</p> <p>If this attribute is omitted, then this frame shall not be considered a drop cap frame.</p> <p>[<i>Note:</i> Although a drop cap is simply a text frame, this element is used to determine how the cap should be positioned relative to the following non-frame paragraph in relative terms (see possible values), rather than relying on absolute sizing. <i>end note</i>]</p> <p>[<i>Example:</i> Consider the following paragraph containing a text frame which should be positioned as a drop cap:</p> <pre><w:p> <w:pPr> <w:framePr w:dropCap="margin" w:lines="3" w:hSpace="432" w:wrap="around" w:vAnchor="text" w:hAnchor="page" /> </w:pPr> <w:r> <w:t>A</w:t> </w:r> </w:p></pre> <p>The dropCap attribute specifies a value of margin, so this drop cap is placed outside of the text margin before the start of the current text. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DropCap simple type (§17.18.20).</p>
h (Frame Height)	<p>Specifies the frame's height.</p> <p>This height is expressed in twentieths of a point.</p> <p>If this attribute is omitted, then its value shall be assumed to be 0.</p> <p>The meaning of the value of the h attribute is defined based on the value of the hRule attribute for this text frame as follows:</p> <ul style="list-style-type: none"> • If the value of hRule is auto, then the frame's height should be automatically determined based on the height of its contents. This value is ignored. • If the value of hRule is atLeast, then the frame's height should be at least the value of this attribute. • If the value of hRule is exact, then the frame's height should be exactly the value of this attribute. <p>[<i>Example:</i> Consider the following paragraph containing a text frame:</p> <pre><w:p></pre>

Attributes	Description
	<pre> <w:pPr> <w:framePr w:w="2419" w:h="2189" w:hRule="atLeast" w:hSpace="187" w:wrap="around" w:vAnchor="text" w:hAnchor="page" w:x="1643" w:y="73" /> </w:pPr> <w:r> <w:t>Text Frame Content.</w:t> </w:r> </w:p> </pre> <p>The h attribute specifies a value of 2189 twentieths of a point, so this text frame is a minimum of 2189 twentieths of a point high regardless of its contents, since its hRule value is set to atLeast. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>
hAnchor (Frame Horizontal Positioning Base)	<p>Specifies the base object from which the horizontal positioning in the x attribute should be calculated.</p> <p>A text frame can be horizontally positioned relative to:</p> <ul style="list-style-type: none"> • The vertical edge of the page before any runs of text (the left edge for left-to-right paragraphs, the right edge for right-to-left paragraphs) • The vertical edge of the text margin before any runs of text (the left edge for left-to-right paragraphs, the right edge for right-to-left paragraphs) • The vertical edge of the text margin for the column in which the anchor paragraph is located <p>If this attribute is omitted, then its value shall be assumed to be page.</p> <p>[<i>Example:</i> Consider a text frame which should be positioned one inch to the right of its column in a left-to-right document. This text frame would be specified using the following WordprocessingML:</p> <pre> <w:pPr> <w:framePr ... w:x="1440" w:hAnchor="column" /> </w:pPr> </pre> <p>These frame properties specify that they are relative to the anchor paragraph's column, and that relative to that column, the frame should be 1440 twentieths of a point in the direction of the flow of text (right, in this case). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_HAnchor simple type (§17.18.35).</p>
hRule (Frame Height Type)	<p>Specifies the meaning of the height specified for this frame.</p> <p>The meaning of the value of the h attribute is defined based on the value of the hRule</p>

Attributes	Description
	<p>attribute for this text frame as follows:</p> <ul style="list-style-type: none"> • If the value of <code>hRule</code> is <code>auto</code>, then the frame's height should be automatically determined based on the height of its contents. The <code>h</code> value is ignored. • If the value of <code>hRule</code> is <code>atLeast</code>, then the frame's height should be at least the value the <code>h</code> attribute. • If the value of <code>hRule</code> is <code>exact</code>, then the frame's height should be exactly the value of the <code>h</code> attribute. <p>If this attribute is omitted, then its value shall be assumed to be <code>auto</code>.</p> <p>[<i>Example:</i> Consider the following paragraph containing a text frame:</p> <pre><w:p> <w:pPr> <w:framePr w:w="2419" w:h="2189" w:hRule="atLeast" w:hSpace="187" w:wrap="around" w:vAnchor="text" w:hAnchor="page" w:x="1643" w:y="73" /> </w:pPr> <w:r> <w:t>Text Frame Content.</w:t> </w:r> </w:p></pre> <p>The <code>h</code> attribute specifies a value of 2189 twentieths of a point, so this text frame is a minimum of 2189 twentieths of a point high regardless of its contents, since its <code>hRule</code> value is set to <code>atLeast</code>. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_HeightRule</code> simple type (§17.18.37).</p>
hSpace (Horizontal Frame Padding)	<p>Specifies the minimum distance which shall be maintained between the current text frame and any non-frame text which has been allowed to flow around this object when the <code>wrap</code> attribute on this text frame is set to <code>around</code>.</p> <p>This distance is expressed in twentieths of a point.</p> <p>If the <code>wrap</code> value is not set to <code>around</code>, this value shall be ignored. If this attribute is omitted, its value shall be assumed to be 0.</p> <p>[<i>Example:</i> Consider a text frame which should have a minimum of a one-half inch spacing from any non-frame text on its left and right sides. This constraint would be specified using the following WordprocessingML:</p> <pre><w:pPr> <w:framePr ... w:hSpace="720" w:wrap="around" /> </w:pPr></pre>

Attributes	Description
	<p>The wrap value of around allows text to wrap around this text frame, and the hSpace attribute specifies that the spacing between text and this frame must be a minimum of 720 twentieths of a point. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>
<p>lines (Drop Cap Vertical Height in Lines)</p>	<p>Specifies the number of lines in the non-frame paragraph to which this text frame is anchored which should be used to calculate the drop cap's height.</p> <p>If the current frame is not a drop cap (the parent framePr element does not have the dropCap attribute), this value is ignored. If the current text frame is a dropped cap and this attribute is present, then any other vertical positioning information shall be ignored.</p> <p>If this attribute is omitted, then its value shall be considered to be 1.</p> <p>[<i>Example</i>: Consider the following paragraph containing a text frame which should be positioned as a drop cap:</p> <pre> <w:p> <w:pPr> <w:framePr w:dropCap="margin" w:lines="3" w:hSpace="432" w:wrap="around" w:vAnchor="text" w:hAnchor="page" w:y="400" w:yAlign="text" /> </w:pPr> <w:r> <w:t>0</w:t> </w:r> </w:p> </pre> <p>Since this frame is being used as a dropped cap, the y and yAlign attributes are ignored and the height of the drop cap is the first three lines of the anchor paragraph. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
<p>vAnchor (Frame Vertical Positioning Base)</p>	<p>Specifies the base object from which the horizontal positioning in the y attribute should be calculated.</p> <p>A text frame can be horizontally positioned relative to:</p> <ul style="list-style-type: none"> • The horizontal edge of the page before any runs of text (the top edge for top-to-bottom sections, the bottom for bottom-to-top sections) • The horizontal edge of the text margin before any runs of text (the top edge for top-to-bottom sections, the bottom for bottom-to-top sections) • The horizontal edge of the page before any runs of text (the top edge for top-to-bottom sections, the bottom for bottom-to-top sections)

Attributes	Description
	<p>If this attribute is omitted, then its value shall be assumed to be page.</p> <p>[<i>Example:</i> Consider a text frame which should be positioned two inches below the page top in a top-to-bottom document. This text frame would be specified using the following WordprocessingML:</p> <pre><w:pPr> <w:framePr ... w:y="2880" w:vAnchor="page" /> </w:pPr></pre> <p>These frame properties specify that they are relative to the anchor page, and that relative to that column, the frame should be 2880 twentieths of a point in the direction of the flow of text (down, in this case). <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_VAnchor simple type (§17.18.100).</p>
vSpace (Vertical Frame Padding)	<p>Specifies the minimum distance which shall be maintained between the current text frame and any non-frame text which is above or below this text frame.</p> <p>This distance is expressed in twentieths of a point.</p> <p>If this attribute is omitted, its value shall be assumed to be 0.</p> <p>[<i>Example:</i> Consider a text frame which should have a minimum of a one-half inch spacing from any non-frame text on its top and bottom sides. This constraint would be specified using the following WordprocessingML:</p> <pre><w:pPr> <w:framePr ... w:vSpace="720" /> </w:pPr></pre> <p>The vspace attribute specifies that the spacing between text and this frame must be a minimum of 720 twentieths of a point. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>
w (Frame Width)	<p>Specifies the exact value for this text frame's width.</p> <p>This value is specified in twentieths of a point.</p> <p>When this attribute is present, the text frame shall be rendered to the exact width specified. If this attribute is omitted, the text frame width shall be automatically determined by the maximum line width of the content within the text frame.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment specifying a text frame:</p>

Attributes	Description
	<pre> <w:p> <w:pPr> <w:framePr w:w="2419" w:h="2189" w:hRule="atLeast" w:hSpace="187" w:wrap="around" w:vAnchor="text" w:hAnchor="page" w:x="1643" w:y="73" /> </w:pPr> <w:r> <w:t>Text Frame Content.</w:t> </w:r> </w:p> </pre> <p>This text frame specifies that its width must be exactly 2419 twips. If this attribute was removed, the text frame would be rendered at the width of the content Text Frame Content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>
wrap (Text Wrapping Around Frame)	<p>Specifies the style of text wrapping which should be allowed around the contents of this text frame. This attribute determines if non-frame text shall be allowed to flow around the contents of this frame.</p> <p>If this attribute is omitted, its value shall be assumed to be around.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment specifying a text frame:</p> <pre> <w:p> <w:pPr> <w:framePr w:w="2419" w:h="2189" w:hRule="atLeast" w:hSpace="187" w:wrap="around" w:vAnchor="text" w:hAnchor="page" w:x="1643" w:y="73" /> </w:pPr> <w:r> <w:t>Text Frame Content.</w:t> </w:r> </w:p> </pre> <p>This text frame specifies that when the frame is rendered on the page, any non-text frame paragraphs which would normally flow onto the same lines must be allowed to do so. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Wrap simple type (§17.18.104).</p>
x (Absolute Horizontal Position)	<p>Specifies an absolute horizontal position for the text frame. This absolute position is specified relative to the horizontal anchor specified by the hAnchor attribute for this text frame.</p>

Attributes	Description
	<p>This value is expressed in twentieths of a point. If it is positive, then the text frame is positioned after the anchor object in the direction of horizontal text flow in this document. If it is negative, then the text frame is positioned before the anchor object in the direction of horizontal text flow in this document.</p> <p>If the xAlign attribute is also specified, then this value is ignored. If this attribute is omitted, then its value shall be assumed to be 0.</p> <p>[Example: Consider the following WordprocessingML fragment specifying a text frame:</p> <pre> <w:p> <w:pPr> <w:framePr w:w="2419" w:h="2189" w:hRule="atLeast" w:hSpace="187" w:wrap="around" w:vAnchor="text" w:hAnchor="page" w:x="1643" w:y="73" /> </w:pPr> <w:r> <w:t>Text Frame Content.</w:t> </w:r> </w:p> </pre> <p>This text frame specifies that it should be located exactly 1643 twentieths of a point after the vertical edge of the page (from the hAnchor attribute). <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_SignedTwipsMeasure simple type (§17.18.81).</p>
xAlign (Relative Horizontal Position)	<p>Specifies a relative horizontal position for the text frame. This relative position is specified relative to the horizontal anchor specified by the hAnchor attribute for this text frame.</p> <p>If omitted, this attribute is not specified and the value of the x attribute determines the absolute horizontal position of the text frame. If specified, the position for this attribute supersede any value which is specified in the x attribute, and that value is ignored.</p> <p>[Example: Consider the following WordprocessingML fragment specifying a text frame:</p> <pre> <w:p> <w:pPr> <w:framePr w:w="2419" w:h="2189" w:hRule="atLeast" w:hSpace="187" w:wrap="around" w:vAnchor="text" w:hAnchor="page" w:x="1643" w:xAlign="left" w:y="73" /> </w:pPr> <w:r> <w:t>Text Frame Content.</w:t> </w:r> </w:p> </pre>

Attributes	Description
	<p>This text frame specifies that it has a horizontal placement of exactly 1643 twentieths of a point relative to the page, but that exact placement is overridden by the presence of the xAlign attribute to place the frame on the left side of the page. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_XAlign simple type (§22.9.2.18).</p>
y (Absolute Vertical Position)	<p>Specifies an absolute vertical position for the text frame. This absolute position is specified relative to the vertical anchor specified by the vAnchor attribute for this text frame.</p> <p>This value is expressed in twentieths of a point. If it is positive, then the text frame is positioned after the anchor object in the direction of vertical text flow in this document. If it is negative, then the text frame is positioned before the anchor object in the direction of vertical text flow in this document.</p> <p>If the yAlign attribute is also specified, then this value is ignored. If this attribute is omitted, then its value shall be assumed to be 0.</p> <p>[Example: Consider the following WordprocessingML fragment specifying a text frame:</p> <pre> <w:p> <w:pPr> <w:framePr w:w="2419" w:h="2189" w:hRule="atLeast" w:hSpace="187" w:wrap="around" w:vAnchor="text" w:hAnchor="page" w:x="1643" w:y="73" /> </w:pPr> <w:r> <w:t>Text Frame Content.</w:t> </w:r> </w:p> </pre> <p>This text frame specifies that it should be located exactly 79 twentieths of a point below the top vertical edge of the anchor's paragraph's text (from the vAnchor attribute), assuming that the vertical text direction is top to bottom. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_SignedTwipsMeasure simple type (§17.18.81).</p>
yAlign (Relative Vertical Position)	<p>Specifies a relative vertical position for the text frame. This relative position is specified relative to the vertical anchor specified by the vAnchor attribute for this text frame.</p> <p>If omitted, this attribute is not specified and the value of the y attribute determines the absolute horizontal position of the text frame. If specified, the position for this attribute supersedes any value which is specified in the y attribute, and that value is ignored, unless the vAnchor is set to text, in which case any relative positioning is not allowed, and is itself ignored.</p>

Attributes	Description
	<p>[<i>Example:</i> Consider the following WordprocessingML fragment specifying a text frame:</p> <pre> <w:p> <w:pPr> <w:framePr w:w="2419" w:h="2189" w:hRule="atLeast" w:hSpace="187" w:wrap="around" w:vAnchor="margin" w:hAnchor="page" w:x="1643" w:y="73" w:yAlign="center" /> </w:pPr> <w:r> <w:t>Text Frame Content.</w:t> </w:r> </w:p> </pre> <p>This text frame specifies that it has a vertical placement of exactly 73 twentieths of a point relative to the top margin, but that exact placement is overridden by the presence of the yAlign attribute to place the frame in the center of the margin. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_YAlign simple type (§22.9.2.20).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FramePr](#)) is located in §A.1. *end note*]

17.3.1.12 ind (Paragraph Indentation)

This element specifies the set of indentation properties applied to the current paragraph.

Indentation settings are overridden on an individual basis - if any single attribute on this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If any single attribute on this element is never specified in the style hierarchy, then no indentation of that indentation type is applied to the paragraph.

[*Example:* Consider a paragraph which should have a one inch indentation from the text margins on both the left and the right sides, except for the first line in each paragraph, which should only be indented one quarter of an inch from the text margin (on the side which begins the flow of text for this paragraph). This set of indentations is specified using the following WordprocessingML:

```

<w:pPr>
  <w:ind w:start="1440" w:end="1440" w:hanging="1080" />
</w:pPr>

```

This set of indentation properties specifies that a 1440 twentieths of a point indentation should be provided on both the left and the right side of the text margins for this paragraph, and that a 1080 twentieths of a point

hanging indent (towards the text margin) should be applied to the text in the first paragraph, giving it a net one-quarter inch indent from the text margin. *end example*]

Attributes	Description
end (End Indentation)	<p>Specifies the indentation which shall be placed at the end of this paragraph – between the right text margin for this paragraph and the right edge of that paragraph's content in a left to right paragraph, and the left text margin and the left edge of that paragraph's text in a right to left paragraph. If the mirrorIndents property (§17.3.1.18) is specified for this paragraph, then this indent is used for the outside page edge - the left page edge for odd numbered pages and the right page edge for even numbered pages.</p> <p>If this attribute is omitted, its value shall be assumed to be zero.</p> <p>All other values for this element are relative to the trailing text margin, Negative values are defined such that the text is moved past the text margin, positive values move the text inside the text margin. As well, if the endChars attribute is specified, then this value is ignored.</p> <p>[Example: Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:ind w:start="720" w:end="-1440" /> </w:pPr></pre> <p>This set of paragraph indentations specifies that this paragraph's text should be indented 1440 twentieths of a point (one inch) into the right text margin in this document, assuming this is a left to right paragraph. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_SignedTwipsMeasure simple type (§17.18.81).</p>
endChars (End Indentation in Character Units)	<p>Specifies the indentation which shall be placed at the end of this paragraph – between the right text margin for this paragraph and the right edge of that paragraph's content in a left to right paragraph, and the left text margin and the left edge of that paragraph's text in a right to left paragraph. If the mirrorIndents property (§17.3.1.18) is specified for this paragraph, then this indent is used for the outside page edge - the left page edge for odd numbered pages and the right page edge for even numbered pages.</p> <p>This value is specified in hundredths of a character unit.</p> <p>If this attribute is omitted, its value shall be assumed to be zero.</p> <p>All other values for this element are relative to the trailing text margin, negative values are defined such that the text is moved past the text margin, positive values move the text inside the text margin. As well, if the end attribute is specified, then its value is ignored, and is superseded by this value.</p> <p>[Example: Consider the following WordprocessingML fragment:</p>

Attributes	Description
	<pre><w:pPr> <w:ind w:endChars="250" /> </w:pPr></pre> <p>This set of paragraph indentations specifies that this paragraph's text should be indented two and a half character units from the right text margin in this document, assuming this is a left to right paragraph. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
firstLine (Additional First Line Indentation)	<p>Specifies the additional indentation which shall be applied to the first line of the parent paragraph. This additional indentation is specified relative to the paragraph indentation which is specified for all other lines in the parent paragraph.</p> <p>The firstLine and hanging attributes are mutually exclusive, if both are specified, then the firstLine value is ignored. If the firstLineChars attribute is also specified, then this value is ignored. If this attribute is omitted, then its value shall be assumed to be zero (if needed).</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:ind w:start="1440" w:end="720" w:firstLine="1440" /> </w:pPr></pre> <p>This set of indentations specifies that the first line should be indented 1440 twentieths of a point (one inch) from the indentation specified for all remaining paragraphs, which is the 1440 twentieths of a point, as specified by the start attribute. This gives the first line a two inch indentation from the text margin. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>
firstLineChars (Additional First Line Indentation in Character Units)	<p>Specifies the additional indentation which shall be applied to the first line of the parent paragraph. This additional indentation is specified relative to the paragraph indentation which is specified for all other lines in the parent paragraph.</p> <p>It is specified in one hundredths of a character unit.</p> <p>The firstLineChars and hangingChars attributes are mutually exclusive, if both are specified, then the firstLineChars value is ignored. If the firstLine attribute is also specified, then this value supersedes its other value. If this attribute is omitted, then its value shall be assumed to be zero (if needed).</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p>

Attributes	Description
	<pre data-bbox="456 254 1430 348"><w:pPr> <w:ind w:start="1440" w:end="720" w:firstLineChars="140" /> </w:pPr></pre> <p data-bbox="415 390 1481 491">This set of indentations specifies that the first line should be indented 140 hundredths of a character units from the indentation specified for all remaining paragraphs, which is the 1440 twentieths of a point specified by the start attribute. <i>end example]</i></p> <p data-bbox="415 533 1471 596">The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
hanging (Indentation Removed from First Line)	<p data-bbox="415 617 1468 718">Specifies the indentation which shall be removed from the first line of the parent paragraph, by moving the indentation on the first line back towards the beginning of the direction of text flow.</p> <p data-bbox="415 760 1451 823">This indentation is specified relative to the paragraph indentation which is specified for all other lines in the parent paragraph.</p> <p data-bbox="415 865 1445 1003">The firstLine and hanging attributes are mutually exclusive, if both are specified, then the firstLine value is ignored. If the hangingChars attribute is also specified, then this value is ignored. If this attribute is omitted, its value shall be assumed to be zero (if needed).</p> <p data-bbox="415 1045 1170 1077">[Example: Consider the following WordprocessingML fragment:</p> <pre data-bbox="456 1119 1317 1213"><w:pPr> <w:ind w:start="1440" w:end="720" w:hanging="720" /> </w:pPr></pre> <p data-bbox="415 1255 1481 1394">This set of indentations specifies that the first line should be indented 720 twentieths of a point (one inch) towards the text margin from the indentation specified for all remaining paragraphs, which is the 1440 twentieths of a point specified by the start attribute. This gives the first line a one-half inch indentation from the text margin. <i>end example]</i></p> <p data-bbox="415 1436 1451 1499">The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>
hangingChars (Indentation Removed From First Line in Character Units)	<p data-bbox="415 1516 1468 1617">Specifies the indentation which shall be removed from the first line of the parent paragraph, by moving the indentation on the first line back towards the beginning of the direction of text flow.</p> <p data-bbox="415 1659 1451 1722">This indentation is specified relative to the paragraph indentation which is specified for all other lines in the parent paragraph.</p> <p data-bbox="415 1764 1027 1795">It is specified in one hundredths of a character unit.</p> <p data-bbox="415 1837 1438 1900">The firstLineChars and hangingChars attributes are mutually exclusive, if both are specified, then the firstLine value is ignored. If the hanging attribute is also specified,</p>

Attributes	Description
	<p>then its value is superseded by this value. If this attribute is omitted, its value shall be assumed to be zero (if needed).</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:ind w:start="1440" w:end="720" w:hangingChars="100" /> </w:pPr></pre> <p>This set of indentations specifies that the first line should be indented one character unit towards the text margin from the indentation specified for all remaining paragraphs, which is the 1440 twentieths of a point specified by the start attribute. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
start (Start Indentation)	<p>Specifies the indentation which shall be placed at the start of this paragraph – between the left text margin for this paragraph and the left edge of that paragraph's content in a left to right paragraph, and the right text margin and the right edge of that paragraph's text in a right to left paragraph. If the mirrorIndents property (§17.3.1.18) is specified for this paragraph, then this indent is used for the inside page edge - the right page edge for odd numbered pages and the left page edge for even numbered pages.</p> <p>If this attribute is omitted, its value shall be assumed to be zero.</p> <p>All other values for this element are relative to the leading text margin, Negative values are defined such that the text is moved past the text margin, positive values move the text inside the text margin. This value can be superseded for the first line only via use of the firstLine or hanging attributes. As well, if the startChars attribute is specified, then this value is ignored.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:ind w:start="720" w:end="2880" /> </w:pPr></pre> <p>This set of paragraph indentations specifies that this paragraph's text should be indented 720 twentieths of a point (one half inch) from the left text margin in this document, assuming this is a left to right paragraph. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_SignedTwipsMeasure simple type (§17.18.81).</p>
startChars (Start Indentation in Character Units)	<p>Specifies the indentation which shall be placed at the start of this paragraph – between the left text margin for this paragraph and the left edge of that paragraph's content in a left to right paragraph, and the right text margin and the right edge of that paragraph's text in a right to left paragraph. If the mirrorIndents property (§17.3.1.18) is specified</p>

Attributes	Description
	<p>for this paragraph, then this indent is used for the inside page edge - the right page edge for odd numbered pages and the left page edge for even numbered pages.</p> <p>This value is specified in hundredths of a character unit.</p> <p>If this attribute is omitted, its value shall be assumed to be zero.</p> <p>All other values for this element are relative to the leading text margin, Negative values are defined such that the text is moved past the text margin, positive values move the text inside the text margin. This value can be superseded for the first line only via use of the firstLine or hanging attributes. As well, if the start attribute is specified, then its value is ignored, and is superseded by this value.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:ind w:startChars="250" /> </w:pPr></pre> <p>This set of paragraph indentations specifies that this paragraph's text should be indented two and a half character units from the left text margin in this document, assuming this is a left to right paragraph. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Ind](#)) is located in §A.1. *end note*]

17.3.1.13 jc (Paragraph Alignment)

This element specifies the paragraph alignment which shall be applied to text in this paragraph.

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then no alignment is applied to the paragraph.

[*Example:* Consider a paragraph which should be right justified to the right page side paragraph extents within a document. This constraint is specified in the following WordprocessingML content:

```
<w:pPr>
  <w:jc w:val="end" />
</w:pPr>
```

The paragraph is now right justified on the page. *end example*]

Attributes	Description
val (Alignment Type)	<p>Specifies the justification which should be applied to the parent object within a document.</p> <p>The possible values (see below) for this attribute are always specified with <code>left</code> specifying justification relative to the leading edge of the paragraph, and therefore change semantic between right-to-left and left-to-right documents.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment for a paragraph in a document:</p> <pre><w:pPr> <w:jc w:val="end" /> </w:pPr></pre> <p>This paragraph is now right justified on the page for a left-to-right paragraph, left justified for a right-to-left paragraph. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_Jc</code> simple type (§17.18.44).</p>

[*Note:* The W3C XML Schema definition of this element's content model (`CT_Jc`) is located in §A.1. *end note*]

17.3.1.14 `keepLines` (Keep All Lines On One Page)

This element specifies that when rendering this document in a page view, all lines of this paragraph are maintained on a single page whenever possible.

This means that if the contents of the current paragraph would normally span across two pages due to the placement of the paragraph's text, all lines in this paragraph shall be moved onto the next page to ensure they are displayed together. If this is not possible because all lines in the paragraph would exceed a single page in any case, then lines in this paragraph shall start on a new page, with page breaks as needed afterwards.

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then this property shall not be applied.

[*Example:* Consider a WordprocessingML document in which a code fragment (such as the schema fragments in this document) are defined such that they should never be broken across a page boundary in order to improve readability. This constraint would be specified using the following paragraph properties in WordprocessingML:

```
<w:pPr>
  <w:keepLines />
  ...
</w:pPr>
```

This setting ensures that the schema fragment is displayed on one page if possible. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.1.15 keepNext (Keep Paragraph With Next Paragraph)

This element specifies that when rendering this document in a paginated view, the contents of this paragraph are at least partly rendered on the same page as the following paragraph whenever possible.

This means that if the contents of the current paragraph would normally be completely rendered on a different page than the following paragraph (because only one of the two paragraphs would fit on the remaining space on the first page), then both paragraphs shall be rendered on a single page. This property can be chained between multiple paragraphs to ensure that all paragraphs are rendered on a single page without any intervening page boundaries. If this is not possible the entire set of paragraphs that are grouped together using this property would exceed a single page in any case, then the set of "keep with next" paragraphs shall start on a new page, with page breaks as needed afterwards.

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then this property shall not be applied.

[Example: Consider the following document with three paragraphs:

[illegible]

As shown above, the second paragraph and third paragraph are being rendered on two separate pages. However, a producer can specify that the second paragraph should not be displayed without any part of the third by setting the `keepNext` element as follows:

```
<w:pPr>
  <w:keepNext/>
  ...
</w:pPr>
```

This would ensure that the second paragraph is displayed on the same page as the third paragraph:

[illegible]

However, if the first paragraph was also set to keepNext, then this set of grouped paragraphs would exceed a page, therefore the set of paragraphs would be grouped and start on the first page, resulting in the second paragraph reappearing on page one:

[illegible]

Since the paragraphs cannot all be put on one page, they all start on page one and flow as needed. *end example]*

This element's content model is defined by the common boolean property definition in §17.17.4.

U+FE30, U+FE31, U+FE33, U+FE34, U+FE36, U+FE38, U+FE3A, U+FE3C, U+FE3E, U+FE40, U+FE42, U+FE44, U+FE4F, U+FE50, U+FE51, U+FE52, U+FE54, U+FE55, U+FE56, U+FE57, U+FE5A, U+FE5C, U+FE5E, U+FF01, U+FF09, U+FF0C, U+FF0E, U+FF1A, U+FF1B, U+FF1F, U+FF3D, U+FF5C, U+FF5D, and U+FF64, respectively)

- Cannot end a line:

([{ ¥ ‘ “ ’ < 《 [] 【 (" ~ ^ _ π ∩ ≧ ≡ ⌊ ⊥ ({ (({

(Unicode character values: U+0028, U+005B, U+007B, U+00A3, U+00A5, U+2018, U+201C, U+2035, U+3008, U+300A, U+300C, U+300E, U+3010, U+3014, U+301D, U+FE35, U+FE37, U+FE39, U+FE3B, U+FE3D, U+FE3F, U+FE41, U+FE43, U+FE59, U+FE5B, U+FE5D, U+FF08, and U+FF5B, respectively)

Japanese

- Cannot start a line:

!%) ,...;?]]ç° ’ ” %’ ” °C、 。 々〉 》 」 』 』) ° ¸ º · 、 º ! %) , . : ; ?] } 。 」、 ° ∅

(Unicode character values: U+0021, U+0025, U+0029, U+002C, U+002E, U+003A, U+003B, U+003F, U+005D, U+007D, U+00A2, U+00B0, U+2019, U+201D, U+2030, U+2032, U+2033, U+2103, U+3001, U+3002, U+3005, U+3009, U+300B, U+300D, U+300F, U+3011, U+3015, U+309B, U+309C, U+309D, U+309E, U+30FB, U+30FD, U+30FE, U+FF01, U+FF05, U+FF09, U+FF0C, U+FF0E, U+FF1A, U+FF1B, U+FF1F, U+FF3D, U+FF5D, U+FF61, U+FF63, U+FF64, U+FF65, U+FF9E, U+FF9F, and U+FFE0, respectively)

- Cannot end a line:

\$(\[\{£¥ ‘ “ ‹ › « » ⁀ ⁁ ⁂ ⁃ ⁄ ⁅ ⁆ ⁇ ⁈ ⁉ ⁊ ⁋ ⁌ ⁍ ⁎ ⁏ ⁐ ⁑ ⁒ ⁓ ⁔ ⁕ ⁖ ⁗ ⁘ ⁙ ⁚ ⁛ ⁜ ⁝ ⁞   ⁠ ⁡ ⁢ ⁣ ⁤ ⁥ ⁦ ⁧ ⁨ ⁩ ⁪ ⁫ ⁬ ⁭ ⁮ ⁯ ⁰ ⁱ ⁲ ⁳ ⁴ ⁵ ⁶ ⁷ ⁸ ⁹ ⁺ ⁻ ⁽ ⁾ ⁿ ⁿ ⁿ ⁿ ⁿ

(Unicode character values: U+0024, U+0028, U+005B, U+005C, U+007B, U+00A3, U+00A5, U+2018, U+201C, U+3008, U+300A, U+300C, U+300E, U+3010, U+3014, U+FF04, U+FF08, U+FF3B, U+FF5B, U+FF62, U+FFE1, and U+FFE5, respectively)

Korean

- Cannot start a line:

!%) ,,:;?]}ç° ’ ” ‘ ” °C> »] j ■) ! %) , . : ; ?] } ∅

(Unicode character values: U+0021, U+0025, U+0029, U+002C, U+002E, U+003A, U+003B, U+003F, U+005D, U+007D, U+00A2, U+00B0, U+2019, U+201D, U+2032, U+2033, U+2103, U+3009, U+300B, U+300D, U+300F, U+3011, U+3015, U+FF01, U+FF05, U+FF09, U+FF0C, U+FF0E, U+FF1A, U+FF1B, U+FF1F, U+FF3D, U+FF5D, and U+FFE0, respectively)

- Cannot end a line:

\$(\[{\text{£¥ ‘ “ ‹ › [] { £ ¥ W

17.3.1.17 left (Left Paragraph Border)

This element specifies the border which shall be displayed on the left side of the page around the specified paragraph. This shall not change based on the paragraph direction.

To determine if any two adjoining paragraphs should have a left border which spans the full line height or not, the left border shall be drawn between the top border or between border at the top (whichever would be rendered for the current paragraph), and the bottom border or between border at the bottom (whichever would be rendered for the current paragraph).

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then no left border shall be applied.

[Example: Consider the following two paragraphs' WordprocessingML definition:

```
<w:p>
  <w:pPr>
    <w:pBdr>
      <w:top w:val="single" w:sz="24" w:space="1" w:color="F2DCDB"
w:themeColor="accent2" w:themeTint="33" />
      <w:left w:val="single" w:sz="24" w:space="4" w:color="B97034"
w:themeColor="accent6" w:themeShade="BF" />
      <w:bottom w:val="single" w:sz="24" w:space="1" w:color="F2DCDB"
w:themeColor="accent2" w:themeTint="33" />
      <w:right w:val="single" w:sz="24" w:space="4" w:color="C3D69B"
w:themeColor="accent3" w:themeTint="99" />
      <w:between w:val="single" w:sz="24" w:space="1" w:color="4F81BD"
w:themeColor="accent1" />
    </w:pBdr>
  </w:pPr>
  <w:r>
    <w:t>First paragraph.</w:t>
  </w:r>
</w:p>
<w:p>
  <w:pPr>
    <w:pBdr>
      <w:top w:val="single" w:sz="24" w:space="1" w:color="F2DCDB"
w:themeColor="accent2" w:themeTint="33" />
      <w:left w:val="single" w:sz="24" w:space="4" w:color="B97034"
w:themeColor="accent6" w:themeShade="BF" />
      <w:bottom w:val="single" w:sz="24" w:space="1" w:color="F2DCDB"
w:themeColor="accent2" w:themeTint="33" />
```

```

    <w:right w:val="single" w:sz="24" w:space="4" w:color="C3D69B"
w:themeColor="accent3" w:themeTint="99" />
    <w:between w:val="single" w:sz="24" w:space="1" w:color="4F81BD"
w:themeColor="accent1" />
  </w:pBdr>
</w:pPr>
<w:r>
  <w:t>Second paragraph.</w:t>
</w:r>
</w:p>

```

Since the paragraph border set is identical between the two paragraphs, the paragraphs are connected by a between border. These paragraphs therefore draw the left border between the top and between borders for the first paragraph, and the between and bottom borders for the second paragraph. *end example*]

This element's content model is defined by the common border properties definition in §17.3.4.

17.3.1.18 `mirrorIndents` (Use Left/Right Indents as Inside/Outside Indents)

This element specifies whether the paragraph indents should be interpreted as mirrored indents. When this element is present, the start indent shall become the inside indent (the one closest to the binding) and the end indent shall become the outside indent (the one furthest from the binding). [*Note*: This mirroring is typically used when the contents of the document are used to generate *signatures* – combinations of pages which are then placed in a binding. When signatures are printed in a left-to-right document, the first, third, etc. pages are printed on the left side of the combined sheet, and the second, fourth, etc. are printed on its right side, then bound and folded. For a right-to-left document, the first, third, etc. pages are printed on the right side of the combined sheet, and the second, fourth, etc. are printed on its left side. *end note*]

If the `mirrorIndents` property is specified for this paragraph, then the inside page edge is the end page edge for odd numbered pages and the start page edge for even numbered pages. Conversely, the outside page edge is the start page edge for odd numbered pages and the end page edge for even numbered pages. Odd and even numbering in the text above refers to the ordinal position of the page in the paginated document, not to the page number which may appear on each page.

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then this property shall not be applied.

[*Example*: Consider a paragraph on the first page of a document which should have a one inch indentation from the text margins on the inside edge when the resulting document is printed and bound. This means that the paragraph has a one inch right border if it is on an odd numbered page, and a one inch left border if it is on an even numbered page. This set of indentations is specified using the following WordprocessingML:

```

<w:pPr>
  <w:ind w:start="1440" />

```



```
<w:mirrorIndents />
</w:pPr>
```

This set of indentation properties specifies that a 1440 twip indentation should be provided on the leading side of the text margins for this paragraph. However, since the mirrorIndents property is set, the start indent is really the inside indent, and if this paragraph is on page one, must result in a one inch right indent from the text margin. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.1.19 numPr (Numbering Definition Instance Reference)

This element specifies that the current paragraph uses numbering information that is defined by a particular *numbering definition instance*.

The presence of this element specifies that the paragraph inherits the properties specified by the numbering definition in the num element (§17.9.15) at the level specified by the level specified in the lvl element (§17.9.6) and shall have an associated number positioned before the beginning of the text flow in this paragraph. When this element appears as part of the paragraph formatting for a paragraph style, then any numbering level defined using the ilvl element shall be ignored, and the pStyle element (§17.9.23) on the associated abstract numbering definition shall be used instead.

[*Example*: Consider a paragraph in a document which should be associated with level 4 of a numbering definition with ID 0. Associating the paragraph with this numbering definition would be specified using the following WordprocessingML:

```
<w:pPr>
  <w:numPr>
    <w:ilvl w:val="4" />
    <w:numId w:val="0" />
  </w:numPr>
</w:pPr>
```

The numPr element specifies that this paragraph must contain numbering information, and its children specify that the numbering definition for that numbering information must have a numId of 0 and an ilvl of 4 within that numbering definition. *end example*

[*Note*: The W3C XML Schema definition of this element's content model ([CT_NumPr](#)) is located in §A.1. *end note*]

17.3.1.20 outlineLvl (Associated Outline Level)

This element specifies the *outline level* which shall be associated with the current paragraph in the document. The *outline level* specifies an integer which defines the level of the associated text. This level shall not affect the appearance of the text in the document, but shall be used to calculate the TOC field (§17.16.5.68) if the

appropriate field switches have been set, and can be used by consumers to provide additional application behavior.

The outline level of text in the document (specified using the `val` attribute) can be from 0 to 9, where 9 specifically indicates that there is no outline level specifically applied to this paragraph. If this element is omitted, then the outline level of the content is assumed to be 9 (no level).

[*Example:* Consider a paragraph in a document which has outline level 1 applied to it. This paragraph would specify the following WordprocessingML:

```
<w:pPr>
  <w:outlineLvl w:val="0" />
</w:pPr>
```

This paragraph is now of outline level 1, and if a table of contents field is inserted that utilizes outlines levels, the text in this paragraph is at level one in the TOC. *end example*]

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <pre><... w:val="1512645511" /></pre> <p>The value of the <code>val</code> attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_DecimalNumber](#)) is located in §A.1. *end note*]

17.3.1.21 **overflowPunct (Allow Punctuation to Extend Past Text Extents)**

This element specifies that the text in this paragraph shall be allowed to extend one character beyond the extents applied by any indents/margins when the character that extends past those extents is a punctuation character.

Omitting this element sets its value to `true`.

[*Example:* Consider a WordprocessingML document with the following string at the end of a line:

"This is some text in quotation marks"

Typically, if the text extents would normally fall between the letter *s* and the closing quotation mark, the quotation mark would be allowed to extend past the end of the line by one character even though the punctuation is not part of the word marks (since the omission of `overflowPunct` is equivalent to setting its `val` attribute to `true`).

However, if this behavior should not be applied to this paragraph, a producer can specify this by setting the property in the WordprocessingML:

```
<w:pPr>
  <w:overflowPunct w:val="0" />
</w:pPr>
```

The line would now break after the letter *s*, regardless of the fact that the next character is a quotation mark. *end example]*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.1.22 p (Paragraph)

This element specifies a paragraph of content in the document.

The contents of a paragraph in a WordprocessingML document shall consist of any combination of the following four kinds of content:

- Paragraph properties
- Annotations (bookmarks, comments, revisions)
- Custom markup
- Run level content (fields, hyperlinks, runs)

[*Example:* Consider a basic WordprocessingML document with a single paragraph. This paragraph would be expressed as follows:

```
<w:document>
  <w:body>
    <w:p>
      <w:r>
        <w:t>Text</w:t>
      </w:r>
      <w:fldSimple w:instr="AUTHOR">
        <w:r>
          <w:t>Author Name</w:t>
        </w:r>
      </w:fldSimple>
    </w:p>
```

```
</w:body>
</w:document>
```

The `p` element is the container for all of the content in the paragraph, which in this example includes both a text run and a simple field. *end example*]

Attributes	Description
rsidDel (Revision Identifier for Paragraph Deletion)	<p>Specifies an identifier used to track the editing session when the paragraph was deleted from the main document.</p> <p>All rsid* attributes throughout this document with the same value, if present, shall indicate that those regions were modified during the same editing session (time between subsequent save actions).</p> <p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions to indicate the order of the modifications relative to other modifications in this document.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>
rsidP (Revision Identifier for Paragraph Properties)	<p>This attribute specifies an identifier used to track the editing session when the paragraph's properties were last modified in this document.</p> <p>All rsid* attributes throughout this document with the same value, if present, shall indicate that those regions were modified during the same editing session (time between subsequent save actions).</p> <p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions to indicate the order of the modifications relative to other modifications in this document.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>
rsidR (Revision Identifier for Paragraph)	<p>This attribute specifies an identifier used to track the editing session when the paragraph was added to the main document.</p> <p>All rsid* attributes throughout this document with the same value, if present, shall indicate that those regions were modified during the same editing session (time between subsequent save actions).</p> <p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions to indicate the order of the modifications relative to other modifications in this document.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>

Attributes	Description
rsidRDefault (Default Revision Identifier for Runs)	<p>This attribute specifies an identifier used for all runs in this paragraph which do not explicitly declare an rsidR attribute. This attribute allows consumers to optimize the locations where rsid* values are written in this document.</p> <p>All rsid* attributes throughout this document with the same value, if present, shall indicate that those regions were modified during the same editing session (time between subsequent save actions).</p> <p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions to indicate the order of the modifications relative to other modifications in this document.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>
rsidRPr (Revision Identifier for Paragraph Glyph Formatting)	<p>This attribute specifies an identifier used to track the editing session when the glyph character representing the paragraph mark was last modified in the main document.</p> <p>All rsid* attributes throughout this document with the same value, if present, shall indicate that those regions were modified during the same editing session (time between subsequent save actions).</p> <p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions to indicate the order of the modifications relative to other modifications in this document.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_P](#)) is located in §A.1. *end note*]

17.3.1.23 [pageBreakBefore \(Start Paragraph on Next Page\)](#)

This element specifies that when rendering this document in a paginated view, the contents of this paragraph are rendered on the start of a new page in the document.

This means that if the contents of the current paragraph would normally be rendered on the middle of a page in the host document, then the paragraph shall be rendered on a new page as if the paragraph was preceded by a page break in the WordprocessingML contents of the document. This property supersedes any use of the keepNext property, so that if any paragraph wishes to be on the same page as this paragraph, they are still be separated by a page break.

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then this property shall not be applied.

[Example: Consider the following document with three paragraphs:

[illegible]

As shown above, the second paragraph is rendered at the bottom of page one. However, a producer can specify that the second paragraph should be displayed at the top of a new page by setting the `pageBreakBefore` element as follows:

```
<w:pPr>
  <w:pageBreakBefore/>
</w:pPr>
```

This would ensure that the second paragraph is displayed on a new page:

[illegible]

Since the paragraph is specified to start on a new page, it begins page two even though it could have fit on page one. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.1.24 pBdr (Paragraph Borders)

This element specifies the borders for the parent paragraph. Each child element shall specify a specific kind of border (left, right, bottom, top, and between).

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then no paragraph borders shall be applied.

[*Example*: Consider a pairing of paragraphs which have a three point red border around them, and a six point border between them. These paragraphs would each have the following set of paragraph borders:

```
<w:pBdr>
  <w:top w:val="single" w:sz="24" w:space="1" w:color="FF0000" />
  <w:left w:val="single" w:sz="24" w:space="4" w:color="FF0000" />
  <w:bottom w:val="single" w:sz="24" w:space="1" w:color="FF0000" />
  <w:right w:val="single" w:sz="24" w:space="4" w:color="FF0000" />
  <w:between w:val="single" w:sz="48" w:space="1" w:color="4D5D2C" />
</w:pBdr>
```

The resulting paragraphs have identical pBdr values, therefore they would use the top, left, bottom, and right borders around them as a units, and the between border between each other. This matching heuristic is further discussed in the child elements of the pBdr element. *end example*]

[*Note*: The W3C XML Schema definition of this element's content model ([CT_PBdr](#)) is located in §A.1. *end note*]

17.3.1.25 pPr (Previous Paragraph Properties)

This element specifies a set of paragraph properties which shall be attributed to a revision by a particular author and at a particular time. This element contains the set of properties which have been tracked as a specific set of revisions by one author.

[*Example*: Consider a paragraph which should have a set of paragraph formatting properties that were added with revision tracking turned on. This set of revised properties is specified in the paragraph properties as follows:

```
<w:p>
  <w:pPr>
    <w:pBdr>
      <w:bottom w:val="single" w:sz="8" w:space="4" w:color="4F81BD" />
    </w:pBdr>
    <w:pPrChange w:author="user1" ... >
```

```

    <w:pPr>
      <w:spacing w:after="300" />
      <w:contextualSpacing />
    </w:pPr>
  </w:pPrChange>
</w:pPr>
</w:p>

```

The pPr element under pPrChange specifies the properties which are applied to the current paragraph with revision tracking turned on - in this case, spacing after the paragraph using the spacing element (§17.3.1.33), and that spacing should be ignored for paragraphs above/below of the same style using the contextualSpacing element (§17.3.1.9). *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_PPrBase](#)) is located in §A.1. *end note*]

17.3.1.26 pPr (Paragraph Properties)

This element specifies a set of paragraph properties which shall be applied to the contents of the parent paragraph after all style/numbering/table properties have been applied to the text. These properties are defined as *direct formatting*, since they are directly applied to the paragraph and supersede any formatting from styles.

[Example: Consider a paragraph which should have a set of paragraph formatting properties. This set of properties is specified in the paragraph properties as follows:

```

<w:p>
  <w:pPr>
    <w:pBdr>
      <w:bottom w:val="single" w:sz="8" w:space="4" w:color="4F81BD" />
    </w:pBdr>
    <w:spacing w:after="300" />
    <w:contextualSpacing />
  </w:pPr>
</w:p>

```

The pPr element specifies the properties which are applied to the current paragraph - in this case, a bottom paragraph border using the bottom element (§17.3.1.7), spacing after the paragraph using the spacing element (§17.3.1.33), and that spacing should be ignored for paragraphs above/below of the same style using the contextualSpacing element (§17.3.1.9). *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_PPr](#)) is located in §A.1. *end note*]

17.3.1.27 pStyle (Referenced Paragraph Style)

This element specifies the style ID of the paragraph style which shall be used to format the contents of this paragraph.

This formatting is applied at the following location in the *style hierarchy*:

- Document defaults
- Table styles
- Numbering styles
- Paragraph styles (this element)
- Character styles
- Direct Formatting

This means that all properties specified in the style element (§17.7.4.17) with a styleId which corresponds to the value in this element's val attribute are applied to the paragraph at the appropriate level in the hierarchy.

If this element is omitted, or it references a style which does not exist, then no paragraph style shall be applied to the current paragraph. As well, this property is ignored if the paragraph properties are part of a paragraph style.

[*Example*: Consider the following WordprocessingML fragment:

```
<w:pPr>
  <w:pStyle w:val="TestParagraphStyle" />
  <w:ind w:start="1440" />
</w:pPr>
```

This paragraph specifies that it inherits all of the paragraph properties specified by the paragraph style with a styleId of TestParagraphStyle, which then has any indentation properties overridden with a start indentation of 1440 twentieths of a point, and no indentation for any other value. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example</i>: Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ...</pre>

Attributes	Description
	<p data-bbox="456 245 613 275"></w:sdtPr></p> <p data-bbox="415 317 1485 422">In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i></p> <p data-bbox="415 464 1341 527">The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_String](#)) is located in §A.1. *end note*]

17.3.1.28 right (Right Paragraph Border)

This element specifies the border which shall be displayed on the right side of the page around the specified paragraph. This shall not change based on the paragraph direction.

To determine if any two adjoining paragraphs should have a right border which spans the full line height or not, the right border shall be drawn between the top border or between border at the top (whichever would be rendered for the current paragraph), and the bottom border or between border at the bottom (whichever would be rendered for the current paragraph).

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then no right border shall be applied.

[Example: Consider the following two paragraphs' WordprocessingML definition:

```
<w:p>
  <w:pPr>
    <w:pBdr>
      <w:top w:val="single" w:sz="24" w:space="1" w:color="F2DCDB"
w:themeColor="accent2" w:themeTint="33" />
      <w:left w:val="single" w:sz="24" w:space="4" w:color="B97034"
w:themeColor="accent6" w:themeShade="BF" />
      <w:bottom w:val="single" w:sz="24" w:space="1" w:color="F2DCDB"
w:themeColor="accent2" w:themeTint="33" />
      <w:right w:val="single" w:sz="24" w:space="4" w:color="C3D69B"
w:themeColor="accent3" w:themeTint="99" />
      <w:between w:val="single" w:sz="24" w:space="1" w:color="4F81BD"
w:themeColor="accent1" />
    </w:pBdr>
  </w:pPr>
  <w:r>
    <w:t>First paragraph.</w:t>
```

```

    </w:r>
</w:p>
<w:p>
  <w:pPr>
    <w:pBdr>
      <w:top w:val="single" w:sz="24" w:space="1" w:color="F2DCDB"
w:themeColor="accent2" w:themeTint="33" />
      <w:left w:val="single" w:sz="24" w:space="4" w:color="B97034"
w:themeColor="accent6" w:themeShade="BF" />
      <w:bottom w:val="single" w:sz="24" w:space="1" w:color="F2DCDB"
w:themeColor="accent2" w:themeTint="33" />
      <w:right w:val="single" w:sz="24" w:space="4" w:color="C3D69B"
w:themeColor="accent3" w:themeTint="99" />
      <w:between w:val="single" w:sz="24" w:space="1" w:color="4F81BD"
w:themeColor="accent1" />
    </w:pBdr>
  </w:pPr>
  <w:r>
    <w:t>Second paragraph.</w:t>
  </w:r>
</w:p>

```

Since the paragraph border set is identical between the two paragraphs, the paragraphs are connected by a between border. These paragraphs therefore draw the right border between the top and between borders for the first paragraph, and the between and bottom borders for the second paragraph. *end example*]

This element's content model is defined by the common border properties definition in §17.3.4.

17.3.1.29 rPr (Run Properties for the Paragraph Mark)

This element specifies the set of run properties applied to the glyph used to represent the physical location of the paragraph mark for this paragraph. This paragraph mark, being a physical character in the document, can be formatted, and therefore shall be capable of representing this formatting like any other character in the document.

If this element is not present, the paragraph mark is unformatted, as with any other run of text.

[*Example:* Consider a run of text displayed as follows, including a display format using the pilcrow sign ¶ for the paragraph mark glyph:

This is some text and the paragraph mark.¶

If we format the display formatting for the paragraph mark by making it red and giving it a 72 point font size, then the WordprocessingML must reflect this formatting on the paragraph as follows:

```
<w:pPr>
```

```

<w:rPr>
  <w:color w:val="FF0000" />
  <w:sz w:val="144" />
</w:rPr>
</w:pPr>

```

The paragraph glyph's formatting is stored in the rPr element under the paragraph properties, since there is no run saved for the paragraph mark itself. *end example*]

The W3C XML Schema definition of this element's content model ([CT_ParaRPr](#)) is located in §A.1. Each child element from the above table shall not occur more than once. [*Note*: This restriction is not reflected in the element's content model due to limitations of W3C XML Schema language. *end note*]

17.3.1.30 rPr (Previous Run Properties for the Paragraph Mark)

This element specifies a set of run properties applied to the glyph used to represent the physical location of the paragraph mark for this paragraph which shall be attributed to a revision by a particular author and at a particular time. This element contains the set of properties which have been tracked as a specific set of revisions by one author.

[*Example*: Consider a run which has a set of run formatting properties that were added with revision tracking turned on. This set of revised properties is specified in the run properties as follows:

```

<w:p>
  <w:pPr>
    <w:rPr>
      <w:b />
      <w:imprint />
      <w:lang w:val="en-CA" />
      <w:rPrChange w:id="1" w:author="user1">
        <w:rPr>
          <w:i />
          <w:dstrike w:val="false" />
        </w:rPr>
      </w:rPrChange>
    </w:rPr>
  </w:pPr>
</w:p>

```

The rPr element under rPrChange specifies the properties which are applied to the run representing the paragraph mark before the revision tracking was turned on - in this case, italics using the i element (§17.3.2.16), and that any double strikethrough which was applied based on the style hierarchy must be turned off using the dstrike element (§17.3.2.9). *end example*]

The W3C XML Schema definition of this element's content model ([CT_ParaRPrOriginal](#)) is located in §A.1. Each child element from the above table shall not occur more than once. [*Note: This restriction is not reflected in the element's content model due to limitations of W3C XML Schema language. end note*]

17.3.1.31 `shd` (Paragraph Shading)

This element specifies the shading applied to the contents of the paragraph.

This shading consists of three components:

- Background Color
- (optional) Pattern
- (optional) Pattern Color

The resulting shading is applied by setting the background color behind the paragraph, then applying the pattern color using the mask supplied by the pattern over that background.

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then no paragraph shading shall be applied.

[*Example:* Consider a paragraph which must have a background consisting of a theme color `accent3` with a theme color `accent6` overlaid using a 20% fill pattern. This requirement is specified using the following WordprocessingML:

```
<w:pPr>
  <w:shd w:val="pct20" w:themeColor="accent6" w:themeFill="accent3" />
</w:pPr>
```

The resulting paragraph uses the background color `accent3` under the foreground pattern color `accent6` as specified by the `pct20` pattern mask. *end example*]

This element's content model is defined by the common shading properties definition in §17.3.5.

17.3.1.32 `snapToGrid` (Use Document Grid Settings for Inter-Line Paragraph Spacing)

This element specifies whether the current paragraph should use the document grid lines per page settings defined in the `docGrid` element (§17.6.5) when laying out the contents in the paragraph. This setting determines whether the additional line pitch specified in the document grid shall be added to each line in this paragraph as specified by the document grid.

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then the paragraph shall use the document grid to lay out text when a document grid is defined for this document.

[*Example:* Consider two single-spaced paragraphs in a section with a document grid set to allow 15 lines per page. This document grid would effectively specifies that an additional line pitch of 45.6 points must be added to each line in order to ensure that the resulting page contains only 15 lines of text.

If this property is set on the first paragraph, but turned off on the second paragraph, as follows:

```
<w:p>
  <w:pPr>
    <w:snapToGrid w:val="off" />
  </w:pPr>
  ...
</w:p>
<w:p>
  ...
</w:p>
```

The resulting document must have 45.6 points of additional line pitch added to each line in paragraph two, but zero lines of additional line pitch added to each line in paragraph one, since the snapToGrid property is turned off. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.1.33 spacing (Spacing Between Lines and Above/Below Paragraph)

This element specifies the inter-line and inter-paragraph spacing which shall be applied to the contents of this paragraph when it is displayed by a consumer.

If this element is omitted on a given paragraph, each of its values is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then the paragraph shall have no spacing applied to its lines, or above and below its contents.

[*Example:* Consider the following WordprocessingML paragraph:

```
<w:pPr>
  <w:spacing w:after="200" w:line="276" w:lineRule="auto" />
</w:pPr>
```

This paragraph specifies that it must have at least 200 twentieths of a point after the last line in each paragraph, and that the spacing in each line should be automatically calculated based on a 1.15 times (276 divided by 240) the normal single spacing calculation. *end example*]

When determining the spacing between any two paragraphs, a consumer shall use the maximum of the inter-line spacing in each paragraph, the spacing after the first paragraph and the spacing before the second paragraph to determine the net spacing between the paragraphs.

[*Example*: Consider two consecutive single-spaced paragraphs in a document, the first of which specifies spacing below of 12 points, the second of which specifies spacing above of 4 points. These constraints are expressed using the following WordprocessingML:

```
<w:p>
  <w:pPr>
    <w:spacing w:after="240" />
  </w:pPr>
  ...
</w:p>
<w:p>
  <w:pPr>
    <w:spacing w:before="80" />
  </w:pPr>
  ...
</w:p>
```

The resulting spacing between the first and second paragraph is 12 points, since that is the largest spacing requested between the two paragraphs. *end example*]

Attributes	Description
after (Spacing Below Paragraph)	<p>Specifies the spacing that should be added after the last line in this paragraph in the document in absolute units.</p> <p>If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then the paragraph shall have no spacing applied below its contents.</p> <p>If the afterLines attribute or the afterAutoSpacing attribute is also specified, then this attribute value is ignored.</p> <p>[<i>Example</i>: Consider the following WordprocessingML paragraph:</p> <pre><w:p> <w:pPr> <w:spacing w:after="240" /> </w:pPr> ... </w:p></pre> <p>This paragraph must have a minimum spacing below its final lines of 240 twentieths of a point, although the actual spacing can be determined by the inter-line spacing or the spacing above the following paragraph, if either are greater. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type</p>

Attributes	Description
<p>afterAutospacing (Automatically Determine Spacing Below Paragraph)</p>	<p>(§22.9.2.14).</p> <p>Specifies whether a consumer shall automatically determine the spacing after this paragraph based on its contents.</p> <p>This automatic spacing shall match the spacing which would be applied to the paragraph in an HTML document where no explicit spacing before/after is specified.</p> <p>If this attribute is specified, then any value in after or afterLines is ignored, and the spacing is automatically determined by the consumer.</p> <p>If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then automatic spacing is turned off (not applied).</p> <p>[<i>Example</i>: Consider a paragraph in a document whose spacing below must automatically be determined by the consumer based on the paragraph's contents. This constraint would be specified by the following WordprocessingML:</p> <pre><w:pPr> <w:spacing ... w:afterAutospacing="on" /> </w:pPr></pre> <p>The resulting paragraph must have the spacing below its last line determined automatically by the consumer to match an HTML document as specified. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
<p>afterLines (Spacing Below Paragraph in Line Units)</p>	<p>Specifies the spacing that should be added after the last line in this paragraph in the document in line units.</p> <p>The value of this attribute is specified in one hundredths of a line.</p> <p>If the afterAutoSpacing attribute is also specified, then this attribute value is ignored. If this setting is never specified in the style hierarchy, then its value shall be zero (if needed).</p> <p>[<i>Example</i>: Consider the following WordprocessingML paragraph:</p> <pre><w:p> <w:pPr> <w:spacing w:afterLines="300" /> </w:pPr> ... </w:p></pre> <p>This paragraph must have a minimum spacing below its final lines of 3 lines, although the</p>

Attributes	Description
	<p>actual spacing can be determined by the inter-line spacing or the spacing above the following paragraph, if either are greater. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
before (Spacing Above Paragraph)	<p>Specifies the spacing that should be added above the first line in this paragraph in the document in absolute units.</p> <p>If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then the paragraph shall have no spacing applied above its contents.</p> <p>If the beforeLines attribute or the beforeAutoSpacing attribute is also specified, then this attribute value is ignored.</p> <p>[<i>Example:</i> Consider the following WordprocessingML paragraph:</p> <pre> <w:p> <w:pPr> <w:spacing w:before="80" /> </w:pPr> ... </w:p> </pre> <p>This paragraph must have a minimum spacing above its first line of 80 twentieths of a point, although the actual spacing can be determined by the inter-line spacing or the spacing below the last line in the preceding paragraph, if either are greater. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>
beforeAutospacing (Automatically Determine Spacing Above Paragraph)	<p>Specifies whether a consumer shall automatically determine the spacing before this paragraph based on its contents.</p> <p>This automatic spacing shall match the spacing which would be applied to the paragraph in an HTML document where no explicit spacing before/after is specified.</p> <p>If this attribute is specified, then any value in before or beforeLines is ignored, and the spacing is automatically determined by the consumer.</p> <p>If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then automatic spacing is turned off (not applied).</p> <p>[<i>Example:</i> Consider a paragraph in a document whose spacing above must automatically</p>

Attributes	Description
	<p>be determined by the consumer based on the paragraph's contents. This constraint would be specified by the following WordprocessingML:</p> <pre><w:pPr> <w:spacing ... w:beforeAutospacing="on" /> </w:pPr></pre> <p>The resulting paragraph must have the spacing above its first line determined automatically by the consumer to match an HTML document as specified. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
<p>beforeLines (Spacing Above Paragraph IN Line Units)</p>	<p>Specifies the spacing that should be added before the first line in this paragraph in the document in line units.</p> <p>The value of this attribute is specified in one hundredths of a line.</p> <p>If the beforeAutoSpacing attribute is also specified, then this attribute value is ignored. If this setting is never specified in the style hierarchy, then its value shall be zero (if needed).</p> <p>[Example: Consider the following WordprocessingML paragraph:</p> <pre><w:p> <w:pPr> <w:spacing w:beforeLines="100" /> </w:pPr> ... </w:p></pre> <p>This paragraph must have a minimum spacing above its first line of 1 line, although the actual spacing can be determined by the inter-line spacing or the spacing below the preceding paragraph, if either are greater. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
<p>line (Spacing Between Lines in Paragraph)</p>	<p>This attribute specifies the amount of vertical spacing between lines of text within this paragraph.</p> <p>If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then no line spacing shall be applied to lines within this paragraph.</p> <p>If the value of the lineRule attribute is either <i>atLeast</i> or <i>exactly</i>, then the value of this attribute shall be interpreted as twentieths of a point. When the value of the lineRule attribute is either <i>exactly</i>, the text shall be positioned as follows within that</p>

Attributes	Description
	<p>line height:</p> <ul style="list-style-type: none"> • When the line height is too small, the text shall be positioned at the bottom of the line (i.e. clipped from the top down) • When the line height is too large, the text shall be centered in the available space. <p>If the value of the lineRule attribute is auto, then the value of the line attribute shall be interpreted as 240ths of a line, in the manner described by the simple type's values.</p> <p>[<i>Example:</i> Consider the following WordprocessingML paragraph which should have an inter-line spacing of 1.15 times the line height. This constraint would be specified using the following WordprocessingML:</p> <pre><w:pPr> <w:spacing w:line="276" w:lineRule="auto" /> </w:pPr></pre> <p>The lineRule attribute value of auto specifies that the value of the line attribute is to be interpreted in 240ths of a single line height, which means that the net spacing is 276/240ths of a line or 1.15 lines tall. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_SignedTwipsMeasure simple type (§17.18.81).</p>
lineRule (Spacing Between Lines)	<p>Specifies how the spacing between lines is calculated as stored in the line attribute.</p> <p>If this attribute is omitted, then it shall be assumed to be of a value auto if a line attribute value is present.</p> <p>If the value of this attribute is either atLeast or exactly, then the value of the line attribute shall be interpreted as twentieths of a point, in the manner described by the simple type's values.</p> <p>If the value of this attribute is auto, then the value of the line attribute shall be interpreted as 240ths of a line, in the manner described by the simple type's values.</p> <p>[<i>Example:</i> Consider the following WordprocessingML paragraph which should have an inter-line spacing of 1.15 times the line height. This constraint would be specified using the following WordprocessingML:</p> <pre><w:pPr> <w:spacing w:line="276" w:lineRule="auto" /> </w:pPr></pre> <p>The lineRule attribute value of auto specifies that the value of the line attribute is to be interpreted in 240ths of a single line height. <i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_LineSpacingRule simple type (§17.18.48).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Spacing](#)) is located in §A.1. *end note*]

17.3.1.34 [suppressAutoHyphens](#) (Suppress Hyphenation for Paragraph)

This element specifies whether any hyphenation shall be performed on this paragraph by the consumer when requested using the autoHyphenation element (§17.15.1.10) in the document's settings. This element specifies whether the current paragraph should be exempted from any hyphenation which is applied by the consumer on this document.

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then the default hyphenation settings for the document, as specified in the autoHyphenation element, shall apply to the contents of this paragraph.

[*Example:* Consider a document which must be hyphenated automatically by a consumer, since it has the autoHyphenation element set to true in its document settings. If this paragraph should be exempted from that hyphenation pass, this requirement would be specified using the following WordprocessingML:

```
<w:pPr>
  <w:suppressAutoHyphens />
</w:pPr>
```

The paragraph would then be exempted from hyphenation by a consumer at display time, regardless of the hyphenation settings for the document. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.1.35 [suppressLineNumbers](#) (Suppress Line Numbers for Paragraph)

This element specifies whether line numbers shall be calculated for lines in this paragraph by the consumer when line numbering is requested using the lnNumType element (§17.6.8) in the paragraph's parent section settings. This element specifies whether the current paragraph's lines should be exempted from line numbering which is applied by the consumer on this document, not just suppressing the display of the numbering, but removing these lines from the line numbering calculation.

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then the default line number settings for the section, as specified in the lnNumType element shall apply to each line of this paragraph.

[*Example:* Consider a document with three paragraphs, each of which are displayed on five lines , all contained in a section which has the `InNumType` element specified. If the second paragraph should be exempted from that line numbering, this requirement would be specified using the following WordprocessingML:

```
<w:pPr>
  <w:suppressLineNumbers />
</w:pPr>
```

The paragraph would then be exempted from line by a consumer at display time, which would result in paragraph one using line numbers one through five, the second paragraph having no line numbers, and the third paragraph using line numbers six through ten. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.1.36 `suppressOverlap` (Prevent Text Frames From Overlapping)

This element specifies whether a text frame which intersects another text frame at display time shall be allowed to overlap the contents of the other text frame. If a text frame cannot overlap other text frames, it shall be repositioned when displayed to prevent this overlap as needed.

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then overlap shall be allowed between a text frame which intersects another text frame displayed at the same location.

[*Example:* Consider a document with two text frames which are allowed to overlap each other. If the second text frame should overlap the contents of another text frame, that constraint would be specified via the following WordprocessingML:

```
<w:p>
  ...
</w:p>
<w:p>
  <w:pPr>
    <w:framePr ... />
    <w:suppressOverlap />
  </w:pPr>
  ...
</w:p>
```

The resulting text frame with the `suppressOverlap` property specified would never overlap any intersecting text frames. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.1.37 `tab` (Custom Tab Stop)

This element specifies a single custom tab stop defined within a set of paragraph properties in a document. A tab stop location shall always be measured relative to the leading edge of the paragraph in which it is used (that is, the left edge for a left-to-right paragraph, and the right edge for a right-to-left paragraph).

[*Example*: Consider a custom tab stops at 1.5" in a WordprocessingML document. This tab stop would be contained within a tab element defining the tab stop as follows:

```
<w:tab w:val="start" w:pos="2160" />
```

The tab element specifies all of the properties for the custom tab stop for the current paragraph property set.
end example]

Attributes	Description
leader (Tab Leader Character)	<p>Specifies the character which shall be used to fill in the space created by a tab which ends at this custom tab stop. This character shall be repeated as required to completely fill the tab spacing generated by the tab character.</p> <p>If this attribute is omitted, then no tab leader character shall be used.</p> <p>[<i>Example</i>: Consider a tab stop which should be preceded by a sequence of underscore characters, as follows:</p> <p>_____Text at the tab stop</p> <p>This tab stop would have a leader attribute value of underscore, indicating that the tab stop must be preceded by underscore characters as needed to fill the tab spacing. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TabTlc simple type (§17.18.85).</p>
pos (Tab Stop Position)	<p>Specifies the position of the current custom tab stop with respect to the current page margins.</p> <p>Negative values are permitted and move the tab stop into the current page margin the specified amount.</p> <p>[<i>Example</i>: Consider a custom tab stops at 1.5" in a WordprocessingML document. This tab stop would be contained within a tab element defining the tab stop as follows:</p> <pre><w:tab w:val="start" w:pos="2160" /></pre> <p>The pos attribute specifies that this custom tab stop must be located 2160 points (1.5 inches) inside the starting text margin. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_SignedTwipsMeasure simple</p>

Attributes	Description
	type (§17.18.81).
val (Tab Stop Type)	<p>Specifies the style of custom tab stop, which determines the behavior of the tab stop and the alignment which shall be applied to text entered at the current custom tab stop.</p> <p>The value of <code>clear</code> is unique and specifies that this tab stop shall be removed when the document is next edited by a consumer which supports rendering the document contents.</p> <p>[<i>Example:</i> Consider a custom tab stops at 1.5" in a WordprocessingML document. This tab stop would be contained within a <code>tab</code> element defining the tab stop as follows:</p> <pre data-bbox="451 653 1029 684"><w:tab w:val="start" w:pos="2160" /></pre> <p>The <code>val</code> attribute specifies that this custom tab stop must align all text entered at its location to its left. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_TabJc</code> simple type (§17.18.84).</p>

[*Note:* The W3C XML Schema definition of this element's content model (`CT_TabStop`) is located in §A.1. *end note*]

17.3.1.38 tabs (Set of Custom Tab Stops)

This element specifies a sequence of custom tab stops which shall be used for any tab characters in the current paragraph.

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then no custom tab stops shall be used for this paragraph.

As well, this property is additive - tab stops at each level in the style hierarchy are added to each other to determine the full set of tab stops for the paragraph. A hanging indent specified via the `hanging` attribute on the `ind` element (§17.3.1.12) shall also always implicitly create a custom tab stop at its location.

[*Example:* Consider a paragraph which contains two custom tab stops at 1.5" and 3.5", respectively. These two tab stops would be contained within a `tabs` element defining the set of tab stops of the paragraph as follows:

```
<w:pPr>
  <w:tabs>
    <w:tab w:val="start" w:pos="2160" />
    <w:tab w:val="start" w:pos="5040" />
  </w:tabs>
</w:pPr>
```

The tabs element specifies all of the customized tab stops for the current paragraph. *end example*]

[*Note*: The W3C XML Schema definition of this element's content model ([CT_Tabs](#)) is located in §A.1. *end note*]

17.3.1.39 textAlignment (Vertical Character Alignment on Line)

This element specifies the vertical alignment of all text on each line displayed within a paragraph. If the line height (before any added spacing) is larger than one or more characters on the line, all characters are aligned to each other as specified by this element.

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then the vertical alignment of all characters on the line shall be automatically determined by the consumer.

[*Example*: Consider a paragraph of text of different font sizes, as follows:

This is text of various sizes.

If the text on this paragraph must be aligned based on the top point of the maximum character height, that requirement would be specified as follows in the WordprocessingML:

```
<w:pPr>
  <w:textAlignment w:val="top" />
</w:pPr>
```

The resulting text would be top aligned, as follows:

This is text of various sizes.

The characters are all aligned to the maximum character extent on the line. *end example*]

Attributes	Description
val (Vertical Character Alignment Position)	<p>Specifies the style of vertical alignment which shall be used to align the characters on each line in the current paragraph.</p> <p>[<i>Example</i>: Consider a paragraph of text of different font sizes which must be aligned based on the baseline point of each character in each line. This requirement would be specified as follows in the WordprocessingML:</p> <pre><w:pPr> <w:textAlignment w:val="baseline" /></pre>

Attributes	Description
	<p data-bbox="456 247 581 279"></w:pPr></p> <p data-bbox="415 317 1435 384">The resulting text would be aligned to the baseline for each character on the line. <i>end example</i></p> <p data-bbox="415 422 1451 489">The possible values for this attribute are defined by the ST_TextAlignment simple type (§17.18.91).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TextAlignment](#)) is located in §A.1. *end note*]

17.3.1.40 [textboxTightWrap \(Allow Surrounding Paragraphs to Tight Wrap to Text Box Contents\)](#)

This element specifies whether, for paragraphs in a text box, the surrounding text shall be allowed to overlap with the empty text box boundaries and tight wrap to the extents of the text within the text box.

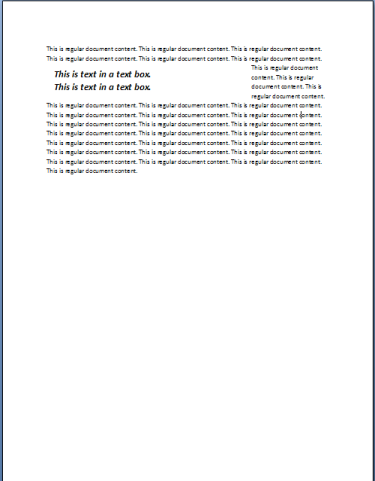
This element shall only be read for paragraphs which are contained within a text box (have a `txbxContent` ancestor), ignored otherwise.

If the parent text box does not meet the following three criteria, then this property has no effect:

- The text box wrapping shall be set to `tight`
- The text box border shall not be set
- The text box shading shall not be set

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then paragraphs in a text box have no tight wrapping overrides, and text shall wrap to the extents of the text box.

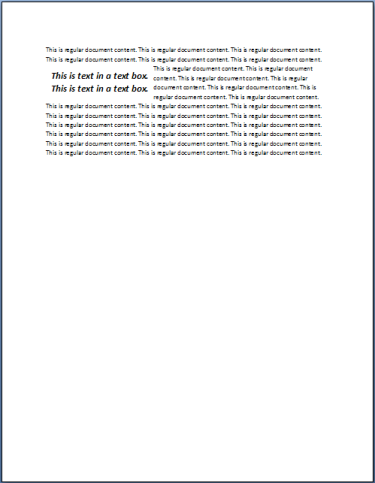
[Example: Consider a document with a tight wrapped text box which extends two-thirds of the way across the page, as follows:



The surrounding text is tightly wrapped to the extents of the text box. If the consumer must tight wrap to the extents of the text, that requirement would be specified using the following WordprocessingML:

```
<w:pPr>
  <w:textboxTightWrap w:val="allLines" />
</w:pPr>
```

This would result in the following display of the content:



The resulting paragraphs within the textbox use the `textboxTightWrap` element to specify that text should be tightly wrapped to the paragraph's extents. *end example*]

Attributes	Description
val (Lines to Tight Wrap to Paragraph Extents)	Specifies the lines in the parent paragraph which shall allow the text to be tight wrapped to the paragraph (and not the text box) extents when displaying the document. [Example: Consider a paragraph in a text box which meets the criteria specified above which must allow wrapping to the text extents on its first line only. That requirement

Attributes	Description
	<p>would be specified using the following WordprocessingML:</p> <pre data-bbox="451 323 1192 420"><w:pPr> <w:textboxTightWrap w:val="firstLineOnly" /> </w:pPr></pre> <p>The resulting paragraph would allow text to tightly wrap to the contents of its first line only. All other lines would wrap to the text box's extents. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_TextboxTightWrap simple type (§17.18.92).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TextboxTightWrap](#)) is located in §A.1. *end note*]

17.3.1.41 textDirection (Paragraph Text Flow Direction)

This element specifies the direction of the text flow for this paragraph.

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then the paragraph shall inherit the text flow settings from the parent section.

[Example: Consider a document with a paragraph in which text must be oriented vertically, flowing from left to right horizontally on the page. This setting would be specified with the following WordprocessingML:

```
<w:pPr>
  <w:textDirection w:val="lr" />
</w:pPr>
```

The textDirection element specifies via the lr value in the val attribute that the text flow must be oriented vertically, with subsequent lines stacked from left to right. *end example*

Attributes	Description
val (Direction of Text Flow)	<p>Specifies the direction of the text flow for this object.</p> <p>[Example: Consider a document with a section in which text be oriented vertically, flowing from left to right horizontally on the page. This setting requires the following WordprocessingML:</p> <pre data-bbox="451 1719 967 1850"><w:sectPr> ... <w:textDirection w:val="lr" /> </w:sectPr></pre>

Attributes	Description
	<p>The textDirection element specifies via the 1r value in the val attribute that the text flow must be oriented vertically, with subsequent lines stacked from left to right. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_TextDirection simple type (§17.18.93).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TextDirection](#)) is located in §A.1. *end note*]

17.3.1.42 top (Paragraph Border Above Identical Paragraphs)

This element specifies the border which shall be displayed above a set of paragraphs which have the same set of paragraph border settings.

To determine if any two adjoining paragraphs shall have an individual top and bottom border or a between border, the set of borders on the two adjoining paragraphs are compared. If the border information on those two paragraphs is identical for all possible paragraphs borders, then the between border is displayed. Otherwise, the final paragraph shall use its bottom border and the following paragraph shall use its top border, respectively. If this border specifies a space attribute, that value determines the space above the text (ignoring any spacing above) which should be left before this border is drawn, specified in points.

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then no between border shall be applied above identical paragraphs.

[Example: Consider the following two paragraphs' WordprocessingML definition:

```
<w:p>
  <w:pPr>
    <w:pBdr>
      <w:top w:val="single" w:sz="24" w:space="1" w:color="F2DCDB"
w:themeColor="accent2" w:themeTint="33" />
      <w:left w:val="single" w:sz="24" w:space="4" w:color="B97034"
w:themeColor="accent6" w:themeShade="BF" />
      <w:bottom w:val="single" w:sz="24" w:space="1" w:color="F2DCDB"
w:themeColor="accent2" w:themeTint="33" />
      <w:right w:val="single" w:sz="24" w:space="4" w:color="C3D69B"
w:themeColor="accent3" w:themeTint="99" />
      <w:between w:val="single" w:sz="24" w:space="1" w:color="4F81BD"
w:themeColor="accent1" />
    </w:pBdr>
  </w:pPr>
```

```

<w:r>
  <w:t>First paragraph.</w:t>
</w:r>
</w:p>
<w:p>
  <w:pPr>
    <w:pBdr>
      <w:top w:val="single" w:sz="24" w:space="1" w:color="F2DCDB"
w:themeColor="accent2" w:themeTint="33" />
      <w:left w:val="single" w:sz="24" w:space="4" w:color="B97034"
w:themeColor="accent6" w:themeShade="BF" />
      <w:bottom w:val="single" w:sz="24" w:space="0" w:color="F2DCDB"
w:themeColor="accent2" w:themeTint="33" />
      <w:right w:val="single" w:sz="24" w:space="4" w:color="C3D69B"
w:themeColor="accent3" w:themeTint="99" />
      <w:between w:val="single" w:sz="24" w:space="1" w:color="4F81BD"
w:themeColor="accent1" />
    </w:pBdr>
  </w:pPr>
  <w:r>
    <w:t>Second paragraph.</w:t>
  </w:r>
</w:p>

```

Since the paragraph border is different between the two paragraphs (the bottom space value goes from 1 to 0), paragraph two uses its top border, which is located one point above the text in that paragraph. *end example*]

This element's content model is defined by the common border properties definition in §17.3.4.

17.3.1.43 `topLinePunct` (Compress Punctuation at Start of a Line)

This element specifies whether punctuation shall be compressed when it appears as the first character in a line, allowing subsequent characters on the line to be move in accordingly.

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then punctuation shall not be compressed in this paragraph, even when it appears at the start of a line.

[*Example:* Consider a paragraph which should allow punctuation at the start of a line to be compressed, in order to prevent it from taking up unnecessary space. This constraint is specified using the following WordprocessingML:

```

<w:pPr>
  <w:topLinePunct w:val="on" />

```

</w:pPr>

The topLinePunct element specifies that this compression must be allowed when displaying this paragraph. *end example]*

This element’s content model is defined by the common boolean property definition in §17.17.4.

17.3.1.44 widowControl (Allow First/Last Line to Display on a Separate Page)

This element specifies whether a consumer shall prevent a single line of this paragraph from being displayed on a separate page from the remaining content at display time by moving the line onto the following page.

When displaying a paragraph in a page, it is sometimes the case that the first line of that paragraph would display as the last line on one page, and all subsequent lines would display on the following page. This property ensures that a consumer shall move the single line to the following page as well to prevent having one line on its own page. As well, if a single line appears at the top of a page, a consumer shall move the preceding line onto the following page as well, to prevent a single line from being displayed on a separate page.

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then this paragraph shall prevent a single line from being shown on a separate page whenever it would normally occur.

[*Example:* Consider a document with a paragraph which must be shown on four lines at display time. If this paragraph would normally be laid out with its first line at the bottom of one page, and its following lines on the next page, as follows:

<p>This-is-paragraph-one.This-is-paragraph-one.This-is-paragraph-one.This-is-paragraph-one.This-is-paragraph-one.This-is-paragraph-one.This-is-paragraph-one.This-is-paragraph-one.This-is-paragraph-one.This-is-paragraph-one.¶</p> <p>This-is-paragraph-two.This-is-</p>	<p>paragraph-two.This-is-paragraph-two.This-is-paragraph-two.¶</p>
--	--

This property would ensure that the default behavior for each paragraph prevented this, by moving this line onto the following paragraph as follows:

<p>This-is-paragraph-one.·This-is-paragraph-one.·This-is-paragraph-one.·This-is-paragraph-one.·This-is-paragraph-one.·This-is-paragraph-one.·This-is-paragraph-one.·This-is-paragraph-one.·This-is-paragraph-one.·This-is-paragraph-one.¶</p>	<p>This-is-paragraph-two.·This-is-paragraph-two.·This-is-paragraph-two.·This-is-paragraph-two.¶</p>
---	---

However, if this default is overridden by specifying the following WordprocessingML:

```
<w:pPr>
  <w:widowControl w:val="off" />
</w:pPr>
```

The specifying of the widowControl element with value off means that the consumer displaying this document must not move the first line onto a separate page if it would be separated from all other lines (the first picture above). *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.1.45 wordWrap (Allow Line Breaking At Character Level)

This element specifies whether a consumer shall break text which exceeds the text extents of a line by breaking the word across two lines (breaking on the character level) or by moving the word to the following line (breaking on the word level). [*Note*: Applications are discouraged from breaking text when it would change the semantics or appearance of the content. *end note*]

If this element is omitted on a given paragraph, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then this paragraph shall break words in space-delimited languages at the word level, not the character level when it is displayed.

[*Example*: Consider a paragraph whose first line ends with the word wor1d, where the text extents for that line would normally fall between the letter o and the letter r. If this element is omitted, a producer would normally move the entire word wor1d to the following line, since the word does not fit within the first line's text extents. However, if this document should allow words to be broken at the character level, that constraint would be specified as follows:

```
<w:pPr>
  <w:wordWrap w:val="off" />
```

```
</w:pPr>
```

The resulting paragraph specifies that wordWrap is turned off, therefore the word "world" would be broken into two lines between the exact two characters (o and r) that match the text extents. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.2 Run

The next level of the document hierarchy is the *run*, which defines a region of text with a common set of properties. A run is represented by an *r* element (§17.3.2.25), which allows the producer to specify a single set of formatting properties, applying the same information to all the contents of the run.

Just as a paragraph can have properties, so too can a run. All of the elements inside an *r* element have their properties controlled by a corresponding optional *rPr* run properties element (§17.7.9.1; §17.3.2.27), which shall be the first child of the *r* element. In turn, the *rPr* element is a container for a set of property elements that are applied to the rest of the children of the *r* element. [Note: The elements inside the *rPr* container element allow the consumer to control whether the content in the following run content is bold, underlined, or visible, for example. *end note*]

[Example: Consider the following run within a WordprocessingML document:

```
<w:r>
  <w:rPr>
    <w:b/>
    <w:i/>
  </w:rPr>
  <w:t>quick</w:t>
</w:r>
```

The run specifies two formatting properties in its run contents: bold and italic. These properties are therefore applied to all content within this run. *end example*

17.3.2.1 b (Bold)

This element specifies whether the bold property shall be applied to all non-complex script characters in the contents of this run when displayed in a document.

This formatting property is a *toggle property* (§17.7.3).

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then bold shall not be applied to non-complex script characters.

[Example: Consider a run of text which must have the *b* property explicitly turned off for the non complex script contents of the run. This constraint is specified using the following WordprocessingML:


```
<w:rPr>
  <w:b w:val="false"/>
</w:rPr>
```

This run explicitly declares that the `b` property is `false` for the non-complex script contents of this run. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.2.2 bCs (Complex Script Bold)

This element specifies whether the bold property shall be applied to all complex script characters in the contents of this run when displayed in a document.

This formatting property is a *toggle property* (§17.7.3).

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then bold shall not be applied to complex script characters.

[*Example*: Consider a run of text which must have the `bCs` property (bold) explicitly turned on for the complex script contents of the run. This constraint is specified using the following WordprocessingML:

```
<w:rPr>
  <w:bCs w:val="true"/>
</w:rPr>
```

This run explicitly declares that the `bCs` property is `true`, so bold is turned on for the complex script contents of this run. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.2.3 bdo (Bidirectional Override)

This element specifies a directional override, which shall be applied as described by the Bidirectional Algorithm (cf. Unicode Technical Report #9). [*Note*: The presence of this markup is functionally equivalent to the presence of a LRO/RLO character at the location of the start element, and a corresponding PDF character at the location of the end element in a string of Unicode text. *end note*]

[*Example*: The right-to-left override can be used to force a product part number made of mixed English, digits, and Hebrew text written from right-to-left, as follows. (Assume lower-case text is English and the upper-case text is Arabic or Hebrew):

```
<w:r>
  <w:t xml:space="preserve">part number: </w:t>
</w:r>
<w:bdo w:val="rtl">
  <w:r>
```

```
<w:t>ad-326D-FG</w:t>
</w:r>
</w:bdo>
```

This generates the following text layout:

```
part number: GF-D623-da.
```

The bidirectional override forces all characters to be displayed right-to-left, regardless of their classification. *end example]*

Attributes	Description
val (Direction of Override)	<p>Specifies the direction of the override being applied.</p> <p>If this attribute is omitted, the override shall be assumed to be ltr.</p> <p>[Example: For example, consider the following bidirectional override:</p> <pre><w:bdo w:val="rtl"> ... </w:bdo></pre> <p>The val attribute explicitly declares that the override is applied right to left. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Direction simple type (§17.18.12).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_BdoContentRun](#)) is located in §A.1. *end note]*

17.3.2.4 bdr (Text Border)

This element specifies information about the border applied to the text in the current run.

The first piece of information specified by the bdr element is that the current shall have a border when displayed. This information is specified simply by the presence of the bdr element in run's properties.

The second piece of information concerns the set of runs which share the current run border. This is determined based on the attributes on the bdr element. If the set of attribute values specifies on two adjacent runs is identical, then those two runs shall be considered to be part of the same run border group and rendered within the same set of borders in the document.

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then no run border shall be applied to the text in this run.

[*Example*: Consider a document in which the following two runs are located adjacent to one another:

```
<w:r>
  <w:rPr>
    <w:bdr w:val="single" w:sz="36" w:space="0" w:color="B8CCE4"
w:themeColor="accent1" w:themeTint="66" />
  </w:rPr>
  <w:t xml:space="preserve">run one</w:t>
</w:r>
<w:r >
  <w:rPr>
    <w:b />
    <w:bdr w:val="single" w:sz="36" w:space="0" w:color="B8CCE4"
w:themeColor="accent1" w:themeTint="66" />
  </w:rPr>
  <w:t>run two</w:t>
</w:r>
```

These two runs, although each is distinct, are combined when rendering the text border because the bdr elements are identical between the two runs. *end example*]

This element's content model is defined by the common border properties definition in §17.3.4.

17.3.2.5 caps (Display All Characters As Capital Letters)

This element specifies that any lowercase characters in this text run shall be formatted for display only as their capital letter character equivalents. This property does not affect any non-alphabetic character in this run, and does not change the Unicode character for lowercase text, only the method in which it is displayed.

This formatting property is a *toggle property* (§17.7.3).

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then the characters are not formatted as capital letters.

This element shall not be present with the smallCaps (§17.3.2.33) property on the same run, since they are mutually exclusive in terms of appearance.

[*Example*: Consider the words Hello, world, which must be displayed in all capital letters in a document. This constraint is specified as follows in the WordprocessingML:

```
<w:r>
  <w:rPr>
    <w:caps w:val="true" />
  </w:rPr>
  <w:t>Hello, world</w:t>
```

</w:r>

This run displays as HELLO, WORLD, even though the lowercase characters are used in the run contents due to the use of the caps element. If this property is removed, the original character forms is displayed (they are not lost). *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.2.6 color (Run Content Color)

This element specifies the color which shall be used to display the contents of this run in the document.

This color can be explicitly specified, or set to allow the consumer to automatically choose an appropriate color based on the background color behind the run's content.

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then the characters are set to allow the consumer to automatically choose an appropriate color based on the background color behind the run's content.

[*Example*: Consider a run of text which should be displayed using the accent3 theme color from the document's Theme part. This requirement would be specified as follows in the resulting WordprocessingML:

```
<w:rPr>
  <w:color w:themeColor="accent3" />
</w:rPr>
```

The color attribute specifies that the run shall use the accent3 theme color. *end example*]

Attributes	Description
themeColor (Run Content Theme Color)	<p>Specifies a theme color which should be applied to the current run.</p> <p>The specified theme color is a reference to one of the predefined theme colors, located in the document's Theme part, which allows for color information to be set centrally in the document.</p> <p>If the themeColor attribute is specified, then the val attribute is ignored for this run.</p> <p>[<i>Example</i>: Consider a run of text which should be displayed using the accent3 theme color from the document's Theme part. This requirement would be specified as follows in the resulting WordprocessingML:</p> <pre><w:rPr> <w:color w:themeColor="accent3" /> </w:rPr></pre> <p>The color attribute specifies that the run must use the accent3 theme color. <i>end</i></p>

Attributes	Description
	<p><i>example]</i></p> <p>The possible values for this attribute are defined by the ST_ThemeColor simple type (§17.18.97).</p>
<p>themeShade (Run Content Theme Color Shade)</p>	<p>Specifies the shade value applied to the supplied theme color (if any) for this run's contents.</p> <p>If the themeShade is supplied, then it is applied to the RGB value of the theme color to determine the final color applied to this run.</p> <p>The themeShade value is stored as a hex encoding of the shade value (from 0 to 255) applied to the current border.</p> <p>[<i>Example:</i> Consider a shade of 40% applied to a run in a document. This shade is calculated as follows:</p> $S_{xml} = 0.4 * 255$ $= 102$ $= 66(hex)$ <p>Te resulting themeShade value in the file format would be 66. <i>end example]</i></p> <p>Given a input red, green, or blue color value C (from 0-255), an output color value of C' (from 0-255), and a shade value S (from 0-100), the shade is applied as follows:</p> $C' = \left(1 - \frac{S}{100}\right) C$ <p>[<i>Example:</i> Consider a document with a run using the accent6 theme color, whose RGB value (in RRGGBB hex format) is F79646.</p> <p>The hex value for the green component is 96 - 150 in decimal. Applying the shade formula with shade of 50%, the output decimal value of the green component is 75, or a hex value of 4B. This transformed value can be seen in the resulting run color WordprocessingML's val attribute:</p> <pre><w:color w:val="7B4B23" w:themeColor="accent6" w:themeShade="80" /></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_UcharHexNumber simple type (§17.18.98).</p>
<p>themeTint (Run Content Theme Color Tint)</p>	<p>Specifies the tint value applied to the supplied theme color (if any) for this run's contents.</p> <p>If the themeTint is supplied, then it is applied to the RGB value of the theme color to</p>

Attributes	Description
	<p>determine the final color applied to this run.</p> <p>The themeTint value is stored as a hex encoding of the tint value (from 0 to 255) applied to the current border.</p> <p>[Example: Consider a tint of 60% applied to a run in a document. This tint is calculated as follows:</p> $ \begin{aligned} T_{xml} &= 0.6 * 255 \\ &= 153 \\ &= 99(hex) \end{aligned} $ <p>The resulting themeTint value in the file format would be 99. <i>end example</i>]</p> <p>Given a input red, green, or blue color value C (from 0-255), an output color value of C' (from 0-255), and a tint value T (from 0-100), the tint is applied as follows:</p> $C' = \left(1 - \frac{T}{100}\right) (255 - C) + C$ <p>[Example: Consider a document with a run using the accent1 theme color, whose RGB value (in RRGGBB hex format) is C0504D.</p> <p>The hex value for the green component is 50 - 80 in decimal. Applying the tint formula with tint of 60%, the output decimal value of the green component is 150, or a hex value of 96. This transformed value can be seen in the resulting run color's WordprocessingML val attribute:</p> <pre><w:color w:val="D99694" w:themeColor="accent1" w:themeTint="99" /></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_UcharHexNumber simple type (§17.18.98).</p>
val (Run Content Color)	<p>Specifies the color for this run.</p> <p>This color can either be presented as a hex value (in RRGGBB format), or auto to allow a consumer to automatically determine the run color as appropriate.</p> <p>If the run specifies the use of a theme color via the themeColor attribute, then this value is superseded by the theme color value.</p> <p>[Example: Consider a run color with value auto, as follows:</p> <pre><w:rPr></pre>

Attributes	Description
	<pre data-bbox="456 247 902 310"><w:color ... w:val="auto" /> </w:rPr></pre> <p data-bbox="415 352 1477 457">This color therefore can be automatically be modified by a consumer as appropriate, for example, in order to ensure that the run contents can be distinguished against the page's background color. <i>end example</i>]</p> <p data-bbox="415 499 1382 562">The possible values for this attribute are defined by the ST_HexColor simple type (§17.18.38).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Color](#)) is located in §A.1. *end note*]

17.3.2.7 [cs \(Use Complex Script Formatting on Run\)](#)

This element specifies whether the contents of this run shall be treated as complex script text regardless of their Unicode character values when determining the formatting for this run.

This means that a consumer shall use the complex script formatting applied to the run [*Example*: The `bCs` value (§17.3.2.2), not the `b` value (§17.3.2.1). *end example*] when determining the resulting formatting properties.

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then the run contents are set to complex script based on the Unicode character positions of the content.

[*Example*: Consider the following run of English text in a WordprocessingML document:

```
<w:r>
  <w:rPr>
    <w:bCs/>
    <w:i/>
    <w:cs/>
  </w:rPr>
  <w:t>some English text</w:t>
</w:r>
```

This run has bold applied to complex script characters, and italics applied to non-complex script characters. However, since the `cs` property is set, the text in this run must be treated as complex script text when determining the resulting formatting. Therefore, the run has bold formatting, but no italic formatting when displayed. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.2.8 `dir` (Bidirectional Embedding Level)

This element specifies that the embedding level of its contents shall be increased, as described by the Bidirectional Algorithm (cf. Unicode Technical Report #9). Unlike the `rtl` element (§17.3.2.30), this element can be nested and causes the embedding level to increase appropriately. Within this element, the semantics for the `rtl` element shall continue apply, specifying a high-level override of the character classification applied at the appropriate embedding level. [Note: The presence of this markup is functionally equivalent to the presence of a LRE/RLE character at the location of the start element, and a corresponding PDF character at the location of the end element in a string of Unicode text. *end note*]

[Example: Consider a left-to-right paragraph that has a quote in a right-to-left language, but the quote itself includes left-to-right text. In this case, the text layout within the quote should be read from right-to-left. Adding this element around the quote increases the embedding level and result in the desired layout. (Assume the lower-case text is English and the upper-case text is Arabic or Hebrew):

```
<w:r>
  <w:t>he said: "</w:t>
</w:r>
<w:dir w:val="rtl">
  <w:r>
    <w:rPr>
      <w:rtl />
    </w:rPr>
    <w:t>I LEAVE FOR </w:t>
  </w:r>
  <w:r>
    <w:t>united states</w:t>
  </w:r>
  <w:r>
    <w:rPr>
      <w:rtl />
    </w:rPr>
    <w:t xml:space="preserve"> TOMORROW</w:t>
  </w:r>
</w:dir>
<w:r>
  <w:t>".</w:t>
</w:r>
```

The alternating RTL and LTR elements help in resolving the classification of characters within this run as follows:

```
he said: "I LEAVE FOR united states TOMORROW".
LLLLLLLLLLLLRRRRRRRRRRLLLLLLLLLLLLLLLLLLLLRRRRRRRRLL
```

But the fact that the quote is enclosed in an RTL embedding; the following embedding levels are generated:

he said: "I LEAVE FOR united states TOMORROW".
00000000001111111111122222222222111111111100

This generates the following text layout:

he said: "WORROMOT united states ROF EVAEL I".

end example]

Attributes	Description
val (Direction of Embedding)	<p>Specifies the direction of the embedding being applied.</p> <p>If this attribute is omitted, the embedding shall be assumed to be ltr.</p> <p>[<i>Example:</i> For example, consider the following bidirectional embedding:</p> <pre><w:dir w:val="rtl"> ... </w:dir></pre> <p>The val attribute explicitly declares that the embedding is applied right to left. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Direction simple type (§17.18.12).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DirContentRun](#)) is located in §A.1. *end note]*

17.3.2.9 dstrike (Double Strikethrough)

This element specifies that the contents of this run shall be displayed with two horizontal lines through each character displayed on the line.

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then double strikethrough shall not be applied to the contents of this run.

This element shall not be present with the strike (§17.3.2.37) property on the same run, since they are mutually exclusive in terms of appearance.

[*Example:* Consider a run of text which must have the dstrike property explicitly turned on for the contents of the run. This constraint is specified using the following WordprocessingML:

```
<w:rPr>
  <w:dstrike w:val="true"/>
</w:rPr>
```

This run explicitly declares that the `dstrike` property is `true`, so the contents of this run has two horizontal strikethrough lines. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.2.10 `eastAsianLayout` (East Asian Typography Settings)

This element specifies any East Asian typography settings which shall be applied to the contents of the run.

The specific typography settings represented by this element include the *two lines in one* and *horizontal in vertical* text options.

The *two lines in one* setting specifies that the characters in this run should be written out on a single line in the document by creating two sub-lines within the regular line, and laying out this text equally between those sub lines.

[*Example:* Consider a paragraph with the text `two lines in one`, which must be displayed within a single logical line in the document. This constraint would be specified as follows in the WordprocessingML:

```
<w:r>
  <w:rPr>
    <w:eastAsianLayout w:id="1" w:combine="on" />
  </w:rPr>
  <w:t>two lines in one</w:t>
</w:r>
```

The resulting text would be displayed on two sub lines within the other text on this line, like this:

Two lines
in one other text

end example]

The *horizontal in vertical* setting specifies that characters in this run should be rendered with a 90 degree rotation to the left from all other contents of the line when displayed in the document, while keeping the text on the same line as all other text in the paragraph.

[*Example:* Consider a paragraph with the text `this word is vertical`, of which the word `vertical` must be displayed vertically within the document. This constraint would be specified as follows in the WordprocessingML:

```
<w:r>
  <w:rPr>
    <w:eastAsianLayout w:id="2" w:vert="on" />
  </w:rPr>
  <w:t>vertical</w:t>
```

</w:r>

The resulting text would be displayed with a 90 degree rotation from the other text content. *end example]*

Attributes	Description
combine (Two Lines in One)	<p>Specifies whether the contents of the current run should be combined into one line using the two lines in one logic described above in the parent element.</p> <p>If this attribute is omitted, then this run shall not be displayed on two sub lines.</p> <p>[<i>Example:</i> Consider a paragraph with the text <code>two lines in one</code>, which must be displayed within a single logical line in the document. This constraint would be specified as follows in the WordprocessingML:</p> <pre><w:r> <w:rPr> <w:eastAsianLayout w:id="1" w:combine="on" /> </w:rPr> <w:t>two lines in one</w:t> </w:r></pre> <p>The resulting text would be displayed on two sub lines within the other text on this line. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
combineBrackets (Display Brackets Around Two Lines in One)	<p>Specifies that the two lines in one text should be enclosed within a pair of brackets when displayed. This attribute's values determine the bracket style to put around combined text.</p> <p>If this attribute is not specified, then no brackets shall be placed around this content when displayed in the document. If the combine attribute is not specified, then this attribute is ignored.</p> <p>[<i>Example:</i> Consider a paragraph with the text <code>two lines in one</code>, which must be displayed within a single logical line in the document and enclosed in curly brackets. This constraint would be specified as follows in the WordprocessingML:</p> <pre><w:r> <w:rPr> <w:eastAsianLayout w:id="1" w:combine="on" w:combineBrackets="curly"/> </w:rPr> <w:t>two lines in one</w:t> </w:r></pre> <p>The resulting text would be displayed on two sub lines within the other text on this line and enclosed within curly brackets when displayed. <i>end example]</i></p>

Attributes	Description
	<p>The possible values for this attribute are defined by the ST_CombineBrackets simple type (§17.18.8).</p>
<p>id (East Asian Typography Run ID)</p>	<p>Specifies a unique ID which shall be used to link multiple runs containing eastAsianLayout element to each other to ensure that their contents are correctly displayed in the document.</p> <p>This means that multiple runs which are broken apart due to differences in formatting can be identified as belonging to the same grouping in terms of eastAsianLayout properties, although they are separated into multiple runs of text.</p> <p>[Example: Consider the following three runs in a document:</p> <pre> <w:r> <w:rPr> <w:eastAsianLayout w:id="-1552701694" w:combine="lines" w:combineBrackets="curly" /> </w:rPr> <w:t>two</w:t> </w:r> <w:r> <w:rPr> <w:u w:val="single" w:color="4F81BD" w:themeColor="accent1" /> <w:eastAsianLayout w:id="-1552701694" w:combine="lines" w:combineBrackets="curly" /> </w:rPr> <w:t>lines in</w:t> </w:r> <w:r> <w:rPr> <w:eastAsianLayout w:id="-1552701694" w:combine="lines" w:combineBrackets="curly" /> </w:rPr> <w:t>one</w:t> </w:r> </pre> <p>Although there are three runs of content, all three regions must be combined into a single two lines in one region based on the identical value used in the id attribute for all three runs. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
<p>vert (Horizontal in Vertical (Rotate Text))</p>	<p>Specifies that characters in this run should be rendered with a 270 degree rotation to the left from all other contents of the line when displayed in the document as described above.</p>

Attributes	Description
	<p>If this attribute is omitted, then the contents of this run shall not be rotated with respect to the normal text flow.</p> <p>[<i>Example:</i> Consider a paragraph with the text <code>this word is vertical</code>, of which the word <code>vertical</code> must be displayed vertically within the document. This constraint would be specified as follows in the WordprocessingML:</p> <pre><w:r> <w:rPr> <w:eastAsianLayout w:id="2" w:vert="on" /> </w:rPr> <w:t>vertical</w:t> </w:r></pre> <p>The resulting text would be displayed with a 270 degree rotation from the other text content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
vertCompress (Compress Rotated Text to Line Height)	<p>Specifies whether the rotated text shall be compressed at display time in order to ensure that it fits into the existing line height without increasing the overall height of the line.</p> <p>If the <code>vert</code> attribute is not specified, then this attribute is ignored. If this attribute is omitted, then text shall not be compressed in order to fit into the existing height of the line when it is rotated.</p> <p>[<i>Example:</i> Consider a paragraph with the text <code>this word is vertical</code>, of which the word <code>vertical</code> must be displayed vertically within the document but must not change the height of the line. This constraint would be specified as follows in the WordprocessingML:</p> <pre><w:r> <w:rPr> <w:eastAsianLayout w:id="2" w:vert="true" w:vertCompress="true" /> </w:rPr> <w:t>vertical</w:t> </w:r></pre> <p>The resulting text would be compressed in order to fit the height of the line as defined by all non-compressed characters. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_EastAsianLayout](#)) is located in §A.1. *end note*]

17.3.2.11 effect (Animated Text Effect)

This element specifies an animated text effect which should be displayed when rendering the contents of this run. This effect is rendered around the extents of the text in the run in the same location as a run border with zero pixels of padding would be rendered (if such a run border was present).

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then no text effect shall be applied to the contents of this run.

[*Example*: Consider a run of text which must have an animated text effect consisting of multiple colored flashing lights (see possible attribute values for descriptions of each effect). This constraint is specified using the following WordprocessingML:

```
<w:rPr>
  <w:effect w:val="lights"/>
</w:rPr>
```

This run explicitly declares that the effect property is `lights`, so the contents of this run has an animated lights text effect. *end example*]

Attributes	Description
val (Animated Text Effect Type)	<p>Specifies the type of animated text effect which shall be applied to this text run.</p> <p>[<i>Example</i>: Consider a run of text which must have an animated text effect consisting of multiple colored flashing lights. This constraint is specified using the following WordprocessingML:</p> <pre><w:rPr> <w:effect w:val="lights"/> </w:rPr></pre> <p>This run explicitly declares a type of text effect, using the <code>val</code> property, of <code>lights</code>, so the contents of this run has the animated lights text effect. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_TextEffect</code> simple type (§17.18.94).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_TextEffect](#)) is located in §A.1. *end note*]

17.3.2.12 `em` (Emphasis Mark)

This element specifies the emphasis mark which shall be displayed for each non-space character in this run. An *emphasis mark* is an additional character that is rendered above or below the main character glyph as specified by the contents of the `val` attribute.

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then no emphasis mark shall be added to each character in the contents of this run.

[*Example*: Consider a run of text which must have a dot underneath each character as an emphasis mark. This constraint is specified using the following WordprocessingML:

```
<w:rPr>
  <w:em w:val="dot"/>
</w:rPr>
```

This run explicitly declares that the emphasis mark type is dot, so the contents of this run has a dot emphasis mark above each character. *end example*]

Attributes	Description
<code>val</code> (Emphasis Mark Type)	<p>Specifies the emphasis mark type used for each character in this run.</p> <p>[<i>Example</i>: Consider a run of text which must have a dot underneath each character as an emphasis mark. This constraint is specified using the following WordprocessingML:</p> <pre><w:rPr> <w:em w:val="dot"/> </w:rPr></pre> <p>This run explicitly declares that the <code>em</code> type is dot, so the contents of this run have a dot emphasis mark beneath each character. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_Em</code> simple type (§17.18.24).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_Em](#)) is located in §A.1. *end note*]

17.3.2.13 `emboss` (Embossing)

This element specifies that the contents of this run should be displayed as if embossed, which makes text appear as if it is raised off the page in relief.

This formatting property is a *toggle property* (§17.7.3).

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then embossing shall not be applied to the contents of this run.

This element shall not be present with either the imprint (§17.3.2.18) or outline (§17.3.2.23) properties on the same run, since they are mutually exclusive in terms of appearance.

[*Example:* Consider a run of text which must have the emboss property explicitly turned on for the contents of the run. This constraint is specified using the following WordprocessingML:

```
<w:rPr>
  <w:emboss w:val="true"/>
</w:rPr>
```

This run explicitly declares that the emboss property is true, so the contents of this run appear embossed. *end example]*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.2.14 fitText (Manual Run Width)

This element specifies that the contents of this run shall not be automatically displayed based on the width of its contents, rather its contents shall be resized to fit the width specified by the val attribute. This expansion/contraction shall be performed by equally increasing/decreasing the size of each character in this run's contents when displayed.

If this element is omitted, then the contents of this run shall be displayed based on the size of its contents.

[*Example:* Consider a document with a run which must be displayed in exactly one-half inch of space, regardless of its contents. This constraint would be specified using the following WordprocessingML:

```
<w:r>
  <w:rPr>
    <w:fitText w:id="50" w:val="720" />
  </w:rPr>
  <w:t>This text must be displayed in one-half of an inch.</w:t>
</w:r>
```

The resulting run contents must be displayed in exactly 720 twentieths of a point (one half of an inch) when displayed in a document. *end example]*

Attributes	Description
id (Fit Text Run ID)	<p>Specifies a unique ID which shall be used to link multiple contiguous runs containing fitText elements to each other to ensure that their contents are correctly merged into the specified width in the document.</p> <p>This means that multiple runs which are broken apart due to differences in formatting can be identified as belonging to the same grouping in terms of fitText properties, although they are multiple runs of text in the WordprocessingML.</p> <p>If the runs are not contiguous, then the id attribute is ignored, and the runs are not</p>

Attributes	Description
	<p>linked.</p> <p>If this attribute is omitted, then this run has no id and shall not be linked with any other run in the parent paragraph.</p> <p>[<i>Example:</i> Consider the following three runs in a document, which should be fit into exactly one inch at display time:</p> <pre> <w:r> <w:rPr> <w:fitText w:id="99" w:val="1440" /> </w:rPr> <w:t>fit this into</w:t> </w:r> <w:r> <w:rPr> <w:b/> <w:fitText w:id="99" w:val="1440" /> </w:rPr> <w:t>one</w:t> </w:r> <w:r> <w:rPr> <w:fitText w:id="99" w:val="1440" /> </w:rPr> <w:t>inch</w:t> </w:r> </pre> <p>Although there are three runs of content, all three regions must be combined into a single fit text region (e.g. they all fit into one inch, rather than one inch each) based on the identical value used in the id attribute for all three runs. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
val (Value)	<p>This attribute specifies the exact width of space which this run shall be fit into when displayed in the document.</p> <p>[<i>Example:</i> Consider a document with a run which must be displayed in exactly one-half inch of space, regardless of its contents. This constraint would be specified using the following WordprocessingML:</p> <pre> <w:r> <w:rPr> <w:fitText w:id="50" w:val="720" /> </w:rPr> <w:t>This text must be displayed in one-half of an inch.</w:t> </pre>

Attributes	Description
	<p><code></w:r></code></p> <p>The resulting run contents must be displayed in exactly 720 twentieths of a point (one half of an inch) when displayed in a document. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_FitText](#)) is located in §A.1. *end note*]

17.3.2.15 highlight (Text Highlighting)

This element specifies a highlighting color which is applied as a background behind the contents of this run.

If this run has any background shading specified using the `shd` element (§17.3.2.32), then the background shading shall be superseded by the highlighting color when the contents of this run are displayed.

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then text highlighting shall not be applied to the contents of this run.

[Example: Consider a run within a paragraph which has run shading applied as well as yellow text highlighting using the `highlight` element. This formatting is specified using the following WordprocessingML:

```
<w:rPr>
  <w:highlight w:val="yellow" />
  <w:shd w:themeFill="accent2" w:themeFillTint="66" />
</w:rPr>
```

The resulting run would have yellow highlighting visible over its contents, as the highlighting supersedes the shading for the contents of the run. *end example*]

Attributes	Description
val (Highlighting Color)	<p>Specifies the color of the text highlighting which shall be applied to the contents of this run.</p> <p>[Example: Consider a text run which must be displayed with colored text highlighting. This highlighting would be specified using the following WordprocessingML:</p> <pre><w:rPr> <w:highlight w:val="red" /> </w:rPr></pre> <p>The resulting text highlighting would be red, as this is the color specified by the <code>val</code></p>

Attributes	Description
	<p>attribute. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_HighlightColor simple type (§17.18.40).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_Highlight](#)) is located in §A.1. *end note*]

17.3.2.16 *i* (Italics)

This element specifies whether the italic property should be applied to all non-complex script characters in the contents of this run when displayed in a document.

This formatting property is a *toggle property* (§17.7.3).

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then italics shall not be applied to non-complex script characters.

[*Example*: Consider a run of text which must have the *i* property explicitly turned on for the non-complex script contents of the run. This constraint is specified using the following WordprocessingML:

```
<w:rPr>
  <w:i />
</w:rPr>
```

This run explicitly declares that the *i* property is true for the non-complex script contents of this run. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.2.17 *iCs* (Complex Script Italics)

This element specifies whether the italic property should be applied to all complex script characters in the contents of this run when displayed in a document.

This formatting property is a *toggle property* (§17.7.3).

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then italics shall not be applied to complex script characters.

[*Example*: Consider a run of text which must have the *iCs* property explicitly turned on for the complex script contents of the run. This constraint is specified using the following WordprocessingML:

```
<w:rPr>
  <w:iCs w:val="true"/>
</w:rPr>
```

This run explicitly declares that the iCs property is true, so italics are turned on for the complex script contents of this run. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.2.18 **imprint (Imprinting)**

This element specifies that the contents of this run should be displayed as if imprinted, which makes text appear to be imprinted or pressed into page (also referred to as 'engrave').

This formatting property is a *toggle property* (§17.7.3).

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then imprinting shall not be applied to the contents of this run.

This element shall not be present with either the emboss (§17.3.2.13) or outline (§17.3.2.23) properties on the same run, since they are mutually exclusive in terms of appearance.

[*Example:* Consider a run of text which must have the imprint property explicitly turned on for the contents of the run. This constraint is specified using the following WordprocessingML:

```
<w:rPr>
  <w:imprint w:val="true"/>
</w:rPr>
```

This run explicitly declares that the imprint property is true, so the contents of this run appear imprinted. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.2.19 **kern (Font Kerning)**

This element specifies whether font kerning shall be applied to the contents of this run. If it is specified, then kerning shall be automatically adjusted when displaying characters in this run as needed.

The val attribute specifies the smallest font size which shall have its kerning automatically adjusted if this setting is specified. If the font size in the sz element (§17.3.2.38) is smaller than this value, then no font kerning shall be performed.

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then font kerning shall not be applied to the contents of this run.

[*Example:* Consider the following WordprocessingML run which has font kerning properties specified:

```
<w:r>
  <w:rPr>
    <w:kern w:val="28" />
    <w:sz w:val="22" />
  </w:rPr>
</w:r>
```

Even though font kerning is turned on via the kern element, the contents of this run must not be kerned because that settings only applied to font sizes of 14 points (28 half-points) or larger. If the kern element's val attribute was less than or equal to the sz element's val attribute, then kerning would be applied:

```
<w:r>
  <w:rPr>
    <w:kern w:val="22" />
    <w:sz w:val="22" />
  </w:rPr>
</w:r>
```

end example]

Attributes	Description
val (Half Point Measurement)	<p>Specifies a positive measurement specified in half-points (1/144 of an inch).</p> <p>The contents of this attribute value are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><... w:val="30" /></pre> <p>The value in the val attribute is 30, which is equivalent to 15 points (30 half-points).</p> <p>This value is interpreted in the context of the parent element. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_HpsMeasure simple type (§17.18.42).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_HpsMeasure](#)) is located in §A.1. *end note]*

17.3.2.20 lang (Languages for Run Content)

This element specifies the languages which shall be used to check spelling and grammar (if requested) when processing the contents of this run.

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then the languages for the contents of this run shall be automatically determined based on their contents using any method desired.

[*Example*: Consider a run which contains both Latin and complex script characters in its contents. If those contents should be interpreted as French (Canada) and Hebrew, respectively, that requirement would be specified as follows in the resulting WordprocessingML:

```
<w:r>
  <w:rPr>
    <w:lang w:val="fr-CA" w:bidirectional="he-IL" />
  </w:rPr>
</w:r>
```

The resulting run specifies that any complex script contents must be spell and grammar checked as if they were Hebrew, and any Latin character contents must be spell and grammar checked as if they were French (Canada). *end example*]

Attributes	Description
bidi (Complex Script Language)	<p>Specifies the language which shall be used when processing the contents of this run which use complex script characters, as determined by the Unicode character values of the run content.</p> <p>If this attribute is omitted, then the languages for the contents of this run using complex script characters shall be automatically determined based on their contents using any appropriate method.</p> <p>[<i>Example</i>: Consider a run which contains complex script characters in its contents. If those contents should be interpreted as Hebrew, that requirement would be specified as follows in the resulting WordprocessingML:</p> <pre><w:r> <w:rPr> <w:lang w:bidirectional="he-IL" /> </w:rPr> </w:r></pre> <p>The resulting run specifies that any complex script contents must be spell and grammar checked using a Hebrew dictionary and grammar engine, if one is available. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Lang simple type (§22.9.2.6).</p>
eastAsia (East Asian Language)	<p>Specifies the language which shall be used when processing the contents of this run which use East Asian characters, as determined by the Unicode character values of the run content.</p> <p>If this attribute is omitted, then the languages for the contents of this run using East</p>

Attributes	Description
	<p>Asian characters shall be automatically determined based on their contents using any appropriate method.</p> <p>[<i>Example:</i> Consider a run which contains East Asian characters in its contents. If those contents should be interpreted as Korean, that requirement would be specified as follows in the resulting WordprocessingML:</p> <pre><w:r> <w:rPr> <w:lang w:eastAsia="ko-KR" /> </w:rPr> </w:r></pre> <p>The resulting run specifies that any complex script contents must be spell and grammar checked using a Korean dictionary and grammar engine, if one is available. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Lang simple type (§22.9.2.6).</p>
val (Latin Language)	<p>Specifies the language which shall be used to check spelling and grammar (if requested) when processing the contents of this run which use Latin characters, as determined by the Unicode character values of the run content.</p> <p>If this attribute is omitted, then the languages for the contents of this run using Latin characters shall be automatically determined based on their contents using any appropriate method.</p> <p>[<i>Example:</i> Consider a run which contains Latin characters in its contents. If those contents should be interpreted as English (Canada), that requirement would be specified as follows in the resulting WordprocessingML:</p> <pre><w:r> <w:rPr> <w:lang w:val="en-CA" /> </w:rPr> </w:r></pre> <p>The resulting run specifies that any complex script contents must be spell and grammar checked using a English (Canada) dictionary and grammar engine, if one is available. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Lang simple type (§22.9.2.6).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Language](#)) is located in §A.1. *end note*]

17.3.2.21 noProof (Do Not Check Spelling or Grammar)

This element specifies that the contents of this run shall not report any errors when the document is scanned for spelling and grammar. [*Note: It is entirely at the consumer's/producer's discretion whether this is done by not checking the region for spelling and grammar, or simply by suppressing the results. end note*]

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then spelling and grammar error shall not be suppressed on the contents of this run.

[*Example: Consider a run of text which must not ever have spelling or grammar errors reported for the contents of the run, for example, the XML fragments included in ECMA-376. This constraint is specified using the following WordprocessingML:*

```
<w:rPr>
  <w:noProof w:val="true"/>
</w:rPr>
```

This run explicitly declares that the noProof property is true, so the contents of this run never report spelling or grammar errors. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.2.22 oMath (Office Open XML Math)

This element specifies that this run contains WordprocessingML which shall be handled as though it was Office Open XML Math.

[*Rationale: Like other run properties can be applied to the glyph representing the paragraph mark, it is possible to create an Office Open XML Math equation on an empty paragraph as well. Since that paragraph mark must be defined by WordprocessingML, it is not possible to store the paragraph using the Office Open XML Math markup. Instead, this run property is stored on the paragraph mark's run properties to indicate that the paragraph mark is part of an Office Open XML Math equation. For example, the first paragraph below is stored as Office Open XML Math:*



The paragraph must be a p (§17.3.1.22) element, but that would mean the data loss of the Math markup when saving as a WordprocessingML package. In order to prevent that data loss, this property stores the Math property as a run property. *end rationale*]

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then this run shall not be treated as Office Open XML Math.

This property can be applied to any run, but that should only introduce the semantic that the run is math in the user interface, and shall not change the appearance of the text.

[*Example:* Consider a paragraph in WordprocessingML where the paragraph mark glyph (the pilcrow mark - ¶) has been formatted as Math. Since this mark is not an actual run, it cannot be written out in the Office Open XML Math syntax, and must be written out as a property on the actual run as follows:

```
<w:pPr>
  <w:rPr>
    <w:oMath />
  </w:rPr>
</w:pPr>
```

This property is therefore used to roundtrip the math setting on this paragraph mark character. *end example]*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.2.23 outline (Display Character Outline)

This element specifies that the contents of this run should be displayed as if they have an outline, by drawing a one pixel wide border around the inside and outside borders of each character glyph in the run.

This formatting property is a *toggle property* (§17.7.3).

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then outline shall not be applied to the contents of this run.

This element shall not be present with either the emboss (§17.3.2.13) or imprint (§17.3.2.18) properties on the same run, since they are mutually exclusive in terms of appearance.

[*Example:* Consider a run of text which must have the outline property explicitly turned off for the contents of the run. This constraint is specified using the following WordprocessingML:

```
<w:rPr>
  <w:outline w:val="false"/>
</w:rPr>
```

This run explicitly declares that the outline property is *false*, so the contents of this run do not appear as if they have an exterior outline around them. *end example]*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.2.24 position (Vertically Raised or Lowered Text)

This element specifies the amount by which text shall be raised or lowered for this run in relation to the default baseline of the surrounding non-positioned text. This allows the text to be repositioned without altering the font size of the contents.

If the `val` attribute is positive, then the parent run shall be raised above the baseline of the surrounding text by the specified number of half-points. If the `val` attribute is negative, then the parent run shall be lowered below the baseline of the surrounding text by the specified number of half-points.

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then the text shall not be raised or lowered relative to the default baseline location for the contents of this run.

[*Example*: Consider a run which must be positioned 12 points above the default baseline location when displaying its contents. This requirement would be specified using the following WordprocessingML:

```
<w:rPr>
  <w:position w:val="24" />
</w:rPr>
```

The resulting run is positioned 24 half-points above the default baseline location because the contents of the `val` attribute are positive. *end example*]

Attributes	Description
val (Signed Half-Point Measurement)	<p>Specifies a positive or negative measurement in half-points (1/144 of an inch).</p> <p>The contents of this attribute value are interpreted based on the context of the parent XML element.</p> <p>[<i>Example</i>: Consider the following WordprocessingML fragment:</p> <pre><w:rPr> <w:position w:val="-12" /> </w:rPr></pre> <p>In this case, the value in the <code>val</code> attribute is amount by which the specified run must be raised or lowered compared to the baseline of the surrounding text.</p> <p>In all cases, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_SignedHpsMeasure</code> simple type (§17.18.80).</p>

[*Note*: The W3C XML Schema definition of this element’s content model (`CT_SignedHpsMeasure`) is located in §A.1. *end note*]

17.3.2.25 `r` (Text Run)

This element specifies a run of content in the parent field, hyperlink, custom XML element, structured document tag, smart tag, or paragraph.

The contents of a run in a WordprocessingML document shall consist of any combination of run content.

[*Example:* Consider a basic WordprocessingML paragraph with a pair of runs. This run would be expressed as follows:

```
<w:document>
  <w:body>
    <w:p>
      <w:r>
        <w:t>Text</w:t>
      </w:r>
      <w:fldSimple w:instr="AUTHOR">
        <w:r>
          <w:t>Author Name</w:t>
        </w:r>
      </w:fldSimple>
    </w:p>
  </w:body>
</w:document>
```

The `r` element is the container for all of the content in the run, which in this example includes both a run in the paragraph and a run within a simple field. *end example*]

Attributes	Description
rsidDel (Revision Identifier for Run Deletion)	<p>Specifies a unique identifier used to track the editing session when the run was deleted from the main document.</p> <p>All rsid* attributes throughout this document with the same value, if present, shall indicate that those regions were modified during the same editing session (time between subsequent save actions).</p> <p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions to indicate the order of the modifications relative to other modifications in this document.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>
rsidR (Revision Identifier for Run)	<p>Specifies a unique identifier used to track the editing session when the run was added to the main document.</p> <p>All rsid* attributes throughout this document with the same value, if present, shall</p>

Attributes	Description
	<p>indicate that those regions were modified during the same editing session (time between subsequent save actions).</p> <p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions to indicate the order of the modifications relative to other modifications in this document.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>
rsidRPr (Revision Identifier for Run Properties)	<p>Specifies a unique identifier used to track the editing session when the run properties were last modified in the main document.</p> <p>All rsid* attributes throughout this document with the same value, if present, shall indicate that those regions were modified during the same editing session (time between subsequent save actions).</p> <p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions to indicate the order of the modifications relative to other modifications in this document.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>

[Note: The W3C XML Schema definition of this element's content model (CT_R) is located in §A.1. *end note*]

17.3.2.26 rFonts (Run Fonts)

This element specifies the fonts which shall be used to display the text contents of this run. Within a single run, there can be up to four types of content present which shall each be allowed to use a unique font:

- ASCII (i.e., the first 128 Unicode code points)
- High ANSI
- Complex Script
- East Asian

The use of each of these fonts shall be determined by the Unicode character values of the run content, unless manually overridden via use of the cs element (§17.3.2.7).

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then the text shall be displayed in any default font which supports that set of characters.

[Example: Consider a single text run with both Arabic and English text, as follows:

Englishالعربية

This content can be expressed in a single WordprocessingML run:

```
<w:r>
  <w:t>English العربية</w:t>
</w:r>
```

Although it is in the same run, the contents are in different font faces by specifying a different font for ASCII and CS characters in the run:

```
<w:r>
  <w:rPr>
    <w:rFonts w:ascii="Courier New" w:cs="Times New Roman" />
  </w:rPr>
  <w:t>English العربية</w:t>
</w:r>
```

This text run must therefore use the Courier New font for all characters in the range U+0000 to U+007F, and must use the Times New Roman font for all characters in the Complex Script range. *end example*]

Attributes	Description
ascii (ASCII Font)	<p>Specifies a font which shall be used to format all characters in the Unicode range (U+0000–U+007F) within the parent run.</p> <p>If the asciiTheme attribute is also specified, then this attribute shall be ignored and that value shall be used instead.</p> <p>If this attribute is not present, the default value is to leave the formatting applied at previous level in the <i>style hierarchy</i>. If this attribute is never applied in the style hierarchy, then the text shall be displayed in any default font which supports these characters.</p> <p>[<i>Example</i>: Consider a run of text consisting of characters in this range, which must be displayed using the Courier New font. This requirement would be specified as follows in the resulting WordprocessingML:</p> <pre><w:rPr> <w:rFonts w:ascii="Courier New" /> </w:rPr></pre> <p>The ascii attribute specifies that the run must use the Courier New font for all text in this range. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
asciiTheme (ASCII Theme Font)	<p>Specifies a theme font which shall be used to format all characters in the Unicode range (U+0000–U+007F) within the parent run. This theme font is a reference to one of the</p>

Attributes	Description
	<p>predefined theme fonts, located in the document's Theme part, which allows for font information to be set centrally in the document.</p> <p>If the <code>ascii</code> attribute is also specified, then that attribute shall be ignored and this value shall be used instead.</p> <p>If this attribute is not present, the default value is to leave the formatting applied at previous level in the <i>style hierarchy</i>. If this attribute is never applied in the style hierarchy, then the text shall be displayed in the font specified by the <code>ascii</code> attribute.</p> <p>[<i>Example</i>: Consider a run of ASCII text which must be displayed using the <code>majorASCII</code> theme font. This requirement would be specified as follows in the resulting WordprocessingML:</p> <pre><w:rPr> <w:rFonts w:asciiTheme="majorAscii" /> </w:rPr></pre> <p>The <code>ascii</code> attribute specifies that the run must use the <code>majorAscii</code> theme font as defined in the document's themes part for all text in this range. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_Theme</code> simple type (§17.18.96).</p>
cs (Complex Script Font)	<p>Specifies a font which shall be used to format all characters in a complex script Unicode range within the parent run.</p> <p>If the <code>cstheme</code> attribute is also specified, then this attribute shall be ignored and that value shall be used instead.</p> <p>If this attribute is not present, the default value is to leave the formatting applied at previous level in the <i>style hierarchy</i>. If this attribute is never applied in the style hierarchy, then the text shall be displayed in any default font which supports complex script content.</p> <p>[<i>Example</i>: Consider a run of Arabic text which must be displayed using the <code>Arial Unicode MS</code> font. This requirement would be specified as follows in the resulting WordprocessingML:</p> <pre><w:rPr> <w:rFonts w:cs="Arial Unicode MS" /> </w:rPr></pre> <p>The <code>cs</code> attribute specifies that the run must use the <code>Arial Unicode MS</code> font for all text in a complex script range. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_String</code> simple type</p>

Attributes	Description
cstheme (Complex Script Theme Font)	<p>(§22.9.2.13).</p> <p>Specifies a theme font which shall be used to format all characters in a complex script Unicode range within the parent run. This theme font is a reference to one of the predefined theme fonts, located in the document's Theme part, which allows for font information to be set centrally in the document.</p> <p>If the cs attribute is also specified, then that attribute shall be ignored and this value shall be used instead.</p> <p>If this attribute is not present, the default value is to leave the formatting applied at previous level in the <i>style hierarchy</i>. If this attribute is never applied in the style hierarchy, then the text shall be displayed in the font specified by the cs attribute.</p> <p>[Example: Consider a run of Arabic text that must be displayed using the majorBidi theme font. This requirement would be specified as follows in the resulting WordprocessingML:</p> <pre><w:rPr> <w:rFonts w:cstheme="majorBidi" /> </w:rPr></pre> <p>The cstheme attribute specifies that the run must use the majorBidi theme font as defined in the document's themes part for all text in a complex script range. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_Theme simple type (§17.18.96).</p>
eastAsia (East Asian Font)	<p>Specifies a font which shall be used to format all characters in an East Asian Unicode range within the parent run.</p> <p>If the eastAsiaTheme attribute is also specified, then this attribute shall be ignored and that value shall be used instead.</p> <p>If this attribute is not present, the default value is to leave the formatting applied at previous level in the <i>style hierarchy</i>. If this attribute is never applied in the style hierarchy, then the text shall be displayed in any default font which supports East Asian content.</p> <p>[Example: Consider a run of Japanese text which must be displayed using the MS Mincho font. This requirement would be specified as follows in the resulting WordprocessingML:</p> <pre><w:rPr> <w:rFonts w:eastAsia="MS Mincho" /> </w:rPr></pre> <p>The eastAsia attribute specifies that the run must use the MS Mincho font for all text in</p>

Attributes	Description
	<p>an East Asian range. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
<p>eastAsiaTheme (East Asian Theme Font)</p>	<p>Specifies a theme font which shall be used to format all characters in an East Asian Unicode range within the parent run. This theme font is a reference to one of the predefined theme fonts, located in the document's Theme part, which allows for font information to be set centrally in the document.</p> <p>If the eastAsia attribute is also specified, then that attribute shall be ignored and this value shall be used instead.</p> <p>If this attribute is not present, the default value is to leave the formatting applied at previous level in the <i>style hierarchy</i>. If this attribute is never applied in the style hierarchy, then the text shall be displayed in the font specified by the eastAsia attribute.</p> <p>[<i>Example</i>: Consider a run of Japanese text which must be displayed using the minorEastAsia theme font. This requirement would be specified as follows in the resulting WordprocessingML:</p> <pre><w:rPr> <w:rFonts w:eastAsiaTheme="minorEastAsia" /> </w:rPr></pre> <p>The eastAsiaTheme attribute specifies that the run must use the minorEastAsia theme font as defined in the document's themes part for all text in an East Asian range. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Theme simple type (§17.18.96).</p>
<p>hAnsi (High ANSI Font)</p>	<p>Specifies a font which shall be used to format all characters in a Unicode range within the parent run which does not fall into one of the three categories defined above, which is called the <i>high ANSI</i> range in WordprocessingML.</p> <p>If the hAnsiTheme attribute is also specified, then this attribute shall be ignored and that value shall be used instead.</p> <p>If this attribute is not present, the default value is to leave the formatting applied at previous level in the <i>style hierarchy</i>. If this attribute is never applied in the style hierarchy, then the text shall be displayed in any default font which supports high ANSI content.</p> <p>[<i>Example</i>: Consider a run of text which falls into a high ANSI range, and must be displayed using the Bauhaus 93 font. This requirement would be specified as follows in the resulting WordprocessingML:</p>

Attributes	Description
	<pre data-bbox="456 289 1015 380"><w:rPr> <w:rFonts w:hAnsi="Bauhaus 93" /> </w:rPr></pre> <p data-bbox="415 426 1455 489">The <code>hAnsi</code> attribute specifies that the run must use the Bauhaus 93 font for all text in a high ANSI range. <i>end example</i>]</p> <p data-bbox="415 531 1341 594">The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>
hAnsiTheme (High ANSI Theme Font)	<p data-bbox="415 615 1468 783">Specifies a theme font which shall be used to format all characters in a Unicode range within the parent run which does not fall into one of the three categories defined above, which is called the <i>high ANSI</i> range in WordprocessingML. This theme font is a reference to one of the predefined theme fonts, located in the document's Theme part, which allows for font information to be set centrally in the document.</p> <p data-bbox="415 825 1463 888">If the <code>hAnsi</code> attribute is also specified, then that attribute shall be ignored and this value shall be used instead.</p> <p data-bbox="415 930 1435 1035">If this attribute is not present, the default value is to leave the formatting applied at previous level in the <i>style hierarchy</i>. If this attribute is never applied in the style hierarchy, then the text shall be displayed in the font specified by the <code>hAnsi</code> attribute.</p> <p data-bbox="415 1077 1479 1182">[<i>Example:</i> Consider a run of text which falls into a high ANSI range, and must be displayed using the <code>minorHAnsi</code> theme font. This requirement would be specified as follows in the resulting WordprocessingML:</p> <pre data-bbox="456 1224 1096 1314"><w:rPr> <w:rFonts w:hAnsiTheme="minorHAnsi" /> </w:rPr></pre> <p data-bbox="415 1356 1479 1419">The <code>hAnsiTheme</code> attribute specifies that the run must use the <code>minorHAnsi</code> theme font as defined in the document's themes part for all text in a high ANSI range. <i>end example</i>]</p> <p data-bbox="415 1461 1352 1524">The possible values for this attribute are defined by the <code>ST_Theme</code> simple type (§17.18.96).</p>
hint (Font Content Type)	<p data-bbox="415 1549 1430 1612">Specifies the font type which shall be used to format any ambiguous characters in the current run.</p> <p data-bbox="415 1654 1463 1864">There are certain characters which are not explicitly stored in the document, and can be mapped into multiple categories of the four mentioned above. This attribute shall be used to arbitrate that conflict, and determine how ambiguities in this run shall be handled. [<i>Note:</i> This is primarily used to handle the formatting on the paragraph mark glyph, and other characters that are not stored as text in the WordprocessingML document. <i>end note</i>]</p>

Attributes	Description
	<p>If this attribute is omitted, then this ambiguity can be resolved by any means available.</p> <p>[<i>Example:</i> Consider the run representing the paragraph mark glyph, which is not stored as a physical character. Since this could therefore be formatted with any of the fonts specified for the run, this ambiguity is resolved using the following WordprocessingML:</p> <pre data-bbox="451 464 998 632"><w:pPr> <w:rPr> <w:rFonts w:hint="eastAsia" /> </w:rPr> </w:pPr></pre> <p>The hint attribute specifies that the run must use the eastAsia font (theme or not, whichever is in use for East Asian text) as defined for this range. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Hint simple type (§17.18.41).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Fonts](#)) is located in §A.1. *end note*]

17.3.2.27 rPr (Previous Run Properties)

This element specifies a set of run properties which shall be attributed to a revision by a particular author and at a particular time. This element contains the set of properties which have been tracked as a specific set of revisions by one author.

[*Example:* Consider a run which has a set of run formatting properties that were added with revision tracking turned on. This set of revised properties is specified in the run properties as follows:

```
<w:r>
  <w:rPr>
    <w:b />
    <w:imprint />
    <w:lang w:val="en-CA" />
    <w:rPrChange ... w:author="user1">
      <w:rPr>
        <w:i />
        <w:dstrike w:val="false" />
      </w:rPr>
    </w:rPrChange>
  </w:rPr>
</w:r>
```

The rPr element under rPrChange specifies the properties which were applied to the current run before revision tracking was turned on - in this case, italics using the i element (§17.3.2.16), and that any double

strikethrough which was applied based on the style hierarchy must be turned off using the `dstrike` element (§17.3.2.9). *end example*]

The W3C XML Schema definition of this element's content model (`CT_RPrOriginal`) is located in §A.1. Each child element from the above table shall not occur more than once. [*Note: This restriction is not reflected in the element's content model due to limitations of W3C XML Schema language. end note*]

17.3.2.28 `rPr` (Run Properties)

This element specifies a set of run properties which shall be applied to the contents of the parent run after all style formatting has been applied to the text. These properties are defined as *direct formatting*, since they are directly applied to the run and supersede any formatting from styles.

This formatting is applied at the following location in the *style hierarchy*:

- Document defaults
- Table styles
- Numbering styles
- Paragraph styles
- Character styles
- Direct formatting (this element)

[*Example: Consider a run which should have a set of run formatting properties. This set of properties is specified in the run properties as follows:*

```
<w:r>
  <w:rPr>
    <w:b />
    <w:imprint />
    <w:lang w:val="en-CA" />
  </w:rPr>
</w:r>
```

The `rPr` element specifies the properties which are applied to the current run - in this case, bold formatting on the run contents using the `b` element (§17.3.2.1), an imprinted (engraved) text effect using the `imprint` element (§17.3.2.18), and that this text should be interpreted as English (Canada) when spell or grammar checking the run text using the `lang` element (§17.3.2.20). *end example*]

The W3C XML Schema definition of this element's content model (`CT_RPr`) is located in §A.1. Each child element from the above table shall not occur more than once. [*Note: This restriction is not reflected in the element's content model due to limitations of W3C XML Schema language. end note*]

17.3.2.29 `rStyle` (Referenced Character Style)

This element specifies the style ID of the character style which shall be used to format the contents of this paragraph.

This formatting is applied at the following location in the *style hierarchy*:

- Document defaults
- Table styles
- Numbering styles
- Paragraph styles
- Character styles (this element)
- Direct Formatting

This means that all properties specified in the style element (§17.7.4.17) with a styleId which corresponds to the value in this element's val attribute are applied to the run at the appropriate level in the hierarchy.

If this element is omitted, or it references a style which does not exist, then no character style shall be applied to the current paragraph. As well, this property is ignored if the run properties are part of a character style.

[*Example*: Consider the following WordprocessingML fragment:

```
<w:rPr>
  <w:pStyle w:val="TestCharacterStyle" />
  <w:b />
  <w:i />
</w:rPr>
```

This run specifies that it inherits all of the run properties specified by the paragraph style with a styleId of TestCharacterStyle, which then have any bold or italics settings overridden and set to be applied to the run.
end example]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example</i>: Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ...</pre>

Attributes	Description
	<p data-bbox="456 247 613 279"></w:sdtPr></p> <p data-bbox="415 317 1479 422">In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p data-bbox="415 459 1341 527">The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_String](#)) is located in §A.1. *end note*]

17.3.2.30 rtl (Right To Left Text)

This element specifies whether the contents of this run shall have right-to-left characteristics. Specifically, the following behaviors are applied when this element’s val attribute is true (or an equivalent):

- **Formatting** – When the contents of this run are displayed, all characters shall be treated as complex script characters. This means that the values of the bCs element (§17.3.2.2) and the iCs element (§17.3.2.17) shall be used to determine bold and italic formatting, that the cs/cstheme attributes on the rFonts element (§17.3.2.26) shall be used to determine the font face, and the szCs element (§17.3.2.39) shall be used to determine the font size.
- **Character Directionality Override** – When the contents of this run are displayed, this property acts as a right-to-left override for characters which are classified as follows (using the Unicode Character Database):
 - Weak types except European Number, European Number Terminator, Common Number Separator, Arabic Number and (for Hebrew text) European Number Separator when constituting part of a number
 - Neutral types
- *[Rationale:* This override allows applications to store and utilize higher-level information beyond that implicitly derived from the Unicode Bidirectional algorithm. For example, if the string “first second” appears in a right-to-left paragraph inside a document, the Unicode algorithm would always result in “first second” at display time (since the neutral character is surrounded by strongly classified characters). However, if the whitespace was entered using a right-to-left input method (e.g. a Hebrew keyboard), then that character could be classified as RTL using this property, allowing the display of “second first” in a right-to-left paragraph, since the user explicitly asked for the space in a right-to-left context. *end rationale*]

This element provides information used to resolve the (Unicode) classifications of individual characters as either L, R, AN or EN. Once this is determined, the line should be displayed subject to the recommendation of the Unicode BiDi algorithm in reordering resolved levels.

This property shall not be used with strongly left-to-right text. Any behavior under that condition is unspecified. . This property, when off, shall not be used with strong right-to-left text. Any behavior under that condition is unspecified.

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then right to left characteristics shall not be applied to the contents of this run.

[*Example*: Consider the following WordprocessingML visual content: “first second, أول ثاني”. This content might appear as follows within its parent paragraph:

```
<w:p>
  <w:r>
    <w:t xml:space="preserve">first second, </w:t>
  </w:r>
  <w:r>
    <w:rPr>
      <w:rtl/>
    </w:rPr>
    <w:t>أول ثاني</w:t>
  </w:r>
</w:p>
```

The presence of the rtl element on the second run specifies that:

- The formatting on that run is specified using the complex-script property variants.
- The whitespace character is treated as right-to-left.

end example]

This element’s content model is defined by the common boolean property definition in §17.17.4.

17.3.2.31 shadow (Shadow)

This element specifies that the contents of this run shall be displayed as if each character has a shadow. For left-to-right text, the shadow is beneath the text and to its right; for right-to-left text, the shadow is beneath the text and to its left.

This formatting property is a *toggle property* (§17.7.3).

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then shadowing shall not be applied to the contents of this run.

This element shall not be present with either the emboss (§17.3.2.13) or imprint (§17.3.2.18) properties on the same run, since they are mutually exclusive in terms of appearance.

[*Example:* Consider a run of text which must have the shadow property explicitly turned on for the contents of the run. This constraint is specified using the following WordprocessingML:

```
<w:rPr>
  <w:shadow w:val="true"/>
</w:rPr>
```

This run explicitly declares that the shadow property is true, so the contents of this run appear with a shadow. *end example]*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.2.32 `shd` (Run Shading)

Like paragraph shading, this element specifies the shading applied to the contents of the run.

This shading consists of three components:

- Background Color
- (optional) Pattern
- (optional) Pattern Color

The resulting shading is applied by setting the background color behind the paragraph, then applying the pattern color using the mask supplied by the pattern over that background.

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then run shading shall not be applied to the contents of this run.

[*Example:* Consider a run which must have a background consisting of a theme color accent6 with a theme color text2 overlaid using a 20% fill pattern. This requirement is specified using the following WordprocessingML:

```
<w:pPr>
  <w:shd w:val="pct20" w:themeColor="text2" w:themeFill="accent6" />
</w:pPr>
```

The resulting run uses the background color accent6 under the foreground pattern color text2 as specified by the pct20 pattern mask. *end example]*

This element's content model is defined by the common shading properties definition in §17.3.5.

17.3.2.33 `smallCaps` (Small Caps)

This element specifies that all small letter characters in this text run shall be formatted for display only as their capital letter character equivalents in a font size two points smaller than the actual font size specified for this text. This property does not affect any non-alphabetic character in this run, and does not change the Unicode character for lowercase text, only the method in which it is displayed. If this font cannot be made two point smaller than the current size, then it shall be displayed as the smallest possible font size in capital letters.

This formatting property is a *toggle property* (§17.7.3).

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then the characters are not formatted as capital letters.

This element shall not be present with the caps (§17.3.2.5) property on the same run, since they are mutually exclusive in terms of appearance.

[*Example*: Consider the words Hello, world, which must be displayed in small capital letters in a document. This constraint is specified as follows in the WordprocessingML:

```
<w:r>
  <w:rPr>
    <w:smallCaps w:val="true" />
    <w:sz w:val="24" />
  </w:rPr>
  <w:t>Hello, world</w:t>
</w:r>
```

This run displays using a 12 point capital letter for the capital letter H and W, and a 10 point capital letter for the lowercase letters in the run, even though the lowercase characters are used in actual run contents. If this property is removed, the original character forms is displayed (they are not lost). *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.2.34 snapToGrid (Use Document Grid Settings For Inter-Character Spacing)

This element specifies whether the current run should use the document grid characters per line settings defined in the docGrid element (§17.6.5) when laying out the contents in this run. This setting determines whether the additional character pitch specified in the document grid shall be added to each character in this run as specified by the document grid.

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then the run shall use the document grid setting to lay out text when a document grid is defined for the parent section.

[*Example*: Consider two runs in a section with a document grid set to allow 20 characters per line. This document grid would effectively specifies that an additional character pitch must be added to each line in order to ensure that the resulting line contains only 20 East Asian characters.

If this property is set on the first run, but turned off on the second run, as follows:


```

<w:r>
  <w:t>Run One</w:t>
</w:r>
<w:r>
  <w:rPr>
    <w:snapToGrid w:val="off" />
  </w:rPr>
  <w:t>Run Two</w:t>
</w:r>

```

The resulting document must have the required additional character pitch added to each character in run one, but zero additional character pitch added to each character in run two, since the `snapToGrid` property is turned off. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.2.35 spacing (Character Spacing Adjustment)

This element specifies the amount of character pitch which shall be added or removed after each character in this run before the following character is rendered in the document. This property has an effect equivalent to the additional character pitched added by a document grid applied to the contents of a run.

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then the run shall not have any additional character pitch applied to any character in its contents.

[*Example:* Consider a run of text which must have ten points of additional character spacing explicitly added to each character within the contents of the run. This constraint is specified using the following WordprocessingML:

```

<w:rPr>
  <w:spacing w:val="200"/>
</w:rPr>

```

This run explicitly declares that the spacing value is 200, so the contents of this run appear as if they have 10 additional points of spacing added between them. *end example*

Attributes	Description
val (Positive or Negative Value in Twentieths of a Point)	<p>Specifies a positive or negative measurement in twentieths of a point (equivalent to 1/1440th of an inch).</p> <p>The contents of this measurement shall be interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider an attribute value of -720 whose type is <code>ST_SignedTwipsMeasure</code>. This attribute value specifies a value of negative one-half of an inch or -36 points (-</p>

Attributes	Description
	<p>720 twentieths of a point = -36 points = -0.5 inches). <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_SignedTwipsMeasure simple type (§17.18.81).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_SignedTwipsMeasure](#)) is located in §A.1. *end note*]

17.3.2.36 specVanish (Paragraph Mark Is Always Hidden)

This element specifies that the given run shall always behave as if it is hidden, even when hidden text is being displayed in the current document.

This property shall only be used to specify that a paragraph mark shall never be used to break the end of a paragraph for display, even if it is being shown on the document, as would be the case if a regularly hidden paragraph was not being displayed in the document. [*Note*: This property was typically used to ensure that a paragraph style can be applied to a part of a paragraph, and still appear as in the Table of Contents (which in previous word processors would ignore the use of the style if it were being used as a character style. *end note*)] If this element is applied to any other run, it can be ignored.

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then the run properties for the paragraph mark shall not always be treated as if hidden.

[*Example*: Consider a paragraph mark which never be used to break the end of the paragraph in the document. This constraint is specified using the following WordprocessingML:

```
<w:pPr>
  <w:rPr>
    <w:specVanish />
  </w:rPr>
</w:pPr>
```

The presence of the specVanish element means that this paragraph mark must always be treated as hidden (must never be used to end the paragraph for display), but can be used to mark the end of use of a paragraph style. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.2.37 strike (Single Strikethrough)

This element specifies that the contents of this run shall be displayed with a single horizontal line through the center of the line.

This formatting property is a *toggle property* (§17.7.3).

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then strikethrough shall not be applied to the contents of this run.

This element shall not be present with the `dstrike` (§17.3.2.9) property on the same run, since they are mutually exclusive in terms of appearance.

[*Example*: Consider a run of text which must have the strike property explicitly turned on for the contents of the run. This constraint is specified using the following WordprocessingML:

```
<w:rPr>
  <w:strike w:val="true"/>
</w:rPr>
```

This run explicitly declares that the strike property is true, so the contents of this run has a single horizontal strikethrough line. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.2.38 `sz` (Non-Complex Script Font Size)

This element specifies the font size which shall be applied to all non complex script characters in the contents of this run when displayed. The font sizes specified by this element's `val` attribute are expressed as half-point values.

If this element is not present, the default is to leave the font size at the value applied at the previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then any appropriate font size can be used for non complex script characters.

[*Example*: Consider a run of text which must have an explicit font size of 13.5 points for the non complex script contents of the run. This constraint is specified using the following WordprocessingML:

```
<w:rPr>
  <w:sz w:val="27"/>
</w:rPr>
```

This run explicitly declares that the `sz` property is 27 half-point for the non-complex script contents of this run, so the text is displayed in 13.5 point font size. *end example*]

Attributes	Description
<code>val</code> (Half Point Measurement)	<p>Specifies a positive measurement specified in half-points (1/144 of an inch).</p> <p>The contents of this attribute value are interpreted based on the context of the parent XML element.</p> <p>[<i>Example</i>: Consider the following WordprocessingML fragment:</p>

Attributes	Description
	<p><code><... w:val="30" /></code></p> <p>The value in the val attribute is 30, which is equivalent to 15 points (30 half-points).</p> <p>This value is interpreted in the context of the parent element. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_HpsMeasure simple type (§17.18.42).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_HpsMeasure](#)) is located in §A.1. *end note]*

17.3.2.39 szCs (Complex Script Font Size)

This element specifies the font size which shall be applied to all complex script characters in the contents of this run when displayed. The font sizes specified by this element’s val attribute are expressed as half-point values.

If this element is not present, the default is to leave the font size at the value applied at the previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then any appropriate font size can be used for complex script characters.

[Example: Consider a run of text which must have an explicit font size of 10 points for the complex script contents of the run. This constraint is specified using the following WordprocessingML:

```
<w:rPr>
  <w:szCs w:val="20"/>
</w:rPr>
```

This run explicitly declares that the sz property is 20 half-point for the non-complex script contents of this run, so the text is displayed in 10 point font size. *end example]*

Attributes	Description
val (Half Point Measurement)	<p>Specifies a positive measurement specified in half-points (1/144 of an inch).</p> <p>The contents of this attribute value are interpreted based on the context of the parent XML element.</p> <p>[Example: Consider the following WordprocessingML fragment:</p> <p><code><... w:val="30" /></code></p> <p>The value in the val attribute is 30, which is equivalent to 15 points (30 half-points).</p> <p>This value is interpreted in the context of the parent element. <i>end example]</i></p>

Attributes	Description
	The possible values for this attribute are defined by the ST_HpsMeasure simple type (§17.18.42).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_HpsMeasure](#)) is located in §A.1.
end note]

17.3.2.40 u (Underline)

This element specifies that the contents of this run should be displayed along with an underline appearing directly below the character height (less all spacing above and below the characters on the line).

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then an underline shall not be applied to the contents of this run.

[*Example:* Consider a run of text which must have a double underline explicitly turned on for the contents of the run. This constraint is specified using the following WordprocessingML:

```
<w:rPr>
  <w:u w:val="double"/>
</w:rPr>
```

This run explicitly declares an underline using the `u` property. The `val` of that underline is `double`, so the style of the underline on this run must be a double line. *end example*]

Attributes	Description
color (Underline Color)	<p>Specifies the color for the underlining on this run.</p> <p>This color can either be presented as a hex value (in RRGGBB format), or <code>auto</code> to allow a consumer to automatically determine the underline color as appropriate.</p> <p>If the underline specifies the use of a theme color via the <code>themeColor</code> attribute, then this value is superseded by the theme color value.</p> <p>[<i>Example:</i> Consider a run color with value <code>auto</code>, as follows:</p> <pre><w:rPr> <w:u ... w:color="auto" /> </w:rPr></pre> <p>This color therefore can be automatically be modified by a consumer as appropriate, for example, in order to ensure that the underline can be distinguished against the page's background color. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_HexColor simple type</p>

Attributes	Description
themeColor (Underline Theme Color)	<p>(§17.18.38).</p> <p>Specifies a theme color which should be applied to the current underline.</p> <p>The specified theme color is a reference to one of the predefined theme colors, located in the document's Theme part, which allows for color information to be set centrally in the document.</p> <p>If the themeColor attribute is specified, then the color attribute is ignored for this underline.</p> <p>[<i>Example:</i> Consider an underlined run of text whose underline should be displayed using the accent3 theme color from the document's Theme part. This requirement would be specified as follows in the resulting WordprocessingML:</p> <pre><w:rPr> <w:u ... w:themeColor="accent3" /> </w:rPr></pre> <p>The themeColor attribute specifies that the underline must use the accent3 theme color. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ThemeColor simple type (§17.18.97).</p>
themeShade (Underline Theme Color Shade)	<p>Specifies the shade value applied to the supplied theme color (if any) for this underline.</p> <p>If the themeShade is supplied, then it is applied to the RGB value of the theme color to determine the final color applied to this underline.</p> <p>The themeShade value is stored as a hex encoding of the shade value (from 0 to 255) applied to the current border.</p> <p>[<i>Example:</i> Consider a shade of 40% applied to a underline in a document. This shade is calculated as follows:</p> $ \begin{aligned} S_{xml} &= 0.4 * 255 \\ &= 102 \\ &= 66(hex) \end{aligned} $ <p>The resulting themeShade value in the file format would be 66. <i>end example</i>]</p> <p>Given an RGB color defined as three hex values in RRGGBB format, the shade is applied as follows:</p> <ul style="list-style-type: none"> • Convert the color to the HSL color format (values from 0 to 1) • Modify the luminance factor as follows:

Attributes	Description
	$L' = L * \text{Shade}_{\text{percentage}}$ <ul style="list-style-type: none"> Convert the resultant HSL color to RGB <p>[<i>Example</i>: Consider a document with a background using the accent2 theme color, whose RGB value (in RRGGBB hex format) is C0504D.</p> <p>The equivalent HSL color value would be $(\frac{1}{360}, 0.48, 0.53)$.</p> <p>Applying the shade formula with a shade percentage of 75% to the luminance, we get:</p> $L' = 0.53 * 0.75$ $= 0.39698$ <p>Taking the resulting HSL color value of $(\frac{1}{360}, 0.48, 0.39698)$ and converting back to RGB, we get 943634.</p> <p>This transformed value can be seen in the resulting underline's color attribute:</p> <pre><w:u w:color="943634" w:themeColor="accent2" w:themeShade="BF" /></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_UcharHexNumber simple type (§17.18.98).</p>
themeTint (Underline Theme Color Tint)	<p>Specifies the tint value applied to the supplied theme color (if any) for this underline's contents.</p> <p>If the themeTint is supplied, then it is applied to the RGB value of the theme color to determine the final color applied to this run.</p> <p>The themeTint value is stored as a hex encoding of the tint value (from 0 to 255) applied to the current border.</p> <p>[<i>Example</i>: Consider a tint of 60% applied to an underline in a document. This tint is calculated as follows:</p> $T_{xml} = 0.6 * 255$ $= 153$ $= 99(\text{hex})$ <p>The resulting themeTint value in the file format would be 99. <i>end example</i>]</p> <p>Given an RGB color defined as three hex values in RRGGBB format, the shade is applied</p>

Attributes	Description
	<p>as follows:</p> <ul style="list-style-type: none"> Convert the color to the HSL color format (values from 0 to 1) Modify the luminance factor as follows: $L' = L * \text{Tint}_{\text{pct}} + (1 - \text{Tint}_{\text{pct}})$ <ul style="list-style-type: none"> Convert the resultant HSL color to RGB <p>[<i>Example:</i> Consider a document with a background using the accent2 theme color, whose RGB value (in RRGGBB hex format) is 4F81BD.</p> <p>The equivalent HSL color value would be $(\frac{213}{360}, 0.45, 0.53)$.</p> <p>Applying the tint formula with a tint percentage of 60% to the luminance, we get:</p> $\begin{aligned} L' &= 0.53 * 0.6 + (1 - .6) \\ &= 0.71 \end{aligned}$ <p>Taking the resulting HSL color value of $(\frac{213}{360}, 0.45, 0.71)$ and converting back to RGB, we get 95B3D7.</p> <p>This transformed value can be seen in the resulting underline formatting's WordprocessingML color attribute:</p> <pre><w:u ... w:color="95B3D7" w:themeColor="accent2" w:themeTint="99" /></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_UcharHexNumber simple type (§17.18.98).</p>
val (Underline Style)	<p>Specifies the pattern which shall be used to create the underline applied beneath the text in this run.</p> <p>Each of these possible patterns are shown in the simple type referenced below.</p> <p>[<i>Example:</i> Consider a run of text which must have a double underline explicitly turned on for the contents of the run. This constraint is specified using the following WordprocessingML:</p> <pre><w:rPr> <w:u w:val="double"/> </w:rPr></pre> <p>The val of the underline on this run is double, so the style of the underline on this run</p>

Attributes	Description
	<p>must be a double line. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_Underline simple type (§17.18.99).</p>

[*Note*: The W3C XML Schema definition of this element's content model (CT_Underline) is located in §A.1. *end note*]

17.3.2.41 **vanish** (Hidden Text)

This element specifies whether the contents of this run shall be hidden from display at display time in a document. [*Note*: The setting should affect the normal display of text, but an application can have settings to force hidden text to be displayed. *end note*]

This formatting property is a *toggle property* (§17.7.3).

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then this text shall not be hidden when displayed in a document.

[*Example*: Consider a run of text which must have the hidden text property turned on for the contents of the run. This constraint is specified using the following WordprocessingML:

```
<w:rPr>
  <w:vanish />
</w:rPr>
```

This run declares that the `vanish` property is set for the contents of this run, so the contents of this run is hidden when the document contents are displayed. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.2.42 **vertAlign** (Subscript/Superscript Text)

This element specifies the alignment which shall be applied to the contents of this run in relation to the default appearance of the run's text. This allows the text to be repositioned as subscript or superscript without altering the font size of the run properties.

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then the text shall not be subscript or superscript relative to the default baseline location for the contents of this run.

[*Example*: Consider a run which must be positioning as superscript when displaying its contents. This requirement would be specified using the following WordprocessingML:

```
<w:rPr>
  <w:vertAlign w:val="superscript" />
</w:rPr>
```

The resulting run is positioned as superscript, therefore it is rendered in a smaller size above the default baseline location for the contents of the run. *end example*]

Attributes	Description
val (Subscript/Superscript Value)	<p>Specifies the type of vertical alignment applied to the contents of the current run.</p> <p>[<i>Example</i>: Consider a run which must be positioning as superscript when displaying its contents. This requirement would be specified using the following WordprocessingML:</p> <pre><w:rPr> <w:vertAlign w:val="superscript" /> </w:rPr></pre> <p>The value of the val attribute is superscript, therefore the run's contents are rendered in a smaller size above the default baseline location for the contents of the run. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_VerticalAlignRun simple type (§22.9.2.17).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_VerticalAlignRun](#)) is located in §A.1. *end note*]

17.3.2.43 w (Expanded/Compressed Text)

This element specifies the amount by which each character shall be expanded or when the character is rendered in the document. This property has an of stretching or compressing each character in the run, as opposed to the spacing element (§17.3.2.35) which expands/compresses the text by adding additional character pitch but not changing the width of the actual characters displayed on the line.

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then the run shall be displayed at 100% of its normal width.

[*Example*: Consider a run of text which must be expanded to 200% of its normal width when displaying each character within the contents of the run. This constraint is specified using the following WordprocessingML:

```
<w:rPr>
  <w:w w:val="200%" />
</w:rPr>
```

This run explicitly declares that the *w* value is 200%, so the contents of this run appear at 200% of their normal character width by stretching the width of each character. *end example*]

Attributes	Description
val (Text Expansion/Compression Value)	<p>Specifies that the percentage by which the contents of this run shall be expanded or compressed with respect to its normal (100%) character width.</p> <p>If this attribute is omitted, then the contents of this run shall be displayed at 100% of its normal size.</p> <p>[<i>Example</i>: Consider a run of text which must be compressed to 200% when displaying each character within the contents of the run. This constraint is specified using the following WordprocessingML:</p> <pre><w:rPr> <w:w w:val="50%" /> </w:rPr></pre> <p>This run explicitly declares that the <i>w</i> value is 50%, so the contents of this run appear at 50% of their normal character width by compressing the width of each character. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TextScale simple type (§17.18.95).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_TextScale](#)) is located in §A.1. *end note*]

17.3.2.44 webHidden (Web Hidden Text)

This element specifies whether the contents of this run shall be hidden from display at display time in a document when the document is being displayed in a web page view. [*Note*: The setting should affect the normal display of text in a web page view, but an application can have settings to force hidden text to be displayed. *end note*] As well, this setting should not affect a normal paginated view of the document.

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then this text shall not be hidden when displayed in a document in a web page view.

[*Example*: Consider a run of text which must have the hidden text property turned on for the contents of the run. This constraint is specified using the following WordprocessingML:

```
<w:rPr>
  <w:webHidden />
</w:rPr>
```

This run declares that the `webHidden` property is set for the contents of this run, so the contents of this run is hidden when the document contents are displayed in a web page view. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.3 Run Content

The final level of the document hierarchy is *run content*, which is defined as the set of elements which can be contained as the contents of a particular run in a document.

[*Note*: Types of run content in WordprocessingML include:

- Text
- Field Codes
- DrawingML objects
- Fields

end note]

[*Example*: Consider the following run within a WordprocessingML document:

```
<w:r>
  <w:rPr>
    <w:b/>
    <w:i/>
  </w:rPr>
  <w:t>quick</w:t>
</w:r>
```

The run content consists of a single string of run text inside the `t` element, which reads *quick*. *end example*]

17.3.3.1 br (Break)

This element specifies that a break shall be placed at the current location in the run content. A *break* is a special character which is used to override the normal line breaking that would be performed based on the normal layout of the document's contents. [*Example*: Normal breaking for English would occur only after a breaking space or optional hyphen character. *end example*]

The behavior of this break character (the location where text shall be restarted after this break) shall be determined by its type and clear attribute values, described below.

[*Example*: Consider the following sentence in a WordprocessingML document:

This is a simple sentence.

Normally, just as shown above, this sentence would be displayed on a single line as it is not long enough to require line breaking (given the width of the current page). However, if a text wrapping break character (a typical line break) were inserted after the word *is*, as follows:

```

<w:r>
  <w:t>This is</w:t>
  <w:br/>
  <w:t xml:space="preserve"> a simple sentence.</w:t>
</w:r>

```

This would imply that this break must be treated as a simple line break, and break the line after that word:

This is
a simple sentence.

The break character forced the following text to be restarted on the next available line in the document. *end example]*

Attributes	Description
clear (Restart Location For Text Wrapping Break)	<p>Specifies the location which shall be used as the next available line when the break's type attribute has a value of <code>textWrapping</code>. This property only affects the restart location when the current run is being displayed on a line which does not span the full text extents due to the presence of a floating object (see possible values for details).</p> <p>If this break is not of style <code>textWrapping</code>, then this attribute shall be ignored. If this attribute is omitted, then its value shall be assumed to be <code>none</code> if needed.</p> <p>[<i>Example:</i> Consider a text wrapping break character which should force the restart location to the next line which spans the full width of the text extents of the page (there are no floating objects which interrupt the line).</p> <p>This line break is of style <code>textWrapping</code>, since it must only advance to the next line, but the <code>clear</code> value must specify that this restart location must ignore all lines which are not of the full line width by specifying a value of <code>all</code>, as follows:</p> <pre><w:br w:type="textWrapping" w:clear="all" /></pre> <p>This break must therefore not use the next available line, but rather the next available line ignoring all lines which do not span the full text width. <i>end example]</i></p> <p>The possible values for this attribute are defined by the <code>ST_BrClear</code> simple type (§17.18.3).</p>
type (Break Type)	<p>Specifies the break type of the current break. The break type determines the next location where text shall be placed after this manual break is applied to the text contents (see possible values for details).</p> <p>If this attribute is omitted, then it shall be assumed to be of style <code>textWrapping</code>.</p> <p>[<i>Example:</i> Consider a manual break which must advance the text to the next text column in the document, rather than just the next available line. This break would therefore be specified as follows:</p>

Attributes	Description
	<p data-bbox="451 283 824 315"><w:br w:type="column"/></p> <p data-bbox="414 352 1469 457">The type attribute specifies a value of <code>column</code>, which means that the break must force the next character in the document to be restarted on the next line in a new text column in the document. <i>end example</i></p> <p data-bbox="414 495 1356 562">The possible values for this attribute are defined by the <code>ST_BrType</code> simple type (§17.18.4).</p>

[Note: The W3C XML Schema definition of this element’s content model (`CT_Br`) is located in §A.1. *end note*]

17.3.3.2 contentPart (Content Part)

This element specifies a reference to XML content in a format not defined by ECMA-376. [Note: This part allows the native use of other commonly used interchange formats, such as:

- MathML (<http://www.w3.org/TR/MathML2/>)
- SMIL (<http://www.w3.org/TR/REC-smil/>)
- SVG (<http://www.w3.org/TR/SVG11/>)

end note]

The relationship type of the explicit relationship specified by this element shall be `http://purl.oclc.org/ooxml/officeDocument/relationships/customXml` and have a `TargetMode` attribute value of `Internal`. If an application cannot process content of the content type specified by the targeted part, then it should continue to process the file. If possible, it should also provide some indication that unknown content was not imported.

[Example: Consider a WordprocessingML document which includes the following MathML markup in a part named `math1.xml`:

```
<mm1:math xmlns:mm1="http://www.w3.org/1998/Math/MathML">
  <mm1:mi>r</mm1:mi>
  <mm1:mo>=</mm1:mo>
  <mm1:msup>
    <mm1:mrow>
      <mm1:mfenced separators="|">
        <mm1:mrow>
          <mm1:mi>V</mm1:mi>
          <mm1:mfrac>
            <mm1:mrow>
              <mm1:mn>3</mm1:mn>
            </mm1:mrow>
          </mm1:mfrac>
        </mm1:mrow>
      </mm1:mfenced>
    </mm1:msup>
  </mm1:math>
```

```

        <mml:mrow>
          <mml:mn>4</mml:mn>
          <mml:mi> $\pi$ </mml:mi>
        </mml:mrow>
      </mml:mfrac>
    </mml:mrow>
  </mml:mfenced>
</mml:mrow>
<mml:mrow>
  <mml:mfrac>
    <mml:mrow>
      <mml:mn>1</mml:mn>
    </mml:mrow>
    <mml:mrow>
      <mml:mn>3</mml:mn>
    </mml:mrow>
  </mml:mfrac>
</mml:mrow>
</mml:msup>
</mml:math>

```

The Main Document Part would reference this content as follows:

```

<w:body>
...
<w:p>
  <w:r>
    <w:contentPart r:id="rId8" />
  </w:r>
</w:p>
...
</w:body>

```

The contentPart element specifies that the content targeted by the relationship with an ID of rId8 is part of the WordprocessingML document. Examining the contents of the corresponding relationship part item, we can see the targets for that relationship:

```

<Relationships ... >
...
  <Relationship Id="rId8" TargetMode="Internal"
Type="http://purl.oclc.org/ooxml/officeDocument/relationships/customXml"
Target="math1.xml" />
...
</Relationships>

```

The corresponding relationship part item shows that the file to be imported is located next to the main document and is named `math1.xml`. *end example*]

Attributes	Description
<p><code>id</code> (Relationship to Part)</p> <p>Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships</p>	<p>Specifies the relationship ID to a specified part.</p> <p>The specified relationship shall match the relationship type required by the parent element:</p> <ul style="list-style-type: none"> • http://purl.oclc.org/ooxml/officeDocument/relationships/customXml for the <code>contentPart</code> element • http://purl.oclc.org/ooxml/officeDocument/relationships/footer for the <code>footerReference</code> element • http://purl.oclc.org/ooxml/officeDocument/relationships/header for the <code>headerReference</code> element • http://purl.oclc.org/ooxml/officeDocument/relationships/font for the <code>embedBold</code>, <code>embedBoldItalic</code>, <code>embedItalic</code>, or <code>embedRegular</code> elements • http://purl.oclc.org/ooxml/officeDocument/relationships/printerSettings for the <code>printerSettings</code> element • http://purl.oclc.org/ooxml/officeDocument/relationships/hyperlink for the <code>longDesc</code> or <code>hyperlink</code> element <p>[<i>Example</i>: Consider an XML element which has the following <code>id</code> attribute:</p> <pre><... r:id="rId10" /></pre> <p>The markup specifies the associated relationship part with relationship ID <code>rId1</code> contains the corresponding relationship information for the parent XML element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_RelationshipId</code> simple type (§22.8.2.1).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_Rel](#)) is located in §A.1. *end note*]

17.3.3.3 control (Embedded Control)

This element specifies that the parent embedded object is a representation of an embedded control. This element shall be used to associate the appropriate embedded control settings and properties when the document is displayed.

If the embedded control is not present, cannot be loaded due to application settings, or is not supported, then a suitable placeholder image shall be used to provide a representation of the presence of an embedded control at the appropriate location in the document.

[*Example*: Consider a run which consists of an embedded control. That run would be specified using the following `WordprocessingML`:


```

<w:r>
  <w:object>
    ...
    <w:control r:id="rId99" w:shapeid="10" ... />
  </w:object>
</w:r>

```

The control element indicates that the parent embedded object is an embedded control, whose settings and properties are stored on this element and the (optional) target of the relationship specified using the id attribute. *end example*]

Attributes	Description
<p>id (Embedded Control Properties Relationship Reference)</p> <p>Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships</p>	<p>Specifies the relationship ID for the relationship which contains the properties for this embedded control. This property bag is contained in a separate part within the Office Open XML package.</p> <p>The relationship explicitly targeted by this attribute shall be of type http://purl.oclc.org/ooxml/officeDocument/relationships/control or the document shall be considered non-conformant.</p> <p>If this attribute is omitted, then the embedded control shall be given no property bag when instantiated.</p> <p>[<i>Example:</i> Consider the following WordprocessingML markup for an embedded control in a document:</p> <pre><w:control r:id="rId5" w:name="CheckBox1" w:shapeid="_x0000_s1027" /></pre> <p>The id attribute in the relationship reference namespace specifies that the relationship with relationship ID rId5 must contain the property data for this embedded control. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
<p>name (Unique Name for Embedded Control)</p>	<p>Specifies a unique name for this embedded control. This name shall be unique across all controls in this document.</p> <p>[<i>Example:</i> Consider the following WordprocessingML markup for an embedded control in a document:</p> <pre><w:control r:id="rId5" w:name="CheckBox1" w:shapeid="_x0000_s1027" /></pre> <p>The name attribute specifies that the unique name for this control must be CheckBox1. <i>end example</i>]</p>

Attributes	Description
	<p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
shapeid (Shape Reference)	<p>Specifies the shape ID for a shape which shall be used to define the presentation and location of this embedded control within the document if the control is floating using the DrawingML syntax.</p> <p>[<i>Note</i>: This positioning data is sufficient to display the control in any case where:</p> <ul style="list-style-type: none"> • The embedded control is not on the current machine • Embedded controls are disabled • Embedded controls of this control type are not supported <p><i>end note</i>]</p> <p>This shape ID reference is resolved by looking for a DrawingML object whose id attribute matches the value specified within this attribute. If no such shape exists, then the control shall be rendered inline in the document content at the current run content location.</p> <p>If this attribute is omitted, then this embedded control shall be displayed inline in the current location in the parent run.</p> <p>[<i>Example</i>: Consider the following WordprocessingML markup for an embedded control in a document:</p> <pre><w:control r:id="rId5" w:name="CheckBox1" w:shapeid="10" /></pre> <p>The shapeid attribute specifies that the DrawingML object with an id attribute value of 10 must contain the positioning data for this embedded control. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_Control](#)) is located in §A.1. *end note*]

17.3.3.4 cr (Carriage Return)

This element specifies that a carriage return shall be placed at the current location in the run content. A *carriage return* is the equivalent of Unicode character 000D, and is used to end the current line of text in WordprocessingML.

The behavior of a carriage return in run content shall be identical to a break character with null type and clear attributes, which shall end the current line and find the next available line on which to continue.

[*Example*: Consider the following sentence in a WordprocessingML document:

This is another simple sentence.

Normally, just as shown above, this sentence would be displayed on a single line as it is not long enough to require line breaking (given the width of the current page). However, if a carriage return were inserted after the word *another*, as follows:

```
<w:r>
  <w:t>This is another</w:t>
  <w:cr/>
  <w:t xml:space="preserve"> simple sentence.</w:t>
</w:r>
```

This would imply that this carriage return character must force a line break, and break the line after that word:

This is another
simple sentence.

The carriage return character forced the following text to be restarted on the next available line in the document. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.1. *end note*]

17.3.3.5 dayLong (Date Block - Long Day Format)

This element specifies the presence of a date block at the current location in the run content. A *date block* is a non-editable region of text which shall display the current date filtered through the specified date picture (see following paragraphs) . [*Note:* The date block is a legacy construct used for compatibility with older word processors, and should not be produced unless it was consumed while reading a document – it is recommended that the DATE field is used in its place. *end note*]

A date block shall be displayed using the primary editing language of the host application, regardless of the languages specified in the parent run's lang property (§17.3.2.20).

The long day format date block shall use a date picture of DDDD, retrieving the long day format for the primary editing language.

[*Example:* Consider a WordprocessingML run with the following run content:

```
<w:r>
  <w:t xml:space="preserve">This is a long date: </w:t>
  <w:dayLong />
</w:r>
```

This run specifies that a long day format date block must be placed after the text string literal *This is a long date:* in the document. Assuming that the host application's primary editing language is French (Canada) and today's date is 2006-04-12, this run would be displayed as follows:

This is a long date: mercredi

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.1. *end note]*

17.3.3.6 dayShort (Date Block - Short Day Format)

This element specifies the presence of a date block at the current location in the run content. A *date block* is a non-editable region of text which shall display the current date filtered through the specified date picture (see following paragraphs) . [*Note:* The date block is a legacy construct used for compatibility with older word processors, and should not be produced unless it was consumed while reading a document – it is recommended that the DATE field is used in its place. *end note]*

A date block shall be displayed using the primary editing language of the host application, regardless of the languages specified in the parent run's lang property (§17.3.2.20).

The short day format date block shall use a date picture of DD, retrieving the short day format for the primary editing language.

[*Example:* Consider a WordprocessingML run with the following run content:

```
<w:r>
  <w:t xml:space="preserve">This is a short date: </w:t>
  <w:dayShort />
</w:r>
```

This run specifies that a short day format date block must be placed after the text string literal `This is a short date:` in the document. Assuming that the host application's primary editing language is English (Canada) and today's date is 2006-04-12, this run would be displayed as follows:

This is a short date: 12

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.1. *end note]*

17.3.3.7 delText (Deleted Text)

This element specifies that this run contains literal text which shall be displayed in the document. The `delText` element shall be used for all text runs which are part of a region of text that is contained in a deleted region using the `del` element (§17.13.5.14).

[*Example:* Consider a paragraph of WordprocessingML content which reads `This is deleted text`, where the words `deleted text` are part of a deleted region of the document. This paragraph would therefore be represented as follows:

```

<w:p>
  <w:r>
    <w:t xml:space="preserve">This is </w:t>
  </w:r>
  <w:del w:author="Cooper W.">
    <w:r>
      <w:delText>deleted text</w:delText>
    </w:r>
  </w:del>
</w:p>

```

The deleted text is contained in a delText node, while the regular text is contained in a t node. *end example*]

Attributes	Description
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	<p>Specifies how white space should be handled for the contents of this element using the W3C space preservation rules.</p> <p>[<i>Example:</i> Consider the following run contained within a WordprocessingML document:</p> <pre> <w:r> <w:t> significant whitespace </w:t> </w:r> </pre> <p>Although there are three spaces on each side of the text content in the run, that whitespace has not been specifically marked as significant, therefore it is subject to the space preservation rules currently specified in that run's scope. <i>end example</i>]</p> <p>The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Text](#)) is located in §A.1. *end note*]

17.3.3.8 [dirty \(Invalidated Field Cache\)](#)

This element specifies that the field has been changed and the results shall be updated on open in a conforming consumer.

This element's content model is defined by the common boolean property definition in §17.17.4.

17.3.3.9 [drawing \(DrawingML Object\)](#)

This element specifies that a DrawingML object is located at this position in the run's contents. The layout properties of this DrawingML object are specified using the WordprocessingML Drawing syntax (§20.4).

[*Example:* Consider a run which consists of a picture which is in line with the text in that paragraph (i.e. on the line and affects the line height). That run would be specified using the following WordprocessingML:

```
<w:r>
  <w:drawing>
    <wp:inline>
      ...
    </wp:inline>
  </w:drawing>
</w:r>
```

The drawing element indicates that a DrawingML object and its WordprocessingML Drawing positioning data are located at the current position in the run (e.g. a picture or a chart). *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_Drawing](#)) is located in §A.1. *end note*]

17.3.3.10 hps (Phonetic Guide Text Font Size)

This element specifies the font size which shall be applied to the phonetic guide text in the contents of this run when displayed.

If this element disagrees with the run properties on the phonetic guide text rt element (§17.3.3.24), then those properties shall be ignored and this element shall determine the size of the phonetic guide text.

[Example: Consider a run of phonetic guide text which must have an explicit font size of 13.5 points. This constraint is specified using the following WordprocessingML:

```
<w:rubyPr>
  ...
  <w:hps w:val="27"/>
  ...
</w:rubyPr>
```

The hps property is 27 half-points for the ruby text in this run, so the phonetic guide text is displayed in 13.5 point font size. *end example*

Attributes	Description
val (Half Point Measurement)	<p>Specifies a positive measurement specified in half-points (1/144 of an inch).</p> <p>The contents of this attribute value are interpreted based on the context of the parent XML element.</p> <p>[Example: Consider the following WordprocessingML fragment:</p> <pre><... w:val="30" /></pre> <p>The value in the val attribute is 30, which is equivalent to 15 points (30 half-points).</p> <p>This value is interpreted in the context of the parent element. <i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_HpsMeasure simple type (§17.18.42).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_HpsMeasure](#)) is located in §A.1. *end note*]

17.3.3.11 hpsBaseText (Phonetic Guide Base Text Font Size)

This element specifies the font size which shall be applied to the base text of this phonetic guide text when displayed. If this element disagrees with the run properties on the phonetic guide base text rubyBase element (§17.3.3.27), then this property shall be ignored and the sz element (§17.3.2.38) in that run shall determine the size of the phonetic guide base text.

[*Example:* Consider a run of phonetic guide base text which shall have an explicit font size of 30 points. This constraint is specified using the following WordprocessingML:

```
<w:rubyPr>
...
<w:hpsBaseText w:val="60"/>
...
</w:rubyPr>
```

The hpsBaseText property is 60 half-points for the base text in this phonetic guide, so the phonetic guide base text is displayed in 30 point font size. *end example*]

Attributes	Description
val (Half Point Measurement)	<p>Specifies a positive measurement specified in half-points (1/144 of an inch).</p> <p>The contents of this attribute value are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><... w:val="30" /></pre> <p>The value in the val attribute is 30, which is equivalent to 15 points (30 half-points).</p> <p>This value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_HpsMeasure simple type (§17.18.42).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_HpsMeasure](#)) is located in §A.1.
end note]

17.3.3.12 **hpsRaise (Distance Between Phonetic Guide Text and Phonetic Guide Base Text)**

This element specifies the distance which shall be left between the phonetic guide base text and the phonetic guide text when this phonetic guide text is displayed.

[*Example*: Consider a run of phonetic guide text which must have 10 points between the phonetic guide base text and the phonetic guide text. This constraint is specified using the following WordprocessingML:

```
<w:rubyPr>
...
<w:hpsRaise w:val="20"/>
...
</w:rubyPr>
```

The hpsRaise property is 20 half-points for the phonetic guide, so the phonetic guide text is displayed 10 points above the phonetic guide base text. *end example*]

Attributes	Description
val (Half Point Measurement)	<p>Specifies a positive measurement specified in half-points (1/144 of an inch).</p> <p>The contents of this attribute value are interpreted based on the context of the parent XML element.</p> <p>[<i>Example</i>: Consider the following WordprocessingML fragment:</p> <pre><... w:val="30" /></pre> <p>The value in the val attribute is 30, which is equivalent to 15 points (30 half-points).</p> <p>This value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_HpsMeasure simple type (§17.18.42).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_HpsMeasure](#)) is located in §A.1.
end note]

17.3.3.13 **lastRenderedPageBreak (Position of Last Calculated Page Break)**

This element specifies that this position delimited the end of a page when this document was last saved by an application which paginates its content.

[*Guidance*: This element must be used by applications to specify the locations of page breaks within a document when it is saved as WordprocessingML, in order to allow other applications (e.g. assistive software) to utilize this information when reading the document. *end guidance*]

[*Example*: Consider a run which consists of the text `This is the end of the page`, where the word `end` was the last word on a page. If the application saving this file had paginated this content, that information can be saved with the file as follows:

```
<w:r>
  <w:t>This is the end</w:t>
  <w:lastRenderedPageBreak/>
  <w:t xml:space="preserve"> of the page</w:t>
</w:r>
```

The `lastRenderedPageBreak` element indicates that there was a page break resulting from pagination of this content, which occurred between the word `end` and the word `of`. *end example*]

[*Note*: The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.1. *end note*]

17.3.3.14 lid (Language ID for Phonetic Guide)

This element specifies the language which shall be used for this phonetic guide.

[*Example*: Consider a run of phonetic guide text which is using Japanese as it language. This constraint is specified using the following WordprocessingML:

```
<w:rubyPr>
  ...
  <w:lid w:val="ja-JP"/>
  ...
</w:rubyPr>
```

The `lid` property is `ja-JP` for the phonetic guide, so the phonetic guide is specified to be Japanese. *end example*]

Attributes	Description
<code>val</code> (Language Code)	<p>Specifies an identifier for a specific language.</p> <p>This code is interpreted in the context of the parent XML element.</p> <p>[<i>Example</i>: Consider an object which must specify the English(Canada) language. That object would use an identifier of <code>en-CA</code> to specify this language. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_Lang</code> simple type (§22.9.2.6).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_Lang](#)) is located in §A.1. *end note*]

17.3.3.15 monthLong (Date Block - Long Month Format)

This element specifies the presence of a date block at the current location in the run content. A *date block* is a non-editable region of text which shall display the current date filtered through the specified date picture (see following paragraphs). [Note: The date block is a legacy construct used for compatibility with older word processors, and should not be produced unless it was consumed while reading a document – it is recommended that the DATE field is used in its place. *end note*]

A date block shall be displayed using the primary editing language of the host application, regardless of the languages specified in the parent run's lang property (§17.3.2.20).

The long month format date block shall use a date picture of MMMM, retrieving the long month format for the primary editing language.

[Example: Consider a WordprocessingML run with the following run content:

```
<w:r>
  <w:t xml:space="preserve">This is a long date: </w:t>
  <w:monthLong />
</w:r>
```

This run specifies that a long month format date block shall be placed after the text string literal *This is a long date:* in the document. Assuming that the host application's primary editing language is French (Canada) and today's date is 2006-04-12, this run would be displayed as follows:

This is a long date: avril

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.1. *end note*]

17.3.3.16 monthShort (Date Block - Short Month Format)

This element specifies the presence of a date block at the current location in the run content. A *date block* is a non-editable region of text which shall display the current date filtered through the specified date picture (see following paragraphs). [Note: The date block is a legacy construct used for compatibility with older word processors, and should not be produced unless it was consumed while reading a document – it is recommended that the DATE field is used in its place. *end note*]

A date block shall be displayed using the primary editing language of the host application, regardless of the languages specified in the parent run's lang property (§17.3.2.20).

The short month format date block shall use a date picture of MM, retrieving the short month format for the primary editing language.

[Example: Consider a WordprocessingML run with the following run content:

```

<w:r>
  <w:t xml:space="preserve">This is a short date: </w:t>
  <w:monthShort />
</w:r>

```

This run specifies that a short month format date block must be placed after the text string literal `This is a short date:` in the document. Assuming that the host application's primary editing language is English (Canada) and today's date is 2006-04-12, this run would be displayed as follows:

This is a short date: 04

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.1. *end note*]

17.3.3.17 movie (Embedded Video)

This element specifies a location within a document where the specified parent image shall be treated as a static placeholder for an embedded movie. [*Note:* A list of suggested video types is provided in §15.2.17. *end note*] The specified movie file's contents should be displayed when requested at this location in the document. The location of the embedded movie to be displayed when supported shall be specified by the relationship whose `Id` attribute matches the `id` attribute on this element.

If the relationship type of the relationship specified by this element is not `http://purl.oclc.org/ooxml/officeDocument/relationships/movie`, or is not present, then the document shall be considered non-conformant. If an application cannot process external content of the content type specified by the targeted part, then it can be ignored.

[*Example:* Consider a WordprocessingML document which contains a DrawingML shape holding the static image for a movie:

```

<w:object>
  <w:drawing>
    ...
  </w:drawing>
  <w:movie r:id="rIdMovie" />
</w:object>

```

The movie element specifies that the part targeted by the relationship with an ID of `rIdMovie` must be imported at the beginning of the document. Examining the contents of the corresponding relationship part item, we can see the targets for that relationship:

```
<Relationships ... >
...
<Relationship Id="rIdMovie" TargetMode="Internal"
Type="http://purl.oclc.org/ooxml/officeDocument/movie" Target="movie.mov" />
...
</Relationships>
```

The corresponding relationship part item shows that the movie file is located next to the main document and is named `movie.mov`. *end example*]

Attributes	Description
<p>id (Relationship to Part)</p> <p>Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships</p>	<p>Specifies the relationship ID to a specified part.</p> <p>The specified relationship shall match the relationship type required by the parent element:</p> <ul style="list-style-type: none"> • http://purl.oclc.org/ooxml/officeDocument/relationships/customXml for the contentPart element • http://purl.oclc.org/ooxml/officeDocument/relationships/footer for the footerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/header for the headerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/font for the embedBold, embedBoldItalic, embedItalic, or embedRegular elements • http://purl.oclc.org/ooxml/officeDocument/relationships/printerSettings for the printerSettings element • http://purl.oclc.org/ooxml/officeDocument/relationships/hyperlink for the longDesc or hyperlink element <p>[Example: Consider an XML element which has the following id attribute:</p> <pre><... r:id="rId10" /></pre> <p>The markup specifies the associated relationship part with relationship ID rId1 contains the corresponding relationship information for the parent XML element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_Rel](#)) is located in §A.1. *end note*]

17.3.3.18 noBreakHyphen (Non Breaking Hyphen Character)

This element specifies that a non breaking hyphen character shall be placed at the current location in the run content.

The behavior of a non-breaking hyphen in run content shall be to display using the same glyph as the hyphen-minus character (U+002D), however, without that hyphen being a line breaking position (unlike the hyphen-minus character, which does allow line breaking).

[*Example:* Consider the following sentence in a WordprocessingML document: ‘Each citizen has a unique Social Security Number of the form “999-99-9999”, where each 9 represents a decimal digit.’ The fragment of this sentence involving the string literal might be represented in WordprocessingML, as follows:

```
<w:r>
  <w:t>Number of the form “999-99-9999”, where</w:t>
</w:r>
```

However, consider the case in which, on rendering, the right margin was such that the quoted string is broken across multiple lines with the hyphens being used as possible line breaking points; for example:.

```
Each citizen has a unique Social Security Number of the form “999-99-
9999”, where ...
```

If such line breaks are undesirable, those hyphens can be marked as non-breaking, as follows:

```
<w:r>
  <w:t>Number of the form “999</w:t>
</w:r>
<w:r>
  <w:noBreakHyphen />
  <w:t>99</w:t>
</w:r>
<w:r>
  <w:noBreakHyphen />
  <w:t>9999”, where</w:t>
</w:r>
```

in which case, for the same margin settings, the rendered result might be like the following:

```
Each citizen has a unique Social Security Number of the form
“999-99-9999”, where ...
```

end example]

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Empty](#)) is located in §A.1. *end note]*

17.3.3.19 object (Embedded Object)

This element specifies that an embedded object is located at this position in the run’s contents. The layout properties of this embedded object, as well as an optional static representation, are specified using the drawing element (§17.3.3.9).

[*Example:* Consider a run which consists of an embedded object which is in line with the text in that paragraph (i.e. on the line and affects the line height). That run would be specified using the following WordprocessingML:

```
<w:r>
  <w:object>
    <w:drawing>
      ...
    </w:drawing>
  </w:object>
</w:r>
```

The object element indicates that an embedded object and its positioning data are located at the current position in the run (e.g. an embedded object). *end example*]

Attributes	Description
<p>dxaOrig (Original Image Width)</p>	<p>Specifies the original (natural) width of the image representation of the current control within the document. Some vector image formats do not store a native size within their format, and this attribute shall only be used in those cases to store this information, so that the image can be appropriately restored as needed.</p> <p>If this element is excluded, then the natural size of the image as stored in its format shall be used.</p> <p>[<i>Example:</i> Consider the following WordprocessingML for an embedded object:</p> <pre><w:object w:dxaOrig="3360" w:dyaOrig="2520"> ... </w:object></pre> <p>The dxaOrig attribute has a value of 3360, which specifies that the image used for the embedded object doesn't store its native width, but that width should be 3360 twentieths of a point. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>
<p>dyaOrig (Original Image Height)</p>	<p>Specifies the original (natural) height of the image representation of the current control within the document. Some vector image formats do not store a native size within their format, and this attribute shall only be used in those cases to store this information, so that the image can be appropriately restored as needed.</p> <p>If this element is excluded, then the natural size of the image as stored in its format shall be used.</p> <p>[<i>Example:</i> Consider the following WordprocessingML for an embedded object:</p> <pre><w:object w:dxaOrig="3360" w:dyaOrig="2520"></pre>

Attributes	Description
	<p>...</p> <p></w:object></p> <p>The dyaOrig attribute has a value of 2520, which specifies that the image used for the embedded object doesn't store its native height, but that height should be 2520 twentieths of a point. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Object](#)) is located in §A.1. *end note*]

17.3.3.20 [objectEmbed \(Embedded Object Properties\)](#)

This element specifies the visual properties and associated server application of an embedded object.

[Example: The following demonstrates a video file embedded in a WordprocessingML document:

```
<w:object ... >
  <w:drawing> ... </w:drawing>
  <w:objectEmbed drawAspect="content" r:id="rId3" progId="AVIFile"
  shapeId="10"/>
</w:object>
```

end example]

Attributes	Description
drawAspect (Object Representation)	<p>Specifies how the object is represented visually in the application.</p> <p>[Example:</p> <pre><w:objectEmbed ... drawAspect="content"/></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ObjectDrawAspect simple type (§17.18.60).</p>
fieldCodes (Field Switches)	<p>This element specifies the WordprocessingML field switches which shall be stored with an embedded object, using the set of field switches defined by the LINK field, as specified in §17.16.5.32. This element shall specify the exact field switches for the field which represents the object.</p> <p>[<i>Rationale:</i> Legacy word processors used fields to represent embedded objects - this element stores the field switches not explicitly defined for embeddings so as not to use the fidelity of their contents. <i>end rationale</i>]</p>

Attributes	Description
	<p>[Example:</p> <pre><w:objectEmbed ... fieldCodes="\f 0"/></pre> <p>This embedded object specifies additional LINK field code values of \f 0, which specifies that the embedded object must retain its source formatting (as defined in §17.16.5.32). <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
<p>id (Relationship to Embedded Object Data)</p> <p>Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships</p>	<p>Specifies the relationship ID for the relationship which targets the Embedded Object Part containing the embedded object data.</p> <p>The specified relationship shall be of type http://purl.oclc.org/ooxml/officeDocument/relationships/oleObject or the document shall be considered non-conformant.</p> <p>[Example: Consider an XML element which has the following id attribute:</p> <pre><... r:id="rId1" /></pre> <p>The markup specifies the associated relationship part with relationship ID rId1 targets the part containing the corresponding embedded object information. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
<p>progId (Object Application)</p>	<p>Specifies the application associated with the object.</p> <p>[Example:</p> <pre><w:objectEmbed ... progId="AVIFile"/></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
<p>shapeId (Object Shape)</p>	<p>Specifies the shape with which the object is associated. A shape provides the visual placeholder for an object and this attribute is set to the ID of the placeholder shape.</p> <p>[Example:</p> <pre><w:objectEmbed ... shapeId="10"/></pre> <p><i>end example]</i></p>

Attributes	Description
	The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([CT_ObjectEmbed](#)) is located in §A.1. end note]

17.3.3.21 objectLink (Linked Object Properties)

This element specifies the visual properties, associated server application and refresh mode of an embedded linked object.

[Example: The following demonstrates a video file embedded in a WordprocessingML document:

```
<w:object ... >
  <w:drawing> ... </w:drawing>
  <w:objectLink drawAspect="icon" r:id="rId3" progId="AVIFile" shapeId="10"
updateMode="user"/>
</w:object>
```

end example]

Attributes	Description
drawAspect (Object Representation)	<p>Specifies how the object is represented visually in the application.</p> <p>[Example:</p> <pre><w:objectEmbed ... drawAspect="content"/></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the ST_ObjectDrawAspect simple type (§17.18.60).</p>
fieldCodes (Field Switches)	<p>This element specifies the WordprocessingML field switches which shall be stored with an embedded object, using the set of field switches defined by the LINK field, as specified in §17.16.5.32. This element shall specify the exact field switches for the field which represents the object.</p> <p>[Rationale: Legacy word processors used fields to represent embedded objects - this element stores the field switches not explicitly defined for embeddings so as not to use the fidelity of their contents. end rationale]</p> <p>[Example:</p>

Attributes	Description
	<p><code><w:objectEmbed ... fieldCodes="\f 0"/></code></p> <p>This embedded object specifies additional LINK field code values of \f 0, which specifies that the embedded object must retain its source formatting (as defined in §17.16.5.32). <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
<p>id (Relationship to Embedded Object Data)</p> <p>Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships</p>	<p>Specifies the relationship ID for the relationship which targets the Embedded Object Part containing the embedded object data.</p> <p>The specified relationship shall be of type http://purl.oclc.org/ooxml/officeDocument/relationships/oleObject or the document shall be considered non-conformant.</p> <p>[Example: Consider an XML element which has the following id attribute:</p> <p><code><... r:id="rId1" /></code></p> <p>The markup specifies the associated relationship part with relationship ID rId1 targets the part containing the corresponding embedded object information. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
<p>lockedField (Object Refresh Flag)</p>	<p>Specifies whether the object's appearance is locked. If it is locked, the object's current representation shall be locked to prevent any user interaction or automatic application behavior from modifying its contents.</p> <p>[Example:</p> <p><code><w:objectLink ... lockedField="true"/></code></p> <p><i>end example</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
<p>progId (Object Application)</p>	<p>Specifies the application associated with the object.</p> <p>[Example:</p> <p><code><w:objectEmbed ... progId="AVIFile"/></code></p> <p><i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

Attributes	Description
shapeId (Object Shape)	<p>Specifies the shape with which the object is associated. A shape provides the visual placeholder for an object and this attribute is set to the ID of the placeholder shape.</p> <p>[Example:</p> <pre><w:objectEmbed ... shapeId="10"/></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
updateMode (Object Update Mode)	<p>Specifies how the object is updated with new data - automatically or on-demand by the user.</p> <p>[Example:</p> <pre><w:objectLink ... updateMode="always"/></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the ST_ObjectUpdateMode simple type (§17.18.61).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_ObjectLink](#)) is located in §A.1. end note]

17.3.3.22 pgNum (Page Number Block)

This element specifies the presence of a page number block at the current location in the run content. A *page number block* is a non-editable region of text which shall display the current page using ascending decimal numbers. [Note: The page number block is a legacy construct used for compatibility with older word processors, and should not be produced unless it was consumed while reading a document – it is recommended that the PAGENUM field is used in its place. end note]

A page number block shall be displayed using ascending decimal numbers, regardless of the languages specified in the parent run's lang property (§17.3.2.20).

[Example: Consider a WordprocessingML run with the following run content:

```
<w:r>
  <w:t xml:space="preserve">This is the current page: </w:t>
  <w:pgNum />
</w:r>
```

This run specifies that a page number block must be placed after the text string literal `This is the current page:` in the document. Assuming that this content is on the first page, this run would be displayed as follows:

This is the current page: 1

end example]

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Empty](#)) is located in §A.1. *end note]*

17.3.3.23 [ptab \(Absolute Position Tab Character\)](#)

This element specifies that an absolute position tab character shall be placed at the current location in the run content. An *absolute position tab* is a character which is used to advance the position on the current line of text when displaying this WordprocessingML content, using the following logic:

Regardless of any number of custom tab stops defined using the `tabs` element (§17.3.1.38) , the absolute position tab character shall advance to the position specified by its `alignment` and `relativeTo` attributes. The resulting end position of the tab character shall not be affected by the addition of any custom tab stops or changes to the value of the `defaultTabStop` element (§17.15.1.25).

If the alignment location specified by the positional tab cannot be found on the current line, because the starting location is past that point, then the tab character shall advance to that location on the next available line in the document.

[*Example:* Consider a paragraph which contains two custom tab stops at 1.5" and 3.5", respectively. These two tab stops would be contained within a `tabs` element defining the set of tab stops of the paragraph as follows:

```
<w:pPr>
  <w:tabs>
    <w:tab w:val="start" w:pos="2160" />
    <w:tab w:val="start" w:pos="5040" />
  </w:tabs>
</w:pPr>
```

If a positional tab character was added to a run in this paragraph starting at 1" inside the margin and was defined as follows:

```
<w:ptab ... w:alignment="center" w:relativeTo="margin" />
```

This positional tab would then ignore the next custom tab stop and the indents on the current paragraph defined using the `ind` element (§17.3.1.12) and would advance to the center of the line with respect to the text margins, moving to a new line if needed. *end example]*

Attributes	Description
alignment (Positional Tab Stop Alignment)	Specifies the location of the positional tab stop on the line, as well as the alignment which shall be applied to text subsequent to the current positional tab stop.

Attributes	Description
	<p>[<i>Example</i>: Consider a positional tab stop in a WordprocessingML document who must move to the left edge of the text margins and whose subsequent text should be left aligned. This positional tab stop would be defined as follows:</p> <pre data-bbox="456 394 1304 426"><w:ptab w:alignment="left" w:relativeTo="margin" ... /></pre> <p>The alignment attribute specifies that this absolute position tab stop must align on the left edge of the line relative to the margin. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PTabAlignment simple type (§17.18.71).</p>
leader (Tab Leader Character)	<p>Specifies the character which shall be used to fill in the space created by a positional tab. This character shall be repeated as required to completely fill the tab spacing generated by the positional tab character.</p> <p>[<i>Example</i>: Consider a positional tab stop which should be preceded by a sequence of underscore characters, as follows:</p> <pre data-bbox="415 905 976 936">_____Text at the positional tab stop</pre> <p>This tab stop would have a leader attribute value of underscore, indicating that the tab stop must be preceded by underscore characters as needed to fill the tab spacing. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PTabLeader simple type (§17.18.72).</p>
relativeTo (Positional Tab Base)	<p>Specifies the extents which shall be used to calculate the absolute positioning of this positional tab character.</p> <p>[<i>Example</i>: Consider a positional tab stop in a WordprocessingML document that should have a resulting position that is centered on the text margins, ignoring both any custom tab stops and any text indents on the paragraph. This positional tab stop would be defined as follows:</p> <pre data-bbox="456 1486 1000 1518"><w:ptab w:relativeTo="margin" ... /></pre> <p>The relativeTo attribute specifies that this absolute position tab stop must be relative to the margin. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PTabRelativeTo simple type (§17.18.73).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_PTab](#)) is located in §A.1. *end note*]

17.3.3.24 `rt` (Phonetic Guide Text)

This element specifies the presence of the guide text within a phonetic guide at the current location in the document.

The contents of the guide text run are specified in the child `r` element (§17.3.2.25).

[*Example:* Consider the following two runs, each containing a phonetic guide:

tōkyō
東京

The guide text run would be specified using the following WordprocessingML:

```
<w:rt>
...
<w:r>
  <w:t>tō</w:t>
</w:r>
</w:rt>
```

The guide text is contained in a run within the `rt` element. *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_RubyContent](#)) is located in §A.1. *end note*]

17.3.3.25 `ruby` (Phonetic Guide)

This element specifies the presence of a phonetic guide at the current location in the document. A *phonetic guide* (often called ruby text) is a run of content with base text which appears at the normal baseline location for text in this run, with phonetic guide text displayed above it in the document. The resulting construct is called a phonetic guide as it is typically used to map words in one language to another phonetically.

The base text is stored in the `rubyBase` element (§17.3.3.27) and the guide text is stored in the `rt` element (§17.3.3.24).

[*Example:* Consider the following two runs, each containing a phonetic guide:

tōkyō
東京

The first run would be specified using the following WordprocessingML:

```

<w:r>
  <w:ruby>
    <w:rubyPr>
      ...
    </w:rubyPr>
    <w:rt>
      ...
      <w:r>
        <w:t>tō</w:t>
      </w:r>
    </w:rt>
    <w:rubyBase>
      ...
      <w:r>
        <w:t>東</w:t>
      </w:r>
    </w:rubyBase>
  </w:ruby>
</w:r>

```

The base text is contained in a run within the rubyBase element, and the guide text is contained in a run within the rt element. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_Ruby](#)) is located in §A.1. *end note*]

17.3.3.26 rubyAlign (Phonetic Guide Text Alignment)

This element specifies the alignment setting which shall be used to determine the placement of phonetic guide text with respect to the base text when this phonetic guide is displayed.

[Example: Consider a run of phonetic guide text which must have the ruby text positioned to the far left of the base text. This constraint is specified using the following WordprocessingML:

```

<w:rubyPr>
  ...
  <w:rubyAlign w:val="left"/>
  ...
</w:rubyPr>

```

The rubyAlign property is left for the phonetic guide, so the ruby text is displayed on the left side of the base text. *end example*

Attributes	Description
val (Phonetic Guide Text Alignment)	Specifies the type of alignment to be applied to the phonetic guide text.

Attributes	Description
Value)	<p>[<i>Example</i>: Consider a run of phonetic guide text which must have the ruby text positioned to the far right of the base text. This constraint is specified using the following WordprocessingML:</p> <pre><w:rubyPr> ... <w:rubyAlign w:val="left"/> ... </w:rubyPr></pre> <p>The value of the val attribute is right for the phonetic guide, so the ruby text is displayed on the right side of the base text. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_RubyAlign simple type (§17.18.75).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_RubyAlign](#)) is located in §A.1. *end note*]

17.3.3.27 rubyBase (Phonetic Guide Base Text)

This element specifies the presence of the base text within a phonetic guide at the current location in the document.

The contents of the base text run are specified in the child r element (§17.3.2.25).

[*Example*: Consider the following two runs, each containing a phonetic guide:

tōkyō
東京

The base text run would be specified using the following WordprocessingML:

```
<w:rubyBase>
...
<w:r>
  <w:t>東京</w:t>
</w:r>
</w:rubyBase>
```

The base text is contained in a run within the rubyBase element. *end example*]

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_RubyContent](#)) is located in §A.1. *end note*]

17.3.3.28 rubyPr (Phonetic Guide Properties)

This element specifies a set of properties which determine the behavior and appearance of a phonetic guide within the document.

[*Example:* Consider the following two runs, each containing a phonetic guide:

tōkyō
東京

The properties for both of these phonetic guides are as follows:

```
<w:r>
  <w:ruby>
    <w:rubyPr>
      <w:rubyAlign w:val="distributeSpace" />
      <w:hps w:val="16" />
      <w:hpsRaise w:val="20" />
      <w:hpsBaseText w:val="22" />
      <w:lid w:val="ja-JP" />
    </w:rubyPr>
    ...
  </w:ruby>
</w:r>
```

The phonetic guide properties specify that the guide text must be:

- Distributed across the top (using the rubyAlign element)
- 8 point font face (using the hps element)
- 10 points above the base text (using the hpaRaise element)
- Japanese (using the lid element)

As well, the phonetic guide properties specify that the base text must be:

- 11 point font face (using the hpsBaseText element)

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_RubyPr](#)) is located in §A.1. *end note]*

17.3.3.29 softHyphen (Optional Hyphen Character)

This element specifies that an optional hyphen character shall be placed at the current location in the run content. An *optional hyphen* is a character which can be used as a line breaking character for the current line of text when displaying this WordprocessingML content, using the following logic:

- When this character is not the character which is used to break the line, then it shall not change the normal display of text (it shall have zero width)
- When this character is the character used to break the line, it shall display using the hyphen-minus character within the display of text

[*Note*: This character is typically used to mark locations where a word can optionally be hyphenated without causing the hyphen character to be displayed unnecessarily. *end note*]

[*Example*: Consider the following sentence in a WordprocessingML document:

This sentence needs to be long enough to cause some kind of line breaking.

Normally, just as shown above, this sentence not would be displayed on a single line as it is long enough to require line breaking (given the width of the current page). However, if an optional hyphen were inserted after the letter r in breaking, as follows:

```
<w:r>
  <w:t>This sentence needs to be long enough to cause some kind of line br</w:t>
  <w:softHyphen/>
  <w:t>eaking.</w:t>
</w:r>
```

This would allow a break at that position, and when that location is the point of the line break, would insert a hyphen-minus in the word after that character:

This sentence needs to be long enough to cause some kind of line breaking.

If this was not the point of the line break, then no character would be displayed at that location:

This sentence should not be long enough to cause line breaking.

The sentence now does not break at that location, so no hyphen appears in the word breaking. *end example*]

[*Note*: The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.1. *end note*]

17.3.3.30 [sym](#) (Symbol Character)

This element specifies the presence of a symbol character at the current location in the run's content. A *symbol character* is a special character within a run's content which does not use any of the run fonts specified in the `rFonts` element (§17.3.2.26) (or by the style hierarchy).

Instead, this character shall be determined by pulling the character with the hexadecimal value specified in the `char` attribute from the font specified in the `font` attribute.

[*Example*: Consider a run containing the following run content:

This is a symbol character: ☞

The last character in that run is a symbol character from the Wingdings font, and the run is specified as follows:

```
<w:r>
  <w:rPr>
    <w:rFonts w:ascii="Courier New" w:hAnsi="Courier New" />
  </w:rPr>
  <w:t>This is a symbol character:</w:t>
  <w:sym w:font="Wingdings" w:char="F03A" />
</w:r>
```

The resulting symbol is the specified using the sym element, and consists of character code 003A formatted as Wingdings, even though the run properties specify the Courier New font. *end example*]

Attributes	Description
char (Symbol Character Code)	<p>Specifies the hexadecimal code for the Unicode character value of the symbol.</p> <p>When this value is stored in the char attribute, it can be stored in either of the following two formats:</p> <ul style="list-style-type: none"> Directly in its Unicode character value from the font glyph In a Unicode character value created by adding F000 to the actual character value, shifting the character value of this character into the Unicode private use area. <p>[<i>Note:</i> The use of the latter syntax allows for interoperability with legacy word processing formats, as they used this technique to store the fact that a particular character or set of characters came from a font which was not Unicode compliant, and therefore any font matching performed on this range (if the specified font was not present) would be undesirable, as the resulting glyphs and their appearance could not be predicted. <i>end note</i>]</p> <p>[<i>Example:</i> Consider a run with a single symbol character defined as follows:</p> <pre><w:r> <w:rPr> <w:rFonts w:ascii="Arial Black" w:hAnsi="Arial Black" /> </w:rPr> <w:sym w:font="Wingdings" w:char="F045" /> </w:r></pre> <p>The symbol character must use the font defined in its font attribute and hence use the Wingdings font. The character value for the character to be used from this font is obtained by removing the F000 value from the value in the char attribute, and therefore is the character at hexadecimal position 0045 in that font. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ShortHexNumber simple type (§17.18.79).</p>
font (Symbol	Specifies a font which shall be used to format this symbol character.

Attributes	Description
Character Font)	<p>[<i>Example:</i> Consider a run with a single symbol character defined as follows:</p> <pre> <w:r> <w:rPr> <w:rFonts w:ascii="Arial Black" w:hAnsi="Arial Black" /> </w:rPr> <w:sym w:font="Wingdings" w:char="F045" /> </w:r> </pre> <p>Although the run specifies that its contents must use the <code>Arial Black</code> font, the symbol character must use the font defined in its font attribute and hence use the <code>Wingdings</code> font. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Sym](#)) is located in §A.1. *end note*]

17.3.3.31 t (Text)

This element specifies that this run contains literal text which shall be displayed in the document. The `t` element shall be used for all text runs which are not:

- Part of a region of text that is contained in a deleted region using the `del` element (§17.13.5.14)
- Part of a region of text that is contained within a field code

[*Example:* Consider a paragraph of WordprocessingML content which reads `This is text`. This paragraph would therefore be represented as follows:

```

<w:p>
  <w:r>
    <w:t>This is text</w:t>
  </w:r>
</w:p>

```

The text is contained in a `t` node. *end example*]

Attributes	Description
<p>xml:space (Content Contains Significant Whitespace)</p> <p>Namespace: <code>http://www.w3.or</code></p>	<p>Specifies how white space should be handled for the contents of this element using the W3C space preservation rules.</p> <p>[<i>Example:</i> Consider the following run contained within a WordprocessingML document:</p> <pre> <w:r> </pre>

Attributes	Description
g/XML/1998/namespaces	<p data-bbox="412 247 1112 317"><code><w:t></code> significant whitespace <code></w:t></code> <code></w:r></code></p> <p data-bbox="412 352 1451 457">Although there are three spaces on each side of the text content in the run, that whitespace has not been specifically marked as significant, therefore it is subject to the space preservation rules currently specified in that run's scope. <i>end example</i></p> <p data-bbox="412 493 1442 527">The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Text](#)) is located in §A.1. *end note*]

17.3.3.32 `tab` (Tab Character)

This element specifies that a tab character shall be placed at the current location in the run content. An *tab* is a character which is used to advance the position on the current line of text when displaying this

WordprocessingML content, using the following logic:

- When there are one or more custom tab stops defined using the `tabs` element (§17.3.1.38), then the tab character shall advance to the next custom tab stop location which is further along than the starting location of the tab
- When there are no custom tab stops which are further than the current position in the line, the tab character shall advance to the nearest multiple of the defaultTabStop element (§17.15.1.25) width value.

[Example: Consider a paragraph which contains two custom tab stops at 1.5" and 3.5", respectively. These two tab stops would be contained within a `tabs` element defining the set of tab stops of the paragraph as follows:

```
<w:pPr>
  <w:tabs>
    <w:tab w:val="start" w:pos="2160" />
    <w:tab w:val="start" w:pos="5040" />
  </w:tabs>
</w:pPr>
```

If a tab character was added to a run in this paragraph and appeared 1.4" along the line after all preceding content was laid out, then this tab would move the position to 1.5". If the tab character appeared 1.6" along the line after all preceding content was laid out, then this tab would move the position to 3.5". In both cases, the tab advanced to the next custom tab stop. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.1. *end note*]

17.3.3.33 `yearLong` (Date Block - Long Year Format)

This element specifies the presence of a date block at the current location in the run content. A *date block* is a non-editable region of text which shall display the current date filtered through the specified date picture (see

following paragraphs). [Note: The date block is a legacy construct used for compatibility with older word processors, and should not be produced unless it was consumed while reading a document – it is recommended that the DATE field is used in its place. *end note*]

A date block shall be displayed using the primary editing language of the host application, regardless of the languages specified in the parent run's lang property (§17.3.2.20).

The long year format date block shall use a date picture of YYYY, retrieving the long year format for the primary editing language.

[Example: Consider a WordprocessingML run with the following run content:

```
<w:r>
  <w:t xml:space="preserve">This is a long date: </w:t>
  <w:yearLong />
</w:r>
```

This run specifies that a long year format date block must be placed after the text string literal `This is a long date:` in the document. Assuming that the host application's primary editing language is English (Canada) and today's date is 2006-04-12, this run would be displayed as follows:

This is a long date: 2006

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.1. *end note*]

17.3.3.34 `yearShort` (Date Block - Short Year Format)

This element specifies the presence of a date block at the current location in the run content. A *date block* is a non-editable region of text which shall display the current date filtered through the specified date picture (see following paragraphs). [Note: The date block is a legacy construct used for compatibility with older word processors, and should not be produced unless it was consumed while reading a document – it is recommended that the DATE field is used in its place. *end note*]

A date block shall be displayed using the primary editing language of the host application, regardless of the languages specified in the parent run's lang property (§17.3.2.20).

The short year format date block shall use a date picture of YY, retrieving the short year format for the primary editing language.

[Example: Consider a WordprocessingML run with the following run content:

```
<w:r>
  <w:t xml:space="preserve">This is a short date: </w:t>
  <w:yearShort />
</w:r>
```

This run specifies that a short year format date block shall be placed after the text string literal `This is a short date:` in the document. Assuming that the host application's primary editing language is French (Canada) and today's date is 2006-04-12, this run would be displayed as follows:

This is a short date: 06

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.1. *end note*]

17.3.4 Border Properties (CT_Border)

This common complex type specifies the set of attributes used to define a object's border.

[*Example:* Consider the following run border:

```
<w:r>
  <w:rPr>
    <w:bdr w:val="single" w:sz="36" w:space="0" w:themeColor="accent1"
w:themeTint="66" />
  </w:rPr>
  <w:t xml:space="preserve">run one</w:t>
</w:r>
```

The `bdr` element specifies a single line border with a width of 3.5 points using the document's `accent1` theme color. *end example]*

Attributes	Description
color (Border Color)	<p>Specifies the color for this border.</p> <p>This value can be defined as either:</p> <ul style="list-style-type: none"> A color value using the RGB color model whose red, green, and blue values are written as numbers in the range 0 to 255, hex encoded, and concatenated. [<i>Example:</i> Full intensity red would be 255 red, 0 green, 0 blue, encoded to FF, 00, 00, and concatenated to FF0000. <i>end example</i>] . RGB colors are specified in the sRGB color space. auto to allow a consumer to automatically determine the border color in order to make the document's text readable. [<i>Example:</i> A document with white text and a background color of auto might result in the use of a black background, in order to ensure legibility of the content. <i>end example</i>] <p>[<i>Example:</i> Consider a border color with value auto, as follows:</p> <pre><w:bottom ... w:color="auto"/></pre> <p>This color therefore can be automatically be modified by a consumer as appropriate, for example, in order to ensure that the border can be distinguished against the page's</p>

Attributes	Description
	<p>background color. <i>end example</i></p> <p>If the border style (the <code>val</code> attribute) specifies the use of an art border, this attribute is ignored. As well, if the border specifies the use of a theme color via the <code>themeColor</code> attribute, this value is superseded by the theme color value.</p> <p>The possible values for this attribute are defined by the <code>ST_HexColor</code> simple type (§17.18.38).</p>
frame (Create Frame Effect)	<p>Specifies whether the specified border should be modified to create a frame effect by reversing the border's appearance from the edge nearest the text to the edge furthest from the text.</p> <p>If this attribute is omitted, then the border is not given any frame effect.</p> <p>[<i>Example:</i> Consider a bottom border which must appear with a frame effect, which is specified in the following WordprocessingML:</p> <pre data-bbox="451 867 919 898"><w:bottom w:frame="true" ... /></pre> <p>This frame's <code>val</code> is <code>true</code>, indicating that the border frame effect must be applied. <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_OnOff</code> simple type (§22.9.2.7).</p>
shadow (Border Shadow)	<p>Specifies whether this border should be modified to create the appearance of a shadow.</p> <p>For the right and bottom borders, this is accomplished by duplicating the border below and right of the normal border location. For the right and top borders, this is accomplished by moving the order down and to the right of its original location.</p> <p>If this attribute is omitted, then the border is not given the shadow effect.</p> <p>[<i>Example:</i> Consider a top border which must appear with a shadow effect, resulting in the following WordprocessingML:</p> <pre data-bbox="451 1482 935 1514"><w:bottom w:shadow="true" ... /></pre> <p>This frame's <code>val</code> is <code>true</code>, indicating that the shadow effect must be applied to the border. <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_OnOff</code> simple type (§22.9.2.7).</p>
space (Border Spacing Measurement)	<p>Specifies the spacing offset that shall be used to place this border on the parent object.</p> <p>When a document has a page border that is relative to the page edges (using a value of <code>page</code> in the <code>offsetFrom</code> attribute on <code>pgBorders</code> (§17.6.10)), it shall specify the distance between the edge of the page and the beginning of this border in points.</p>

Attributes	Description
	<p>When a document has a page border that is relative to the text extents (using a value of text in the offsetFrom attribute on pgBorders (§17.6.10)), or any other border type, it shall specify the distance between the edge of the object and the beginning of this border in points.</p> <p>[<i>Example:</i> Consider a document with a set of page borders all specified to appear 24 points from the edge of the page. The resulting WordprocessingML would be as follows:</p> <pre><w:pgBorders w:offsetFrom="page"> <w:bottom ... w:space="24" /> </w:pgBorders</pre> <p>The offsetFrom attribute specifies that the space value provides the offset of the page border from the page edge, and the value of the space attribute specifies that the page offset must be 24 points. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PointMeasure simple type (§17.18.68).</p>
sz (Border Width)	<p>Specifies the width of the current border.</p> <p>If the border style (val attribute) specifies a line border, the width of this border is specified in measurements of eighths of a point, with a minimum value of two (one-fourth of a point) and a maximum value of 96 (twelve points). Any values outside this range can be reassigned to a more appropriate value.</p> <p>If the border style (val attribute) specifies an art border, the width of this border is specified in measurements of points, with a minimum value of one and a maximum value of 31. Any values outside this range can be reassigned to a more appropriate value.</p> <p>[<i>Example:</i> Consider a document with a three point wide dashed line border on all sides, resulting in the following WordprocessingML markup:</p> <pre><w:top w:val="dashed" w:sz="24" .../> <w:left w:val="dashed" w:sz="24" .../> <w:bottom w:val="dashed" w:sz="24" .../> <w:right w:val="dashed" w:sz="24" .../></pre> <p>The border style is specified using the val attribute, and because that border style is a line border (dashed), the sz attribute specifies the size in eighths of a point (24 eighths of a point = 3 points). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_EighthPointMeasure simple type (§17.18.23).</p>
themeColor (Border Theme)	<p>Specifies the base theme color used to generate the border color. The border color is the RGB value associated with themeColor as further transformed by themeTint or</p>

Attributes	Description
Color)	<p>themeShade (if one is present), else the background color is the RGB value associated with themeColor.</p> <p>The specified theme color is a reference to one of the predefined theme colors, located in the document's Theme part (§14.2.7 and §20.1.6.9), which allows color information to be set centrally in the document.</p> <p>To determine the color to display, the following actions are performed:</p> <ul style="list-style-type: none"> • Using the mapping specified in the ST_ThemeColor simple type (§17.18.97), the appropriate attribute on the clrSchemeMapping element (§17.15.1.20) is read. • Using that value and the mapping specified in the ST_ColorSchemeIndex simple type (§17.18.103), the appropriate element in the document's Theme part is read to get the base theme color. • The specified color is modified based on the presence of the themeTint or themeShade attribute. <p>[<i>Example:</i> Consider a set of borders configured to use the accent2 theme color, resulting in the following WordprocessingML markup:</p> <pre><w:top ... w:themeColor="accent2" w:themeTint="99" /> <w:bottom ... w:themeColor="accent2" w:themeTint="99" /> <w:left ... w:themeColor="accent2" w:themeTint="99" /> <w:right ... w:themeColor="accent2" w:themeTint="99" /></pre> <p>If the Settings part contained the following markup:</p> <pre><w:clrSchemeMapping ... w:accent2="accent2"/></pre> <p>and the Theme part contained the following XML markup:</p> <pre><a:accent2> <a:srgbClr val="4F81BD"/> </a:accent2></pre> <p>the resulting border color would be 95B3D7 (the result of a 60% tint applied to the original theme color; see the calculations in themeTint below for details). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ThemeColor simple type (§17.18.97).</p>
themeShade (Border Theme Color Shade)	<p>Specifies the shade value applied to the supplied theme color (if any) for this border instance. If the themeColor attribute is not present, then this attribute shall not be used.</p> <p>If the themeShade is supplied, then it is applied to the RGB value of the theme color (from the theme part) to determine the final color applied to this border.</p> <p>The themeShade value is stored as a hex encoding of the shade value (from 0–255)</p>

Attributes	Description
	<p>applied to the current border.</p> <p>[<i>Example:</i> Consider a shade of 40% applied to a border in a document. This shade is calculated as follows:</p> $ \begin{aligned} S_{xml} &= 0.4 * 255 \\ &= 102 \\ &= 66(hex) \end{aligned} $ <p>The resulting themeShade value in the file format would be 66. <i>end example</i>]</p> <p>Given an RGB color defined as three hex values in RRGGBB format, the shade is applied as follows:</p> <ul style="list-style-type: none"> • Convert the color to the HSL color format (values from 0 to 1) • Modify the luminance factor as follows: $L' = L * \text{Shade}_{\text{percentage}}$ <ul style="list-style-type: none"> • Convert the resultant HSL color to RGB <p>[<i>Example:</i> Consider a document with a background using the accent2 theme color, whose RGB value (in RRGGBB hex format) is C0504D.</p> <p>The equivalent HSL color value would be $\left(\frac{1}{360}, 0.48, 0.53\right)$.</p> <p>Applying the shade formula with a shade percentage of 75% to the luminance, we get:</p> $ \begin{aligned} L' &= 0.53 * 0.75 \\ &= 0.39698 \end{aligned} $ <p>Taking the resulting HSL color value of $\left(\frac{1}{360}, 0.48, 0.39698\right)$ and converting back to RGB, we get 943634.</p> <p>This transformed value can be seen in the resulting background's color attribute:</p> <pre><w:top w:val="single" w:sz="4" w:space="24" w:color="943634" w:themeColor="accent2" w:themeShade="BF"/></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_UcharHexNumber simple type (§17.18.98).</p>
themeTint (Border Theme Color Tint)	Specifies the tint value applied to the supplied theme color (if any) for this border instance. If the themeColor attribute is not present, then this attribute shall not be used.

Attributes	Description
	<p>If the themeTint is supplied, then it is applied to the RGB value of the theme color (from the theme part) to determine the final color applied to this border.</p> <p>The themeTint value is stored as a hex encoding of the tint value (from 0–255) applied to the current border.</p> <p>[<i>Example</i>: Consider a tint of 60% applied to a border in a document. This tint is calculated as follows:</p> $\begin{aligned} T_{xml} &= 0.6 * 255 \\ &= 153 \\ &= 99(hex) \end{aligned}$ <p>The resulting themeTint value in the file format would be 99. <i>end example</i>]</p> <p>Given an RGB color defined as three hex values in RRGGBB format, the shade is applied as follows:</p> <ul style="list-style-type: none"> • Convert the color to the HSL color format (values from 0 to 1) • Modify the luminance factor as follows: $L' = L * \text{Tint}_{\text{pct}} + (1 - \text{Tint}_{\text{pct}})$ <ul style="list-style-type: none"> • Convert the resultant HSL color to RGB <p>[<i>Example</i>: Consider a document with a background using the accent2 theme color, whose RGB value (in RRGGBB hex format) is 4F81BD.</p> <p>The equivalent HSL color value would be $(\frac{213}{360}, 0.45, 0.53)$.</p> <p>Applying the tint formula with a tint percentage of 60% to the luminance, we get:</p> $\begin{aligned} L' &= 0.53 * 0.6 + (1 - .6) \\ &= 0.71 \end{aligned}$ <p>Taking the resulting HSL color value of $(\frac{213}{360}, 0.45, 0.71)$ and converting back to RGB, we get 95B3D7.</p> <p>This transformed value can be seen in the resulting background's color attribute:</p> <pre><w:top w:val="single" w:sz="4" w:space="24" w:color="95B3D7" w:themeColor="accent2" w:themeTint="99"/></pre> <p><i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_UcharHexNumber simple type (§17.18.98).
val (Border Style)	<p>Specifies the style of border used on this object.</p> <p>This border can either be an art border (a repeated image along the borders - shall only be used for page borders) or a line border (a line format repeated along the borders) - see the simple type definition for a description of each border style.</p> <p>[<i>Example:</i> Consider a left border resulting in the following WordprocessingML:</p> <pre><w:left w:val="single" .../></pre> <p>This border's val is single, indicating that the border style is a single line. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Border simple type (§17.18.2).</p>

[*Note:* The W3C XML Schema definition of this complex type's content model ([CT_Border](#)) is located in §A.1. *end note*]

17.3.5 Shading Properties (CT_Shd)

This common complex type specifies the set of attributes used to define a object's shading.

[*Example:* Consider the following paragraph shading:

```
<w:pPr>
  <w:shd w:val="pct20" w:themeColor="accent6" w:themeFill="accent3" />
</w:pPr>
```

The resulting paragraph uses the background color `accent3` under the foreground pattern color `accent6` as specified by the `pct20` pattern mask. *end example*]

Attributes	Description
color (Shading Pattern Color)	<p>Specifies the color used for any foreground pattern specified for this shading using the val attribute.</p> <p>This color can either be presented as a hex value (in RRGGBB format), or auto to allow a consumer to automatically determine the foreground shading color as appropriate.</p> <p>If the shading style (the val attribute) specifies the use of no shading format or is omitted, then this property has no effect. Also, if the shading specifies the use of a theme color via the themeColor attribute, then this value is superseded by the theme color value.</p>

Attributes	Description
	<p>If this attribute is omitted, then its value shall be assumed to be auto.</p> <p>[<i>Example:</i> Consider a shading of style <code>pct20</code> with a foreground color value of <code>auto</code>, as follows:</p> <pre><w:shd w:val="pct20"... w:color="auto"/></pre> <p>The foreground color for this shading pattern therefore can be automatically be modified by a consumer as appropriate, for example, in order to ensure that the shading color can be distinguished against the page's background color. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_HexColor</code> simple type (§17.18.38).</p>
fill (Shading Background Color)	<p>Specifies the color used for the background for this shading.</p> <p>This color can either be presented as a hex value (in <code>RRGGBB</code> format), or <code>auto</code> to allow a consumer to automatically determine the background shading color as appropriate.</p> <p>If this attribute is omitted, then its value shall be assumed to be auto.</p> <p>[<i>Example:</i> Consider a shading using a background color of hex value <code>C3D69B</code>, using the following WordprocessingML:</p> <pre><w:shd w:val="pct15" w:fill="C3D69B" /></pre> <p>The background color for this shading therefore is a color with a hex value of <code>C3D69B</code>. <i>end example</i>]</p> <p>If the shading specifies the use of a theme color via the <code>themeFill</code> attribute, then this value is superseded by the theme color value.</p> <p>The possible values for this attribute are defined by the <code>ST_HexColor</code> simple type (§17.18.38).</p>
themeColor (Shading Pattern Theme Color)	<p>Specifies a theme color which should be applied to any foreground pattern specified for this shading using the <code>val</code> attribute.</p> <p>The specified theme color is a reference to one of the predefined theme colors, located in the document's themes part, which allows for color information to be set centrally in the document.</p> <p>If this element is omitted, then no theme color is applied, and the color attribute shall be used to determine the shading pattern color.</p> <p>[<i>Example:</i> Consider a paragraph which must have a background consisting of a theme</p>

Attributes	Description
	<p>color accent3 with a theme color accent6 overlaid using a 20% fill pattern. This requirement is specified using the following WordprocessingML:</p> <pre><w:pPr> <w:shd w:val="pct20" w:themeColor="accent6" w:themeFill="accent3" /> </w:pPr></pre> <p>The resulting paragraph uses the foreground pattern color accent6 in the region specified by the pct20 pattern mask. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_ThemeColor simple type (§17.18.97).</p>
themeFill (Shading Background Theme Color)	<p>Specifies a theme color which should be applied to the background for this shading.</p> <p>The specified theme color is a reference to one of the predefined theme colors, located in the document's themes part, which allows for color information to be set centrally in the document.</p> <p>If this element is omitted, then no theme color is applied, and the color attribute shall be used to determine the shading background color.</p> <p>[<i>Example:</i> Consider a paragraph which must have a background consisting of a theme color accent3 with a theme color accent6 overlaid using a 20% fill pattern. This requirement is specified using the following WordprocessingML:</p> <pre><w:shd w:val="pct20" w:themeColor="accent6" w:themeFill="accent3" /></pre> <p>The resulting shading uses the background color specified by the accent3 theme color. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_ThemeColor simple type (§17.18.97).</p>
themeFillShade (Shading Background Theme Color Shade)	<p>Specifies the shade value applied to the supplied theme color (if any) for this shading color.</p> <p>If the themeFillShade is supplied, then it is applied to the RGB value of the themeFill color (from the theme part) to determine the final color applied to this border.</p> <p>The themeFillShade value is stored as a hex encoding of the shade value (from 0 to 255) applied to the current border.</p> <p>[<i>Example:</i> Consider a shade of 40% applied to a background shading color in a document. This shade is calculated as follows:</p>

Attributes	Description
	$S_{xml} = 0.4 * 255$ $= 102$ $= 66(hex)$ <p>The resulting themeFillShade value in the file format would be 66. <i>end example]</i></p> <p>Given an RGB color defined as three hex values in RRGGBB format, the shade is applied as follows:</p> <ul style="list-style-type: none"> • Convert the color to the HSL color format (values from 0 to 1) • Modify the luminance factor as follows: $L' = L * Shade_{percentage}$ <ul style="list-style-type: none"> • Convert the resultant HSL color to RGB <p>[<i>Example:</i> Consider a document with a background using the accent2 theme color, whose RGB value (in RRGGBB hex format) is C0504D.</p> <p>The equivalent HSL color value would be $(\frac{1}{360}, 0.48, 0.53)$.</p> <p>Applying the shade formula with a shade percentage of 75% to the luminance, we get:</p> $L' = 0.53 * 0.75$ $= 0.39698$ <p>Taking the resulting HSL color value of $(\frac{1}{360}, 0.48, 0.39698)$ and converting back to RGB, we get 943634.</p> <p>This transformed value can be seen in the resulting shading's fill attribute:</p> <pre><w:shd w:val="pct15" w:fill="943634" w:themeFill="accent2" w:themeFillShade="BF" /></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_UcharHexNumber simple type (§17.18.98).</p>
themeFillTint (Shading Background Theme Color Tint)	<p>Specifies the tint value applied to the supplied theme color (if any) for this shading instance.</p> <p>If the themeFillTint is supplied, then it is applied to the RGB value of the themeFill color (from the theme part) to determine the final color applied to this border.</p> <p>The themeFillTint value is stored as a hex encoding of the tint value (from 0 to 255) applied to the current border.</p>

Attributes	Description
	<p>[<i>Example:</i> Consider a tint of 60% applied to a border in a document. This tint is calculated as follows:</p> $ \begin{aligned} T_{xml} &= 0.6 * 255 \\ &= 153 \\ &= 99(hex) \end{aligned} $ <p>The resulting themeFillTint value in the file format would be 99. <i>end example</i>]</p> <p>Given an RGB color defined as three hex values in RRGGBB format, the shade is applied as follows:</p> <ul style="list-style-type: none"> • Convert the color to the HSL color format (values from 0 to 1) • Modify the luminance factor as follows: $L' = L * \text{Tint}_{pct} + (1 - \text{Tint}_{pct})$ <ul style="list-style-type: none"> • Convert the resultant HSL color to RGB <p>[<i>Example:</i> Consider a document with a background using the accent2 theme color, whose RGB value (in RRGGBB hex format) is 4F81BD.</p> <p>The equivalent HSL color value would be $(\frac{213}{360}, 0.45, 0.53)$.</p> <p>Applying the tint formula with a tint percentage of 60% to the luminance, we get:</p> $ \begin{aligned} L' &= 0.53 * 0.6 + (1 - .6) \\ &= 0.71 \end{aligned} $ <p>Taking the resulting HSL color value of $(\frac{213}{360}, 0.45, 0.71)$ and converting back to RGB, we get 95B3D7.</p> <p>This transformed value can be seen in the resulting shading's fill attribute:</p> <pre> <w:top w:val="single" w:sz="4" w:space="24" w:fill="95B3D7" w:themeFillColor="accent2" w:themeFillTint="99" /> </pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_UcharHexNumber simple type (§17.18.98).</p>
themeShade (Shading Pattern Theme Color Shade)	Specifies the shade value applied to the supplied theme color (if any) for this shading color.

Attributes	Description
	<p>If the themeShade is supplied, then it is applied to the RGB value of the themeColor color (from the theme part) to determine the final color applied to this border.</p> <p>The themeShade value is stored as a hex encoding of the shade value (from 0 to 255) applied to the current border.</p> <p>[<i>Example</i>: Consider a shade of 40% applied to a background shading color in a document. This shade is calculated as follows:</p> $ \begin{aligned} S_{xml} &= 0.4 * 255 \\ &= 102 \\ &= 66(hex) \end{aligned} $ <p>Te resulting themeShade value in the file format would be 66. <i>end example</i>]</p> <p>Given an RGB color defined as three hex values in RRGGBB format, the shade is applied as follows:</p> <ul style="list-style-type: none"> • Convert the color to the HSL color format (values from 0 to 1) • Modify the luminance factor as follows: $L' = L * \text{Shade}_{\text{percentage}}$ <ul style="list-style-type: none"> • Convert the resultant HSL color to RGB <p>[<i>Example</i>: Consider a document with a background using the accent2 theme color, whose RGB value (in RRGGBB hex format) is C0504D.</p> <p>The equivalent HSL color value would be $\left(\frac{1}{360}, 0.48, 0.53\right)$.</p> <p>Applying the shade formula with a shade percentage of 75% to the luminance, we get:</p> $ \begin{aligned} L' &= 0.53 * 0.75 \\ &= 0.39698 \end{aligned} $ <p>Taking the resulting HSL color value of $\left(\frac{1}{360}, 0.48, 0.39698\right)$ and converting back to RGB, we get 943634.</p> <p>This transformed value can be seen in the resulting background's color attribute:</p> <pre><w:shd w:val="pct15" w:color="943634" w:themeColor="accent2" w:themeShade="BF" /></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_UcharHexNumber simple</p>

Attributes	Description
	type (§17.18.98).
themeTint (Shading Pattern Theme Color Tint)	<p>Specifies the tint value applied to the supplied theme color (if any) for this shading instance.</p> <p>If the themeTint is supplied, then it is applied to the RGB value of the themeColor color (from the theme part) to determine the final color applied to this border.</p> <p>The themeTint value is stored as a hex encoding of the tint value (from 0 to 255) applied to the current border.</p> <p>[<i>Example:</i> Consider a tint of 60% applied to a border in a document. This tint is calculated as follows:</p> $ \begin{aligned} T_{xml} &= 0.6 * 255 \\ &= 153 \\ &= 99(hex) \end{aligned} $ <p>The resulting themeTint value in the file format would be 99. <i>end example</i>]</p> <p>Given an RGB color defined as three hex values in RRGGBB format, the shade is applied as follows:</p> <ul style="list-style-type: none"> • Convert the color to the HSL color format (values from 0 to 1) • Modify the luminance factor as follows: $L' = L * \text{Tint}_{pct} + (1 - \text{Tint}_{pct})$ <ul style="list-style-type: none"> • Convert the resultant HSL color to RGB <p>[<i>Example:</i> Consider a document with a background using the accent2 theme color, whose RGB value (in RRGGBB hex format) is 4F81BD.</p> <p>The equivalent HSL color value would be $\left(\frac{213}{360}, 0.45, 0.53\right)$.</p> <p>Applying the tint formula with a tint percentage of 60% to the luminance, we get:</p> $ \begin{aligned} L' &= 0.53 * 0.6 + (1 - .6) \\ &= 0.71 \end{aligned} $ <p>Taking the resulting HSL color value of $\left(\frac{213}{360}, 0.45, 0.71\right)$ and converting back to RGB, we get 95B3D7.</p> <p>This transformed value can be seen in the resulting shading's color attribute:</p> <pre><w:shd w:val="pct15" w:color="95B3D7" w:themeColor="accent2" w:themeTint="99" /></pre>

Attributes	Description
	<p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_UcharHexNumber simple type (§17.18.98).</p>
val (Shading Pattern)	<p>Specifies the pattern which shall be used to lay the pattern color over the background color for this paragraph shading.</p> <p>This pattern consists of a mask which is applied over the background shading color to get the locations where the pattern color should be shown. Each of these possible masks are shown in the simple type values referenced below.</p> <p>[<i>Example:</i> Consider a shaded paragraph which uses a 10 percent foreground fill, resulting in the following WordprocessingML:</p> <pre data-bbox="451 793 857 825"><w:shd w:val="pct10" ... /></pre> <p>This shading val is <code>pct10</code>, indicating that the border style is a 10 percent foreground fill mask. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Shdc simple type (§17.18.78).</p>

[*Note:* The W3C XML Schema definition of this complex type's content model ([CT_Shdc](#)) is located in §A.1. *end note]*

17.4 Tables

Another form of block-level content in WordprocessingML, a *table* is a set of paragraphs (and other block-level content) arranged in *rows* and *columns*. Tables in WordprocessingML are defined via the `tbl` element, which is analogous to the HTML `<table>` tag. The table element specifies the location of a table present in the document.

A `tbl` element (§17.4.37) has two elements that define its properties:

- `tblPr` (§17.4.59), which defines the set of table-wide properties (such as style and width)
- `tblGrid` (§17.4.48), which defines the grid layout of the table.

A `tbl` element can also contain an arbitrary non-zero number of rows, where each row is specified with a `tr` element (§17.4.78). Each `tr` element can contain an arbitrary non-zero number of cells, where each cell is specified with a `tc` element (§17.4.65).

[*Example:* Consider an empty one-cell table (i.e.; a table with one row, one column) and 1 point borders on all sides as follows:

This table is represented by the following WordprocessingML:

```
<w:tbl>
  <w:tblPr>
    <w:tblW w:w="5000" w:type="pct"/>
    <w:tblBorders>
      <w:top w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:start w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:bottom w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:end w:val="single" w:sz="4" w:space="0" w:color="auto"/>
    </w:tblBorders>
  </w:tblPr>
  <w:tblGrid>
    <w:gridCol w:w="10296"/>
  </w:tblGrid>
  <w:tr>
    <w:tc>
      <w:tcPr>
        <w:tcW w:w="0" w:type="auto"/>
      </w:tcPr>
      <w:p/>
    </w:tc>
  </w:tr>
</w:tbl>
```

This table specifies table-wide properties of 100% of page width using the `tblW` element and the set of table borders using the `tblBorders` element, the table grid which defines a set of shared vertical edges within the table using the `tblGrid` element, and a single row using the `tr` element. *end example*

17.4.1 **bidirectional (Visually Right to Left Table)**

This element specifies that the cells with this table shall be visually represented in a right to left direction. This element also affects the application of all table-level properties.

When this property is specified, then the ordering of all cells (and table-level properties) in this table shall be applied to the table assuming that the table is a normal left to right table, but the table cells shall be displayed in a right to left direction. *[Example: A left border on the first table cell must be displayed on the right side of that cell (which would be the rightmost cell) in a visually right to left table. end example]*

If this element is omitted, then the table shall not be presented right to left.

[Example: Consider the following table which has the logical right to left property set:

	Three	Two	One

This property would be specified in the WordprocessingML as follows:

```
<w:tblPr>
  <w:bidirectional/>
</w:tblPr>
```

Since the bidirectional element specifies this is a visually right to left table, the actual table data would be stored in its logical order as follows:

```
<w:tr>
  <w:tc>
    <w:p>
      <w:r>
        <w:t>One</w:t>
      </w:r>
    </w:p>
  </w:tc>
  <w:tc>
    <w:p>
      <w:r>
        <w:t>Two</w:t>
      </w:r>
    </w:p>
  </w:tc>
  <w:tc>
    <w:p>
      <w:r>
        <w:t>Three</w:t>
      </w:r>
    </w:p>
  </w:tc>
  <w:tc>
    <w:p/>
  </w:tc>
</w:tr>
```

The first logical cell with text One is stored first in the file format, and displayed on the rightmost in this table visually. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.4.2 **bottom (Table Cell Bottom Margin Exception)**

This element specifies the amount of space which shall be left between the bottom extent of the cell contents and the border of a specific table cell within a table. This setting shall override the table cell bottom margin definition specified by the bottom element contained within the table properties (§17.4.5).

This value is specified in the units applied via its type attribute. Any width value of type pct or auto for this element shall be ignored.

If omitted, then this table cell shall use the bottom cell margins defined in the bottom element contained within the table properties (§17.4.5).

[*Example:* Consider a table with two cells in which the first table cell's bottom margin is specified via an exception to be ten times larger (0.2 inches vs. 0.02 inches) than the other table cell margins:

This text fills the extents of the cell.
So does this

The first cell in the table would be specified using the following WordprocessingML:

```
<w:tc>
  <w:tcPr>
    <w:tcMar>
      <w:bottom w:w="288" w:type="dxa" />
    </w:tcMar>
  </w:tcPr>
</w:tc>
```

The first cell in this table has an exception applied to the table cell bottom cell margin setting it to 288 twentieths of a point (0.2 inches). *end example*

This element's content model is defined by the common table measurement definition in §17.4.87.

17.4.3 **bottom (Table Cell Bottom Border)**

This element specifies the border which shall be displayed at the bottom of the current table cell. The appearance of this table cell border in the document shall be determined by the following settings:

- If the net tblCellSpacing element value (§17.4.44;§17.4.43;§17.4.45) applied to the cell is non-zero, then the cell border shall always be displayed
- Otherwise, the display of the border is subject to the conflict resolution algorithm defined by the tcBorders element (§17.4.66) and the tblBorders element (§17.4.39;§17.4.38)

If this element is omitted, then the bottom of this table cell shall not have a cell border, and its border can use the table's border settings as appropriate.

[Example: Consider a table in which the first cell in the first row specifies a bottom cell border

R1C1	R1C2
R2C1	R2C2

This bottom cell border is specified using the following WordprocessingML:

```
<w:tc>
  <w:tcPr>
    ...
    <w:tcBorders>
      <w:bottom w:val="thinThickThinSmallGap" w:sz="24" w:space="0"
w:color="FF0000"/>
    </w:tcBorders>
  </w:tcPr>
<w:p/>
</w:tc>
```

The bottom element specifies a three point border of type thinThinThickSmallGap. *end example]*

This element's content model is defined by the common border properties definition in §17.3.4.

17.4.4 bottom (Table Bottom Border)

This element specifies the border which shall be displayed at the bottom of the current table. The appearance of this table border in the document shall be determined by the following settings:

- The display of the border is subject to the conflict resolution algorithm defined by the tcBorders element (§17.4.66) and the tblBorders element (§17.4.39;§17.4.38)

If this element is omitted, then the bottom of this table shall have the border specified by the associated table style. If no bottom border is specified in the style hierarchy, then this table shall not have a bottom border.

[Example: Consider a table in which the table properties specifies a bottom table border, as follows:

R1C1	R1C2
R2C1	R2C2

This bottom table border is specified using the following WordprocessingML:


```

<w:tbl>
  <w:tblPr>
    <w:tblBorders>
      <w:bottom w:val="thinThickThinMediumGap" w:sz="24" w:space="0"
w:color="D0D0D0" w:themeColor="accent3" w:themeTint="99"/>
    </w:tblBorders>
  </w:tblPr>
  ...
</w:tbl>

```

The bottom element specifies a three point bottom table border of type thinThinThickMediumGap. *end example]*

This element's content model is defined by the common border properties definition in §17.3.4.

17.4.5 bottom (Table Cell Bottom Margin Default)

This element specifies the amount of space which shall be left between the bottom extent of the cell contents and the border of all table cells within the parent table (or table row). This setting can be overridden by the table cell bottom margin definition specified by the bottom element contained within the table cell's properties (§17.4.2).

This value is specified in the units applied via its type attribute. Any width value of type pct or auto for this element shall be ignored.

If this element is omitted, then it shall inherit the table cell margin from the associated table style. If a bottom margin is never specified in the style hierarchy, then this table shall have no bottom cell padding by default (excepting individual cell overrides).

[*Example:* Consider a two by two table in which the default table cell bottom margin is specified to be exactly 0.25 inches, as follows (marked with an arrow in the first table cell below):

R1C1	R2C1
R2C1	R2C2

This table property is specified using the following WordprocessingML markup:

```
<w:tbl>
  <w:tblPr>
    <w:tblCellMar>
      <w:bottom w:w="360" w:type="dxa"/>
    </w:tblCellMar>
  </w:tblPr>
  ...
</w:tbl>
```

Every cell in the table has a default cell margin setting it to 360 twentieths of a point. *end example*]

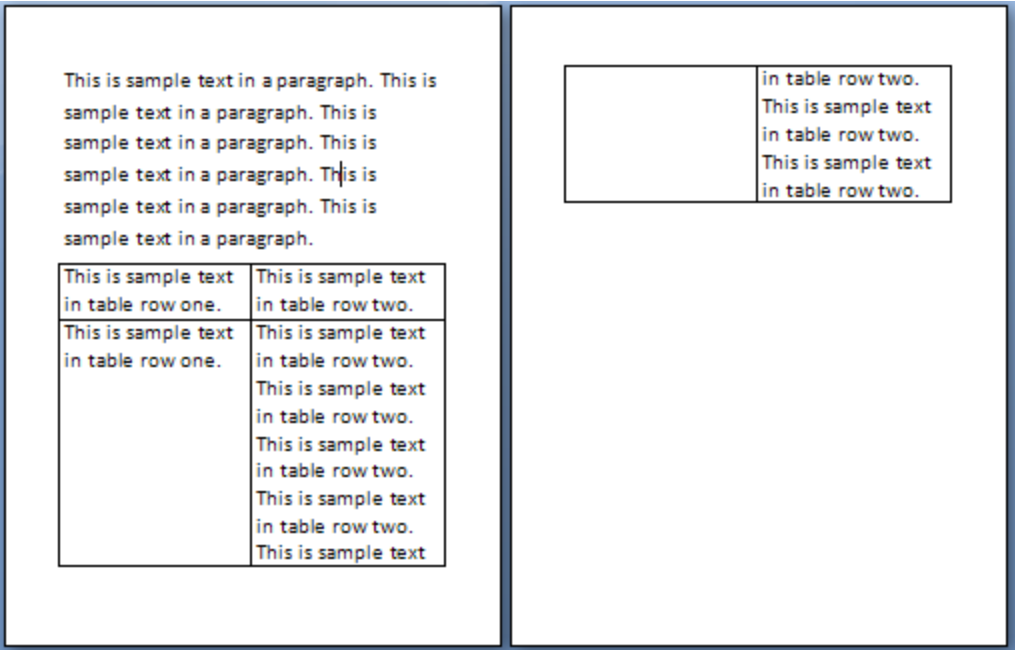
This element’s content model is defined by the common table measurement definition in §17.4.87.

17.4.6 cantSplit (Table Row Cannot Break Across Pages)

This element specifies whether the contents within the current cell shall be rendered on a single page. When displaying the contents of a table cell (such as the table cells in ECMA-376), it is possible that a page break would fall within the contents of a table cell, causing the contents of that cell to be displayed across two different pages. If this property is set, then all contents of a table row shall be rendered on the same page by moving the start of the current row to the start of a new page if necessary. If the contents of this table row cannot fit on a single page, then this row shall start on a new page and flow onto multiple pages as necessary.

If this element is not present, the default behavior is dictated by the setting in the associated table style. If this property is not specified in the style hierarchy, then this table row shall be allowed to split across multiple pages.

[Example: Consider the following content displayed on two different pages of a WordprocessingML document:



When this content is displayed, the contents of the 2nd table row in this document are displayed across two different pages. If the contents of this row are to be displayed on one page, then this requirement would be specified as follows:

```
<w:tr>
  <w:trPr>
    ...
    <w:cantSplit />
  </w:trPr>
  ...
</w:tr>
```

The presence of the `cantSplit` element specifies that the table row must not be broken across multiple pages, therefore the second table row starts on a new page:

<p>This is sample text in a paragraph. This is sample text in a paragraph. This is sample text in a paragraph. This is sample text in a paragraph. This is sample text in a paragraph.</p> <table> <tr> <td>This is sample text in table row one.</td> <td>This is sample text in table row two.</td> </tr> </table>	This is sample text in table row one.	This is sample text in table row two.	<table> <tr> <td>This is sample text in table row one.</td> <td> <p>This is sample text in table row two.</p> <p>This is sample text in table row two.</p> <p>This is sample text in table row two.</p> <p>This is sample text in table row two.</p> <p>This is sample text in table row two.</p> <p>This is sample text in table row two.</p> <p>This is sample text in table row two.</p> <p>This is sample text in table row two.</p> </td> </tr> </table>	This is sample text in table row one.	<p>This is sample text in table row two.</p> <p>This is sample text in table row two.</p> <p>This is sample text in table row two.</p> <p>This is sample text in table row two.</p> <p>This is sample text in table row two.</p> <p>This is sample text in table row two.</p> <p>This is sample text in table row two.</p> <p>This is sample text in table row two.</p>
This is sample text in table row one.	This is sample text in table row two.				
This is sample text in table row one.	<p>This is sample text in table row two.</p> <p>This is sample text in table row two.</p> <p>This is sample text in table row two.</p> <p>This is sample text in table row two.</p> <p>This is sample text in table row two.</p> <p>This is sample text in table row two.</p> <p>This is sample text in table row two.</p> <p>This is sample text in table row two.</p>				

This setting therefore ensures that the content is always displayed on a single page (if it fits on one page). *end example]*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.4.7 **cnfStyle (Table Row Conditional Formatting)**

This element specifies the set of conditional table style formatting properties which have been applied to this table row. [Note: This property is an optimization which is used by consumers to determine if a given property on a table row is the result of the table style conditional formatting properties vs. direct formatting on the table cell itself. It specifies the components of the conditional formatting in the table style applied to this cell, so that the table's conditional formatting can be applied after the document is displayed without having the table style properties override the style hierarchy. *end note]*

If this element is omitted, then its value shall be assumed to be zero for all entries in the bit mask.

[*Example:* Consider a table row in the top of a table with a table style applied. This table cell would need to specify the following WordprocessingML to express that fact:

```
<w:tr>
  <w:trPr>
    <w:cnfStyle w:firstRow="true" />
    ...
  </w:trPr>
  ...
</w:tr>
```

This table row specifies that it has the conditional properties from the table style for the first row of the parent table by setting the appropriate attribute value. *end example]*

Attributes	Description
<p>evenHBand (Even Numbered Horizontal Band)</p>	<p>Specifies that the object has inherited the conditional properties applied to the even numbered horizontal bands of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the second row of a table with a table style applied, and where the band width is one row. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:evenHBand="true" /> ... </w:pPr> ... </w:p></pre> <p>This paragraph specifies that it has the conditional properties from the table style for the even numbered horizontal bands of the parent table. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
<p>evenVBand (Even Numbered Vertical Band)</p>	<p>Specifies that the object has inherited the conditional properties applied to the even numbered vertical bands of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the second column of a table with a table style applied, and where the band width is one column. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:evenVBand="true" /> ...</pre>

Attributes	Description
	<pre> </w:pPr> ... </w:p> </pre> <p>This paragraph specifies that it has the conditional properties from the table style for the even numbered vertical bands of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
firstColumn (First Column)	<p>Specifies that the object has inherited the conditional properties applied to the first column of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the first column of a table with a table style applied. This paragraph would need to specify the following WordprocessingML:</p> <pre> <w:p> <w:pPr> <w:cnfStyle w:firstColumn="true" /> ... </w:pPr> ... </w:p> </pre> <p>This paragraph specifies that it has the conditional properties from the table style for the first column of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
firstRow (First Row)	<p>Specifies that the object has inherited the conditional properties applied to the first row of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the top row of a table with a table style applied. This paragraph would need to specify the following WordprocessingML:</p> <pre> <w:p> <w:pPr> <w:cnfStyle w:firstRow="true" /> ... </w:pPr> ... </w:p> </pre> <p>This paragraph specifies that it has the conditional properties from the table style for the first row of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
firstRowFirstColumn (First Row and	<p>Specifies that the object has inherited the conditional properties applied to the cell that is in the first row and first column of the parent object.</p>

Attributes	Description
First Column)	<p>[<i>Example:</i> Consider a paragraph in the first row and first column of a table. This paragraph would need to specify the following WordprocessingML:</p> <pre> <w:p> <w:pPr> <w:cnfStyle w:firstRow="true" w:firstColumn="true" w:firstRowFirstColumn="true" /> ... </w:pPr> ... </w:p> </pre> <p>This paragraph specifies that it has the conditional properties from the table style for the cell in the first row and first column of the parent table. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
firstRowLastColumn (First Row and Last Column)	<p>Specifies that the object has inherited the conditional properties applied to the cell that is in the first row and last column of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the first row and last column of a table. This paragraph would need to specify the following WordprocessingML:</p> <pre> <w:p> <w:pPr> <w:cnfStyle w:firstRow="true" w:lastColumn="true" w:firstRowLastColumn="true" /> ... </w:pPr> ... </w:p> </pre> <p>This paragraph specifies that it has the conditional properties from the table style for the cell in the first row and last column of the parent table. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
lastColumn (Last Column)	<p>Specifies that the object has inherited the conditional properties applied to the last column of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the last column of a table with a table style applied. This paragraph would need to specify the following WordprocessingML:</p> <pre> <w:p> <w:pPr> <w:cnfStyle w:lastColumn="true" /> ... </pre>

Attributes	Description
	<pre> </w:pPr> ... </w:p> </pre> <p>This paragraph specifies that it has the conditional properties from the table style for the last column of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
lastRow (Last Row)	<p>Specifies that the object has inherited the conditional properties applied to the last row of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the bottom row of a table with a table style applied. This paragraph would need to specify the following WordprocessingML:</p> <pre> <w:p> <w:pPr> <w:cnfStyle w:lastRow="true" /> ... </w:pPr> ... </w:p> </pre> <p>This paragraph specifies that it has the conditional properties from the table style for the last row of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
lastRowFirstColumn (Last Row and First Column)	<p>Specifies that the object has inherited the conditional properties applied to the cell that is in the last row and first column of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the last row and first column of a table. This paragraph would need to specify the following WordprocessingML:</p> <pre> <w:p> <w:pPr> <w:cnfStyle w:lastRow="true" w:firstColumn="true" w:lastRowFirstColumn="true" /> ... </w:pPr> ... </w:p> </pre> <p>This paragraph specifies that it has the conditional properties from the table style for the cell in the last row and first column of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
lastRowLastColumn	<p>Specifies that the object has inherited the conditional properties applied to the cell that</p>

Attributes	Description
n (Last Row and Last Column)	<p>is in the last row and last column of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the last row and last column of a table. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:lastRow="true" w:lastColumn="true" w:lastRowLastColumn="true" /> ... </w:pPr> ... </w:p></pre> <p>This paragraph specifies that it has the conditional properties from the table style for the cell in the last row and last column of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
oddHBand (Odd Numbered Horizontal Band)	<p>Specifies that the object has inherited the conditional properties applied to the odd numbered horizontal bands of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the third row of a table with a table style applied, and where the band width is one column. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:oddHBand="true" /> ... </w:pPr> ... </w:p></pre> <p>This paragraph specifies that it has the conditional properties from the table style for the odd numbered horizontal bands of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
oddVBand (Odd Numbered Vertical Band)	<p>Specifies that the object has inherited the conditional properties applied to the odd numbered vertical bands of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the third column of a table with a table style applied, and where the band width is one column. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr></pre>

Attributes	Description
	<pre> <w:cnfStyle w:oddVBand="true" /> ... </w:pPr> ... </w:p> </pre> <p>This paragraph specifies that it has the conditional properties from the table style for the odd numbered vertical bands of the parent table. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Cnf](#)) is located in §A.1. *end note*]

17.4.8 cnfStyle (Table Cell Conditional Formatting)

This element specifies the set of conditional table style formatting properties which have been applied to this table cell. [Note: This property is an optimization which is used by consumers to determine if a given property on a table cell is the result of the table style conditional formatting properties vs. direct formatting on the table cell itself. It specifies the components of the conditional formatting in the table style applied to this cell, so that the table's conditional formatting can be applied after the document is displayed without having the table style properties override the style hierarchy. *end note*]

If this element is omitted, then its value shall be assumed to be zero for all entries in the bit mask.

[Example: Consider a table cell in the top right corner of a table with a table style applied and where the table is formatted as left to right. This table cell would need to specify the following WordprocessingML to express that fact:

```

<w:tc>
  <w:tcPr>
    <w:cnfStyle w:firstRow="true" w:lastColumn="true"
w:firstRowLastColumn="true" />
    ...
  </w:tcPr>
  ...
</w:tc>

```

This table cell specifies that it has the conditional properties from the table style for the first column, first row, and the top right corner of the parent table by setting the appropriate attributes. *end example*]

Attributes	Description
evenHBand (Even Numbered Horizontal Band)	Specifies that the object has inherited the conditional properties applied to the even numbered horizontal bands of the parent object.

Attributes	Description
	<p>[<i>Example:</i> Consider a paragraph in the second row of a table with a table style applied, and where the band width is one row. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:evenHBand="true" /> ... </w:pPr> ... </w:p></pre> <p>This paragraph specifies that it has the conditional properties from the table style for the even numbered horizontal bands of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
evenVBand (Even Numbered Vertical Band)	<p>Specifies that the object has inherited the conditional properties applied to the even numbered vertical bands of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the second column of a table with a table style applied, and where the band width is one column. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:evenVBand="true" /> ... </w:pPr> ... </w:p></pre> <p>This paragraph specifies that it has the conditional properties from the table style for the even numbered vertical bands of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
firstColumn (First Column)	<p>Specifies that the object has inherited the conditional properties applied to the first column of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the first column of a table with a table style applied. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:firstColumn="true" /> ... </w:pPr></pre>

Attributes	Description
	<p>...</p> <p></w:p></p> <p>This paragraph specifies that it has the conditional properties from the table style for the first column of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
firstRow (First Row)	<p>Specifies that the object has inherited the conditional properties applied to the first row of the parent object.</p> <p>[<i>Example</i>: Consider a paragraph in the top row of a table with a table style applied. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:firstRow="true" /> ... </w:pPr> ... </w:p></pre> <p>This paragraph specifies that it has the conditional properties from the table style for the first row of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
firstRowFirstColumn (First Row and First Column)	<p>Specifies that the object has inherited the conditional properties applied to the cell that is in the first row and first column of the parent object.</p> <p>[<i>Example</i>: Consider a paragraph in the first row and first column of a table. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:firstRow="true" w:firstColumn="true" w:firstRowFirstColumn="true" /> ... </w:pPr> ... </w:p></pre> <p>This paragraph specifies that it has the conditional properties from the table style for the cell in the first row and first column of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
firstRowLastColumn (First Row and	<p>Specifies that the object has inherited the conditional properties applied to the cell that is in the first row and last column of the parent object.</p>

Attributes	Description
Last Column)	<p>[<i>Example:</i> Consider a paragraph in the first row and last column of a table. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:firstRow="true" w:lastColumn="true" w:firstRowLastColumn="true" /> ... </w:pPr> ... </w:p></pre> <p>This paragraph specifies that it has the conditional properties from the table style for the cell in the first row and last column of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
lastColumn (Last Column)	<p>Specifies that the object has inherited the conditional properties applied to the last column of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the last column of a table with a table style applied. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:lastColumn="true" /> ... </w:pPr> ... </w:p></pre> <p>This paragraph specifies that it has the conditional properties from the table style for the last column of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
lastRow (Last Row)	<p>Specifies that the object has inherited the conditional properties applied to the last row of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the bottom row of a table with a table style applied. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:lastRow="true" /> ... </w:pPr></pre>

Attributes	Description
	<p>...</p> <p></w:p></p> <p>This paragraph specifies that it has the conditional properties from the table style for the last row of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
lastRowFirstColumn (Last Row and First Column)	<p>Specifies that the object has inherited the conditional properties applied to the cell that is in the last row and first column of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the last row and first column of a table. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:lastRow="true" w:firstColumn="true" w:lastRowFirstColumn="true" /> ... </w:pPr> ... </w:p></pre> <p>This paragraph specifies that it has the conditional properties from the table style for the cell in the last row and first column of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
lastRowLastColumn (Last Row and Last Column)	<p>Specifies that the object has inherited the conditional properties applied to the cell that is in the last row and last column of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the last row and last column of a table. This paragraph would need to specify the following WordprocessingML:</p> <pre><w:p> <w:pPr> <w:cnfStyle w:lastRow="true" w:lastColumn="true" w:lastRowLastColumn="true" /> ... </w:pPr> ... </w:p></pre> <p>This paragraph specifies that it has the conditional properties from the table style for the cell in the last row and last column of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
oddHBand (Odd	Specifies that the object has inherited the conditional properties applied to the odd

Attributes	Description
Numbered Horizontal Band)	<p>numbered horizontal bands of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the third row of a table with a table style applied, and where the band width is one column. This paragraph would need to specify the following WordprocessingML:</p> <pre> <w:p> <w:pPr> <w:cnfStyle w:oddHBand="true" /> ... </w:pPr> ... </w:p> </pre> <p>This paragraph specifies that it has the conditional properties from the table style for the odd numbered horizontal bands of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
oddVBand (Odd Numbered Vertical Band)	<p>Specifies that the object has inherited the conditional properties applied to the odd numbered vertical bands of the parent object.</p> <p>[<i>Example:</i> Consider a paragraph in the third column of a table with a table style applied, and where the band width is one column. This paragraph would need to specify the following WordprocessingML:</p> <pre> <w:p> <w:pPr> <w:cnfStyle w:oddVBand="true" /> ... </w:pPr> ... </w:p> </pre> <p>This paragraph specifies that it has the conditional properties from the table style for the odd numbered vertical bands of the parent table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Cnf](#)) is located in §A.1. *end note*]

17.4.9 divId (Associated HTML div ID)

This element specifies the HTML div information which is associated with the current table row. This information, stored in the Web Settings part, is used to associate one or more table rows with a particular HTML div element. [*Note:* This property is used when saving an HTML document into the WordprocessingML format

in order to prevent a loss of all HTML `div` information, so that the document can later be saved back into HTML format and have the stored information replaced, since the HTML `div` can store formatting properties on arbitrary regions. *end note*

In order to determine the associated HTML `div` properties, the value of the `val` attribute on this element is used to look up an associated `div` element (§17.15.2.8) whose `id` attribute matches this value.

If this table row does not have a `divId` element present, then this table row shall not have any associated HTML `div` information. If this element is present, but the `val` attribute specifies an `id` value which does not have an associated `div` element, then this element is ignored.

[*Example:* Consider an HTML document defined as follows:

```
<html>
  <body>
    <div style="...">
      <table>
        <tr>
          <td>R1C1</td>
          ...
        </tr>
      </table>
      <p>
        ...
      </p>
    </div>
    ...
  </body>
</html>
```

This HTML document specifies a `div` spanning the table and the first paragraph. If this document is saved into WordprocessingML, then both the rows of the table and the paragraph must have a `divId` which points at the same `div` information in the web settings part:

```
<w:trPr>
  ...
  <w:divId w:val="1102603671"/>
</w:trPr>
```

The `val` attribute then points at a `div` element which stores the associated `div` properties:

```
<w:divs>
  <w:div w:id="1102603671">
    ...
  </w:div>
</w:divs>
```

This specifies that this table's rows are part of a single HTML div. *end example*]

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example</i>: Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <p style="text-align: center;"><... w:val="1512645511" /></p> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_DecimalNumber](#)) is located in §A.1. *end note*]

17.4.10 end (Table Cell Trailing Margin Exception)

This element specifies the amount of space which shall be present between the trailing extent of the current cell's text contents and the trailing border of a specific individual table cell within a table. This setting shall override the table cell trailing margin definition specified by the end element contained within the table properties (§17.4.11).

This value is specified in the units applied via its type attribute. Any width value of type pct or auto for this element shall be ignored.

If omitted, then this table cell shall use the trailing cell margins defined in the end element contained within the table properties (§17.4.11).

[*Example*: Consider a two row, two column LTR table in which the first table cell in the second row has a trailing margin which is specified via an exception to be 0.5 inches, the region marked with an arrow in the table below:

R1C1	R1C2
------	------

R2C1	↔	R2C2
------	---	------

The exception on this cell would be specified using the following WordprocessingML:

```
<w:tc>
  <w:tcPr>
    <w:tcMar>
      <w:end w:w="720" w:type="dxa" />
    </w:tcMar>
  </w:tcPr>
  ...
</w:tc>
```

The R2C1 cell in this table has an exception applied to the table cell trailing cell margin setting it to 720 twentieths of a point (0.5 inches). *end example*

This element's content model is defined by the common table measurement definition in §17.4.87.

17.4.11 end (Table Cell Trailing Margin Default)

This element specifies the amount of space which shall be present between the trailing extent of the cell contents and the trailing border of all table cells within the parent table (or table row) . This setting can be overridden by the table cell trailing margin definition specified by the end element contained within the table cell's properties (§17.4.10).

This value is specified in the units applied via its type attribute. Any width value of type pct or auto for this element shall be ignored.

If this element is omitted, then it shall inherit the table cell margin from the associated table style. If a trailing margin is never specified in the style hierarchy, this table shall have 115 twentieths of a point (0.08 inches) left cell padding by default (excepting individual cell overrides).

[*Example*: Consider a two by two LTR table in which the default table cell trailing margin is specified to be exactly 0.25 inches, as follows (marked with an arrow in the first table cell below):

R1C1	↔	R2C1
R2C1		R2C2

This table property is specified using the following WordprocessingML markup:

```
<w:tbl>
  <w:tblPr>
    <w:tblCellMar>
      <w:end w:w="360" w:type="dxa"/>
    </w:tblCellMar>
  </w:tblPr>
  ...
</w:tbl>
```

Every cell in the table has a default trailing cell margin setting it to 360 twentieths of a point. *end example*]

This element's content model is defined by the common table measurement definition in §17.4.87.

17.4.12 end (Table Cell Trailing Edge Border)

This element specifies the border which shall be displayed on the trailing edge of the current table cell (right for LTR tables, left for RTL tables). The appearance of this table cell border in the document shall be determined by the following settings:

- If the net tblCellSpacing element value (§17.4.44;§17.4.43;§17.4.45) applied to the cell is non-zero, then the cell border shall always be displayed
- Otherwise, the display of the border is subject to the conflict resolution algorithm defined by the tcBorders element (§17.4.66) and the tblBorders element (§17.4.39;§17.4.38)

If this element is omitted, then the trailing edge of this table cell shall not have a cell border, and its border can use the table's border settings as appropriate.

[*Example:* Consider an LTR table in which the second cell in the first row specifies a trailing dge cell border as follows:

R1C1	R1C2
R2C1	R2C2

This trailing edge cell border is specified using the following WordprocessingML:

```
<w:tc>
  <w:tcPr>
    ...
    <w:tcBorders>
      <w:end w:val="double" w:sz="4" w:space="0" w:color="FF0000" />
    </w:tcBorders>
  </w:tcPr>
<w:p/>
</w:tc>
```

The end element specifies a ½ point border of type double on the trailing edge of the table cell. *end example]*

This element's content model is defined by the common border properties definition in §17.3.4.

17.4.13 end (Table Trailing Edge Border)

This element specifies the border which shall be displayed at the trailing edge of the current table (right for LTR tables, left for RTL tables). The appearance of this table border in the document shall be determined by the following settings:

- The display of the border is subject to the conflict resolution algorithm defined by the tcBorders element (§17.4.66) and the tblBorders element (§17.4.39; §17.4.38)

If this element is omitted, then the trailing edge of this table shall have the border specified by the associated table style. If no trailing edge border is specified in the style hierarchy, then this table shall not have a trailing edge border.

[*Example:* Consider an LTR table in which the table properties specify a trailing edge table border, as follows:

R1C1	R1C2
R2C1	R2C2

This trailing edge table border is specified using the following WordprocessingML:

```
<w:tbl>
  <w:tblPr>
    <w:tblBorders>
      <w:end w:val="thinThickThinMediumGap" w:sz="24" w:space="0"
w:color="D0D0D0" w:themeColor="accent3" w:themeTint="99"/>
    </w:tblBorders>
  </w:tblPr>
  ...
</w:tbl>
```

The end element specifies a three point trailing edge table border of type thinThinThickMediumGap. *end example]*

This element's content model is defined by the common border properties definition in §17.3.4.

17.4.14 gridAfter (Grid Columns After Last Cell)

This element specifies the number of grid columns in the parent table's table grid (§17.4.48; §17.4.47) which shall be left after the last cell in the table row.

If this element conflicts with the remaining size of the document grid after all table cells in this row have been added to the grid, then it shall be ignored. If this element is not specified, then its value shall be assumed to be zero grid units.

[*Example:* Consider a table whose second row ends before the first row by one grid unit:

In this table, the second row leaves one grid unit after its cell contents, which is represented using the following WordprocessingML:

```
<w:tr>
  <w:trPr>
    <w:gridAfter w:val="1" />
    ...
  </w:trPr>
  ...
</w:tr>
```

The gridAfter element specifies that 1 grid unit remains after the row's contents. *end example]*

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <div><... w:val="1512645511" /></div> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_DecimalNumber](#)) is located in §A.1. *end note]*

17.4.15 gridBefore (Grid Columns Before First Cell)

This element specifies the number of grid columns in the parent table's table grid (§17.4.48; §17.4.47) which must be skipped before the contents of this table row (its table cells) are added to the parent table. [Note: This property is used to specify tables whose leading edge (left for left-to-right tables, right for right-to-left tables) does not start at the first grid column (the same shared edge). *end note*]

If this element is omitted, then its value shall be assumed to be zero grid units. If this element's value is larger than the size of the table grid, then the value shall be ignored and the first cell in the row can span the full table grid (i.e. the second cell, if one exists, should start at the last shared edge in the table).

[Example: Consider a table whose second row starts after the first grid unit:

In this table, the second row skips one grid unit at the beginning which is represented by the following WordprocessingML:

```
<w:tr>
  <w:trPr>
    <w:gridBefore w:val="1" />
    ...
  </w:trPr>
  ...
</w:tr>
```

end example]

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[Example: Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <pre><... w:val="1512645511" /></pre> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_DecimalNumber](#)) is located in §A.1.
end note]

17.4.16 gridCol (Grid Column Definition)

This element specifies the presence and details about a single grid column within a table grid. A *grid column* is a logical column in a table used to specify the presence of a shared vertical edge in the table. When table cells are then added to this table, these shared edges (or grid columns, looking at the column between those shared edges) determine how table cells are placed into the table grid.

[Example: If a table row specifies that it is preceded by two grid columns, then it would start on the third vertical edge in the table including edges which are not shared by all columns. *end example*]

If the table grid does not match the requirements of one or more rows in the table (i.e. it does not define enough grid columns), then the grid can be redefined as needed when the table is processed.

[Example: Consider the following, more complex table that has two rows and two columns; as shown, the columns are not aligned:

This table is represented by laying out the cells on a table grid consisting of three table grid columns as follows, each grid column representing a logical vertical column in the table:

The dashed lines represent the virtual vertical continuations of each table grid column, and thus resulting table grid is represented as the following in WordprocessingML:

```
<w:tblGrid>
  <w:gridCol w:w="5051" />
  <w:gridCol w:w="3008" />
  <w:gridCol w:w="1531" />
</w:tblGrid>
```

end example]

Attributes	Description
w (Grid Column	Specifies the width of this grid column.

Attributes	Description
Width)	<p>[<i>Note</i>: This value does not solely determine the actual width of the resulting grid column in the document. When the table is displayed in a document, these widths determine the initial width of each grid column, which can then be overridden by:</p> <ul style="list-style-type: none"> • The table layout algorithm (§17.4.52;§17.4.53) applied to the current table row(s) • The preferred widths of specific cells which are part of that grid column as the table is displayed (which is an input to the algorithm above) <p><i>end note</i>]</p> <p>This value is specified in twentieths of a point.</p> <p>If this attribute is omitted, then the last saved width of the grid column is assumed to be zero.</p> <p>[<i>Example</i>: Consider the following table grid definition:</p> <pre><w:tblGrid> <w:gridCol w:w="6888"/> <w:gridCol w:w="248"/> <w:gridCol w:w="886"/> <w:gridCol w:w="1554"/> </w:tblGrid></pre> <p>This table grid specifies four grid columns, each of which has an initial size of 6888 twentieths of a point, 248 twentieths of a point, 886 twentieths of a point, and 1554 twentieths of a point respectively. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_TblGridCol](#)) is located in §A.1. *end note*]

17.4.17 gridSpan (Grid Columns Spanned by Current Table Cell)

This element specifies the number of grid columns in the parent table's table grid which shall be spanned by the current cell. This property allows cells to have the appearance of being merged, as they span vertical boundaries of other cells in the table.

If this element is omitted, then the number of grid units spanned by this cell shall be assumed to be one. If the number of grid units specified by the val attribute exceeds the size of the table grid, then the table grid shall be augmented as needed to create the number of grid columns required.

[*Example*: Consider the following table that has two rows and two columns where the columns are not aligned:

This table is represented by laying out the cells on a table grid consisting of three table grid columns, each grid column representing a logical vertical column in the table:

The first table cell in the first row spans two grid column units. The second cell in the second row also consumes two grid column units (see the grid lines represented using emphasized lines in the example above). This table is represented using the following WordprocessingML:

```
<w:tbl>
...
<w:tr>
  <w:tc>
    <w:tcPr>
      ...
      <w:gridSpan w:val="2" />
    </w:tcPr>
  </w:tc>
...
</w:tr>
<w:tr>
  <w:tc>
    ...
  </w:tc>
  <w:tc>
    <w:tcPr>
      ...
      <w:gridSpan w:val="2" />
    </w:tcPr>
  </w:tc>
</w:tr>
</w:tbl>
```

The gridSpan element indicates the number of columns spanned by each cell with respect to the table grid (in the case of R1C1 and TR2C2, two. *end example*]

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example</i>: Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <pre><... w:val="1512645511" /></pre> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_DecimalNumber](#)) is located in §A.1. *end note*]

17.4.18 header (Header Cell Reference)

This element specifies a reference, using a unique identifier, to a table header cell that is associated with the current table cell. The identifier representing the reference shall be stored on this element's val attribute and is used to reference the unique identifier value of the *id* attribute of a header cell *tc* element of the current table. The contents of the table header cell *tc* element designated by the specific unique identifier in its *id* attribute shall be used as the table header information associated with the table cell that references that specific unique identifier.

If this element is omitted or the value of the header cell identifier cannot be resolved, no header cell shall be associated with the current table cell.

[*Example*: Consider the following 3 x 3 table with four header cells with values A, B, C, and D and four data cells with values x1, x2, y1, and y2:

	A	B
C	x1	x2
D	y1	y2

Each of the data cells is associated with two header cells and can be represented in WordprocessingML as follows:

```
<w:tbl>
...
<w:tr>
```

```

...
<w:tc >
...
</w:tc>
<w:tc w:id="HeaderA">
...
<w:p>
  <w:r>
    <w:t>A</w:t>
  </w:r>
</w:p>
</w:tc>
...
</w:tr>
<w:tr>
...
<w:tc w:id="HeaderC">
...
<w:p>
  <w:r>
    <w:t>C</w:t>
  </w:r>
</w:p>
</w:tc>
<w:tc>
  <w:tcPr>
...
    <w:headers>
      <w:header w:val="HeaderA" />
      <w:header w:val="HeaderC" />
    </w:headers>
...
  </w:tcPr>
<w:p>
  <w:r>
    <w:t>x1</w:t>
  </w:r>
</w:p>
</w:tc>
...
</w:tr>
</w:tbl>

```

The `headers` element specifies the list of header cells associated with the table cell that has a value of `x1`. In this example the table cell with the content value of `x1` is associated with headers that have an id of `HeaderA` and `HeaderC`. *end example*

Attributes	Description
<code>val</code> (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the <code>val</code> attribute is the ID of the associated paragraph style's <code>styleId</code>.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the <code>val</code> attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model (`CT_String`) is located in §A.1. *end note*]

17.4.19 headers (Header Cells Associated With Table Cell)

This element specifies the list of header cells, as specified by children header elements, that provide header information associated with the current table cell. Each header cell shall specify a unique identifier, as specified by the use of the attribute `id` on the header cell `tc` element. This element is typically used to gather header information about data and sub header cells.

If this element is omitted or no children header element exists, no header cell shall be associated with the given table cell.

[*Example:* Consider the following 3 x 3 table with four header cells with values `A`, `B`, `C`, and `D` and four data cells with values `x1`, `x2`, `y1`, and `y2`:

	A	B
C	x1	x2
D	y1	y2

Each of the data cells is associated with two header cells and can be represented in WordProcessingML as follows:

```

<w:tbl>
...
<w:tr>
...
  <w:tc >
    ...
  </w:tc>
  <w:tc w:id="HeaderA">
    ...
    <w:p>
      <w:r>
        <w:t>A</w:t>
      </w:r>
    </w:p>
  </w:tc>
...
</w:tr>
<w:tr>
...
  <w:tc w:id="HeaderC">
    ...
    <w:p>
      <w:r>
        <w:t>C</w:t>
      </w:r>
    </w:p>
  </w:tc>
  <w:tc>
    <w:tcPr>
      ...
      <w:headers>
        <w:header w:val="HeaderA" />
        <w:header w:val="HeaderC" />
      </w:headers>
      ...
    </w:tcPr>
  <w:p>

```

```

        <w:r>
          <w:t>x1</w:t>
        </w:r>
      </w:p>
    </w:tc>
  ...
</w:tr>
</w:tbl>

```

The headers element specifies the list of header cells associated with the table cell that has a value of x1. In this example x1 is associated with headers that have an id of HeaderA and HeaderC. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_Headers](#)) is located in §A.1. *end note*]

17.4.20 hidden (Hidden Table Row Marker)

This element specifies that the glyph representing the end character of current table row shall not be displayed in the current document.

[Note: This setting is used to hide the end of row glyph in order to ensure that the entire table row is hidden and not displayed in the document, as if any part of the row is visible, the row is displayed. *end note*]

[Note: Applications can have settings which allow hidden content to be displayed, in which case this content can be visible - this property is not meant to supersede that setting. *end note*]

If this element is omitted, then this table row shall not be hidden in the document.

[Example: Consider a table with a table row in which the row is specified to be hidden. That requirement is specified using the following WordprocessingML:

```

<w:tbl>
  ...
  <w:tr>
    <w:trPr>
      <w:hidden />
    ...
  </w:trPr>
  ...
</w:tr>
</w:tbl>

```

In this example this row is not be displayed nor printed, as the hidden element is specified on in table row's properties. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.4.21 hideMark (Ignore End Of Cell Marker In Row Height Calculation)

This element specifies whether the end of cell glyph shall influence the height of the given table row in the table. If it is specified, then only printing characters in this cell shall be used to determine the row height.

[*Rationale*: Typically, the height of a table row is determined by the height of all glyphs in all cells in that row, including the non-printing end of cell glyph characters. However, if these characters are not formatted, they are always created with the document default style properties. This means that the height of a table row cannot ever be reduced below the size of the end of cell marker glyph without manually formatting each paragraph in that run.

In a typical document, this behavior is desirable as it prevents table rows from 'disappearing' if they have no content. However, if a table row is being used as a border (for example, by shading its cells or putting an image in them), then this behavior makes it impossible to have a virtual border that is reasonably small without formatting each cell's content directly. This setting specifies that the end of cell glyph shall be ignored for this cell, allowing it to collapse to the height of its contents without formatting each cell's end of cell marker, which would have the side effect of formatting any text ever entered into that cell. *end rationale*]

If this element is omitted, then the end of cell marker shall be included in the determination of the height of this row.

[*Example*: Consider the following WordprocessingML table:

More is some small text.			

Notice that the only printing content in this table row is displayed using 5 point font, yet the row height is influenced by the end of cell markers in the empty cells.

If each cell in the second row in this table was set to exclude the table cell from this calculation, using the following WordprocessingML:

```
<w:tcPr>  
  <w:hideMark/>  
</w:tcPr>
```

The resulting table must exclude the cell markers from the row height calculation:

More is some text.			

The hideMark element specified that each cell marker was excluded, resulting in the row height being defined by the actual run contents. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.4.22 **insideH (Table Inside Horizontal Edges Border)**

This element specifies the border which shall be displayed on all horizontal table cell borders which are not on an outmost edge of the parent table (all horizontal borders which are not the topmost or bottommost border). The appearance of this table cell border in the document shall be determined by the following settings:

- The display of the border on interior edges is subject to the conflict resolution algorithm defined by the tcBorders element (§17.4.66) and the tblBorders element (§17.4.39;§17.4.38)

If this element is omitted, then the inside horizontal borders of this table shall have the border specified by the associated table style. If no inside horizontal edge border is specified in the style hierarchy, then this table shall not have an inside horizontal edge border.

[*Example:* Consider a table in which the table specifies a border on all interior horizontal and vertical edges, as follows:

R1C1	R1C2
R2C1	R2C2

This interior horizontal cell border is specified using the following WordprocessingML:

```
<w:tblPr>
  <w:tblBorders>
    <w:insideH w:val="doubleWave" w:sz="6" w:space="0" w:color="92D050"/>
    <w:insideV w:val="doubleWave" w:sz="6" w:space="0" w:color="92D050"/>
  </w:tblBorders>
  ...
</w:tblPr>
```

The insideH element specifies a 3/4 point border of type doubleWave. *end example*]

This element's content model is defined by the common border properties definition in §17.3.4.

17.4.23 **insideH (Table Cell Inside Horizontal Edges Border)**

This element specifies the border which shall be displayed on all interior horizontal edges of the current group of table cells. [*Note:* Although individual table cells have no concept of an internal edge, which would render this property useless in most cases, it is used to determine the cell borders to apply to a specific group of cells as part of table conditional formatting in a table style, for example, the inside horizontal edges on the set of cells in the first column. *end note*]

The appearance of this table cell border in the document shall be determined by the following settings:

- If the net tblCellSpacing element value (§17.4.44;§17.4.43;§17.4.45) applied to the cell is non-zero, then the cell border shall always be displayed
- Otherwise, the display of the border is subject to the conflict resolution algorithm defined by the tcBorders element (§17.4.66) and the tblBorders element (§17.4.39;§17.4.38)

If this element is omitted, then the specified conditional formatting on the table shall not change the current set of internal edge borders on its set of table cells (i.e. their current setting shall remain unchanged).

[*Example:* Consider a table in which the conditional formatting on the first column specified in the associated table style specifies a double line red cell border for all internal horizontal lines as follows:

R1C1	R1C2
R2C1	R2C2

This inner horizontal edge cell border is specified using the following WordprocessingML:

```
<w:tblStylePr w:type="firstCol">
  <w:tcPr>
    <w:tcBorders>
      <w:insideH w:val="double" w:sz="4" w:space="0" w:color="FF0000"/>
    </w:tcBorders>
  </w:tcPr>
</w:tblStylePr>
```

The insideH element specifies a ¼ point border of type double. *end example*]

This element’s content model is defined by the common border properties definition in §17.3.4.

17.4.24 insideV (Table Inside Vertical Edges Border)

This element specifies the border which shall be displayed on all vertical table cell borders which are not on an outmost edge of the parent table (all horizontal borders which are not the leftmost or rightmost border). The appearance of this table cell border in the document shall be determined by the following settings:

- The display of the border on interior edges is subject to the conflict resolution algorithm defined by the tcBorders element (§17.4.66) and the tblBorders element (§17.4.39;§17.4.38)

If this element is omitted, then the inside vertical borders of this table shall have the border specified by the associated table style. If no inside vertical edge border is specified in the style hierarchy, then those cells in this table shall not have an inside vertical edge border.

[*Example:* Consider a table in which the table specifies a border on all interior horizontal and vertical edges, as follows:

R1C1	R1C2
------	------

R2C1

R2C2

This interior horizontal cell border is specified using the following WordprocessingML:

```
<w:tblPr>
  <w:tblBorders>
    <w:insideH w:val="doubleWave" w:sz="6" w:space="0" w:color="92D050"/>
    <w:insideV w:val="doubleWave" w:sz="6" w:space="0" w:color="92D050"/>
  </w:tblBorders>
  ...
</w:tblPr>
```

The insideV element specifies a 3/4 point border of type doubleWave on all interior vertical edges. *end example*]

This element's content model is defined by the common border properties definition in §17.3.4.

17.4.25 insideV (Table Cell Inside Vertical Edges Border)

This element specifies the border which shall be displayed on all interior vertical edges of the current group of table cells. [Note: Although individual table cells have no concept of an internal edge, which would render this property useless in most cases, it is used to determine the cell borders to apply to a specific group of cells as part of table conditional formatting in a table style, for example, the inside vertical edges on the set of cells in the header row. *end note*]

The appearance of this table cell border in the document shall be determined by the following settings:

- If the net tblCellSpacing element value (§17.4.44;§17.4.43;§17.4.45) applied to the cell is non-zero, then the cell border shall always be displayed
- Otherwise, the display of the border is subject to the conflict resolution algorithm defined by the tcBorders element (§17.4.66) and the tblBorders element (§17.4.39;§17.4.38)

If this element is omitted, then the specified conditional formatting on the table shall not change the current set of internal edge borders on its set of table cells (i.e. their current setting shall remain unchanged).

[Example: Consider a table in which the conditional formatting on the header row in the associated table style specifies a double line red cell border for all internal vertical lines as follows:

R1C1	R1C2
R2C1	R2C2

This inner vertical edge cell border is specified using the following WordprocessingML:

```
<w:tblStylePr w:type="firstRow">
  <w:tcPr>
    <w:tcBorders>
      <w:insideV w:val="double" w:sz="4" w:space="0" w:color="FF0000"/>
    </w:tcBorders>
  </w:tcPr>
</w:tblStylePr>
```

The insideV element specifies a ¼ point border of type double. *end example*

This element’s content model is defined by the common border properties definition in §17.3.4.

17.4.26 jc (Table Alignment Exception)

This element specifies the alignment of the set of rows which are part of the current table properties exception list with respect to the text margins in the current section. When a table is placed in a WordprocessingML document that does not have the same width as the margins, this property is used to determine how the table is positioned with respect to those margins. The interpretation of property is reversed if the parent table is right to left using the bidiVisual element (§17.4.1).

If this property is omitted on a table, then the justification shall be determined by the default set of table properties on the parent table.

[Example: Consider the following WordprocessingML table, centered on the text margins with a subset of its rows justified to the left margin by a table property exception:

That exception would be specified using the following WordprocessingML:

```
<w:tblPrEx>
  <w:jc w:val="start"/>
</w:tblPrEx>
```

The jc element specifies that the rows which are part of the table properties exception table must be left aligned with respect to the text margins. *end example*

Attributes	Description
val (Alignment Type)	Specifies the justification which should be applied to the parent table. [Example: Consider the following WordprocessingML fragment for a table in a document:

Attributes	Description
	<pre><w:tblPr> <w:jc w:val="center" /> </w:tblPr></pre> <p>This table is now centered on the page. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_JcTable simple type (§17.18.45).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_JcTable](#)) is located in §A.1. *end note*]

17.4.27 jc (Table Row Alignment)

This element specifies the alignment of a single row in the parent table with respect to the text margins in the current section. When a table is placed in a WordprocessingML document that does not have the same width as the margins, this property is used to determine how a specific row in that table is positioned with respect to those margins. The interpretation of property is reversed if the parent table is right to left using the `bidirectional` element (§17.4.1).

If this property is omitted on a table, then the justification shall be determined by the default set of table properties on the parent table.

[Example: Consider the following WordprocessingML table, centered on the text margins with its second rows justified to the left margin by a table row level justification:

That row level setting would be specified using the following WordprocessingML:

```
<w:trPr>
  <w:jc w:val="start"/>
</w:trPr>
```

The `jc` element specifies that the rows which are part of the table properties exception table must be left aligned with respect to the text margins. *end example*

Attributes	Description
val (Alignment)	Specifies the justification which should be applied to the parent table.

Attributes	Description
Type)	<p>[<i>Example:</i> Consider the following WordprocessingML fragment for a table in a document:</p> <pre><w:tblPr> <w:jc w:val="center" /> </w:tblPr></pre> <p>This table is now centered on the page. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_JcTable simple type (§17.18.45).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_JcTable](#)) is located in §A.1. *end note*]

17.4.28 jc (Table Alignment)

This element specifies the alignment of the current table with respect to the text margins in the current section. When a table is placed in a WordprocessingML document that does not have the same width as the margins, this property is used to determine how the table is positioned with respect to those margins. The interpretation of property is reversed if the parent table is right to left using the bidiVisual element (§17.4.1).

If this property is omitted on a table, then the justification shall be determined by the associated table style. If this property is not specified in the style hierarchy, then the table shall be left justified with zero indentation from the leading margin (the left margin in a left-to-right table or the right margin in a right-to-left table).

[*Example:* Consider the following WordprocessingML table, justified to the left margin by default:

R1C1	R1C2	R1C3
R2C1	R2C2	R2C3

This table does not fill the entire width of the text margins. If the table should be right justified to the margin, as follows:

R1C1	R1C2	R1C3
R2C1	R2C2	R2C3

That requirement would be specified using the following WordprocessingML:

```
<w:tblPr>
  <w:jc w:val="end"/>
</w:tblPr>
```

The `jc` element specifies that the table must be right aligned with respect to the text margins. *end example*]

Attributes	Description
val (Alignment Type)	<p>Specifies the justification which should be applied to the parent table.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment for a table in a document:</p> <pre><w:tblPr> <w:jc w:val="center" /> </w:tblPr></pre> <p>This table is now centered on the page. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_JcTable</code> simple type (§17.18.45).</p>

[*Note:* The W3C XML Schema definition of this element's content model (`CT_JcTable`) is located in §A.1. *end note*]

17.4.29 noWrap (Don't Wrap Cell Content)

This element specifies how this table cell shall be laid out when the parent table is displayed in a document. This setting only affects the behavior of the cell when the `tblLayout` for this row (§17.4.52; §17.4.53) is set to use the auto algorithm.

This setting shall be interpreted in the context of the `tcW` element (§17.4.71) as follows:

- If the table cell width has a type attribute value of `fixed`, then this element specifies that that this table cell shall never be smaller than that fixed value when other cells on the line are not at their absolute minimum width.
- If the table cell width has a type attribute value of `pct` or `auto`, then this element specifies that when running the auto fit algorithm, the contents of that this table cell shall be treated as though they have no breaking characters (the contents should be treated as a single contiguous non-breaking string)

If this element is omitted, then cell content shall be allowed to wrap (the cell can be shrunk as needed if it is a fixed preferred width value, and the contents shall be treated as having breaking characters if it is a percentage or automatic width value).

[*Example:* Consider the following three row by three column WordprocessingML table:

In this table, each cell has a fixed preferred width of 2.38 inches (3427 twentieths of a point), and the `tblLayout` for this row (§17.4.52; §17.4.53) is set to use the auto algorithm. If a long non breaking string is added to the middle row, as follows, the two cells are adjusted to override their preferences and accommodate the string:

	SS	

However, if the first table cell has the `noWrap` element present as follows:

```
<w:tcPr>
    <w:nowrap/>
</w:tcPr>
```

The noWrap element specifies that because it is a fixed width cell, that cell shall not be collapsed beyond its original size until all other cells are at their minimum size, so in this example the cell maintains its width:

[illegible]

end example]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.4.30 shd (Table Shading Exception)

This element specifies the shading which shall be applied to all cells in the current row as part of a set of table-level property exceptions. Similarly to paragraph shading, this shading shall be applied to the contents of the tab up to the table borders, regardless of the presence of text - unlike cell shading, table shading shall include any cell padding. This property shall be superseded by any cell-level shading on any cell in this row (§17.4.32).

This shading consists of three components:

- Background Color
- (optional) Pattern
- (optional) Pattern Color

The resulting shading is applied by setting the background color behind the paragraph, then applying the pattern color using the mask supplied by the pattern over that background.

If this element is omitted, then the cell shading shall be determined by the table-level cell shading settings (§17.4.31) for the current table.

[*Example:* Consider a table in which the final two rows have a set of table-level property exceptions giving them theme color shading in the background2 theme color, as follows:

This table-level shading exception would be specified using the following WordprocessingML:

```
<w:tblPrEx>
  <w:jc w:val="start" />
  <w:shd w:val="clear" w:color="auto" w:fill="EEEECE1" w:themeFill="background2"
/>
</w:tblPrEx>
```

The shd element specifies cell shading with a clear pattern using a background theme color of background2. *end example]*

This element's content model is defined by the common shading properties definition in §17.3.5.

17.4.31 shd (Table Shading)

This element specifies the shading which shall be applied to the extents the current table. Similarly to paragraph shading, this shading shall be applied to the contents of the tab up to the table borders, regardless of the presence of text - unlike cell shading, table shading shall include any cell padding. This property shall be superseded by any cell-level shading via any table-level property exceptions (§17.4.30); or on any cell in this row (§17.4.32).

This shading consists of three components:

- Background Color
- (optional) Pattern
- (optional) Pattern Color

The resulting shading is applied by setting the background color behind the paragraph, then applying the pattern color using the mask supplied by the pattern over that background.

If this element is omitted, then the cells within this table shall have the shading specified by the associated table style. If no cell shading is specified in the style hierarchy, then the cells in this table shall not have any cell shading (i.e. they shall be transparent).

[Example: Consider a table in which the first cell in the first row has cell-level red shading, as follows:

R1C1	R1C2
R2C1	R2C2

This table level cell shading would be specified using the following WordprocessingML:

```
<w:tbl>
  <w:tblPr>
    <w:shd w:val="clear" w:color="auto" w:fill="FF0000"/>
    ...
  </w:tblPr>
  ...
</w:tbl>
```

The shd element specifies cell shading with a clear pattern using a background color of FF0000 (red). *end example]*

This element’s content model is defined by the common shading properties definition in §17.3.5.

17.4.32 shd (Table Cell Shading)

This element specifies the shading which shall be applied to the extents of the current table cell. Similarly to paragraph shading, this shading shall be applied to the contents of the cell up to the cell borders, regardless of the presence of text.

This shading consists of three components:

- Background Color
- (optional) Pattern
- (optional) Pattern Color

The resulting shading is applied by setting the background color behind the paragraph, then applying the pattern color using the mask supplied by the pattern over that background.

If this element is omitted, then the cell shading shall be determined by the table-level or table-level exception cell shading settings (§17.4.30;§17.4.31) for the current table.

[Example: Consider a table in which the first cell in the first row has cell-level red shading, as follows:

R1C1	R1C2
R2C1	R2C2

This cell shading would be specified using the following WordprocessingML:


```

<w:tc>
  <w:tcPr>
    <w:shd w:val="clear" w:color="auto" w:fill="FF0000" />
  </w:tcPr>
</w:tc>

```

The shd element specifies cell shading with a clear pattern using a background color of FF0000 (red). *end example]*

This element's content model is defined by the common shading properties definition in §17.3.5.

17.4.33 start (Table Cell Leading Edge Border)

This element specifies the border which shall be displayed on the leading edge of the current table cell (left for LTR tables, right for RTL tables). The appearance of this table cell border in the document shall be determined by the following settings:

- If the net tblCellSpacing element value (§17.4.44;§17.4.43;§17.4.45) applied to the cell is non-zero, then the cell border shall always be displayed
- Otherwise, the display of the border is subject to the conflict resolution algorithm defined by the tcBorders element (§17.4.66) and the tblBorders element (§17.4.39;§17.4.38)

If this element is omitted, then the leading edge of this table cell shall not have a cell border, and its border can use the table's border settings as appropriate.

[*Example:* Consider an LTR table in which the second cell in the first row specifies a leading edge cell border:

R1C1	R1C2
R2C1	R2C2

This leading edge cell border is specified using the following WordprocessingML:

```

<w:tc>
  <w:tcPr>
    ...
    <w:tcBorders>
      <w:start w:val="double" w:sz="4" w:space="0" w:color="FF0000" />
    </w:tcBorders>
  </w:tcPr>
</w:tc>

```

The start element specifies a ½ point border of type double on the leading edge of the table cell. *end example]*

This element's content model is defined by the common border properties definition in §17.3.4.


17.4.34 start (Table Cell Leading Margin Default)

This element specifies the amount of space which shall be left between the leading edge of the cell contents and the leading edge of all table cells within the parent table (or table row). This setting can be overridden by the table cell leading margin definition specified by the start element contained within the table cell's properties (§17.4.35).

This value is specified in the units applied via its type attribute. Any width value of type pct or auto for this element shall be ignored.

If this element is omitted, then it shall inherit the table cell margin from the associated table style. If a leading margin is never specified in the style hierarchy, this table shall have 115 twentieths of a point (0.08 inches) left cell padding by default (excepting individual cell overrides).

[Example: Consider a two by two LTR table in which the default table cell leading margin is specified to be exactly 0.25 inches, as follows (marked with an arrow in the first table cell below):

 R1C1	R2C1
R2C1	R2C2

This table property is specified using the following WordprocessingML markup:

```
<w:tbl>
  <w:tblPr>
    <w:tblCellMar>
      <w:start w:w="360" w:type="dxa"/>
    </w:tblCellMar>
  </w:tblPr>
  ...
</w:tbl>
```

Every cell in the table has a default leading cell margin setting it to 360 twentieths of a point. *end example*]

This element’s content model is defined by the common table measurement definition in §17.4.87.

17.4.35 start (Table Cell Leading Margin Exception)

This element specifies the amount of space which shall be left between the leading extent of the current cell contents and the leading edge border of a specific individual table cell within a table. This setting shall override the table cell leading margin definition specified by the start element contained within the table properties (§17.4.34).

This value is specified in the units applied via its type attribute. Any width value of type pct or auto for this element shall be ignored.

If omitted, then this table cell shall use the leading cell margins defined in the start element contained within the table properties (§17.4.34).

[*Example:* Consider a two row, two column LTR table in which the first table cell in the second row has a leading margin which is specified via an exception to be 0.5 inches, causing the text to be position 0.5" inside the cell, as follows:

R1C1	R1C2
R2C1	R2C2

The exception on this cell would be specified using the following WordprocessingML:

```
<w:tc>
  <w:tcPr>
    <w:tcMar>
      <w:start w:w="720" w:type="dxa" />
    </w:tcMar>
  </w:tcPr>
</w:tc>
```

The R2C1 cell in this table has an exception applied to the table cell leading margin setting it to 720 twentieths of a point (0.5 inches). *end example*]

This element's content model is defined by the common table measurement definition in §17.4.87.

17.4.36 start (Table Leading Edge Border)

This element specifies the border which shall be displayed at the leading edge of the current table (left for LTR tables, right for RTL tables). The appearance of this table border in the document shall be determined by the following settings:

- The display of the border is subject to the conflict resolution algorithm defined by the tcBorders element (§17.4.66) and the tblBorders element (§17.4.39;§17.4.38)

If this element is omitted, then the leading edge of this table shall have the border specified by the associated table style. If no leading edge border is specified in the style hierarchy, then this table shall not have a left border.

[*Example:* Consider an LTR table in which the table properties specify a leading edge table border, as follows:

R1C1	R1C2
R2C1	R2C2

This leading edge table border is specified using the following WordprocessingML:

```
<w:tbl>
  <w:tblPr>
    <w:tblBorders>
      <w:start w:val="thinThickThinMediumGap" w:sz="24" w:space="0"
w:color="D0D0D0" w:themeColor="accent3" w:themeTint="99"/>
    </w:tblBorders>
  </w:tblPr>
  ...
</w:tbl>
```

The start element specifies a three point leading edge table border of type `thinThinThickMediumGap`. *end example]*

This element’s content model is defined by the common border properties definition in §17.3.4.

17.4.37 tbl (Table)

This element specifies the contents of a table present in the document. A *table* is a set of paragraphs (and other block-level content) arranged in *rows* and *columns*. Tables in WordprocessingML are defined via the `tbl` element, which is analogous to the HTML `table` tag.

When two `tbl` elements having the same style (§17.4.62) are present within the document content, without any intervening `p` elements, the corresponding tables shall be treated as a single table.

[*Example:* Consider an empty one-cell table (i.e.; a table with one row, one column) and 1 point borders on all sides:

--

This table is represented by the following WordprocessingML:

```

<w:tbl>
  <w:tblPr>
    <w:tblW w:w="5000" w:type="pct"/>
    <w:tblBorders>
      <w:top w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:start w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:bottom w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:end w:val="single" w:sz="4" w:space="0" w:color="auto"/>
    </w:tblBorders>
  </w:tblPr>
  <w:tblGrid>
    <w:gridCol w:w="10296"/>
  </w:tblGrid>
  <w:tr>
    <w:tc>
      <w:tcPr>
        <w:tcW w:w="0" w:type="auto"/>
      </w:tcPr>
      <w:p/>
    </w:tc>
  </w:tr>
</w:tbl>

```

This table specifies table-wide properties of 100% of page width using the `tblW` element (§17.4.63); a the set of table borders using the `tblBorders` element (§17.4.38); the table grid which defines a set of shared vertical edges within the table using the `tblGrid` element (§17.4.48); and a single table row using the `tr` element (§17.4.78). *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Tbl](#)) is located in §A.1. *end note*]

17.4.38 `tblBorders` (Table Borders)

This element specifies the set of borders for the edges of the current table, using the six border types defined by its child elements.

If the cell spacing for any row is non-zero as specified using the `tblCellSpacing` element (§17.4.44; §17.4.43; §17.4.45), then there is no border conflict and the table border (or table-level exception border, if one is specified) shall be displayed.

If the cell spacing is zero, then there is a conflict [*Example:* Between the left border of all cells in the first column and the left border of the table. *end example*], which shall be resolved as follows:

- If there is a cell border, then the cell border shall be displayed
- If there is no cell border but there is a table-level exception border on this table row, then the table-level exception border shall be displayed

- If there is no cell or table-level exception border, then the table border shall be displayed

If this element is omitted, then this table shall have the borders specified by the associated table style. If no borders are specified in the style hierarchy, then this table shall not have any table borders.

[*Example:* Consider a table with no associated table style, which defines a set of table borders via direct formatting as follows:

These table borders are specified using the following WordprocessingML:

```
<w:tbl>
  <w:tblPr>
    <w:tblW w:w="0" w:type="auto"/>
    <w:tblBorders>
      <w:top w:val="single" w:sz="4" w:space="0" w:color="000000"
w:themeColor="text1"/>
      <w:start w:val="single" w:sz="4" w:space="0" w:color="000000"
w:themeColor="text1"/>
      <w:bottom w:val="single" w:sz="4" w:space="0" w:color="000000"
w:themeColor="text1"/>
      <w:end w:val="single" w:sz="4" w:space="0" w:color="000000"
w:themeColor="text1"/>
      <w:insideH w:val="single" w:sz="4" w:space="0" w:color="000000"
w:themeColor="text1"/>
      <w:insideV w:val="single" w:sz="4" w:space="0" w:color="000000"
w:themeColor="text1"/>
    </w:tblBorders>
    ...
  </w:tblPr>
  ...
</w:tbl>
```

The tblBorders element specifies the set of table borders applied to the current table. *end example]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TblBorders](#)) is located in §A.1. *end note]*

17.4.39 tblBorders (Table Borders Exceptions)

This element specifies the set of borders for the edges of the parent table row via a set of table-level property exceptions, using the six border types defined by its child elements.

If the cell spacing for any row is non-zero as specified using the `tblCellSpacing` element (§17.4.44; §17.4.43; §17.4.45), then there is no border conflict and the table-level exception border shall be displayed.

If the cell spacing is zero, then there is a conflict [*Example*: Between the left border of all cells in the first column and the left border of the table-level exceptions. *end example*], which shall be resolved as follows:

- If there is a cell border, then the cell border shall be displayed
- If there is no cell border, then the table-level exception border shall be displayed

If this element is omitted, then this table shall have the borders specified by the associated table level borders (§17.4.38).

[*Example*: Consider a table in which the final two rows have a set of table-level property exceptions giving them a thicker set of table borders, as follows:

These table borders are specified via a set of table-level property exceptions using the following WordprocessingML:

```
<w:tr>
  <w:tblPrEx>
    <w:tblBorders>
      <w:top w:val="single" w:sz="24" w:space="0" w:color="000000"
w:themeColor="text1"/>
      <w:start w:val="single" w:sz="24" w:space="0" w:color="000000"
w:themeColor="text1"/>
      <w:bottom w:val="single" w:sz="24" w:space="0" w:color="000000"
w:themeColor="text1"/>
      <w:end w:val="single" w:sz="24" w:space="0" w:color="000000"
w:themeColor="text1"/>
      <w:insideH w:val="single" w:sz="24" w:space="0" w:color="000000"
w:themeColor="text1"/>
      <w:insideV w:val="single" w:sz="24" w:space="0" w:color="000000"
w:themeColor="text1"/>
    </w:tblBorders>
  </w:tblPrEx>
</w:tr>
```

The `tblBorders` element specifies the set of table borders applied to the final two rows in this table as part of the table-level property exceptions. *end example]*

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_TblBorders](#)) is located in §A.1. *end note]*

17.4.40 tblCaption (Table Caption)

This element specifies the caption for the table.

[*Example:* Consider a table which specifies a caption. This object might contain the following XML markup:

```
<w:tbl>
  <w:tblPr>
    <w:tblCaption w:val="Here is the caption of the table" />
    ...
  </w:tblPr>
</w:tbl>
```

end example]

Attributes	Description
val (String Value)	Specifies that its contents contain a string. The contents of this string are interpreted based on the context of the parent XML element.

Attributes	Description
	<p>[<i>Example</i>: Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's <code>styleId</code>.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>

[*Note*: The W3C XML Schema definition of this element's content model (`CT_String`) is located in §A.1. *end note*]

17.4.41 **tblCellMar (Table Cell Margin Exceptions)**

This element specifies a set of cell margins for all cells in the parent table row via a set of table-level property exceptions. These settings can be overridden by the table cell margin definition specified by the `tcMar` element contained within the table cell's properties (§17.4.41).

If this element is omitted, then it shall inherit the table cell margins from the table-level cell margins (§17.4.42).

[*Example*: Consider a table whose final two rows are defined to have default cell margins of 0.1 inches for all sides via a table-level property exception, as follows:

This set of table cell margin exceptions is specified using the following WordprocessingML:

```
<w:tblPrEx>
  <w:tblCellMar>
    <w:top w:w="144" w:type="dxa"/>
    <w:start w:w="144" w:type="dxa"/>
    <w:bottom w:w="144" w:type="dxa"/>
    <w:end w:w="144" w:type="dxa"/>
  </w:tblCellMar>
  ...
</w:tblPrEx>
```

The `tblCellMar` element as a child of `tblPrEx` specifies the set of default cell margins for all cells in final two rows in current table, in this case, 144 twentieths of a point on all sides. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TblCellMar](#)) is located in §A.1. *end note*]

17.4.42 `tblCellMar` (Table Cell Margin Defaults)

This element specifies the default cell margin settings for all cells in the current table. These setting can be overridden by the table cell margin definition specified by the `tcMar` element contained within the table cell's properties (§17.4.68) or by a set of table-level property exceptions (§17.4.41).

If this element is omitted, then it shall inherit the table cell margins from the associated table style. If table margins are never specified in the style hierarchy, then each margin shall use its default margin size (see child element definitions).

[*Example:* Consider a table defined to have default cells margins of 0.1 inches for all sides, as follows:

R1C1	R1C2
R2C1	R2C2

This set of default table cell margins would be specified using the following WordprocessingML:

```
<w:tblPr>
  <w:tblCellMar>
    <w:top w:w="144" w:type="dxa"/>
    <w:start w:w="144" w:type="dxa"/>
    <w:bottom w:w="144" w:type="dxa"/>
    <w:end w:w="144" w:type="dxa"/>
  </w:tblCellMar>
  ...
</w:tblPr>
```

The `tblCellMar` element as a child of `tblPr` specifies the set of default cell margins for all cells in the current table, in this case, 144 twentieths of a point. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TblCellMar](#)) is located in §A.1. *end note*]

17.4.43 `tblCellSpacing` (Table Row Cell Spacing)

This element specifies the default table cell spacing (the spacing between adjacent cells and the edges of the table) for all cells in the parent row. If specified, this element specifies the minimum amount of space which shall be left between all cells in the table including the width of the table borders in the calculation. It is important to note that row-level cell spacing shall be added inside of the text margins, which shall be aligned with the innermost starting edge of the text extents in a cell without row-level indentation or cell spacing. Row-level cell spacing shall not increase the width of the overall table.

This value is specified in the units applied via its type attribute. Any width value of type `pct` or `auto` for this element shall be ignored.

[*Example:* Consider a table whose first cell has a six point wide table border, and a table cell spacing value of 0.01 inches. The resulting table would have 0.01 inches of space between each table cell regardless of the width of the cell border, as follows (notice that no border is covered by any other border):

R1C1	R1C2
R2C1	R2C2

end example]

If this element is omitted, then the cells in this row shall inherit the cell spacing from the associated table level properties.

[*Example:* Consider a table where the second row has a cell spacing of 0.1 inches for all sides specified via the table row properties as follows:

This table row cell spacing is specified using the following WordprocessingML:

```
<w:trPr>
  <w:tblCellSpacing w:w="144" w:type="dxa"/>
  ...
</w:trPr>
```

The `tblCellSpacing` element as a child of `trPr` specifies the default cell spacing between all cells in the current row, in this case 144 twentieths of a point. *end example*]

This element’s content model is defined by the common table measurement definition in §17.4.87.

17.4.44 `tblCellSpacing` (Table Cell Spacing Exception)

This element specifies a table cell spacing exception for all cells in the parent table row as part of a set of table-level property exceptions. If specified, this element specifies the minimum amount of space which shall be left between all cells in the parent row after including the width of the table borders in the calculation. This setting shall be superseded by the row cell spacing value (§17.4.43). It is important to note that table-level cell spacing shall be added outside of the text margins, which shall be aligned with the innermost starting edge of the text extents in a table cell.

This value is specified in the units applied via its `type` attribute. Any width value of type `pct` or `auto` for this element shall be ignored.

[*Example:* Consider a table whose first cell has a six point wide table border, and a table cell spacing value of 0.01 inches. The resulting table would have 0.01 inches of space between each table cell regardless of the width of the cell border, as follows (notice that no border is covered by any other border):

R1C1	R1C2
R2C1	R2C2

end example]

If this element is omitted, then the row shall inherit the table cell spacing from the table-level cell spacing setting (§17.4.42), excepting the case of a row level override.

[*Example:* Consider a table whose final two rows are defined to have cell spacing of 0.1 inches for all sides via a table-level property exception, as follows:

--	--	--

This table cell spacing exception is specified using the following WordprocessingML:

```
<w:tblPrEx>
  <w:tblCellSpacing w:w="144" w:type="dxa"/>
  ...
</w:tblPrEx>
```

The `tblCellSpacing` element as a child of `tblPrEx` specifies the default cell spacing between all cells in final two rows in the current table, in this case 144 twentieths of a point. *end example*

This element's content model is defined by the common table measurement definition in §17.4.87.

17.4.45 `tblCellSpacing` (Table Cell Spacing Default)

This element specifies the default table cell spacing (the spacing between adjacent cells and the edges of the table) for all cells in the parent table. If specified, this element specifies the minimum amount of space which shall be left between all cells in the table including the width of the table borders in the calculation. This setting shall be superseded by a table-level exception (§17.4.44) or the row cell spacing value (§17.4.43) in that order. It is important to note that table-level cell spacing shall be added outside of the text margins, which shall be aligned with the innermost starting edge of the text extents in a table cell.

This value is specified in the units applied via its `type` attribute. Any width value of type `pct` or `auto` for this element shall be ignored.

[*Example:* Consider a table whose first cell has a six point wide table border, and a table cell spacing value of 0.01 inches. The resulting table would have 0.01 inches of space between each table cell regardless of the width of the cell border, as follows (notice that no border is covered by any other border):

R1C1	R1C2
R2C1	R2C2

end example

If this element is omitted, then the table shall inherit the table cell spacing from the associated table style. If table cell spacing is never specified in the style hierarchy, no cell spacing shall be added to the parent table.

[*Example:* Consider a table with a default cell spacing of 0.1 inches for all sides as follows:

R1C1	R1C2
------	------

R2C1

R2C2

This table cell spacing default is specified using the following WordprocessingML:

```
<w:tblPr>
  <w:tblCellSpacing w:w="144" w:type="dxa"/>
  ...
</w:tblPr>
```

The tblCellSpacing element as a child of tblPr specifies the default cell spacing between all cells in the current table, in this case 144 twentieths of a point. *end example*

This element's content model is defined by the common table measurement definition in §17.4.87.

17.4.46 tblDescription (Table Description)

This element specifies the description for the table.

[*Example:* Consider a table which specifies a description. This object might contain the following XML markup:

```
<w:tbl>
  <w:tblPr>
    <w:tblDescription w:val="Here is the description of the table" />
    ...
  </w:tblPr>
</w:tbl>
```

end example

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p>

Attributes	Description
	<pre data-bbox="456 249 1078 380"><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p data-bbox="415 422 1469 525">In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i></p> <p data-bbox="415 564 1341 630">The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_String](#)) is located in §A.1. *end note*]

17.4.47 tblGrid (Previous Table Grid)

This element specifies a previous table grid state, the modifications to which shall be attributed to a revision by a particular author and at a particular time. This element contains the table grid settings which were previously in place before a specific set of revisions by one author. The *table grid* is a definition of the set of grid columns which define all of the shared vertical edges of the table, as well as default widths for each of these grid columns. These grid column widths are then used to determine the size of the table based on the table layout algorithm used (§17.4.52;§17.4.53).

[Example: Consider the following table with four vertical edges (grid columns):

If we now modify this table by reducing the size of the last column without changing the overall table width, as follows:

This table would have a table grid consisting of four grid columns as follows:

```
<w:tblGrid>
  <w:gridCol w:w="2088"/>
  <w:gridCol w:w="1104"/>
  <w:gridCol w:w="3583"/>
  <w:gridCol w:w="2801"/>
  <w:tblGridChange w:id="1">
    <w:tblGrid>
      <w:gridCol w:w="2088"/>
      <w:gridCol w:w="1104"/>
      <w:gridCol w:w="3192"/>
      <w:gridCol w:w="3192"/>
    </w:tblGrid>
  </w:tblGridChange>
</w:tblGrid>
```

The `tblGrid` element as a child of `tblGridChange` contains the previous definition for the table grid, consisting of all for grid columns as well as the original widths for those columns. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TblGridBase](#)) is located in §A.1. *end note*]

17.4.48 `tblGrid` (Table Grid)

This element specifies the table grid for the current table. The *table grid* is a definition of the set of grid columns which define all of the shared vertical edges of the table, as well as default widths for each of these grid columns. These grid column widths are then used to determine the size of the table based on the table layout algorithm used (§17.4.52;§17.4.53).

If the table grid is omitted, then a new grid shall be constructed from the actual contents of the table assuming that all grid columns have a width of 0.

[*Example:* Consider the following table with four vertical edges (grid columns):

This table would have a table grid consisting of four grid columns as follows:


```
<w:tblGrid>
  <w:gridCol w:w="2088"/>
  <w:gridCol w:w="1104"/>
  <w:gridCol w:w="3192"/>
  <w:gridCol w:w="3192"/>
</w:tblGrid>
```

The `tblGrid` element contains the current definition for the table grid, consisting of all for grid columns as well as default widths for those columns. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_TblGrid](#)) is located in §A.1. *end note*]

17.4.49 `tblHeader` (Repeat Table Row on Every New Page)

This element specifies that the current table row shall be repeated at the top of each new page on which part of this table is displayed. This gives this table row the behavior of a 'header' row on each of these pages. This element can be applied to any number of rows at the top of the table structure in order to generate multi-row table headers.

If this element is omitted, this table row shall not be repeated on each new page on which the table is displayed. As well, if this row is not contiguously connected with the first row of the table (that is, if this table row is not either the first row, or all rows between this row and the first row are not marked as header rows) then this property shall be ignored.

[Example: Consider a table which must have its first row repeated on each new page, like the attribute listings in ECMA-376, for example:

Attributes	Description

Attributes	Description

Notice that the first row in the table is repeated on the top of the second page. This requirement would be specified as follows in the WordprocessingML for that row:

```
<w:trPr>
  <w:tblHeader />
</w:trPr>
```

The tblHeader element specifies that this table row is repeated as a header row at the top of each page. *end example*

This element’s content model is defined by the common boolean property definition in §17.17.4.

17.4.50 tblInd (Table Indent from Leading Margin)

This element specifies the indentation which shall be added before the leading edge of the current table in the document (the left edge in a left-to-right table, and the right edge in a right-to-left table). This indentation should shift the table into the text margin by the specified amount.

This value is specified in the units applied via its type attribute. Any width value of type pct or auto for this element shall be ignored.

If this element is omitted, then the table shall inherit the table indentation from the associated table style. If table indentation is never specified in the style hierarchy, no indentation shall be added to the parent table. If

the resulting justification on any table row is not left after applying the value of the jc element from the three levels of this property (§17.4.26;§17.4.27;§17.4.28), then this property shall be ignored.

[Example: Consider a table which must be indented one inch from the left margin, as follows:

R1C1	R1C2
R2C1	R2C2

This setting would be specified using the following WordprocessingML:

```
<w:tblPr>
  <w:jc w:val="start"/>
  <w:tblInd w:w="1440" w:type="dxa"/>
</w:tblPr>
```

If the properties on this table were now modified to justify it on the right side by setting the value of the jc element to right, as follows:

```
<w:tblPr>
  <w:jc w:val="end"/>
  <w:tblInd w:w="1440" w:type="dxa"/>
</w:tblPr>
```

This table would now have no indent, as the justification is no longer on the leading edge (left):

R1C1	R1C2
R2C1	R2C2

end example]

This element's content model is defined by the common table measurement definition in §17.4.87.

17.4.51 tblInd (Table Indent from Leading Margin Exception)

This element specifies the indentation which shall be added before the leading edge of the set of parent table rows which have this set of table-level property exceptions applied. This indentation should shift the table into the text margin by the specified amount in the document (the left edge in a left-to-right table, and the right edge in a right-to-left table).

This value is specified in the units applied via its type attribute. Any width value of type pct or auto for this element shall be ignored.

If this element is omitted, then the table shall inherit the table indentation from the associated table level property setting. If the resulting justification on the parent table row is not left after applying the value of the

jc element from the three levels of this property (§17.4.26;§17.4.27;§17.4.28), then this property shall be ignored.

[*Example:* Consider a table in which the last two rows must be indented one inch from the left margin via a table-level property exception definition, as follows:

This setting would be specified using the following WordprocessingML:

```
<w:tblPrEx>
  <w:tblInd w:w="1440" w:type="dxa"/>
</w:tblPrEx>
```

The tblInd element as a child of tblPrEx specifies that the rows with the table-level property exception must be indented by 1440 twentieths of a point (one inch). *end example]*

This element’s content model is defined by the common table measurement definition in §17.4.87.

17.4.52 tblLayout (Table Layout)

This element specifies the algorithm which shall be used to lay out the contents of this table within the document. When a table is displayed in a document, it can either be displayed using a fixed width or autofit layout algorithm (each discussed in the simple type referenced by the val attribute).

If this element is omitted, then the value of this element shall be assumed to be auto.

[*Example:* Consider a table which must use the fixed width table layout algorithm. This requirement is specified using the following WordprocessingML:

```
<w:tblPr>
  <w:tblLayout w:type="fixed"/>
</w:tblPr>
```

The tblLayout element specifies that the table must use the fixed layout algorithm. *end example]*

Attributes	Description
type (Table Layout Setting)	Specifies the algorithm which shall be used to lay out the contents of the parent table (see simple type definition for details on each algorithm used). [<i>Example:</i> Consider a table which must use the AutoFit width table layout algorithm. This requirement is specified using the following WordprocessingML:

Attributes	Description
	<pre><w:tblPr> <w:tblLayout w:type="autofit"/> </w:tblPr></pre> <p>The tblLayout element specifies that the table must use the auto layout algorithm. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_TblLayoutType simple type (§17.18.87).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TblLayoutType](#)) is located in §A.1. *end note]*

17.4.53 tblLayout (Table Layout Exception)

This element specifies the algorithm which shall be used to lay out the contents of all rows with this table within the table which have the set of table-level property exceptions specified by the parent element. When a table is displayed in a document, it can either be displayed using a fixed width or autofit layout algorithm (each discussed in the simple type referenced by the val attribute).

If this element is omitted, then the value of this element shall be assumed to be auto.

[Example: Consider a table which must use the fixed width table layout algorithm. This requirement is specified using the following WordprocessingML:

```
<w:tblPrEx>
  <w:tblLayout w:type="fixed"/>
</w:tblPrEx>
```

The tblLayout element specifies that the table must use the fixed layout algorithm. *end example]*

Attributes	Description
type (Table Layout Setting)	<p>Specifies the algorithm which shall be used to lay out the contents of the parent table (see simple type definition for details on each algorithm used).</p> <p>[Example: Consider a table which must use the AutoFit width table layout algorithm. This requirement is specified using the following WordprocessingML:</p> <pre><w:tblPr> <w:tblLayout w:type="autofit"/> </w:tblPr></pre> <p>The tblLayout element specifies that the table must use the auto layout algorithm. <i>end example]</i></p>

Attributes	Description
	The possible values for this attribute are defined by the ST_TblLayoutType simple type (§17.18.87).

[Note: The W3C XML Schema definition of this element’s content model ([CT_TblLayoutType](#)) is located in §A.1. *end note*]

17.4.54 tblLook (Table Style Conditional Formatting Settings Exception)

This element specifies the components of the conditional formatting of the referenced table style (if one exists) which shall be applied to the set of table rows with the current table-level property exceptions. A table style can specify up to six different optional conditional formats [*Example*: Different formatting for first column. *end example*], which then can be applied or omitted from individual table rows in the parent table.

The default setting is to apply the row and column banding formatting, but not the first row, last row, first column, or last column formatting.

[*Example*: Consider a table which must use the following conditional formatting properties from the referenced table style:

- First row conditional formatting
- Last row conditional formatting
- No row banding formatting
- No column banding formatting

The resulting WordprocessingML would be specified as follows:

```
<w:tblPrEx>
  <w:tblLook w:firstRow="true" w:lastRow="true" w:noHBand="true"
w:noVBand="true" />
</w:tblPrEx>
```

The `tblLook` element specifies which components of the table style are applied to the current table. *end example*]

Attributes	Description
firstColumn (First Column)	Specifies that the first column conditional formatting shall be applied to the table. The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).
firstRow (First Row)	Specifies that the first row conditional formatting shall be applied to the table. The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).
lastColumn (Last	Specifies that the last column conditional formatting shall be applied to the table.

Attributes	Description
Column)	The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).
lastRow (Last Row)	Specifies that the last row conditional formatting shall be applied to the table. The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).
noHBand (No Horizontal Banding)	Specifies that the horizontal banding conditional formatting shall not be applied to the table. The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).
noVBand (No Vertical Banding)	Specifies that the vertical banding conditional formatting shall not be applied to the table. The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).

[Note: The W3C XML Schema definition of this element's content model ([CT_TblLook](#)) is located in §A.1. *end note*]

17.4.55 tblLook (Table Style Conditional Formatting Settings)

This element specifies the components of the conditional formatting of the referenced table style (if one exists) which shall be applied to the current table. A table style can specify up to six different optional conditional formats [*Example*: Different formatting for first column. *end example*], which then can be applied or omitted from individual tables in the document.

The default setting is to apply the row and column banding formatting, but not the first row, last row, first column, or last column formatting.

[*Example*: Consider a table which must use the following conditional formatting properties from the referenced table style:

- First row conditional formatting
- Last row conditional formatting
- No row banding formatting
- No column banding formatting

The resulting WordprocessingML would be specified as follows:

```
<w:tblPr>
  <w:tblLook w:firstRow="true" w:lastRow="true" w:noHBand="true"
w:noVBand="true" />
</w:tblPr>
```

The `tblLook` element specifies which components of the table style are applied to the current table. *end example]*

Attributes	Description
<code>firstColumn</code> (First Column)	Specifies that the first column conditional formatting shall be applied to the table. The possible values for this attribute are defined by the <code>ST_OnOff</code> simple type (§22.9.2.7).
<code>firstRow</code> (First Row)	Specifies that the first row conditional formatting shall be applied to the table. The possible values for this attribute are defined by the <code>ST_OnOff</code> simple type (§22.9.2.7).
<code>lastColumn</code> (Last Column)	Specifies that the last column conditional formatting shall be applied to the table. The possible values for this attribute are defined by the <code>ST_OnOff</code> simple type (§22.9.2.7).
<code>lastRow</code> (Last Row)	Specifies that the last row conditional formatting shall be applied to the table. The possible values for this attribute are defined by the <code>ST_OnOff</code> simple type (§22.9.2.7).
<code>noHBand</code> (No Horizontal Banding)	Specifies that the horizontal banding conditional formatting shall not be applied to the table. The possible values for this attribute are defined by the <code>ST_OnOff</code> simple type (§22.9.2.7).
<code>noVBand</code> (No Vertical Banding)	Specifies that the vertical banding conditional formatting shall not be applied to the table. The possible values for this attribute are defined by the <code>ST_OnOff</code> simple type (§22.9.2.7).

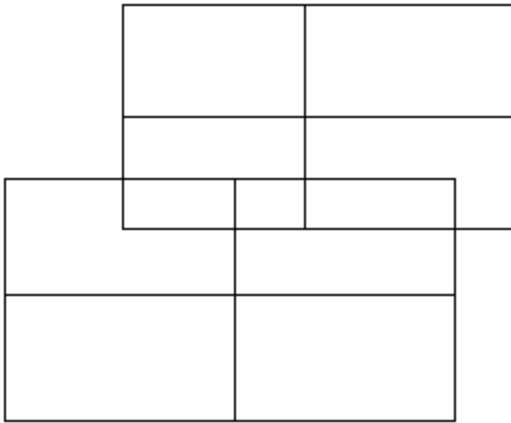
[Note: The W3C XML Schema definition of this element's content model (`CT_TblLook`) is located in §A.1. *end note]*

17.4.56 `tblOverlap` (Floating Table Allows Other Tables to Overlap)

This element specifies whether the current table shall allow other floating tables to overlap its extents when the tables are displayed in a document. If specified, then no adjustment shall be made to prevent tables whose properties would normally cause them to overlap from overlapping when displayed. If turned off, then the tables shall be adjusted as needed to prevent them from overlapping when displayed by adjusting the floating table properties as needed.

If this element is omitted on a given table, then this table shall allow other tables to overlap when displayed. If the parent table is not floating via the `tblpPr` element (§17.4.57), then this element shall be ignored.

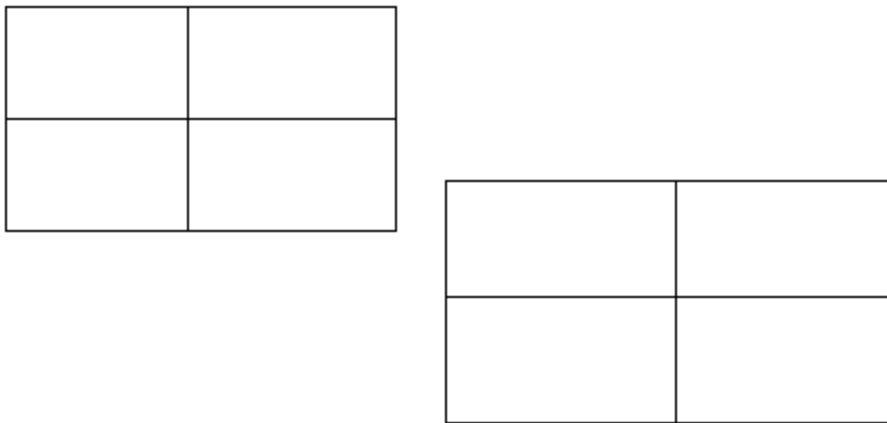
[Example: Consider two floating tables in a WordprocessingML document which overlap when displayed, as follows:



If either of these tables specifies that it must not allow overlapping, using the following WordprocessingML:

```
<w:tblPr>
  <w:tblOverlap w:val="never"/>
</w:tblPr>
```

The resulting tables must not overlap, and must be adjusted at display time to prevent any overlapping, for example:



The `tblOverlap` element with a value of `never` specifies that the specified table cannot overlap with other floating tables in the document. *end example*

Attributes	Description
val (Floating Table Overlap Setting)	Specifies whether a floating table shall allow other floating tables in the document to overlap its extents when displayed.

Attributes	Description
	<p>[<i>Example:</i> The following WordprocessingML specifies that the table is not allowed to overlap:</p> <pre data-bbox="451 352 933 384"><w:tblOverlap w:val="never" /></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_TblOverlap simple type (§17.18.88).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_TblOverlap](#)) is located in §A.1. *end note]*

17.4.57 tblpPr (Floating Table Positioning)

This element specifies information about the current table with regard to floating tables. *Floating tables* are tables in a document which are not part of the main text flow in the document, and are instead absolutely positioned with a specific size and position relative to non-frame content in the current document.

The first piece of information specified by the `tblpPr` element is that the current table is actually a floating table. This information is specified simply by the presence of the `tblpPr` element in table's properties. If the `tblpPr` element is omitted, the table shall not floating in the document.

The second piece of information is the positioning of the table, which is specified by the attribute values stored on the `tblpPr` element. In all absolute positioning cases, the positioning of the table is relative to its top-left corner position. For relative positioning (e.g. center), the positioning of the table is relative to its entire frame.

Note that the table still has a logical position in the file (its location within the block-level elements in the document). This logical location shall be used to calculate the position of the table relative to a paragraph, using the next regular (non-table, non-frame) paragraph in the document.

[*Example:* Consider a floating table which is positioned three inches from the edge of the page extents on both its top and left edges (i.e. the top-left corner occurs at 3" x 3"). This floating table would be specified using the following WordprocessingML:

```
<w:tbl>
  <w:tblpPr>
    <w:tblpPr w:leftFromText="144" w:rightFromText="144" w:topFromText="144"
w:bottomFromText="144" w:vertAnchor="page" w:horzAnchor="page" w:tblpX="4320"
w:tblpY="4320"/>
    ...
  </w:tblpPr>
...</w:tbl>
```

The presence of the `tblpPr` element dictates that this table is a floating table, and its attributes specify that the floating table shall be anchored 4320 twentieths of a point (3 inches) from the top and left edges of the current page. *end example*]

Attributes	Description
bottomFromText (Distance From Bottom of Table to Text)	<p>Specifies the minimum distance which shall be maintained between the current floating table and the top of text in the paragraph which is below this floating table.</p> <p>This distance is expressed in twentieths of a point.</p> <p>If this attribute is omitted, its value shall be assumed to be 0.</p> <p>[<i>Example</i>: Consider a floating table which should have a minimum of a one-half inch spacing from any text on its bottom side. This constraint would be specified using the following WordprocessingML:</p> <pre><w:tblPr> <w:tblpPr ... w:bottomFromText="720" /> </w:tblPr></pre> <p>The <code>bottomFromText</code> attribute specifies that the spacing between text and this floating table shall be a minimum of 720 twentieths of a point. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_TwipsMeasure</code> simple type (§22.9.2.14).</p>
horzAnchor (Table Horizontal Anchor)	<p>Specifies the base object from which the horizontal positioning in the <code>tblpX</code> and/or <code>tblpXSpec</code> attribute should be calculated.</p> <p>A floating table can be horizontally positioned relative to:</p> <ul style="list-style-type: none"> • The vertical edge of the page before any runs of text (the left edge for left-to-right paragraphs, the right edge for right-to-left paragraphs) • The vertical edge of the text margin before any runs of text (the left edge for left-to-right paragraphs, the right edge for right-to-left paragraphs) • The vertical edge of the text margin for the column in which the anchor paragraph is located <p>If this attribute is omitted, then its value shall be assumed to be <code>page</code>.</p> <p>[<i>Example</i>: Consider a floating table which should be positioned one inch to the right of its column in a left-to-right document. This floating table would be specified using the following WordprocessingML:</p> <pre><w:tblPr> <w:tblpPr ... w:tblpX="1440" w:horzAnchor="margin" /> </w:tblPr></pre> <p>These table properties specify that they are relative to the current margin, and that</p>

Attributes	Description
	<p>relative to that column, the floating table should be 1440 twentieths of a point. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_HAnchor simple type (§17.18.35).</p>
<p>leftFromText (Distance From Left of Table to Text)</p>	<p>Specifies the minimum distance which shall be maintained between the current floating table and the edge of text in the paragraph which is to the left of this floating table.</p> <p>This distance is expressed in twentieths of a point.</p> <p>If this attribute is omitted, its value shall be assumed to be 0.</p> <p>[<i>Example:</i> Consider a floating table which should have a minimum of a one-half inch spacing from any text on its left. This constraint would be specified using the following WordprocessingML:</p> <pre data-bbox="451 829 1047 926"><w:tblPr> <w:tblpPr ... w:leftFromText="720" /> </w:tblPr></pre> <p>The leftFromText attribute specifies that the spacing between text and this floating table must be a minimum of 720 twentieths of a point. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>
<p>rightFromText ((Distance From Right of Table to Text)</p>	<p>Specifies the minimum distance which shall be maintained between the current floating table and the edge of text in the paragraph which is to the right of this floating table.</p> <p>This distance is expressed in twentieths of a point.</p> <p>If this attribute is omitted, its value shall be assumed to be 0.</p> <p>[<i>Example:</i> Consider a floating table which should have a minimum of a one-half inch spacing from any text on its right. This constraint would be specified using the following WordprocessingML:</p> <pre data-bbox="451 1549 1063 1646"><w:tblPr> <w:tblpPr ... w:rightFromText="720" /> </w:tblPr></pre> <p>The rightFromText attribute specifies that the spacing between text and this floating table must be a minimum of 720 twentieths of a point. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>

Attributes	Description
tblpX (Absolute Horizontal Distance From Anchor)	<p>Specifies an absolute horizontal position for the floating table. This absolute position is specified relative to the horizontal anchor specified by the <code>horzAnchor</code> attribute for this floating table.</p> <p>This value is expressed in twentieths of a point. If it is positive, then the floating table is positioned after the anchor object in the direction of horizontal text flow in this document. If it is negative, then the floating table is positioned before the anchor object in the direction of horizontal text flow in this document.</p> <p>If the <code>tblpXSpec</code> attribute is also specified, then this value is ignored. If this attribute is omitted, then its value shall be assumed to be 0.</p> <p>[Example: Consider the following WordprocessingML fragment specifying a floating table:</p> <pre><w:tbl> <w:tblPr> <w:tblpPr ... w:horzAnchor="page" w:tblpX="1643"/> </w:tblPr> ... </w:tbl></pre> <p>This floating table specifies that it should be located exactly 1643 twentieths of a point after the vertical edge of the page (from the <code>horzAnchor</code> attribute). <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_SignedTwipsMeasure</code> simple type (§17.18.81).</p>
tblpXSpec (Relative Horizontal Alignment From Anchor)	<p>Specifies a relative horizontal position for the floating table. This relative position is specified relative to the horizontal anchor specified by the <code>horzAnchor</code> attribute for this floating table.</p> <p>If omitted, this attribute is not specified and the value of the <code>tblpX</code> attribute determines the absolute horizontal position of the floating table. If specified, the position for this attribute supersedes any value which is specified in the <code>tblpX</code> attribute, and that value is ignored.</p> <p>[Example: Consider the following WordprocessingML fragment specifying a floating table:</p> <pre><w:tbl> <w:tblPr> <w:tblpPr ... w:horzAnchor="page" w:tblpX="1643" w:tblpXSpec="left"/> </w:tblPr> ... </w:tbl></pre> <p>This floating table specifies that it has a horizontal placement of exactly 1643 twentieths</p>

Attributes	Description
	<p>of a point relative to the page, but that exact placement is overridden by the presence of the tblpXSpec attribute to place the table on the left side of the page. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_XAlign simple type (§22.9.2.18).</p>
tblpY (Absolute Vertical Distance From Anchor)	<p>Specifies an absolute vertical position for the floating table. This absolute position is specified relative to the vertical anchor specified by the vertAnchor attribute for this floating table.</p> <p>This value is expressed in twentieths of a point. If it is positive, then the floating table is positioned after the anchor object in the direction of vertical text flow in this document. If it is negative, then the floating table is positioned before the anchor object in the direction of vertical text flow in this document.</p> <p>If the tblpYSpec attribute is also specified, then this value is ignored. If this attribute is omitted, then its value shall be assumed to be 0.</p> <p>[Example: Consider the following WordprocessingML fragment specifying a floating table:</p> <pre><w:tbl> <w:tblPr> <w:tblpPr ... w:vertAnchor="text" w:tblpY="73" /> </w:tblPr> ... </w:tbl></pre> <p>This floating table specifies that it should be located exactly 79 twentieths of a point below the top vertical edge of the anchor's paragraph's text (from the vertAnchor attribute), assuming that the vertical text direction is top to bottom. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_SignedTwipsMeasure simple type (§17.18.81).</p>
tblpYSpec (Relative Vertical Alignment from Anchor)	<p>Specifies a relative vertical position for the floating table. This relative position is specified relative to the vertical anchor specified by the vertAnchor attribute for this floating table.</p> <p>If omitted, this attribute is not specified and the value of the tblpY attribute determines the absolute horizontal position of the floating table. If specified, the position for this attribute supersedes any value which is specified in the tblpY attribute, and that value is ignored, unless the vertAnchor is set to text, in which case any relative positioning is not allowed, and is itself ignored.</p> <p>[Example: Consider the following WordprocessingML fragment specifying a floating table:</p> <pre><w:tbl> <w:tblPr></pre>

Attributes	Description
	<pre> <w:tblpPr ... w:vertAnchor="margin" w:tblpY="73" w:tblpYSpec="center"/> </w:tblpPr> ... </w:tbl> </pre> <p>This floating table specifies that it has a vertical placement of exactly 73 twentieths of a point relative to the top margin, but that exact placement is overridden by the presence of the tblpYSpec attribute to place the table in the center of the margin. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_YAlign simple type (§22.9.2.20).</p>
topFromText (Distance From Top of Table to Text)	<p>Specifies the minimum distance which shall be maintained between the current floating table and the bottom edge of text in the paragraph which is above this floating table.</p> <p>This distance is expressed in twentieths of a point.</p> <p>If this attribute is omitted, its value shall be assumed to be 0.</p> <p>[<i>Example:</i> Consider a floating table which should have a minimum of a one-half inch spacing from any text above it. This constraint would be specified using the following WordprocessingML:</p> <pre> <w:tblpPr> <w:tblpPr ... w:topFromText="720" /> </w:tblpPr> </pre> <p>The topFromText attribute specifies that the spacing between text and this floating table must be a minimum of 720 twentieths of a point. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>
vertAnchor (Table Vertical Anchor)	<p>Specifies the base object from which the vertical positioning in the tblpY attribute should be calculated.</p> <p>A floating table can be horizontally positioned relative to:</p> <ul style="list-style-type: none"> • The horizontal edge of the page before any runs of text (the top edge for top-to-bottom sections, the bottom for bottom-to-top sections) • The horizontal edge of the text margin before any runs of text (the top edge for top-to-bottom sections, the bottom for bottom-to-top sections) • The horizontal edge of the page before any runs of text (the top edge for top-to-bottom sections, the bottom for bottom-to-top sections) <p>If this attribute is omitted, then its value shall be assumed to be page.</p>

Attributes	Description
	<p>[<i>Example</i>: Consider a floating table which should be positioned two inches below the page top in a top-to-bottom document. This floating table would be specified using the following WordprocessingML:</p> <pre><w:tblPr> <w:tblpPr ... w:tblpY="2880" w:vertAnchor="page" /> </w:tblPr></pre> <p>These floating table properties specify that they are relative to the anchor page, and that relative to that page, the table should be 2880 twentieths of a point in the direction of the flow of text (down, in this case). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_VAnchor simple type (§17.18.100).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_TblPPr](#)) is located in §A.1. *end note*]

17.4.58 tblPr (Previous Table Properties)

This element specifies a previous set of table properties, the modifications to which shall be attributed to a revision by a particular author and at a particular time. This element contains the table property settings which were previously in place before a specific set of revisions by one author. These properties affect the appearance of all rows and cells within the parent table, but can be overridden by individual table-level exception, row, and cell level properties, as defined by each property.

[*Example*: Consider the following simple WordprocessingML table:

--	--

If the table justification is set to center and the table shading to set to red with revision marking on, as follows:

--	--

The revision tracked on this table would be specified as follows in the WordprocessingML:


```

<w:tblPr>
  <w:tblStyle w:val="TableGrid"/>
  <w:tblW w:w="0" w:type="auto"/>
  <w:jc w:val="center"/>
  <w:shd w:val="clear" w:color="auto" w:fill="FF0000"/>
  <w:tblLook w:firstRow="true" w:firstColumn="true"
    w:noVBand="true" />
  <w:tblPrChange w:id="0" ... >
    <w:tblPr>
      <w:tblStyle w:val="TableGrid"/>
      <w:tblW w:w="0" w:type="auto"/>
      <w:tblLook w:firstRow="true" w:firstColumn="true"
        w:noVBand="true" />
    </w:tblPr>
  </w:tblPrChange>
</w:tblPr>

```

The `tblPr` element as a child of `tblPrChange` contains the previous definition for the table properties, consisting of the properties set before the current tracked revision. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_TblPrBase](#)) is located in §A.1. *end note*]

17.4.59 `tblPr` (Table Properties)

This element specifies the set of table-wide properties applied to the current table. These properties affect the appearance of all rows and cells within the parent table, but can be overridden by individual table-level exception, row, and cell level properties as defined by each property.

[Example: Consider the following simple WordprocessingML table:

--	--

This table defines a one point single border for all border types and is set to 100% of page width - both table-wide properties. The resulting table is represented by the following WordprocessingML:

```
<w:tbl>
  <w:tblPr>
    <w:tblW w:w="0" w:type="auto"/>
    <w:tblBorders>
      <w:top w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:start w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:bottom w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:end w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:insideH w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:insideV w:val="single" w:sz="4" w:space="0" w:color="auto"/>
    </w:tblBorders>
  </w:tblPr>
  ...
</w:tbl>
```

In this example, the `tblW` element (§17.4.63) defines the total width of the table, which, in this case, is set to a type of `auto`, which specifies that the table should be automatically sized to fit its contents. The `tblBorders` element (§17.4.38) specifies each of the table's borders, and specifies a one point border on the top, left, bottom, right and inside horizontal and vertical border. *end example*

[Note: The W3C XML Schema definition of this element's content model (`CT_TblPr`) is located in §A.1. *end note*]

17.4.60 `tblPrEx` (Table-Level Property Exceptions)

This element specifies a set of table properties which shall be applied to the contents of this row in place of the table properties specified in the `tblPr` element.

[Note: These properties are typically used in cases involving legacy documents, as well as cases where two existing independent tables are merged (in order to prevent the look of the second table from being superseded by the first table). *end note*]

[Example: Consider the following two tables in a WordprocessingML document:

These two tables each have a different set of table level borders. If the interceding paragraphs between these two tables is removed and the tables are merged together, it is obviously undesirable to have the second table lose its formatting and match the properties of the first table. Therefore, when the tables are merged as follows (note that there is now only one table):

The resulting WordprocessingML for the last three rows of the table would include the following set of table-level property exceptions:

```
<w:tr>
  <w:tblPrEx>
    <w:tblBorders>
      <w:top w:val="thinThickThinMediumGap" w:sz="24" w:space="0"
w:color="auto"/>
      <w:start w:val="thinThickThinMediumGap" w:sz="24" w:space="0"
w:color="auto"/>
      <w:bottom w:val="thinThickThinMediumGap" w:sz="24" w:space="0"
w:color="auto"/>
      <w:end w:val="thinThickThinMediumGap" w:sz="24" w:space="0"
w:color="auto"/>
      <w:insideH w:val="thinThickThinMediumGap" w:sz="24" w:space="0"
w:color="auto"/>
      <w:insideV w:val="thinThickThinMediumGap" w:sz="24" w:space="0"
w:color="auto"/>
    </w:tblBorders>
  </w:tblPrEx>
  ...
</w:tr>
```

The `tblPrEx` element contains all table-level properties which are being overridden for the current row in the table. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model (`CT_TblPrEx`) is located in §A.1. *end note*]

17.4.61 tblPrEx (Previous Table-Level Property Exceptions)

This element specifies a previous set of table-level property exceptions, the modifications to which shall be attributed to a revision by a particular author and at a particular time. This element contains the table-level property exceptions which were previously in place before a specific set of revisions by one author.

[Example: Consider the following two tables in a WordprocessingML document. If the interceding paragraphs between these two tables is removed and the tables are merged together, it is obviously undesirable to have the second table lose its formatting and match the properties of the first table. Therefore, when the tables are merged as follows (note that there is now only one table):

If the border type is changed to a red border of type thinThickThinSmallGap with revisions tracked, as follows:

The resulting WordprocessingML for the last three rows of the table would include the following set of table-level property exceptions with revision tracking:

```

<w:tr>
  <w:tblPrEx>
    <w:tblBorders>
      <w:top w:val="thinThickThinMediumGap" w:sz="24" w:space="0"
        w:color="auto"/>
      <w:start w:val="thinThickThinMediumGap" w:sz="24" w:space="0"
        w:color="auto"/>
      <w:bottom w:val="thinThickThinMediumGap" w:sz="24" w:space="0"
        w:color="auto"/>
      <w:end w:val="thinThickThinMediumGap" w:sz="24" w:space="0"
        w:color="auto"/>
      <w:insideH w:val="thinThickThinMediumGap" w:sz="24" w:space="0"
        w:color="auto"/>
      <w:insideV w:val="thinThickThinMediumGap" w:sz="24" w:space="0"
        w:color="auto"/>
    </w:tblBorders>
    <w:tblPrExChange w:id="9" ... >
      <w:tblPrEx>
        <w:tblBorders>
          <w:top w:val="thinThickThinSmallGap" w:sz="24" w:space="0"
            w:color="FF0000"/>
          <w:start w:val="thinThickThinSmallGap" w:sz="24" w:space="0"
            w:color="FF0000"/>
          <w:bottom w:val="thinThickThinSmallGap" w:sz="24" w:space="0"
            w:color="FF0000"/>
          <w:end w:val="thinThickThinSmallGap" w:sz="24" w:space="0"
            w:color="FF0000"/>
          <w:insideH w:val="thinThickThinSmallGap" w:sz="24" w:space="0"
            w:color="FF0000"/>
          <w:insideV w:val="thinThickThinSmallGap" w:sz="24" w:space="0"
            w:color="FF0000"/>
        </w:tblBorders>
      </w:tblPrEx>
    </w:tblPrExChange>
  </w:tblPrEx>
  ...
</w:tr>

```

The `tblPrEx` element as a child of `tblPrExChange` contains the previous definition for the table-level property exceptions, consisting of the properties set before the current tracked revision. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TblPrExBase](#)) is located in §A.1. *end note*]

17.4.62 tblStyle (Referenced Table Style)

This element specifies the style ID of the table style which shall be used to format the contents of this table.

This formatting is applied at the following location in the *style hierarchy*:

- Document defaults
- Table styles (this element)
- Numbering styles
- Paragraph styles
- Character styles
- Direct Formatting

This means that all properties specified in the style element (§17.7.4.17) with a styleId which corresponds to the value in this element's val attribute are applied to the table at the appropriate level in the hierarchy.

If this element is omitted, or it references a style which does not exist, then no table style shall be applied to the current table. As well, this property is ignored if the table properties are themselves part of a table style.

[Example: Consider the following WordprocessingML fragment:

```
<w:tblPr>
  <w:tblStyle w:val="TestTableStyle" />
</w:tblPr>
```

This table specifies that it inherits all of the table properties specified by the table style with a styleId of TestTableStyle. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[Example: Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ...</pre>

Attributes	Description
	<p><code></w:sdtPr></code></p> <p>In this case, the decimal number in the <code>val</code> attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model (`CT_String`) is located in §A.1. *end note*]

17.4.63 tblW (Preferred Table Width)

This element specifies the preferred width for this table. This preferred width is used as part of the table layout algorithm specified by the `tblLayout` element (§17.4.52; §17.4.53) - full description of the algorithm in the `ST_TblLayout` simple type (§17.18.87).

All widths in a table are considered preferred because:

- The table shall satisfy the shared columns as specified by the `tblGrid` element (§17.4.48)
- Two or more widths can have conflicting values for the width of the same grid column
- The table layout algorithm (§17.18.87) can require a preference to be overridden

This value is specified in the units applied via its type attribute. Any width value of type `pct` for this element shall be calculated relative to the text extents of the page (page width excluding margins).

If this element is omitted, then the cell width shall be of type `auto`.

[Example: Consider a WordprocessingML table defined as follows:

```
<w:tbl>
  <w:tblPr>
    <w:tblW w:type="dxa" w:w="1440"/>
  </w:tblPr>
  ...
</w:tbl>
```

This table specifies that it has a preferred table width of 1440 twentieths of a point (one inch). The resulting table would therefore be sized such that the table maintains that preferred width, as follows:

	Hello world	
--	----------------	--

The text `Hello world` makes the middle cell larger, and the other two cells are size to maintain the preferred widths of one inch for the overall table width:

	Hello world this is a longer string.	
--	--	--

However, when the middle table cell requires a larger width to accommodate non-breaking text, that preference can be overridden as needed:

	Hello worlddddddddddddddddddddddddddddddd	
--	--	--

In this case, the middle cell's long non breaking string caused the table to be expanded to prevent breaking the string, and therefore to override the preferred width on the table. *end example*]

This element’s content model is defined by the common table measurement definition in §17.4.87.

17.4.64 tblW (Preferred Table Width Exception)

This element specifies the preferred width for the parent table row via a set of table-level property exceptions. This preferred width is used as part of the table layout algorithm specified by the `tblLayout` element (§17.4.52n; §17.4.53) - full description of the algorithm in the `ST_TblLayout` simple type (§17.18.87).

All widths in a table are considered preferred because:

- The table shall satisfy the shared columns as specified by the `tblGrid` element (§17.4.48)
- Two or more widths can have conflicting values for the width of the same grid column
- The table layout algorithm (§17.18.87) can require a preference to be overridden

This value is specified in the units applied via its `type` attribute. Any width value of type `pct` for this element shall be calculated relative to the text extents of the page (page width excluding margins).

If this element is omitted, then the cell width shall be of type `auto`.

[*Example*: Consider a row in a `WordprocessingML` table defined as follows:


```

<w:tr>
  <w:tblPrEx>
    <w:tblW w:type="auto" w:w="1440"/>
  </w:tblPrEx>
  <w:trPr>

  </w:trPr>
  ...
</w:tr>

```

This table-level property exception specifies that it has a preferred table width of 1440 twentieths of a point (one inch). The resulting table row would therefore be sized such that the table maintains that preferred width, as follows:

	Hello world	
--	----------------	--

The text Hello world makes the middle cell larger, and the other two cells are size to maintain the preferred widths of one inch for the overall table width:

	Hello world this is a longer string.	
--	--	--

However, when the middle table cell requires a larger width to accommodate non-breaking text, that preference can be overridden as needed:

	Hello worlddddddddddddddddddddddddddddddd	
--	--	--

In this case, the middle cell's long non breaking string caused the table to be expanded to prevent breaking the string, and therefore to override the preferred width on the table row. *end example*]

This element's content model is defined by the common table measurement definition in §17.4.87.

17.4.65 tc (Table Cell)

This element specifies a single cell in a table row, which contains the table's content. Table cells in WordprocessingML are analogous to HTML td elements.

A tc element has one formatting child element, tcPr (§17.4.69), which defines the properties for the cell. Each unique property on the table cell is specified by a child element of this element. As well, a table cell can contain any block-level content, which allows for the nesting of paragraphs and tables within table cells.

If a table cell does not include at least one block-level element, then this document shall be considered corrupt.

[Example: Consider a table consisting of a single table cell, which contains the text Hello, world:

Hello, world

This table cell's content is represented by the following WordprocessingML:

```
<w:tc>
  <w:tcPr>
    <w:tcW w:w="0" w:type="auto"/>
  </w:tcPr>
  <w:p>
    <w:r>
      <w:t>Hello, world</w:t>
    </w:r>
  </w:p>
</w:tc>
```

The tc element contains a set of cell-level properties defined using the tcPr element, and a single block-level element - in this case, a paragraph. *end example*]

Attributes	Description
id (Table Cell Identifier)	<p>Specifies a unique identifier for the current table cell. This identifier shall be unique within the table, and is used to identify this table cell as a header cell for other cells within the table, using the headers child element.</p> <p>If this element is omitted, this table cell has no unique identifier.</p> <p>[Example: Consider a table cell defined as follows:</p> <div><w:tc w:id="januaryeight"> ... </w:tc></div> <p>The value in the id specifies a unique identifer of januaryeight. Other cells in the table are then able to reference this cell as a row or column header by referencing this ID. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Tc](#)) is located in §A.1. *end note*]

17.4.66 tcBorders (Table Cell Borders)

This element specifies the set of borders for the edges of the current table cell, using the eight border types defined by its child elements.

If the cell spacing for any row is non-zero as specified using the `tblCellSpacing` element (§17.4.44; §17.4.43; §17.4.45), then there is never a border conflict (as the non-zero cell spacing is applied above and beyond each individual cell border's width) and all table, table-level exception, and table cell borders shall be displayed.

If the cell spacing is zero, then there can be a conflict between two adjacent cell borders [*Example*: Between the left border of all cells in the second column and the right border of all cells in the first column of the table. *end example*], which shall be resolved as follows:

5. If either conflicting table cell border is `nil` or `none` (no border), then the opposing border shall be displayed.
6. If a cell border conflicts with a table border, the cell border always wins.
7. Each border shall then be assigned a weight using the following formula, and the border value using this calculation shall be displayed over the alternative border:

$$W_{\text{border}} = \# \text{ of lines in border} * \text{border number}$$

1. The border number shall be determined by this list:

single	1
thick	2
double	3
dotted	4
dashed	5
dotDash	6
dotDotDash	7
triple	8
thinThickSmallGap	9
thickThinSmallGap	10
thinThickThinSmallGap	11
thinThickMediumGap	12
thickThinMediumGap	13
thinThickThinMediumGap	14
thinThickLargeGap	15
thickThinLargeGap	16

thinThickThinLargeGap	17
wave	18
doubleWave	19
dashSmallGap	20
dashDotStroked	21
threeDEmboss	22
threeDEngrave	23
outset	24
inset	25

2. If the borders have an equal weight, than the higher of the two on this precedence list shall win:

- single
- thick
- double
- dotted
- dashed
- dotDash
- dotDotDash
- triple
- thinThickSmallGap
- thickThinSmallGap
- thinThickThinSmallGap
- thinThickMediumGap
- thickThinMediumGap
- thinThickThinMediumGap
- thinThickLargeGap
- thickThinLargeGap
- thinThickThinLargeGap
- wave
- doubleWave
- dashSmallGap
- dashDotStroked
- threeDEmboss
- threeDEngrave
- outset
- inset

3. If the borders have an identical style, than each border color shall be assigned a brightness value as follows:

$$\text{Brightness} = R + B + 2 * G$$

The color with the smaller brightness value shall win.

4. If the borders have an identical brightness value above, then each border color shall be assigned a new brightness value as follows:

$$\text{Brightness} = B + 2 * G$$

The color with the smaller brightness value shall win.

5. If the borders have an identical brightness value above, then each border color shall be assigned a brightness value as follows:

$$\text{Brightness} = G$$

The color with the smaller brightness value shall win.

6. If the borders have an identical brightness value above, then they are functionally identical, and the first border in reading order should be displayed.

[*Example:* Consider the following two cell table (with exaggerated table cell spacing for clarity):

--	--

If we collapse the cell spacing, there are conflicting borders at all edges. For each cell/table border conflict, rule #2 says that the cell border must win. For the conflict in the center between two cell borders, rule #3 gives us a larger border weight for the right cell's border, resulting in the following table:

--	--

end example]

If this element is omitted, then this table shall have the borders specified by the associated table style. If no borders are specified in the style hierarchy, then this table shall not have any table borders.

[*Example:* Consider a table whose first cell specifies cell-level borders consisting of a thick double red line, as follows:

These cell borders are specified using the following WordprocessingML:

```
<w:tcPr>
  <w:tcBorders>
    <w:top w:val="double" w:sz="24" w:space="0" w:color="FF0000"/>
    <w:start w:val="double" w:sz="24" w:space="0" w:color="FF0000"/>
    <w:bottom w:val="double" w:sz="24" w:space="0" w:color="FF0000"/>
    <w:end w:val="double" w:sz="24" w:space="0" w:color="FF0000"/>
  </w:tcBorders>
</w:tcPr>
```

The tcBorders element specifies the set of borders applied to the first cell as a 3 point double border. *end example]*

[Note: The W3C XML Schema definition of this element’s content model ([CT_TcBorders](#)) is located in §A.1. *end note]*

17.4.67 tcFitText (Fit Text Within Cell)

This element specifies that the contents of the current cell shall have their inter-character spacing increased or reduced as necessary to fit the width of the text extents of the current cell. This setting shall behave identically to placing the contents of this paragraph in a run and using the fitText element (§17.3.2.14), if the width provided on that element matched the width of the current cell.

If this element is omitted, then the text in this cell shall not be fit to the current cell extents.

[Example: Consider a 2 row by two column table, in which the contents of the two cells in the first row have both have the fit text property set, as follows:

```
<w:tcPr>
  <w:tcFitText w:val="true"/>
</w:tcPr>
```

The resulting table cells must have their contents fit to the extents of the parent table cell, as follows:

S a m p l e t e x t i n R 1 C 1 .	And this table cell instead contains a very very long string of sample text in R2C2.
R2C1	R2C2

end example]

This element’s content model is defined by the common boolean property definition in §17.17.4.

17.4.68 tcMar (Single Table Cell Margins)

This element specifies a set of cell margins for a single table cell in the parent table.

This setting, if present, shall override the table cell margins from the table-level cell margins (§17.4.42).

[*Example:* Consider a table whose first cell is defined to have default cell margins of 0.5 inches for all sides rather than the table defaults, as follows:

R1C1
R2C1

This set of table cell margins is specified using the following WordprocessingML:

```
<w:tcPr>
  <w:tcMar>
    <w:top w:w="720" w:type="dxa"/>
    <w:start w:w="720" w:type="dxa"/>
    <w:bottom w:w="720" w:type="dxa"/>
    <w:end w:w="720" w:type="dxa"/>
  </w:tcMar>
  ...
</w:tcPr>
```

The tcMar element as a child of tcPr specifies the set of table cell margins used for the first table cell, in this case, 720 twentieths of a point on all sides. *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TcMar](#)) is located in §A.1. *end note*]

17.4.69 tcPr (Table Cell Properties)

This element specifies the set of properties which shall be applied a specific table cell. Each unique property is specified by a child element of this element. In any instance where there is a conflict between the table level, table-level exception, or row level properties with a corresponding table cell property, these properties shall overwrite the table or row wide properties.

[*Example:* Consider a table where the cell width overwrites the table width represented in the following WordprocessingML:

```
<w:tbl>
  <w:tblPr>
    <w:tblCellMar>
      <w:start w:w="0" w:type="dxa"/>
    </w:tblCellMar>
  </w:tblPr>
  ...
  <w:tr>
    <w:tc>
      <w:tcPr>
        <w:tcMar>
          <w:start w:w="720" w:type="dxa"/>
        </w:tcMar>
      </w:tcPr>
      ...
    </w:tc>
  </w:tr>
</w:tbl>
```

This table cell has a left cell margin of 720 twentieths of a point (one half inch) as specified in the tcMar element, which overwrites the table level setting of 0 left table cell margin. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TcPr](#)) is located in §A.1. *end note*]

17.4.70 tcPr (Previous Table Cell Properties)

This element specifies a previous set of table cell properties, the modifications to which shall be attributed to a revision by a particular author and at a particular time. This element contains the table cell property settings which were previously in place before a specific set of revisions by one author. Each unique property is specified by a child element of this element. In any instance where there is a conflict between the table level, table-level exception, or row level properties with a corresponding table cell property, these properties shall overwrite the table or row wide properties.

[*Example:* Consider a basic two row by two column table as follows:

If the cell shading in the first cell is set to red with revision tracking enabled, as follows:

This revision is specified as follows in the associated WordprocessingML:

```
<w:tc>
  <w:tcPr>
    <w:tcW w:w="4788" w:type="dxa"/>
    <w:shd w:val="clear" w:color="auto" w:fill="FF0000"/>
    <w:tcPrChange w:id="2" ...>
      <w:tcPr>
        <w:tcW w:w="4788" w:type="dxa"/>
      </w:tcPr>
    </w:tcPrChange>
  </w:tcPr>
<w:p/>
</w:tc>
```

The tcPr element beneath the tcPrChange element specifies the set of table cell properties which were in place before the current revision to the document. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TcPrInner](#)) is located in §A.1. *end note*]

17.4.71 tcW (Preferred Table Cell Width)

This element specifies the preferred width for this table cell. This preferred width is used as part of the table layout algorithm specified by the tblLayout element (§17.4.52; §17.4.53) - full description of the algorithm in the ST_TblLayout simple type (§17.18.87).

All widths in a table are considered preferred because:

- The table shall satisfy the shared columns as specified by the tblGrid element (§17.4.48)
- Two or more widths can have conflicting values for the width of the same grid column
- The table layout algorithm (§17.18.87) can require a preference to be overridden

This value is specified in the units applied via its type attribute. Any width value of type pct for this element shall be calculated relative to the overall width of the table.

If this element is omitted, then the cell width shall be of type auto.

[*Example:* Consider a WordprocessingML table defined as follows:

```
<w:tbl>
  <w:tr>
    <w:tc>
      <w:tcPr>
        <w:tcW w:type="pct" w:w="33.3%"/>
      </w:tcPr>
      ...
    </w:tc>
    <w:tc>
      <w:tcPr>
        <w:tcW w:type="pct" w:w="33.3%"/>
      </w:tcPr>
      ...
    </w:tc>
    <w:tc>
      <w:tcPr>
        <w:tcW w:type="pct" w:w="33.3%"/>
      </w:tcPr>
      ...
    </w:tc>
  </w:tr>
</w:tbl>
```

This table specifies that it has no preferred table width, but each cell must be exactly 33.3 percent of the overall table width. The resulting table would therefore be sized such that all columns are of the width of the maximum column, as follows:

	Hello world	
--	-------------	--

The text Hello world makes the middle cell larger, and the other two cells are increased in size to maintain the preferred widths of one-third of the overall table width. However, when the middle table cell requires a larger size to accommodate non-breaking text, that preference can be overridden as needed:

	Hello worlddddddddddddddddddddddddddddddddddddd	

In this case, the middle cell's long non breaking string caused the table to reach the text margins on the page, and therefore to override the preferred widths on the empty cells. *end example*]

This element’s content model is defined by the common table measurement definition in §17.4.87.

17.4.72 textDirection (Table Cell Text Flow Direction)

This element specifies the direction of the text flow for this table cell.

If this element is omitted on a given table cell, its value is determined by the setting previously set at any level of the style hierarchy (i.e. that previous setting remains unchanged). If this setting is never specified in the style hierarchy, then the table cell shall inherit the text flow settings from the parent section.

[*Example:* Consider a table with one cell in which all the table cell's text flow is oriented vertically, flowing from right to left horizontally within that cell:

Text in this table cell

This table cell would specify this text flow using the following WordprocessingML:

```
<w:tc>
  <w:tcPr>
    ...
    <w:textDirection w:val="r1" />
  </w:tcPr>
  ...
</w:tc>
```

The textDirection element specifies via the r1 value in the val attribute that the text flow is to be oriented vertically, with subsequent lines stacked from right to left. *end example*

Attributes	Description
val (Direction of Text Flow)	<p>Specifies the direction of the text flow for this object.</p> <p>[<i>Example:</i> Consider a document with a section in which text must be oriented vertically, flowing from left to right horizontally on the page. This setting requires the following WordprocessingML:</p> <pre><w:sectPr> ... <w:textDirection w:val="lr" /> </w:sectPr></pre> <p>The textDirection element specifies via the lr value in the val attribute that the text flow be oriented vertically, with subsequent lines stacked from left to right. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TextDirection simple type (§17.18.93).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TextDirection](#)) is located in §A.1.
end note]

17.4.73 tl2br (Table Cell Top Left to Bottom Right Diagonal Border)

This element specifies the border which shall be displayed on the top left side to bottom right diagonal within the current table cell.

If this element is omitted, then the top left to bottom right diagonal of this table cell shall not have a cell border, and its border can use the table's border settings as appropriate.

[Example: Consider a table in which the first cell in the first row specifies a top left to bottom right diagonal cell border as follows:

R1C1	R1C2
R2C1	R2C2

This diagonal cell border is specified using the following WordprocessingML:

```
<w:tc>
  <w:tcPr>
    ...
    <w:tcBorders>
      <w:tl2br w:val="double" w:sz="4" w:space="0" w:color="FF0000"/>
    </w:tcBorders>
  </w:tcPr>
</w:p>
</w:tc>
```

The tl2br element specifies a ½ point border of type double on the table cell's diagonal. *end example*]

This element's content model is defined by the common border properties definition in §17.3.4.

17.4.74 top (Table Cell Top Border)

This element specifies the border which shall be displayed at the top of the current table cell. The appearance of this table cell border in the document shall be determined by the following settings:

- If the net tblCellSpacing element value (§17.4.44;§17.4.43;§17.4.45) applied to the cell is non-zero, then the cell border shall always be displayed
- Otherwise, the display of the border is subject to the conflict resolution algorithm defined by the tcBorders element (§17.4.66) and the tblBorders element (§17.4.39;§17.4.38)

If this element is omitted, then the top of this table cell shall not have a cell border, and its border can use the table's border settings as appropriate.

[*Example:* Consider a table in which the first cell in the first row specifies a top cell border , as follows:

R1C1	R1C2
R2C1	R2C2

This top cell border is specified using the following WordprocessingML:

```
<w:tc>
  <w:tcPr>
    ...
    <w:tcBorders>
      <w:top w:val="thinThickThinSmallGap" w:sz="24" w:space="0"
w:color="FF0000"/>
    </w:tcBorders>
  </w:tcPr>
  <w:p/>
</w:tc>
```

The top element specifies a three point border of type `thinThinThickSmallGap`. *end example]*

This element's content model is defined by the common border properties definition in §17.3.4.

17.4.75 top (Table Cell Top Margin Default)

This element specifies the amount of space which shall be left between the top extent of the cell contents and the top border of all table cells within the parent table. This setting can be overridden by the table cell top margin definition specified by the top element contained within the table cell's properties (§17.4.77).

This value is specified in the units applied via its type attribute. Any width value of type `pct` or `auto` for this element shall be ignored.

If this element is omitted, then it shall inherit the table cell margin from the associated table style. If a top margin is never specified in the style hierarchy, then this table shall have no top cell padding by default (excepting individual cell overrides).

[*Example:* Consider a two by two table in which the default table cell top margin is specified to be exactly 0.25 inches, as follows (marked with an arrow in the first table cell below):

R1C1	R2C1
R2C1	R2C2

This table property is specified using the following WordprocessingML markup:

```
<w:tbl>
  <w:tblPr>
    <w:tblCellMar>
      <w:top w:w="360" w:type="dxa"/>
    </w:tblCellMar>
  </w:tblPr>
  ...
</w:tbl>
```

Every cell in the table has a default cell margin setting it to 360 twentieths of a point. *end example*]

This element's content model is defined by the common table measurement definition in §17.4.87.

17.4.76 top (Table Top Border)

This element specifies the border which shall be displayed at the top of the current table. The appearance of this table border in the document shall be determined by the following settings:

- The display of the border is subject to the conflict resolution algorithm defined by the tcBorders element (§17.4.66) and the tblBorders element (§17.4.39;§17.4.38)

If this element is omitted, then the top of this table shall have the border specified by the associated table style. If no top border is specified in the style hierarchy, then this table shall not have a top border.

[*Example:* Consider a table in which the table properties specifies a top table border, as follows:

R1C1	R1C2
R2C1	R2C2

This top table border is specified using the following WordprocessingML:

```
<w:tbl>
  <w:tblPr>
    <w:tblBorders>
      <w:top w:val="thinThickThinMediumGap" w:sz="24" w:space="0"
w:color="D0D0D0" w:themeColor="accent3" w:themeTint="99"/>
    </w:tblBorders>
  </w:tblPr>
  ...
</w:tbl>
```

The top element specifies a three point top table border of type thinThinThickMediumGap. *end example*].

This element's content model is defined by the common border properties definition in §17.3.4.

17.4.77 top (Table Cell Top Margin Exception)

This element specifies the amount of space which shall be left between the top extent of the cell contents and the top border of a specific table cell within a table. This setting shall override the table cell top margin definition specified by the top element contained within the table properties (§17.4.75).

This value is specified in the units applied via its type attribute. Any width value of type pct or auto for this element shall be ignored.

If omitted, then this table cell shall use the bottom cell margins defined in the top element contained within the table properties (§17.4.75).

[*Example:* Consider a table with two cells in which the first table cell's top margin is specified via an exception to be ten times larger (0.2 inches vs. 0.02 inches) than the other table cell margins:

This text fills the extents of the cell.
So does this

The first cell in the table would be specified using the following WordprocessingML:

```
<w:tc>
  <w:tcPr>
    <w:tcMar>
      <w:top w:w="288" w:type="dxa" />
    </w:tcMar>
  </w:tcPr>
</w:tc>
```

The first cell in this table has an exception applied to the table cell top cell margin setting it to 288 twentieths of a point (0.2 inches). *end example*

This element's content model is defined by the common table measurement definition in §17.4.87.

17.4.78 tr (Table Row)

This element specifies a single table row, which contains the table's cells. Table rows in WordprocessingML are analogous to HTML tr elements.

A tr element has one formatting child element, trPr (§17.4.81), which defines the properties for the row. Each unique property on the table row is specified by a child element of this element. As well, a table row can contain any row-level content, which allows for the use of table cells.

If a table cell does not include at least one child element other than the row properties, then this document shall be considered corrupt.

[Example: Consider a table consisting of a single table cell, which contains the text Hello, world:

Hello World

This table row's content is represented by the following WordprocessingML:

```
<w:tr>
  <w:tc>
    <w:tcPr>
      <w:tcW w:w="0" w:type="auto"/>
    </w:tcPr>
    <w:p>
      <w:r>
        <w:t>Hello, world</w:t>
      </w:r>
    </w:p>
  </w:tc>
</w:tr>
```

The tr element contains a single row-level element - in this case, a table cell. *end example]*

Attributes	Description
rsidDel (Revision Identifier for Table Row Deletion)	<p>Specifies a unique identifier used to track the editing session when the row was deleted from the main document.</p> <p>All rsid* attributes throughout this document with the same value, if present, shall indicate that those regions were modified during the same editing session (time between subsequent save actions).</p> <p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions to indicate the order of the modifications relative to other modifications in this document.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>
rsidR (Revision Identifier for Table Row)	<p>Specifies a unique identifier used to track the editing session when the table row was added to the main document.</p> <p>All rsid* attributes throughout this document with the same value, if present, shall indicate that those regions were modified during the same editing session (time between subsequent save actions).</p>

Attributes	Description
	<p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions to indicate the order of the modifications relative to other modifications in this document.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>
rsidRPr (Revision Identifier for Table Row Glyph Formatting)	<p>Specifies a unique identifier used to track the editing session when the glyph character representing the table row mark was last modified in the main document.</p> <p>All rsid* attributes throughout this document with the same value, if present, shall indicate that those regions were modified during the same editing session (time between subsequent save actions).</p> <p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions to indicate the order of the modifications relative to other modifications in this document.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>
rsidTr (Revision Identifier for Table Row Properties)	<p>Specifies a unique identifier used to track the editing session when the table row's properties were last modified in this document.</p> <p>All rsid* attributes throughout this document with the same value, if present, shall indicate that those regions were modified during the same editing session (time between subsequent save actions).</p> <p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions to indicate the order of the modifications relative to other modifications in this document.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Row](#)) is located in §A.1. *end note*]

17.4.79 tr2bl (Table Cell Top Right to Bottom Left Diagonal Border)

This element specifies the border which shall be displayed on the top right to bottom left diagonal within the current table cell.

If this element is omitted, then the top right to bottom left diagonal of this table cell shall not have a cell border, and its border can use the table's border settings as appropriate.

[Example: Consider a table in which the second cell in the second row specifies a top right to bottom left diagonal cell border as follows:

R1C1	R1C2
R2C1	R2C2

This diagonal cell border is specified using the following WordprocessingML:

```
<w:tc>
  <w:tcPr>
    ...
    <w:tcBorders>
      <w:tr2bl w:val="double" w:sz="4" w:space="0" w:color="FF0000"/>
    </w:tcBorders>
  </w:tcPr>
</w:tc>
```

The tr2bl element specifies a ½ point border of type double on the table cell's diagonal. *end example*

This element's content model is defined by the common border properties definition in §17.3.4.

17.4.80 trHeight (Table Row Height)

This element specifies the height of the current table row within the current table. This height shall be used to determine the resulting height of the table row, which can be absolute or relative (depending on its attribute values).

If omitted, then the table row shall automatically resize its height to the height required by its contents (the equivalent of an hRule value of auto).

[Example: Consider the following WordprocessingML table:

Some text in R1C1.	

Examining the WordprocessingML for this table, the trHeight element is not specified, so the row heights are automatically determined by their contents (in the first row, the text Some text in R1C1.). If the first row shall be restricted to 0.1 inches high (144 twentieths of a point) regardless of its contents, that would be specified using the trHeight element as follows:

```
<w:trPr>
  <w:trHeight w:val="144" w:hRule="exact"/>
</w:trPr>
```

The resulting table row would be exactly 144 twentieths of a point high:

2189	144

end example]

Attributes	Description
hRule (Table Row Height Type)	<p>Specifies the meaning of the height specified for this table row.</p> <p>The meaning of the value of the val attribute is defined based on the value of the hRule attribute for this table row as follows:</p> <ul style="list-style-type: none"> • If the value of hRule is <code>auto</code>, then the table row's height should be automatically determined based on the height of its contents. The h value is ignored. • If the value of hRule is <code>atLeast</code>, then the table row's height should be at least the value the h attribute. • If the value of hRule is <code>exact</code>, then the table row's height should be exactly the value of the h attribute. <p>If this attribute is omitted, then its value shall be assumed to be <code>auto</code>.</p> <p>[<i>Example:</i> Consider the following paragraph containing a table row:</p> <pre><w:tr> <w:trPr> <w:trHeight w:val="2189" w:hRule="atLeast"/> </w:trPr> ... </w:tr></pre> <p>The hRule attribute specifies a value of <code>atLeast</code>, so the table row is a minimum of 2189 twentieths of a point high regardless of its contents, since its val value is 2189 twentieths of a point. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_HeightRule simple type (§17.18.37).</p>
val (Table Row Height)	<p>Specifies the table row's height.</p> <p>This height is expressed in twentieths of a point.</p> <p>If this attribute is omitted, then its value shall be assumed to be 0.</p> <p>The meaning of the value of the val attribute is defined based on the value of the hRule attribute for this table row as follows:</p> <ul style="list-style-type: none"> • If the value of hRule is <code>auto</code>, then the table row's height should be automatically determined based on the height of its contents. This value is ignored.

Attributes	Description
	<ul style="list-style-type: none">• If the value of hRule is atLeast, then the table row's height should be at least the value of this attribute.• If the value of hRule is exact, then the table row's height should be exactly the value of this attribute. <p>[Example: Consider the following table row:</p> <pre><w:tr> <w:trPr> <w:trHeight w:val="2189" w:hRule="atLeast"/> </w:trPr> ... </w:tr></pre> <p>The val attribute specifies a value of 2189 twentieths of a point, so this table row is a minimum of 2189 twentieths of a point high regardless of its contents (growing if needed), since its hRule value is set to atLeast. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Height](#)) is located in §A.1. *end note*]

17.4.81 trPr (Table Row Properties)

This element specifies the set of row-level properties applied to the current table row. Each unique property is specified by a child element of this element. These properties affect the appearance of all cells in the current row within the parent table, but can be overridden by individual cell-level properties, as defined by each property.

[Example: Consider the following WordprocessingML table:

0.1 inches high	

The first row must have a table-row level property which specifies that it shall be restricted to 0.1 inches high (144 twentieths of a point) regardless of its contents, that would be specified using the trHeight element as follows:

```
<w:trPr>
  <w:trHeight w:val="144" w:hRule="exact"/>
  ...
</w:trPr>
```

The `trPr` element specifies the set of table row properties applied to the current table row in the document, in this case a row height requirement using the `trHeight` element (§17.4.80). *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TrPr](#)) is located in §A.1. *end note*]

17.4.82 `trPr` (Previous Table Row Properties)

This element specifies a previous set of table cell properties, the modifications to which shall be attributed to a revision by a particular author and at a particular time. This element contains the table cell property settings which were previously in place before a specific set of revisions by one author. Each unique property is specified by a child element of this element. These properties affect the appearance of all cells in the current row within the parent table, but can be overridden by individual cell-level properties, as defined by each property.

[*Example:* Consider the following WordprocessingML table:

Some text in R1C1.	

This table has a row height for row one of exactly 0.1". If we change that to a row height of at least 0.1" with revision marking enabled, the table would appear as follows:

Some text in R1C1.	

The resulting WordprocessingML would be:

```
<w:tr>
  <w:trPr>
    <w:trHeight w:val="144"/>
    <w:trPrChange w:id="2" ... >
      <w:trPr>
        <w:trHeight w:hRule="exact" w:val="144"/>
      </w:trPr>
    </w:trPrChange>
  </w:trPr>
  ...
</w:tr>
```

The `trPr` element as a child of `trPrChange` specifies the set of table row properties which were in place before the current revision to the document. *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TrPrBase](#)) is located in §A.1. *end note*]

17.4.83 vAlign (Table Cell Vertical Alignment)

This element specifies the vertical alignment for text within the current table cell. The vertical alignment of this text is determined by the value of the val attribute.

[Example: Consider a table with a single cell with text vertically aligned to the bottom of the cell:

R1C1

This requirement would be specified using the following WordprocessingML:

```
<w:tc>
  <w:tcPr>
    <w:vAlign w:val="bottom" />
  </w:tcPr>
  <w:p>
    <w:r>
      <w:t>R1C1</w:t>
    </w:r>
  </w:p>
</w:tc>
```

The vAlign element specifies the vertical alignment of the cell contents, in the case, the bottom of the table cell.
end example]

Attributes	Description
val (Vertical Alignment Setting)	<p>Specifies the vertical alignment for text between the top and bottom margins of the parent container (page or table cell).</p> <p>[Example: Consider a region where the text must be vertically centered in the parent element. This would require a val value of center, in order to specify that all justification vertically must be centered relative to the parent. For a section, this setting would be specified as follows:</p> <div><w:vAlign w:val="center" /></div> <p>The val attribute of center specifies that the content is centered relative to its container (in this case, the page). <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_VerticalJc simple type (§17.18.101).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_VerticalJc](#)) is located in §A.1. *end note*]

17.4.84 vMerge (Vertically Merged Cell)

This element specifies that this cell is part of a vertically merged set of cells in a table. The `val` attribute on this element determines how this cell is defined with respect to the previous cell in the table (i.e., whether this cell continues the vertical merge or starts a new merged group of cells).

If this element is omitted, then this cell shall not be part of any vertically merged grouping of cells, and any vertically merged group of preceding cells shall be closed. If a vertically merged group of cells do not span the same set of grid columns, then the document is non-conformant.

[*Example:* Consider a table with three rows and two columns with the last column completely vertically merged:

The second cell in the first row starts a vertical merge that is completed in the last cell, resulting in the following WordprocessingML:

```
<w:tbl>
...
<w:tr>
  <w:tc>
    ...
  </w:tc>
  <w:tc>
    ...
  </w:tc>
  <w:tc>
    <w:tcPr>
      <w:vMerge w:val="restart"/>
    </w:tcPr>
    ...
  </w:tc>
</w:tr>
```

```
<w:tr>
  <w:tc>
    ...
  </w:tc>
  <w:tc>
    ...
  </w:tc>
  <w:tc>
    <w:tcPr>
      <w:vMerge w:val="continue"/>
    </w:tcPr>
    ...
  </w:tc>
</w:tr>
<w:tr>
  <w:tc>
    ...
  </w:tc>
  <w:tc>
    ...
  </w:tc>
  <w:tc>
    <w:tcPr>
      <w:vMerge w:val="continue"/>
    </w:tcPr>
    ...
  </w:tc>
</w:tr>
</w:tbl>
```

The vMerge element defines the cells that are vertically merged, and how each cell is merged together. *end example]*

Attributes	Description
val (Vertical Merge Type)	<p>Specifies how the table cell is part of a vertically merged region. This determines whether the cell should join onto an existing grouping of merged cells if any exist, or start a new group of merged cells. Refer to the simple type definition for a full description of each type.</p> <p>If this attribute is omitted, its value shall be assumed to be <code>continue</code>.</p> <p>[<i>Example:</i> Consider a table cell where a vertical cell merge begins . This setting is represented as the following WordprocessingML:</p>

Attributes	Description
	<pre><w:tcPr> <w:vMerge w:val="restart"/> </w:tcPr></pre> <p>The attribute value of <code>restart</code> specifies that this element must start a new vertically merged region in this table. <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_Merge</code> simple type (§17.18.57).</p>

[Note: The W3C XML Schema definition of this element's content model (`CT_VMerge`) is located in §A.1. *end note*]

17.4.85 wAfter (Preferred Width After Table Row)

This element specifies the preferred width for the total number of grid columns after this table row as specified in the `gridAfter` element (§17.4.14). This preferred width is used as part of the table layout algorithm specified by the `tblLayout` element (§17.4.52; §17.4.53) - full description of the algorithm in the `ST_TblLayout` simple type (§17.18.87).

All widths in a table are considered preferred because:

- The table shall satisfy the shared columns as specified by the `tblGrid` element (§17.4.48)
- Two or more widths can have conflicting values for the width of the same grid column
- The table layout algorithm (§17.18.87) can require a preference to be overridden

This value is specified in the units applied via its type attribute. Any width value of type `pct` for this element shall be calculated relative to the text extents of the page (page width excluding margins).

If this element is omitted, then the cell width shall be of type `auto`.

[Example: Consider a WordprocessingML table row defined as follows:

```
<w:tr>
  <w:trPr>
    <w:gridAfter w:val="2"/>
    <w:wAfter w:type="dxa" w:w="1440"/>
  </w:trPr>
  ...
</w:tr>
```

This table specifies that it has a preferred table width of 1440 twentieths of a point (one inch) for the two grid columns after the end of that row. The resulting table would therefore be sized such that that set of grid columns is one inch whenever possible, for example the second row in this table:

end example]

This element’s content model is defined by the common table measurement definition in §17.4.87.

17.4.86 wBefore (Preferred Width Before Table Row)

This element specifies the preferred width for the total number of grid columns before this table row as specified in the gridAfter element (§17.4.14). This preferred width is used as part of the table layout algorithm specified by the tblLayout element (§17.4.52; §17.4.53) - full description of the algorithm in the ST_TblLayout simple type (§17.18.87).

All widths in a table are considered preferred because:

- The table shall satisfy the shared columns as specified by the tblGrid element (§17.4.48)
- Two or more widths can have conflicting values for the width of the same grid column
- The table layout algorithm (§17.18.87) might require a preference to be overridden

This value is specified in the units applied via its type attribute. Any width value of type pct for this element shall be calculated relative to the text extents of the page (page width excluding margins).

If this element is omitted, then the cell width shall be of type auto.

[Example: Consider a WordprocessingML table row defined as follows:

```
<w:tr>
  <w:trPr>
    <w:gridBefore w:val="1"/>
    <w:wBefore w:type="dxa" w:w="1440"/>
  </w:trPr>
  ...
</w:tr>
```

This table specifies that it has a preferred table width of 1440 twentieths of a point (one inch) for the grid column before the start of the row. The resulting table would therefore be sized such that that grid column is one inch whenever possible, for example the second row in this table:

end example]

This element's content model is defined by the common table measurement definition in §17.4.87.

17.4.87 Table Measurement (CT_TblWidth)

This common complex type specifies a measurement to be used within a table. These properties contain two pieces of information:

- The type of measurement (percentage-based, absolute, or automatic)
- The value of the measurement

[*Example:* Consider the following table measurement:

```
<... w:type="pct" w:w="100%"/>
```

The type attribute specifies that the measurement is percentage-based, and the w attribute specifies the measurement is 100%. *end example]*

Attributes	Description
type (Table Width Type)	<p>Specifies the units of the width property being defined by the parent element's w attribute. This property is used to define various properties of a table, including: cell spacing, preferred width, and table margins.</p> <p>If this attribute is omitted, then its value shall be assumed to be dxa (twentieths of a point).</p> <p>[<i>Example:</i> Consider a table with a table cell bottom cell spacing with a type of dxa, as follows:</p> <pre><w:bottom ... w:type="dxa" /></pre> <p>This type must therefore be used to interpret the width specified in the w attribute as a value in twentieths of a point. <i>end example]</i></p> <p>If the value of the type attribute and the actual measurement specified by the w attribute are contradictory, the type specified by the type attribute shall be ignored.</p> <p>The possible values for this attribute are defined by the ST_TblWidth simple type (§17.18.90).</p>
w (Table Width Value)	<p>Specifies the value of the width property being defined by the parent element. This property is used to define various properties of a table, including: cell spacing, preferred widths, and table margins.</p> <p>If this attribute is omitted, then its value shall be assumed to be 0.</p> <p>[<i>Example:</i> Consider a table with a bottom margin with a width of 302, as follows:</p>

Attributes	Description
	<p data-bbox="456 283 1015 315"><w:bottom w:w="302" w:type="dxa" /></p> <p data-bbox="415 352 1458 491">The value in the w attribute must therefore be used to determine the width being specified in the context of the units specified in the type attribute. In this case, the type is twentieths of a point (dxa), so the width is 302 twentieths of a point (.2097 inches). <i>end example</i></p> <p data-bbox="415 529 1422 596">The possible values for this attribute are defined by the ST_MeasurementOrPercent simple type (§17.18.107).</p>

[*Note:* The W3C XML Schema definition of this complex type's content model ([CT_TblWidth](#)) is located in §A.1. *end note*]

17.5 Custom Markup

Within a WordprocessingML document, semantic information may be supplied beyond the presentation information specified by ECMA-376. [*Example:* An invoice document might wish to specify that a particular sentence of text is a customer name, in order for that information to be easily extracted from the document without the need to parse the text using regular expression matching or similar. *end example*]

There are three distinct forms in which extra-standard semantics can be inserted into a WordprocessingML document, each with their own specific intended usage:

- Smart tags
- Custom XML markup
- Structured document tags (content controls)

The elements and attributes which define each of these forms is described in the following clauses.

17.5.1 Custom XML and Smart Tags

The first form of extra-standard semantics that can be embedded in a WordprocessingML document is represented by smart tags. Implementations can establish sets of smart tags that allow semantic labels to be added around an arbitrary run or set of runs within a document to provide information about the type of data contained within.

[*Example:* Consider the following text in a WordprocessingML document, with a smart tag around the stock symbol 'CNTS':

This is a stock symbol: CNTS

This text would translate to the following WordprocessingML markup:

```

<w:p w:rsidR="00672474" w:rsidRDefault="00672474">
  <w:r>
    <w:t xml:space="preserve">This is a stock symbol: </w:t>
  </w:r>
  <w:smartTag w:uri="http://www.example.com"
    w:element="stockticker">
    <w:r>
      <w:t>CNTS</w:t>
    </w:r>
  </w:smartTag>
</w:p>

```

As shown above, the smart tag is delimited by the smartTag element, which surrounds the run (or runs) which contain the text which is part of the smart tag. *end example*]

The smartTag element has two required attributes:

- The uri attribute is used to specify the namespace, in terms of a vocabulary or classification scheme, of which the term specified for this smart tag is a member. [*Example*: In the above example, the smart tag specifies `http://www.example.com` to identify the classification scheme. *end example*]
- The element attribute, in combination with the uri attribute, specifies the classification for this smart tag. [*Example*: In the above example, the smart tag specifies the classification term `stockticker` from the identified namespace. *end example*]

The second form of extra-standard semantics that can be embedded in a WordprocessingML document is custom XML markup. Custom XML markup allows the application of the XML elements defined in any schema syntax (XML Schema, NVDL, etc.) to be applied to the contents of a WordprocessingML document in two types of location: around a paragraph or set of paragraphs (at the block level); or around an arbitrary run or set of runs within a document (at the inline level) to provide semantics to that content within the context and structures defined by the associated schema definition.

The distinction between custom XML markup and smart tags is that custom XML markup is based on a schema, which may be specified using the attachedSchema element (§17.15.1.5). As a result, the custom XML elements can be validated against the schema. Also, as shown below, custom XML markup can be used at the block-level as well as on the inline (run) level.

[*Example*: Consider a simple XML Schema which defines two elements: a root element of `invoice`, and a child element of `customerName` - the first defining that this file's contents are an invoice, and the second specifying that the enclosed text as a customer's name:

 invoice This is an invoice.

And this is a customer name:  customerName Tristan Davis invoice

This output would translate to the following WordprocessingML markup:

```
<w:customXml w:uri="http://www.example.com/2006/invoice" w:element="invoice">
  <w:p>
    <w:r>
      <w:t>This is an invoice.</w:t>
    </w:r>
  </w:p>
  <w:p>
    <w:r>
      <w:t xml:space="preserve">And this is a customer name: </w:t>
    </w:r>
    <w:customXml w:uri="http://www.example.com/2006/invoice"
w:element="customerName">
      <w:r>
        <w:t>Tristan Davis</w:t>
      </w:r>
    </w:customXml>
  </w:p>
</w:customXml>
```

As shown above, each of the XML elements from the supplied XML schema is represented within the document output as a customXml element. *end example*]

A custom XML element in a document has two required attributes.

- The first is the uri attribute, whose contents specify the namespace of the custom XML element in the document. In the example above, the elements each belong to the `http://www.example.com/2006/invoice` namespace.
- The second is the element attribute, whose contents specify the name of the custom XML element at this location in the document. In the example above, the root element is called `invoice` and the child element is called `customerName`.

As well as the required information specified above, custom XML elements can also specify any number of attributes (as specified in the associated XML Schema) on the element. To add this information, the `customXmlPr` (properties on the custom XML element) specify one or more `attr` elements.

[*Example:* Using the example above, we can add a type attribute to the `customerName` element as follows:

```

<w:customXml w:uri="http://www.example.com/2006/invoice"
w:element="customerName">
  <w:customXmlPr>
    <w:attr w:uri="http://www.example.com/2006/invoice" w:name="type"
w:val="individual"/>
  </w:customXmlPr>
  <w:r>
    <w:t>Tristan Davis</w:t>
  </w:r>
</w:customXml>

```

The resulting XML, as seen above, simply adds an attr element which specifies the attribute for the custom XML element. *end example*]

17.5.1.1 attr (Custom XML Attribute)

This element specifies a custom XML attribute which shall be located on the parent custom XML element specified via the customXml element (§17.5.1.4;§17.5.1.5;§17.5.1.3; §17.5.1.6). The uri attribute can specify the Namespace of the custom XML attribute, and the name attribute shall specify the local name of the custom XML attribute. For any set of sibling attr elements, all the pairs of Namespace and local name shall be distinct.

[*Example:* Consider a custom XML element with the following properties:

```

<w:customXmlPr>
  <w:attr w:name="companyName" ... />
  <w:attr w:name="companySymbol" ... />
</w:customXmlPr>

```

This set of custom XML properties specifies that the parent custom XML element must have two attributes associated with it, the first with a name of companyName, and the second with a name of companySymbol. *end example*]

Attributes	Description
name (Name)	<p>Specifies the name of the current custom XML attribute or smart tag property.</p> <p>[<i>Example:</i> Consider a custom XML attribute which must have a name of companyName. This requirement would be specified using the following WordprocessingML:</p> <pre> <w:customXmlPr> <w:attr w:name="companyName" ... /> </w:customXmlPr> </pre> <p>The name attribute specifies that the name for this property must be companyName. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_XmlName simple type</p>

Attributes	Description
	(§22.9.2.21).
uri (Namespace)	<p>Specifies the namespace URI of the current custom XML attribute or smart tag property.</p> <p>If this attribute is omitted, the URI shall be assumed to be null (no associated URI).</p> <p>[<i>Example:</i> Consider a smart tag property which must have a namespace URI of <code>http://schemas.openxmlformats.org/2006/example</code>. This requirement would be specified using the following WordprocessingML:</p> <pre><w:smartTagPr> <w:attr w:uri="http://schemas.openxmlformats .org/2006/example" ... /> </w:smartTagPr></pre> <p>The uri attribute specifies that the namespace for this property must be <code>http://schemas.openxmlformats.org/2006/example</code>. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
val (Value)	<p>Specifies the value of the current custom XML attribute or smart tag property.</p> <p>[<i>Example:</i> Consider a smart tag property which must have a value of <code>propertyValue</code>. This requirement would be specified using the following WordprocessingML:</p> <pre><w:smartTagPr> <w:attr ... w:val="propertyValue" /> </w:smartTagPr></pre> <p>The val attribute specifies that the value for this property must be <code>propertyValue</code>. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model (CT_Attr) is located in §A.1. *end note*]

17.5.1.2 attr (Smart Tag Property)

This element specifies a single smart tag property which shall be located on the parent smart tag, specified via the smartTag element (§17.5.1.9). The attributes on this element shall be used to specify the contents of smart tag property.

[*Example:* Consider a smart tag with the following properties:


```

<w:smartTagPr>
  <w:attr w:name="attributeOne" ... />
  <w:attr w:name="attributeTwo" ... />
</w:smartTagPr>

```

This property bag specifies that the parent smart tag must have two properties associated with it, the first with a name of attributeOne, and the second with a name of attributeTwo. *end example*].

Attributes	Description
name (Name)	<p>Specifies the name of the current custom XML attribute or smart tag property.</p> <p>[<i>Example</i>: Consider a custom XML attribute which must have a name of companyName. This requirement would be specified using the following WordprocessingML:</p> <pre> <w:customXmlPr> <w:attr w:name="companyName" ... /> </w:customXmlPr> </pre> <p>The name attribute specifies that the name for this property must be companyName. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_XmlName simple type (§22.9.2.21).</p>
uri (Namespace)	<p>Specifies the namespace URI of the current custom XML attribute or smart tag property.</p> <p>If this attribute is omitted, the URI shall be assumed to be null (no associated URI).</p> <p>[<i>Example</i>: Consider a smart tag property which must have a namespace URI of http://schemas.openxmlformats.org/2006/example. This requirement would be specified using the following WordprocessingML:</p> <pre> <w:smartTagPr> <w:attr w:uri="http://schemas.openxmlformats .org/2006/example" ... /> </w:smartTagPr> </pre> <p>The uri attribute specifies that the namespace for this property must be http://schemas.openxmlformats.org/2006/example. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
val (Value)	<p>Specifies the value of the current custom XML attribute or smart tag property.</p> <p>[<i>Example</i>: Consider a smart tag property which must have a value of propertyValue. This requirement would be specified using the following WordprocessingML:</p>

Attributes	Description
	<pre><w:smartTagPr> <w:attr ... w:val="propertyValue" /> </w:smartTagPr></pre> <p>The val attribute specifies that the value for this property must be propertyValue. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_Attr](#)) is located in §A.1. *end note*]

17.5.1.3 customXml (Inline-Level Custom XML Element)

This element specifies the presence of a custom XML element around one or more inline level structures (runs, images, fields, etc.) within a paragraph. The attributes on this element shall be used to specify the name and namespace URI of the current custom XML element.

[Example: Consider a custom XML element with the name firstName that must be located around a two text runs in a WordprocessingML document. This requirement would be specified as follows in the WordprocessingML:

```
<w:p>
  <w:customXml w:element="firstName" ... >
    <w:r>
      ...
    </w:r>
    <w:r>
      ...
    </w:r>
  </w:customXml>
  ...
</w:p>
```

The customXml element specifies that the name of the custom XML element is firstName, and the custom XML element contains a two text runs (it is an inline-level element). *end example*

Attributes	Description
element (Element name)	<p>Specifies the name of the current custom XML element or smart tag within the document.</p> <p>[Example: Consider a custom XML element which must have a name of companyName. This requirement would be specified using the following WordprocessingML:</p>

Attributes	Description
	<p><code><w:customXml w:element="companyName" ... ></code> <code>...</code> <code></w:customXml></code></p> <p>The element attribute specifies that the name for this element must be <code>companyName</code>. <i>end example]</i></p> <p>The possible values for this attribute are defined by the <code>ST_XmlName</code> simple type (§22.9.2.21).</p>
uri (Custom XML Markup Namespace)	<p>Specifies the namespace URI of the current custom XML element or smart tag.</p> <p>If this attribute is omitted, the URI shall be assumed to be null (no associated URI).</p> <p>[<i>Example:</i> Consider a custom XML element which must have a namespace URI of <code>urn:customXmlExample</code>. This requirement would be specified using the following WordprocessingML:</p> <p><code><w:customXml ... w:uri="urn:customXmlExample" ></code> <code>...</code> <code></w:customXml></code></p> <p>The <code>uri</code> attribute specifies that the namespace for this element must be <code>urn:customXmlExample</code>. <i>end example]</i></p> <p>The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CustomXmlRun](#)) is located in §A.1. *end note]*

17.5.1.4 customXml (Cell-Level Custom XML Element)

This element specifies the presence of a custom XML element around a single table cell. The attributes on this element shall be used to specify the name and namespace URI of the current custom XML element.

[*Example:* Consider a custom XML element with the name `company` that must be located around a single table cell in a WordprocessingML document. This requirement would be specified as follows in the WordprocessingML:

```
<w:tr>
  <w:customXml w:element="company" ... >
    <w:tc>
      ...
    </w:tc>
  </w:customXml>
  ...
</w:tr>
```

The customXml element specifies that the name of the custom XML element is company, and the custom XML element contains a single table cell (it is a cell-level element). *end example*

Attributes	Description
element (Custom XML Element Name)	<p>Specifies the name of the current custom XML element or smart tag within the document.</p> <p>[<i>Example:</i> Consider a custom XML element which must have a name of companyName. This requirement would be specified using the following WordprocessingML:</p> <pre><w:customXml w:element="companyName" ... > ... </w:customXml></pre> <p>The element attribute specifies that the name for this element must be companyName. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_XmlName simple type (§22.9.2.21).</p>
uri (Custom XML Element Namespace)	<p>Specifies the namespace URI of the current custom XML element or smart tag.</p> <p>If this attribute is omitted, the URI shall be assumed to be null (no associated URI).</p> <p>[<i>Example:</i> Consider a custom XML element which must have a namespace URI of urn:customXmlExample. This requirement would be specified using the following WordprocessingML:</p> <pre><w:customXml ... w:uri="urn:customXmlExample" > ... </w:customXml></pre> <p>The uri attribute specifies that the namespace for this element must be urn:customXmlExample. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CustomXmlCell](#)) is located in §A.1. *end note*]

17.5.1.5 customXml (Row-Level Custom XML Element)

This element specifies the presence of a custom XML element around a single table row. The attributes on this element shall be used to specify the name and namespace URI of the current custom XML element.

[*Example:* Consider a custom XML element with the name `invoiceItem` that must be located around a single table row in a WordprocessingML document. This requirement would be specified as follows in the WordprocessingML:

```
<w:tbl>
  <w:customXml w:element="invoiceItem" ... >
    <w:tr>
      ...
    </w:tr>
  </w:customXml>
  ...
</w:tbl>
```

The `customXml` element specifies that the name of the custom XML element is `invoiceItem`, and the custom XML element contains a single table row (it is a row-level element). *end example*]

Attributes	Description
element (Custom XML Element Name)	<p>Specifies the name of the current custom XML element or smart tag within the document.</p> <p>[<i>Example:</i> Consider a custom XML element which must have a name of <code>companyName</code>. This requirement would be specified using the following WordprocessingML:</p> <pre><w:customXml w:element="companyName" ... > ... </w:customXml></pre> <p>The element attribute specifies that the name for this element must be <code>companyName</code>. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_XmlName</code> simple type (§22.9.2.21).</p>
uri (Custom XML Element Namespace)	<p>Specifies the namespace URI of the current custom XML element or smart tag.</p> <p>If this attribute is omitted, the URI shall be assumed to be null (no associated URI).</p> <p>[<i>Example:</i> Consider a custom XML element which must have a namespace URI of <code>urn:customXmlExample</code>. This requirement would be specified using the following</p>

Attributes	Description
	<p>WordprocessingML:</p> <pre><w:customXml ... w:uri="urn:customXmlExample" > ... </w:customXml></pre> <p>The uri attribute specifies that the namespace for this element must be urn:customXmlExample. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_CustomXmlRow](#)) is located in §A.1. *end note*]

17.5.1.6 customXml (Block-Level Custom XML Element)

This element specifies the presence of a custom XML element around one or more block level structures (paragraphs, tables, etc.). The attributes on this element shall be used to specify the name and namespace URI of the current custom XML element.

[*Example:* Consider a custom XML element with the name address that must be located around a single paragraph in a WordprocessingML document. This requirement would be specified as follows in the WordprocessingML:

```
<w:body>
  <w:customXml w:element="address" ... >
    <w:p>
      ...
    </w:p>
  </w:customXml>
  ...
</w:body>
```

The customXml element specifies that the name of the custom XML element is address, and the custom XML element contains a single paragraph (it is a block-level element). *end example*

Attributes	Description
element (Custom XML Element Name)	<p>Specifies the name of the current custom XML element or smart tag within the document.</p> <p>[<i>Example:</i> Consider a custom XML element which must have a name of companyName. This requirement would be specified using the following WordprocessingML:</p>

Attributes	Description
	<pre><w:customXml w:element="companyName" ... > ... </w:customXml></pre> <p>The element attribute specifies that the name for this element must be <code>companyName</code>. <i>end example]</i></p> <p>The possible values for this attribute are defined by the <code>ST_XmlName</code> simple type (§22.9.2.21).</p>
uri (Custom XML Element Namespace)	<p>Specifies the namespace URI of the current custom XML element or smart tag.</p> <p>If this attribute is omitted, the URI shall be assumed to be null (no associated URI).</p> <p>[<i>Example:</i> Consider a custom XML element which must have a namespace URI of <code>urn:customXmlExample</code>. This requirement would be specified using the following WordprocessingML:</p> <pre><w:customXml ... w:uri="urn:customXmlExample" > ... </w:customXml></pre> <p>The uri attribute specifies that the namespace for this element must be <code>urn:customXmlExample</code>. <i>end example]</i></p> <p>The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CustomXmlBlock](#)) is located in §A.1. *end note]*

17.5.1.7 customXmlPr (Custom XML Element Properties)

This element specifies the set of properties which shall be applied to the parent custom XML element.

[*Example:* Consider a custom XML element with the following properties specified:

```
<w:customXmlPr>
  <w:placeholder w:val="[Fill in your name]"/>
  <w:attr w:name="status" w:val="draft"/>
</w:customXmlPr>
```

This custom XML element specifies two properties: the presence of placeholder text via the placeholder element (§17.5.1.8) and a single custom XML attribute via the attr element (§17.5.1.1). *end example]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CustomXmlPr](#)) is located in §A.1.
end note]

17.5.1.8 placeholder (Custom XML Element Placeholder Text)

This element specifies the placeholder text which shall be displayed in place of this custom XML element when the contents of this custom XML markup are empty (i.e. there are no runs of text within the current custom XML element). If this custom XML element does contain run content, then this text shall not be displayed.

The `val` attribute stores the string of text which shall be displayed as the placeholder text. This string can be displayed in any font face/size desired by the hosting application.

[*Example:* Consider a custom XML element with the following properties specified:

```
<w:customXmlPr>
  <w:placeholder w:val="[Fill in your name]"/>
  <w:attr w:name="status" w:val="draft"/>
</w:customXmlPr>
```

The placeholder element specifies that this custom XML element must display the text contents [Fill in your name] whenever there is no run content within the parent custom XML element. For example, if the custom XML element was specified as follows:

```
<w:customXml>
  <w:customXmlPr>
    <w:placeholder w:val="[Fill in your name]"/>
  </w:customXmlPr>
<w:p/>
</w:customXml>
```

This custom XML element has no run content and the placeholder text would be displayed. However, if there is run content, as follows:

```
<w:customXml>
  <w:customXmlPr>
    <w:placeholder w:val="[Fill in your name]"/>
  </w:customXmlPr>
<w:p>
  <w:r>
    <w:t>Name</w:t>
  </w:r>
</w:p>
</w:customXml>
```

This custom XML element now contains run content, and the placeholder text must not be displayed. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre data-bbox="451 499 954 604"><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre data-bbox="451 781 1084 919"><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_String](#)) is located in §A.1. *end note*]

17.5.1.9 smartTag (Inline-Level Smart Tag)

This element specifies the presence of a smart tag around one or more inline structures (runs, images, fields, etc.) within a paragraph. The attributes on this element shall be used to specify the name and namespace URI of the current smart tag.

[*Example:* Consider a smart tag with the name firstName that must be located around a two text runs in a WordprocessingML document. This requirement would be specified as follows in the WordprocessingML:

```

<w:p>
  <w:smartTag w:element="firstName" ... >
    <w:r>
      ...
    </w:r>
    <w:r>
      ...
    </w:r>
  </w:smartTag>
  ...
</w:p>

```

The smartTag element specifies that the name of the smart tag is `firstName`, and the smart tag contains a two text runs (it is an inline-level smart tag). *end example*

Attributes	Description
element (Smart Tag Name)	<p>Specifies the name of the current custom XML element or smart tag within the document.</p> <p>[<i>Example:</i> Consider a custom XML element which must have a name of <code>companyName</code>. This requirement would be specified using the following WordprocessingML:</p> <pre> <w:customXml w:element="companyName" ... > ... </w:customXml> </pre> <p>The element attribute specifies that the name for this element must be <code>companyName</code>. <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_XmlName</code> simple type (§22.9.2.21).</p>
uri (Smart Tag Namespace)	<p>Specifies the namespace URI of the current custom XML element or smart tag.</p> <p>If this attribute is omitted, the URI shall be assumed to be null (no associated URI).</p> <p>[<i>Example:</i> Consider a custom XML element which must have a namespace URI of <code>urn:customXmlExample</code>. This requirement would be specified using the following WordprocessingML:</p> <pre> <w:customXml ... w:uri="urn:customXmlExample" > ... </w:customXml> </pre> <p>The uri attribute specifies that the namespace for this element must be <code>urn:customXmlExample</code>. <i>end example</i></p>

Attributes	Description
	The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SmartTagRun](#)) is located in §A.1. *end note*]

17.5.1.10 smartTagPr (Smart Tag Properties)

This element specifies the set of properties which shall be applied to the parent smart tag.

[*Example:* Consider a smart tag with the following properties specified:

```
<w:smartTagPr>
  <w:attr w:name="date" w:val="01/01/2006"/>
  <w:attr w:name="status" w:val="draft"/>
</w:smartTagPr>
```

This smart tag specifies two properties: the presence of two smart tag properties via the attr element (§17.5.1.2). *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SmartTagPr](#)) is located in §A.1. *end note*]

17.5.2 Structured Document Tags

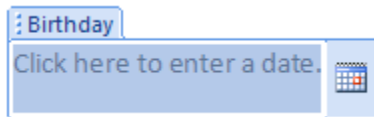
The final form of extra-standard semantics that can be embedded in a WordprocessingML document is represented by structured document tags (SDTs).

As shown above, smart tags and custom XML markup each provide a facility for embedding extra-standard semantics into the document: smart tags, via the ability to provide a basic namespace/name for a run or set of runs within a documents; and custom XML markup, via the ability to tag the document with XML elements and attributes specified by any XML Schema file.

However, each of these techniques, while they each provide a way to add the desired semantic information, does not provide a way to affect the presentation or interaction within the document. To bridge these two worlds, structured document tags allow both the specification of extra-standard semantics as well as the ability to influence the presentation of that data in the document.

This means that the implementation can define the semantics and context of the tag, but can then use a rich set of pre-defined properties to define its behavior and appearance within the WordprocessingML document's presentation.

[*Example:* Consider a region which should be tagged with the semantic of "birthday", for the user to enter their date or birth into the document. Ideally, this region would also utilize a date picker to allow the user to enter the date from a calendar:



This content would be specified using the following WordprocessingML:

```
<w:sdt>
  <w:sdtPr>
    <w:alias w:val="Birthday"/>
    <w:id w:val="8775518"/>
    <w:placeholder>
      <w:docPart w:val="DefaultPlaceholder_22479095"/>
    </w:placeholder>
    <w:showingPlcHdr/>
    <w:date>
      <w:dateFormat w:val="M/d/yyyy"/>
      <w:lid w:val="EN-US"/>
    </w:date>
  </w:sdtPr>
  <w:sdtContent>
    <w:p>
      <w:r>
        <w:rPr>
          <w:rStyle w:val="PlaceholderText"/>
        </w:rPr>
        <w:t>Click here to enter a date...</w:t>
      </w:r>
    </w:p>
  </w:sdtContent>
</w:sdt>
```

end example]

As shown above, each of the structured document tags in the WordprocessingML file is represented using the sdt element.

Within a structured document tag, there are two child elements which contain the definition and the content of this SDT. The first of these is the sdtPr element, which contains the set of properties specified for this structured document tag. The second is the sdtContent element, which contains all the content which is contained within this structured document tag.

17.5.2.1 alias (Friendly Name)

This element specifies the friendly name associated with the current structured document tag. The string representing the friendly name shall be stored on this element's val attribute.

If this element is omitted, then no friendly name shall be associated with the given structured document tag.

[*Example:* Consider the following properties on a structured document tag:

```
<w:sdtPr>
  <w:alias w:val="Birthday"/>
  ...
</w:sdtPr>
```

This set of properties specifies via the alias element that the friendly name for the nearest ancestor structured document tag must be Birthday. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_String](#)) is located in §A.1. *end note*]

17.5.2.2 bibliography (Bibliography Structured Document Tag)

This element specifies that the nearest ancestor structured document tag shall be of type bibliography.

This setting does not require or imply that the contents of the structured document tag shall contain only a field of type BIBLIOGRAPHY, it shall only be used to specify that the structured document tag is of this kind, which can be used by an application as desired.

[*Example:* Consider the following structured document tag:

```
<w:sdt>
  <w:sdtPr>
    ...
    <w:bibliography/>
  </w:sdtPr>
  ...
</w:sdt>
```

The bibliography element in this structured document tag's properties specify that the type of structured document tag is bibliography. *end example]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.1. *end note]*

17.5.2.3 **calendar (Date Picker Calendar Type)**

This element specifies the calendar which shall be displayed for the current date picker structured document tag, if a user interface is present for the structured document tag. The calendar information is stored on this element's val attribute.

If this element is omitted, then the calendar shall be gregorian.

[*Example:* Consider the following structured document tag properties:

```
<w:sdtPr>
  <w:date w:fullDate="2006-01-01T06:30:00Z">
    <w:calendar w:val="gregorian"/>
  </w:date>
</w:sdtPr>
```

The calendar element specifies that the calendar information for a calendar which might be displayed in the document must be the Gregorian calendar format (gregorian). *end example]*

Attributes	Description
val (Calendar Type Value)	<p>Specifies a type of calendar, the use of which is determined by the parent XML element.</p> <p>If this attribute is omitted, then the calendar type shall be gregorian.</p> <p>[<i>Example:</i> Consider the following WordprocessingML for a document containing a structured document tag:</p> <p style="text-align: center;"><w:sdtPr></p>

Attributes	Description
	<pre> <w:date ... > <w:calendar w:val="japan"/> </w:date> </w:sdtPr> </pre> <p>The val attribute value of japan specifies that the Japanese Emperor Era calendar must be used; in this case, it is used for the calendar displayed for a date structured document tag. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_CalendarType simple type (§22.9.2.1).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_CalendarType](#)) is located in §A.1. *end note*]

17.5.2.4 citation (Citation Structured Document Tag)

This element specifies that the nearest ancestorstructured document tag shall be of type `citation`.

This setting does not require or imply that the contents of the structured document tag shall contain only a field of type CITATION, it shall only be used to specify that the structured document tag is of this type, which can be used by an application as desired.

[Example: Consider the following structured document tag:

```

<w:sdt>
  <w:sdtPr>
    ...
    <w:citation/>
  </w:sdtPr>
  ...
</w:sdt>

```

The citation element in this structured document tag's properties specify that the type of structured document tag is `citation`. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.1. *end note*]

17.5.2.5 comboBox (Combo Box Structured Document Tag)

This element specifies that the nearest ancestorstructured document tag shall be a combo box when displayed in the document.

This setting specifies that the behavior for this structured document tag shall be as follows:

- The child elements of this element specify choices which shall be presented to the user

- Formatting applied to any part of this structured document tag's contents shall apply to its entire contents

As well, the structured document tag shall satisfy the following restraints or the document shall be considered non-conformant:

- The contents shall only be contain a single run (one set of formatting properties)
- The contents shall not contain more than a single paragraph or table cell and shall not contain a table row or table

[*Example*: Consider the following structured document tag:

```
<w:sdt>
  <w:sdtPr>
    ...
    <w:comboBox>
      ...
    </w:comboBox>
  </w:sdtPr>
  ...
</w:sdt>
```

The comboBox element in this structured document tag's properties specify that the type of structured document tag is a combo box. *end example*]

Attributes	Description
lastValue (Combo Box Last Saved Value)	<p>Specifies the value associated with the current display text for the combo box structured document tag.</p> <p>If this structured document tag is not mapped to XML using the dataBinding element (§17.5.2.6), then this attribute shall be ignored. If this structured document tag is mapped to XML, it shall be used to determine whether the current display text in the combo box structured document tag shall be retained when the document is opened, as follows:</p> <ul style="list-style-type: none">• When the XML mapping is created, the content in the custom XML data is retrieved• If this content has an associated list item (matching its value attribute), then the corresponding display text shall be displayed in the structured document tag• If no list item exists, this content shall be matched against the lastValue attribute value. If the values match, the current display text shall be retained. If the values do not match, the current custom XML data content shall be the new display text (since no match exists in the combo box list items) <p>[<i>Example</i>: Consider a combo box structured document tag defined as follows:</p> <pre><w:sdt></pre>

Attributes	Description
	<pre> <w:sdtPr> <w:dataBinding ... /> <w:comboBox w:lastValue="2"/> </w:sdtPr> <w:sdtContent> <w:r> <w:t>Hello, world</w:t> </w:r> </w:sdtContent> </w:sdt> </pre> <p>The current run content of the structured document tag reads Hello, world. When this document is opened, if the current value of the associated custom XML data is 2, the matching lastValue attribute specifies that the contents of the combo box must continue to be the current display text of the combo box even though there is no listItem whose value is 2 (and normally, the content of the structured document tag would be set to 2. Essentially, this attribute specifies a listItem whose value is 2 and whose displayText is Hello, world (the current structured document tag contents). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_SdtComboBox](#)) is located in §A.1. *end note*]

17.5.2.6 dataBinding (XML Mapping)

This element specifies the information that shall be used to establish a mapping between the nearest ancestor structured document tag and an XML element stored within a Custom XML Data part in the current WordprocessingML document.

If this element is omitted, then no XML mapping shall be associated with the current structured document tag. If the nearest ancestor structured document tag is of type rich text or document part gallery, then this property shall be ignored.

If this element is present and the nearest ancestor structured document tag is not of a rich text type, then the current value of the structured document tag shall be determined by finding the XML element (if any) which is determined by the attributes on this element. If this information does not result in an XML element, then the application can use any algorithm desired to find the closest available match. If this information does result in an XML element, then the contents of that element shall be used to replace the current run content within the document.

[Example: Consider the following structured document tag:

```

<w:sdt>
  <w:sdtPr>
    <w:dataBinding w:xpath="/root/name/first" ... />
    <w:text/>
  </w:sdtPr>
  <w:sdtContent>
    <w:r>
      <w:t>old text</w:t>
    </w:r>
  </w:sdtContent>
</w:sdt>

```

This structured document tag specifies that it contains only plain text via the text element, and that it must be mapped to the element in the first Custom XML Data part which contains an element that matches the XPath expression `/root/name/first`. When that element is located, its contents must replace the existing run content in the document (for example, if its contents are `new text`, then the contents of the run for this structured document tag must be `new text` when the document is displayed. *end example*]

Attributes	Description
prefixMappings (XML Namespace Prefix Mappings)	<p>Specifies the set of prefix mappings which shall be used to interpret the XPath expression specified on the <code>xpath</code> attribute when the XPath expression is evaluated against the custom XML data parts in the current document.</p> <p>This attribute's value shall be specified using the following syntax: <code>xmlns:prefix= 'namespace'</code>, where <code>prefix</code> is the namespace prefix to be mapped, and <code>namespace</code> is the namespace to be mapped to the current prefix. Each prefix mapping shall be delimited by one or more whitespace characters in the attribute's contents.</p> <p>If this attribute is omitted, then the prefix mappings specified on each of the custom XML data parts itself shall be used to evaluate the given XPath expression.</p> <p>[<i>Example:</i> Consider the following structured document tag properties:</p> <pre> <w:sdtPr> <w:dataBinding w:xpath="//ns0:book" w:prefixMappings="xmlns:ns0= 'http://example.com/example'"/> <w:text/> </w:sdtPr> </pre> <p>This structured document tag specifies that it contains an XML mapping, and that mapping's <code>prefixMapping</code> attribute must signify that the set of namespace prefix mappings to be used to evaluate the <code>xpath</code> attribute value must be <code>xmlns:ns0='http://example.com/example'</code>. <i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).
storeItemID (Custom XML Data Storage ID)	<p>Specifies the custom XML data identifier for the custom XML data part which shall be used to evaluate the given XPath expression. The <i>custom XML data identifier</i>, specified using the storeItemID attribute of the dataStoreItem element (§22.5.2.1) on the Custom XML Data Properties part is a string that uniquely identifies a particular custom XML data part in a WordprocessingML document (as multiple parts can have the same namespace for their root element).</p> <p>If specified, then the XPath expression specified on the xpath attribute shall only be evaluated against the custom XML data part whose properties part has a matching custom XML data identifier. If no custom XML data part exists with a matching identifier, then the XML mapping shall not be connected.</p> <p>If omitted, then the XPath expression shall be evaluated against each custom XML data part in turn until the given XPath expression is resolved to an XML element.</p> <p>[Example: Consider the following structured document tag properties:</p> <pre> <w:sdtPr> <w:dataBinding w:xpath="//ns0:book" w:storeItemID="testXmlPart" /> <w:text/> </w:sdtPr> </pre> <p>This structured document tag specifies that it contains an XML mapping, and that mapping must only be evaluated against the custom XML part whose identifier is equal to testXmlPart (if one exists). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
xpath (XPath)	<p>Specifies the XPath expression which shall be evaluated to find the custom XML node which is mapped to the nearest ancestorstructured document tag. This XPath expression shall be specified using the syntax defined in the XML Path Language (XPath) Version 1.0 specification (see Annex A for bibliographic reference information).</p> <p>[Example: Consider the following structured document tag properties:</p> <pre> <w:sdtPr> <w:dataBinding w:xpath="//ns0:book" w:prefixMappings="xmlns:ns0= 'http://example.com/example'"/> <w:text/> </w:sdtPr> </pre>

Attributes	Description
	<p>This structured document tag specifies that it contains an XML mapping, and that mapping's xpath attribute must signify that the XPath expression to be evaluated must be <code>//ns0:book</code>. Because the <code>prefixMapping</code> attribute is also specified, those prefix mappings must be used to evaluate this XPath expression. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_DataBinding](#)) is located in §A.1. *end note*]

17.5.2.7 **date** (Date Structured Document Tag)

This element specifies that the nearest ancestorstructured document tag shall be a date picker when displayed in the document.

This setting specifies that the behavior for this structured document tag shall be as follows:

- The child elements of this element specify how the dates in this structured document tag shall be stored in any mapped custom XML data and displayed in the document
- Formatting applied to any part of this structured document tag's contents shall apply to its entire contents

As well, the structured document tag shall satisfy the following restraints or the document shall be considered non-conformant:

- The contents shall only be contain a single run (one set of formatting properties)
- The contents shall not contain more than a single paragraph or table cell and shall not contain a table row or table cell

[Example: Consider the following structured document tag:

```
<w:sdt>
  <w:sdtPr>
    ...
    <w:date>
      ...
    </w:date>
  </w:sdtPr>
  ...
</w:sdt>
```

The date element in this structured document tag's properties specifies that the type of structured document tag is a date picker. *end example*]

Attributes	Description
fullDate (Last Known Date in XML Schema DateTime Format)	<p>Specifies the full date and time last entered into the nearest ancestorstructured document tag using the standard XML Schema DateTime syntax.</p> <p>[<i>Note:</i> This cache is used because the date display mask stored on the dateFormat element (§17.5.2.8) might not contain all of the information about the date, which might be needed if the date display mask is later changed. <i>end note</i>]</p> <p>If this attribute is specified, then the current fullDate attribute shall be used to populate the run content of the nearest ancestorstructured document tag by filtering it through the date display mask specified in the dateFormat element, if one is present.</p> <p>If this attribute is omitted, then the current display text shall be maintained when the document is displayed.</p> <p>[<i>Example:</i> Consider the following structured document tag properties:</p> <pre> <w:sdtPr> ... <w:date w:fullDate="2006-01-01T05:30:00Z"> ... </w:date> </w:sdtPr> </pre> <p>The full XML Schema DateTime format for the current structured document tag is specified via the fullDate attribute value as 2006-01-01T05:30:00Z. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SdtDate](#)) is located in §A.1. *end note*]

17.5.2.8 dateFormat (Date Display Mask)

The element specifies the display format which shall be used to format any date entered into the nearest ancestorstructured document tag in full DateTime format [*Example:* Through a user interface (a date picker), or through custom XML data associated with this structured document tag via the dataBinding element (§17.5.2.6). *end example*] before displaying it in the structured document tag's run content.

If this element is omitted, then the date shall be formatted using the standard date display mask for the language ID specified on the lid element (§17.5.2.20) if present, or the language ID of the run contents otherwise.

The date display mask specified in the val attribute shall be interpreted using the semantics specified in §17.16.4.1.

[*Example*: Consider the following structured document tag properties:

```
<w:sdtPr>
  <w:date w:fullDate="2006-01-01T06:30:00Z">
    <w:dateFormat w:val="MM-YYYY"/>
  </w:date>
</w:sdtPr>
```

The full XML Schema DateTime format for the current structured document tag is specified via the fullDate attribute value as 2006-01-01T06:30:00Z, and the date display mask is MM-YYYY, therefore the resulting date displayed in the document must be 01-2006 (the month and long year from the full date value, respectively).
end example]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example</i>: Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestorstructured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note*: The W3C XML Schema definition of this element's content model (CT_String) is located in §A.1. *end note*]

17.5.2.9 docPart (Document Part Reference)

This element specifies the name of the document part that shall be displayed in the nearest ancestor structured document tag when its run contents are empty. If this element is specified, then a document part whose name element (§17.12.12) specifies a name matching the value of this element, and which belongs to the `bbP1cHdr` style shall be located to be used as the placeholder text for the nearest ancestor structured document tag.

If no document part is located matching the criteria specified by this element, then five non-breaking spaces shall be used as the default placeholder text.

[*Example:* Consider a structured document tag defined as follows:

```
<w:sdt>
  <w:sdtPr>
    <w:placeholder>
      <w:docPart w:val="DefaultPlaceholder_22610170" />
    </w:placeholder>
    ...
  </w:sdtPr>
  <w:sdtContent>
    ...
  </w:sdtContent>
</w:sdt>
```

This structured document tag specifies through the `docPart` element that its placeholder text must be specified in the document part of style `bbP1cHdr` whose name is equal to `DefaultPlaceholder_22610170`. *end example]*

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the <code>val</code> attribute is the ID of the associated paragraph style's <code>styleId</code>.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre>

Attributes	Description
	<p>In this case, the decimal number in the <code>val</code> attribute is the caption of the nearest ancestorstructured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model (`CT_String`) is located in §A.1. *end note*]

17.5.2.10 docPartCategory (Document Part Category Filter)

This element specifies the category of document parts that shall be used as the filter when determining the possible choices of document parts that are displayed for insertion into the nearest ancestorstructured document tag. A document part *category* is a sub-classification within a given document part gallery which can be used to further categorize the parts in a given gallery. [Example: Gallery `custom1` might have categories of `Legal Clauses`, `Conformance Clauses`, etc. *end example*]. The category which shall be used as a filter is stored in this element's `val` attribute.

If this element is omitted, then the nearest ancestorstructured document tag shall display all document parts in the specified gallery regardless their specified category. If this element is present, but no document parts of the specified gallery and category combination are located by the application, then no document parts shall be displayed (i.e. the application shall not fall back to showing document parts in all categories in the specified gallery).

[Example: Consider the following properties for a structured document tag:

```
<w:sdtPr>
  <w:docPartList>
    <w:docPartGallery w:val="custom1"/>
    <w:docPartCategory w:val="Legal Clauses"/>
  </w:docPartList>
</w:sdtPr>
```

This structured document tag specifies that it must present a selection of document parts for insertion via the `docPartList` element (§17.5.2.12), and those document parts must only be the parts which are in the `custom1` gallery via the `docPartType` element (§17.5.2.11), and within that gallery, only the document parts which are in a category called `Legal Clauses` via this element. *end example*

Attributes	Description
<code>val</code> (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML</p>

Attributes	Description
	<p>element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre data-bbox="456 394 951 489"><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the <code>val</code> attribute is the ID of the associated paragraph style's <code>styleId</code>.</p> <p>However, consider the following fragment:</p> <pre data-bbox="456 674 1078 804"><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the <code>val</code> attribute is the caption of the nearest ancestorstructured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model (`CT_String`) is located in §A.1. *end note*]

17.5.2.11 docPartGallery (Document Part Gallery Filter)

This element specifies the gallery of document parts that shall be used as the filter when determining the possible choices of document parts that are displayed for insertion into the nearest ancestorstructured document tag. A document part *gallery* is a classification of document parts, which might then be subdivided into categories. [*Example:* A gallery with a name of `custom1` might have categories of `Legal` `Clauses`, `Conformance` `Clauses`, etc. *end example*]. The gallery which shall be used is stored in this element's `val` attribute.

If this element is omitted, then the nearest ancestorstructured document tag shall display all document parts in its default gallery. If this element is present, but no document parts of the specified gallery are located by the application, then document parts in the default gallery shall be displayed (i.e. the application shall behave as if the value was omitted).

[*Example:* Consider the following properties for a structured document tag:

```
<w:sdtPr>
  <w:docPartList>
    <w:docPartGallery w:val="custom1"/>
  </w:docPartList>
</w:sdtPr>
```

This structured document tag specifies that it must present a selection of document parts for insertion via the docPartList element (§17.5.2.12), and those document parts must only be the parts which are in the custom1 gallery via this element. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestorstructured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element’s content model (CT_String) is located in §A.1. *end note*]

17.5.2.12 docPartList (Document Part Gallery Structured Document Tag)

This element specifies that the nearest ancestorstructured document tag shall be of a document part gallery type.

This setting does not require or imply that the contents of the structured document tag shall contain only the exact contents of a document part of the specified gallery and category which is present on the current machine, it shall only be used to specify that the structured document tag is of this kind, which shall be used by an application to present the possible list of choices for insertion into the nearest ancestor structured document tag.

[*Example:* Consider the following structured document tag:

```
<w:sdt>
  <w:sdtPr>
    ...
    <w:docPartList>
      ...
    </w:docPartList>
  </w:sdtPr>
  ...
</w:sdt>
```

The docPartList element in this structured document tag's properties specifies that the type of structured document tag is a document part gallery. The child elements must specify the gallery and category filters for this list, if any. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SdtDocPart](#)) is located in §A.1. *end note*]

17.5.2.13 docPartObj (Built-In Document Part Structured Document Tag)

This element specifies that the nearest ancestor structured document tag shall be of a document part type.

This setting does not require or imply that the contents of the structured document tag shall contain only the exact contents of a document part of the specified gallery and category which is present on the current machine, it shall only be used to specify that the structured document tag is of this kind, which shall be used by an application to present the possible list of choices for insertion into the nearest ancestor structured document tag.

This element differs from the docPartList element (§17.5.2.12) in that it can be used to semantically tag a set of block-level objects in a WordprocessingML document without requiring the ability to specify a category and gallery of objects which can be swapped with it via the user interface.

[*Example:* Consider the following structured document tag:

```

<w:sdt>
  <w:sdtPr>
    ...
    <w:docPartObj>
      ...
      </w:docPartObj>
    </w:sdtPr>
  ...
</w:sdt>

```

The docPartObj element in this structured document tag's properties specify that the type of structured document tag is a document part. The child elements must specify the gallery and category semantics for this part, if any. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_SdtDocPart](#)) is located in §A.1. *end note*]

17.5.2.14 docPartUnique (Built-In Document Part)

This element specifies that this structured document tag is being used to encapsulate a built-in document part (i.e. this element appears as a child element of the docPartObj element).

[Example: Consider the following structured document tag:

```

<w:sdt>
  <w:sdtPr>
    ...
    <w:docPartObj>
      ...
      <w:docPartUnique/>
    </w:docPartObj>
  </w:sdtPr>
  ...
</w:sdt>

```

The docPartUnique element in this structured document tag's properties specify that the type of structured document tag is a container for a document part. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.5.2.15 dropDownList (Drop-Down List Structured Document Tag)

This element specifies that the nearest ancestor structured document tag shall be a drop-down list when displayed in the document.

This setting specifies that the behavior for this structured document tag shall be as follows:

- The contents shall not be editable when displayed by a hosting application regardless of the locking settings
- The child elements of this element specify choices which shall be displayed in a standard drop-down list format

As well, the structured document tag shall satisfy the following restraints or the document shall be considered non-conformant:

- The contents shall only be contain a single run (one set of formatting properties)
- The contents shall not contain more than a single paragraph or table cell and shall not contain a table row or table

[*Example:* Consider the following structured document tag:

```
<w:sdt>
  <w:sdtPr>
    ...
    <w:dropDownList>
      ...
    </w:dropDownList>
  </w:sdtPr>
  ...
</w:sdt>
```

The dropDownList element in this structured document tag's properties specify that the type of structured document tag is a drop-down list. *end example*]

Attributes	Description
lastValue (Drop-down List Last Saved Value)	<p>Specifies the value associated with the current display text for the drop-down list structured document tag.</p> <p>If this structured document tag is not mapped to XML using the dataBinding element (§17.5.2.6), then this attribute shall be ignored. If this structured document tag is mapped to XML, it shall be used to determine whether the current display text in the combo box structured document tag shall be retained when the document is opened, as follows:</p> <ul style="list-style-type: none"> • When the XML mapping is created, the content in the custom XML data is retrieved • If this content has an associated list item (matching its value attribute), then the corresponding display text shall be displayed in the structured document tag • If no list item exists, this content shall be matched against the lastValue attribute value. If the values match, the current display text shall be retained. If the values do not match, the current custom XML data content shall be the new display text (since no match exists in the combo box list items) <p>[<i>Example:</i> Consider a drop-down list structured document tag defined as follows:</p>

Attributes	Description
	<pre><w:sdt> <w:sdtPr> <w:dataBinding ... /> <w:dropDownList w:lastValue="2"/> </w:sdtPr> <w:sdtContent> <w:r> <w:t>Hello, world</w:t> </w:r> </w:sdtContent> </w:sdt></pre> <p>The current run content of the structured document tag reads <code>Hello, world</code>. When this document is opened, if the current value of the associated custom XML data is 2, the matching <code>lastValue</code> attribute specifies that the contents of the combo box must continue to be the current display text of the combo box even though there is no <code>listItem</code> whose value is 2 (and normally, the content of the structured document tag would be set to 2. Essentially, this attribute specifies a <code>listItem</code> whose value is 2 and whose <code>displayText</code> is <code>Hello, world</code> (the current structured document tag contents). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_SdtDropDownList](#)) is located in §A.1. *end note*]

17.5.2.16 **equation** (Equation Structured Document Tag)

This element specifies that the nearest ancestor structured document tag shall be of type `equation`.

This setting does not require or imply that the contents of the structured document tag shall contain only an equation or associated placeholder text, it shall only be used to specify that the structured document tag is of this kind, which can be used by an application as desired.

[Example: Consider the following structured document tag:

```
<w:sdt>
  <w:sdtPr>
    ...
    <w:equation/>
  </w:sdtPr>
  ...
</w:sdt>
```

The equation element in this structured document tag's properties specify that the type of structured document tag is equation. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.1. *end note*]

17.5.2.17 group (Group Structured Document Tag)

This element specifies that the nearest ancestor structured document tag shall be a restricted grouping when displayed in the document.

This setting specifies that the behavior for this structured document tag shall be as follows:

- The contents of this structured document tag shall not be editable when displayed by a hosting application regardless of the locking settings. This restriction can be superseded by any structured document tag contained within the group, as each structured document tag specifies the locking properties for its own content.

[*Example:* Consider the following structured document tag:

```
<w:sdt>
  <w:sdtPr>
    ...
    <w:group/>
  </w:sdtPr>
  ...
</w:sdt>
```

The group element in this structured document tag's properties specify that the type of structured document tag is a restricted group. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.1. *end note*]

17.5.2.18 id (Unique ID)

This element specifies a unique numerical ID for the nearest ancestor structured document tag. This ID shall be persisted through multiple sessions (i.e. shall not be changed once specified).

If multiple structured document tags specify the same decimal number value for the id attribute, then the first structured document tag in the document shall maintain this original ID, and all subsequent structured document tags shall have new identifiers assigned to them when the document is opened.

If this element is omitted, then the nearest ancestor structured document tag shall have a new unique identifier assigned to it when the document is opened.

[*Example:* Consider the following structured document tag properties:

```
<w:sdtPr>
  <w:id w:val="8775518"/>
  ...
</w:sdtPr>
```

This set of properties specifies via the val attribute on the id element that the ID for the parent structured document must be 8775518 (subject, of course, to the conflict management and resolution discussed above). *end example*

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example</i>: Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <pre><... w:val="1512645511" /></pre> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_DecimalNumber](#)) is located in §A.1. *end note*]

17.5.2.19 label (Structured Document Tag Label)

This element specifies the label identifier associated with the current structured document tag. The identifier representing the label shall be stored on this element’s val attribute and is used to reference the unique identifier value of a structured document tag. The contents of the structured document tag resolved by a specific unique identifier shall be used as the label content for the structured document tag that references that specific unique identifier of the structured document tag. If multiple instances of the label element are present, the labels referenced are ordered from most general to most specific. [*Example*: A form element for specifying country name might reference the label for these three items (in order): “Sender”, “Home Address”, and “Country”. *end example*]

If this element is omitted or the value of the label identifier cannot be resolved, then no label shall be associated with the given structured document tag.

[*Example*: Consider the following two structured document tags where one structured document tag references another structured document tag as a label:


```

<w:sdt>
  <w:sdtPr>
    <w:id w:val="5" />
  </w:sdtPr>
  <w:sdtContent>
    <w:p>
      <w:r>
        <w:t>Name</w:t>
      </w:r>
    </w:p>
  </w:sdtContent>
</w:sdt>
...
<w:sdt>
  <w:sdtPr>
    <w:id w:val="6" />
    <w:label w:val="5" />
  </w:sdtPr>
  ...
</w:sdt>

```

The label element specifies that the structured document tag with an identifier value of 6 uses the contents of the structured document tag with an identifier value of 5 as a label source. In this example, the label contents are “Name”. *end example*]

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <pre><... w:val="1512645511" /></pre> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_DecimalNumber](#)) is located in §A.1. *end note*]

17.5.2.20 **lid (Date Picker Language ID)**

This element specifies the language ID that shall be used for displaying a calendar for the current date picker structured document tag, if a user interface is present for the structured document tag.

If this element is omitted, then the language ID shall be the language ID of the run contents of the nearest ancestor structured document tag.

[*Example:* Consider the following structured document tag properties:

```
<w:sdtPr>
  <w:date w:fullDate="2006-01-01T06:30:00Z">
    <w:lid w:val="ja-JP"/>
  </w:date>
</w:sdtPr>
```

The calendar language ID for a calendar which can be displayed in the document must be the default calendar format for the Japanese (Japan) language format (ja-JP). *end example*]

Attributes	Description
val (Language Code)	<p>Specifies an identifier for a specific language.</p> <p>This code is interpreted in the context of the parent XML element.</p> <p>[<i>Example:</i> Consider an object which must specify the English(Canada) language. That object would use an identifier of en-CA to specify this language. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Lang simple type (§22.9.2.6).</p>

[*Note:* The W3C XML Schema definition of this element’s content model (CT_Lang) is located in §A.1. *end note*]

17.5.2.21 **listItem (Combo Box List Item)**

This element specifies a single list item within the parent combo box structured document tag. Each list item shall be displayed in the list displayed for the nearest ancestor structured document tag (if a user interface is present).

[*Example:* Consider the following combo box structured document tag:

```

<w:sdt>
  <w:sdtPr>
    <w:comboBox>
      <w:listItem w:displayText="Zero" w:value="0"/>
      <w:listItem w:displayText="One" w:value="1"/>
    </w:comboBox>
  </w:sdtPr>
  ...
</w:sdt>

```

Each listItem element within the comboBox element specifies a single list item entry, in this case resulting in two list items within the parent combo box structured document tag. *end example*]

Attributes	Description
displayText (List Entry Display Text)	<p>Specifies the text to display in the run content (as well as any supplied user interface) in place of the value attribute contents for this drop-down list entry.</p> <p>This value shall be used as follows:</p> <ul style="list-style-type: none"> • If the nearest ancestor structured document tag is mapped to a custom XML element, the value in that custom XML element shall be mapped the content of the value attribute, and the resulting displayText attribute value (if one is present) shall be displayed in the run content. If no displayText attribute is present, then the value shall be displayed. • If the corresponding entry is selected via a user interface, this value shall be stored in the parent element's run content in the document (this is the value that shall be shown in the document's WordprocessingML content). <p>If this attribute is omitted, then the content of the value attribute shall be used as the display text for the current list item entry.</p> <p>[<i>Example:</i> Consider the following drop-down list structured document tag:</p> <pre> <w:sdt> <w:sdtPr> <w:dropDownList> <w:listItem w:displayText="The Letter A" w:value="a"/> <w:listItem w:displayText="The Letter B" w:value="b"/> </w:dropDownList> </w:sdtPr> ... </w:sdt> </pre> <p>The displayText attribute for the first entry is The Letter A and the second is The Letter B, therefore, these values are used to determine the display text if the nearest ancestor structured document tag is mapped to custom XML data in a custom XML data part. <i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).
value (List Entry Value)	<p>Specifies the value for the current list item entry.</p> <p>This value shall be used as follows:</p> <ul style="list-style-type: none"> • If the nearest ancestor structured document tag is mapped to a custom XML element, the value in that custom XML element shall be mapped to this value, and the resulting displayText attribute value (if one is present) shall be displayed in the run content. If no displayText attribute is present, then the value shall be displayed. • If the corresponding entry is selected via a user interface, this value shall be stored in the parent element's listItem attribute value. <p>[Example: Consider the following combo box structured document tag:</p> <pre> <w:sdt> <w:sdtPr> <w:comboBox> <w:listItem w:displayText="Zero" w:value="0"/> <w:listItem w:displayText="One" w:value="1"/> </w:comboBox> </w:sdtPr> ... </w:sdt> </pre> <p>The value attribute for the first entry is 0 and the second is 1, therefore, these values are used to determine the display text if the nearest ancestor structured document tag is mapped to custom XML data in a custom XML data part. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_SdtListItem](#)) is located in §A.1. *end note*]

17.5.2.22 listItem (Drop-Down List Item)

This element specifies a single list item within the parent drop-down list structured document tag. Each list item shall be displayed in the list displayed for the nearest ancestor structured document tag (if a user interface is present).

[Example: Consider the following combo box structured document tag:

```

<w:sdt>
  <w:sdtPr>
    <w:dropDownList>
      <w:listItem w:displayText="The Letter A" w:value="a"/>
      <w:listItem w:displayText="The Letter B" w:value="b"/>
    </w:dropDownList>
  </w:sdtPr>
  ...
</w:sdt>

```

Each listItem element within the dropDownList element specifies a single list item entry, in this case resulting in two list items within the parent drop-down list structured document tag. *end example*]

Attributes	Description
displayText (List Entry Display Text)	<p>Specifies the text to display in the run content (as well as any supplied user interface) in place of the value attribute contents for this drop-down list entry.</p> <p>This value shall be used as follows:</p> <ul style="list-style-type: none"> • If the nearest ancestor structured document tag is mapped to a custom XML element, the value in that custom XML element shall be mapped the content of the value attribute, and the resulting displayText attribute value (if one is present) shall be displayed in the run content. If no displayText attribute is present, then the value shall be displayed. • If the corresponding entry is selected via a user interface, this value shall be stored in the parent element's run content in the document (this is the value that shall be shown in the document's WordprocessingML content). <p>If this attribute is omitted, then the content of the value attribute shall be used as the display text for the current list item entry.</p> <p>[<i>Example:</i> Consider the following drop-down list structured document tag:</p> <pre> <w:sdt> <w:sdtPr> <w:dropDownList> <w:listItem w:displayText="The Letter A" w:value="a"/> <w:listItem w:displayText="The Letter B" w:value="b"/> </w:dropDownList> </w:sdtPr> ... </w:sdt> </pre> <p>The displayText attribute for the first entry is The Letter A and the second is The Letter B, therefore, these values are used to determine the display text if the nearest ancestor structured document tag is mapped to custom XML data in a custom XML data part. <i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).
value (List Entry Value)	<p>Specifies the value for the current list item entry.</p> <p>This value shall be used as follows:</p> <ul style="list-style-type: none"> • If the nearest ancestor structured document tag is mapped to a custom XML element, the value in that custom XML element shall be mapped to this value, and the resulting displayText attribute value (if one is present) shall be displayed in the run content. If no displayText attribute is present, then the value shall be displayed. • If the corresponding entry is selected via a user interface, this value shall be stored in the parent element's listItem attribute value. <p>[Example: Consider the following combo box structured document tag:</p> <pre> <w:sdt> <w:sdtPr> <w:comboBox> <w:listItem w:displayText="Zero" w:value="0"/> <w:listItem w:displayText="One" w:value="1"/> </w:comboBox> </w:sdtPr> ... </w:sdt> </pre> <p>The value attribute for the first entry is 0 and the second is 1, therefore, these values are used to determine the display text if the nearest ancestor structured document tag is mapped to custom XML data in a custom XML data part. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_SdtListItem](#)) is located in §A.1. *end note*]

17.5.2.23 lock (Locking Setting)

This element specifies the set of behaviors that shall be applied to the contents of the nearest ancestor structured document tag when the contents of this documents are edited by an application (whether through a user interface or directly). The type of locking applied to the structured document tag is specified via the value of the associated val attribute.

If this element is omitted, then the locking settings implied for the structured document tag shall be as follows:

- If the structured document tag specifies that it is a group via the group element (§17.5.2.17), then the contents of the structured document tag shall be editable, but the entire tag can be deleted.
- For all other kinds, no locking settings shall be applied to the structured document tag.

[*Example:* Consider the following plain text structured document tag:

```
<w:sdt>
  <w:sdtPr>
    <w:lock w:val="sdtLocked"/>
    ...
    <w:text/>
  </w:sdtPr>
  ...
</w:sdt>
```

This plain text structured document tag's properties contain a lock element, specifying locking behaviors for the structured document tag. Since the locking val attribute value is sdtLocked, this locking setting must specify that the contents of the structured document tag can be edited, but the structured document tag itself must not be deleted from the document. *end example*]

Attributes	Description
val (Locking Type)	<p>Specifies the type of locking which shall be applied to the nearest ancestor structured document tag.</p> <p>If this attribute is omitted, this its value shall be assumed to be unlocked (using the defaults stated above).</p> <p>[<i>Example:</i> Consider the following plain text structured document tag properties:</p> <pre><w:sdtPr> <w:lock w:val="contentLocked"/> ... <w:text/> </w:sdtPr></pre> <p>The val attribute value is contentLocked, therefore this locking setting shall specify that the contents of the structured document tag must not be edited, but the structured document tag itself can be deleted from the document. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Lock simple type (§17.18.49).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Lock](#)) is located in §A.1. *end note*]

17.5.2.24 picture (Picture Structured Document Tag)

This element specifies that the nearest ancestor structured document tag shall be a picture when displayed in the document.

This setting specifies that the behavior for this structured document tag shall be as follows:

- The contents shall always be restricted to a single picture using the DrawingML (§20.1) syntax

As well, the structured document tag shall satisfy the following restraints or the document shall be considered non-conformant:

- The contents shall only be a single picture using the DrawingML (§20.1) syntax
- The contents shall not contain more than a single paragraph or table cell and shall not contain a table row or table

[*Example:* Consider the following structured document tag:

```
<w:sdt>
  <w:sdtPr>
    ...
    <w:picture/>
  </w:sdtPr>
  ...
</w:sdt>
```

The text element in this structured document tag's properties specify that the type of structured document tag is a picture. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.1. *end note*]

17.5.2.25 placeholder (Structured Document Tag Placeholder Text)

This element specifies the placeholder text which should be displayed when this structured document tag's run contents are empty, the associated mapped XML element is empty as specified via the dataBinding element (§17.5.2.6) or the showingPlcHdr element (§17.5.2.39) is set in the structured document tag's properties. The placeholder text which shall be shown is itself specified via the child element docPart.

If this element is omitted, then five non-breaking spaces shall be used as the default placeholder text for this structured document tag.

[*Example:* Consider a structured document tag defined as follows:


```

<w:sdt>
  <w:sdtPr>
    <w:placeholder>
      <w:docPart w:val="DefaultPlaceholder_22610170" />
    </w:placeholder>
    ...
  </w:sdtPr>
  <w:sdtContent>
    ...
  </w:sdtContent>
</w:sdt>

```

This structured document tag specifies through the placeholder element that its placeholder text must be specified in the document part of type `bbPlcHdr` whose name is equal to `DefaultPlaceholder_22610170`. *end example]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Placeholder](#)) is located in §A.1. *end note]*

17.5.2.26 richText (Rich Text Structured Document Tag)

This element specifies that the nearest ancestor structured document tag shall be a rich text box when displayed in the document.

If no type element (the `xsd:choice` block in the XML Schema fragment for the parent `sdtPr` element) is specified, then the nearest ancestor structured document tag shall be of type `richText`.

[*Example:* Consider the following structured document tag:

```

<w:sdt>
  <w:sdtPr>
    ...
    <w:richText/>
  </w:sdtPr>
  ...
</w:sdt>

```

The `richText` element in this structured document tag's properties specify that the type of structured document tag is a rich text box. *end example]*.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.1. *end note]*

17.5.2.27 rPr (Run Properties For Structured Document Tag Contents)

This element specifies the set of run properties that shall be applied to the text entered into the nearest ancestor structured document tag in replacement of placeholder text. When placeholder text is present in a structured document tag, its formatting is often different than the desired underlying formatting, and this

element specifies the formatting which shall be used for non-placeholder text contents when they are initially added to the control.

If this element is not present, the inserted is unformatted, as with any other run of text - it shall not inherit the properties of the placeholder text.

[*Example:* Consider the following structured document tag:

```
<w:sdt>
  <w:sdtPr>
    <w:placeholder>
      <w:docPart w:val="TestPlaceholderDocPart"/>
    </w:placeholder>
    <w:showingPlcHdr/>
    <w:rPr>
      <w:rStyle w:val="UserName"/>
    </w:rPr>
    ...
  </w:sdtPr>
  <w:sdtContent>
    <w:r>
      <w:rPr>
        <w:rStyle w:val="PlaceholderText"/>
      </w:rPr>
      <w:t>[Type Your Name Here]</w:t>
    </w:r>
  </w:sdtContent>
</w:sdt>
```

This structured document tag specifies that its current contents are placeholder text via the `showingPlcHdr` element (§17.5.2.39), and that text has the `PlaceholderText` character style applied to it.

Now, assume that that style created grey shaded text (typical for placeholder text). This formatting would clearly not be desirable for any text entered into the structured document tag. Therefore, when this text is added, the `rPr` element in the `sdtPr` is used to store the formatting on the resulting text.

In this example, the text which initially populates the control shall be formatted with the `UserName` character style. *end example*]

The W3C XML Schema definition of this element's content model (CT_RPr) is located in §A.1. Each child element from the above table shall not occur more than once. [*Note:* This restriction is not reflected in the element's content model due to limitations of W3C XML Schema language. *end note*]

17.5.2.28 rPr (Structured Document Tag End Character Run Properties)

This element specifies the set of run properties which shall be applied to the character present to delimit the end of the structured document tag's contents. When these properties are applied, they shall be applied in addition to the run properties specified for the entire structured document tag via the rPr element (§17.5.2.27) stored in the tag's main property container.

If this element is not present, the inserted closing tag shall be formatting identically to the start tag.

[Example: Consider the following structured document tag:

```
<w:sdt>
  <w:sdtPr>
    <w:placeholder>
      <w:docPart w:val="TestPlaceholderDocPart"/>
    </w:placeholder>
    <w:showingPlcHdr/>
    <w:rPr>
      <w:rStyle w:val="UserName"/>
    </w:rPr>
    ...
  </w:sdtPr>
  <w:sdtEndPr>
    <w:rPr>
      <w:b/>
      <w:i/>
    </w:rPr>
  </w:sdtEndPr>
  <w:sdtContent>
    ...
  </w:sdtContent>
</w:sdt>
```

The rPr elements under the tag's properties specify that this structured document tag specifies that its start character must have formatting in the character style UserName, and that the end character must have the formatting in the character style UserName as well as bold and italic direct formatting. *end example*

The W3C XML Schema definition of this element's content model ([CT_RPr](#)) is located in §A.1. Each child element from the above table shall not occur more than once. [Note: This restriction is not reflected in the element's content model due to limitations of W3C XML Schema language. *end note*]

17.5.2.29 sdt (Block-Level Structured Document Tag)

This element specifies the presence of a structured document tag around one or more block-level structures (paragraphs, tables, etc.). The two child elements of this element shall be used to specify the properties and content of the current structured document tag via the sdtPr and sdtContent elements, respectively.

[*Example:* Consider a structured document tag with the friendly name `address` that must be located around a single paragraph in a WordprocessingML document. This requirement would be specified as follows in the WordprocessingML:

```
<w:body>
  <w:sdt>
    <w:sdtPr>
      <w:alias w:val="address"/>
    </w:sdtPr>
    <w:sdtContent>
      <w:p>
        ...
      </w:p>
    </w:sdtContent>
  </w:sdt>
  ...
</w:body>
```

The `sdt` element specifies the structured document tag, the child `sdtPr` element contains the friendly name property set to `address`, and the `sdtContent` element contains a single paragraph (it is a block-level structured document tag). *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SdtBlock](#)) is located in §A.1. *end note*]

17.5.2.30 `sdt` (Row-Level Structured Document Tag)

This element specifies the presence of a structured document tag around a single table row. The two child elements of this element shall be used to specify the properties and content of the current structured document tag via the `sdtPr` and `sdtContent` elements, respectively.

[*Example:* Consider a structured document tag with the friendly name `invoiceItem` that must be located around a single table row in a WordprocessingML document. This requirement would be specified as follows in the WordprocessingML:

```

<w:tbl>
  <w:sdt>
    <w:sdtPr>
      <w:alias w:val="invoiceItem"/>
    </w:sdtPr>
    <w:sdtContent>
      <w:tr>
        ...
      </w:tr>
    </w:sdtContent>
  </w:sdt>
  ...
</w:tbl>

```

The sdt element specifies the structured document tag, the child sdtPr element contains the friendly name property set to `invoiceItem`, and the sdtContent element contains a single table row (it is a row-level structured document tag). *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SdtRow](#)) is located in §A.1. *end note*]

17.5.2.31 sdt (Inline-Level Structured Document Tag)

This element specifies the presence of a structured document tag around one or more inline-level structures (runs, DrawingML objects, fields, etc.) in the current paragraph. The two child elements of this element shall be used to specify the properties and content of the current structured document tag via the sdtPr and sdtContent elements, respectively.

[*Example:* Consider a structured document tag with the friendly name `firstName` that must be located around two runs in a WordprocessingML document. This requirement would be specified as follows in the WordprocessingML:

```

<w:p>
  <w:sdt>
    <w:sdtPr>
      <w:alias w:val="firstName"/>
    </w:sdtPr>
    <w:sdtContent>
      <w:r>
        ...
      </w:r>
      <w:r>
        ...
      </w:r>
    </w:sdtContent>
  </w:sdt>
  ...
</w:p>

```

The sdt element specifies the structured document tag, the child sdtPr element contains the friendly name property set to `firstName`, and the sdtContent element contains two runs (it is an inline-level structured document tag). *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SdtRun](#)) is located in §A.1. *end note*]

17.5.2.32 sdt (Cell-Level Structured Document Tag)

This element specifies the presence of a structured document tag around a single table cell. The two child elements of this element shall be used to specify the properties and content of the current structured document tag via the sdtPr and sdtContent elements, respectively.

[*Example:* Consider a structured document tag with the friendly name `company` that must be located around a single table cell in a WordprocessingML document. This requirement would be specified as follows in the WordprocessingML:

```

<w:tr>
  <w:sdt>
    <w:sdtPr>
      <w:alias w:val="company"/>
    </w:sdtPr>
    <w:sdtContent>
      <w:tc>
        ...
      </w:tc>
    </w:sdtContent>
  </w:sdt>
  ...
</w:tr>

```

The sdt element specifies the structured document tag, the child sdtPr element contains the friendly name property set to *company*, and the sdtContent element contains a single table cell (it is a cell-level structured document tag). *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_SdtCell](#)) is located in §A.1. *end note*]

17.5.2.33 sdtContent (Cell-Level Structured Document Tag Content)

This element specifies the last known contents of a structured document tag around a single table cell. This element's contents shall be treated as a cache of the contents to be displayed in the structured document tag for the following reasons:

- If the structured document tag specifies an XML mapping via the dataBinding element (§17.5.2.6), changes to the custom XML data part shall be reflected in the structured document tag as needed
- If the contents of the structured document tag are placeholder text via the showingPlcHdr element (§17.5.2.39), then this content can be updated with the placeholder text stored in the Glossary Document part

[Example: Consider a structured document tag with the friendly name *company* that must be located around a single table cell in a WordprocessingML document. This requirement would be specified as follows in the WordprocessingML:

```

<w:tr>
  <w:sdt>
    <w:sdtPr>
      <w:alias w:val="company"/>
    </w:sdtPr>
    <w:sdtContent>
      <w:tc>
        ...
      </w:tc>
    </w:sdtContent>
  </w:sdt>
  ...
</w:tr>

```

The sdtContent element contains a single table cell (it is an cell-level structured document tag content container). *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SdtContentCell](#)) is located in §A.1. *end note*]

17.5.2.34 sdtContent (Block-Level Structured Document Tag Content)

This element specifies the last known contents of a structured document tag around one or more block-level structures (paragraphs, tables, etc.). This element's contents shall be treated as a cache of the contents to be displayed in the structured document tag for the following reasons:

- If the structured document tag specifies an XML mapping via the dataBinding element (§17.5.2.6), changes to the custom XML data part shall be reflected in the structured document tag as needed
- If the contents of the structured document tag are placeholder text via the showingPlcHdr element (§17.5.2.39), then this content can be updated with the placeholder text stored in the Glossary Document part

[*Example:* Consider a structured document tag with the friendly name address that must be located around a single paragraph in a WordprocessingML document. This requirement would be specified as follows in the WordprocessingML:


```

<w:body>
  <w:sdt>
    <w:sdtPr>
      <w:alias w:val="address"/>
    </w:sdtPr>
    <w:sdtContent>
      <w:p>
        ...
      </w:p>
    </w:sdtContent>
  </w:sdt>
  ...
</w:body>

```

The sdtContent element contains a single paragraph (it is a block-level structured document tag content container). *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SdtContentBlock](#)) is located in §A.1. *end note*]

17.5.2.35 sdtContent (Row-Level Structured Document Tag Content)

This element specifies the last known contents of a structured document tag around a single table row.

[*Note:* Unlike other types of structured document tags, this type of structure document tag cannot show placeholder text or have mapped XML data, therefore it is never a cache. *end note*]

[*Example:* Consider a structured document tag with the friendly name `invoiceItem` that must be located around a single table row in a WordprocessingML document. This requirement would be specified as follows in the WordprocessingML:

```

<w:tbl>
  <w:sdt>
    <w:sdtPr>
      <w:alias w:val="invoiceItem"/>
    </w:sdtPr>
    <w:sdtContent>
      <w:tr>
        ...
      </w:tr>
    </w:sdtContent>
  </w:sdt>
  ...
</w:tbl>

```

The sdtContent element contains a single table row (it is an row-level structured document tag content container). *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT SdtContentRow](#)) is located in §A.1. *end note*]

17.5.2.36 sdtContent (Inline-Level Structured Document Tag Content)

This element specifies the last known contents of a structured document tag around one or more inline-level structures (runs, DrawingML objects, fields, etc.). This element's contents shall be treated as a cache of the contents to be displayed in the structured document tag for the following reasons:

- If the structured document tag specifies an XML mapping via the dataBinding element (§17.5.2.6), changes to the custom XML data part shall be reflected in the structured document tag as needed
- If the contents of the structured document tag are placeholder text via the showingPlcHdr element (§17.5.2.39), then this content can be updated with the placeholder text stored in the Glossary Document part

[*Example:* Consider a structured document tag with the friendly name firstName that must be located around two runs in a WordprocessingML document. This requirement would be specified as follows in the WordprocessingML:

```
<w:p>
  <w:sdt>
    <w:sdtPr>
      <w:alias w:val="firstName"/>
    </w:sdtPr>
    <w:sdtContent>
      <w:r>
        ...
      </w:r>
      <w:r>
        ...
      </w:r>
    </w:sdtContent>
  </w:sdt>
  ...
</w:p>
```

The sdtContent element contains two adjacent runs (it is an inline-level structured document tag content container). *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT SdtContentRun](#)) is located in §A.1. *end note*]

17.5.2.37 `sdtEndPr` (Structured Document Tag End Character Properties)

This element specifies the properties which shall be applied to the physical character which delimits the end of a structured document tag.

[*Example:* Consider a structured document tag with the following properties specified for the end tag:

```
<w:sdtEndPr>
  <w:rPr>
    ...
  </w:rPr>
</w:sdtEndPr>
```

This structured document tag specifies properties for its end character within the `sdtEndPr` element. *end example]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SdtEndPr](#)) is located in §A.1. *end note]*

17.5.2.38 `sdtPr` (Structured Document Tag Properties)

This element specifies the set of properties that shall be applied to the nearest ancestor structured document tag.

[*Example:* Consider a structured document tag with the following properties specified:

```
<w:sdtPr>
  <w:alias w:val="Birthday"/>
  <w:id w:val="8775518"/>
  <w:date>
    <w:dateFormat w:val="M/d/yyyy"/>
    <w:lid w:val="EN-US"/>
  </w:date>
</w:sdtPr>
```

This structured document tag specifies three properties: the a friendly name of Birthday via the `alias` element (§17.5.2.1), a unique ID of 8775518 via the `id` element (§17.5.2.18), and a structured document tag type of date picker via the `date` element (§17.5.2.7) which itself has a set of date-specific properties. *end example]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SdtPr](#)) is located in §A.1. *end note]*

17.5.2.39 `showingPlcHdr` (Current Contents Are Placeholder Text)

This element specifies whether the content of the `sdtContent` element (§17.5.2.34; §17.5.2.33; §17.5.2.35; §17.5.2.36) for the nearest ancestor structured document tag shall be interpreted to contain placeholder text for this structured document tag (as opposed to regular text contents within the structured document tag). If this element is present and set to true, this state shall be resumed (showing placeholder text) upon opening this document.

If this element is omitted, then the structured document tag shall not be interpreted to be showing placeholder text when the document is displayed.

[*Example:* Consider the following structured document tag:

```
<w:sdt>
  <w:sdtPr>
    <w:showingPlcHdr/>
    ...
    <w:richText/>
  </w:sdtPr>
  <w:sdtContent>
    <w:r>
      <w:t>[Type your name here]</w:t>
    </w:r>
  </w:sdtContent>
</w:sdt>
```

This structured document tag has run contents which read [Type your name here], which would typically be interpreted as the current contents of the structured document tag. However, since the showingPlcHdr element has been specified in the structured document tag's properties, this content must instead be interpreted as the placeholder text for the structured document tag. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.5.2.40 storeMappedDataAs (Custom XML Data Date Storage Format)

This element specifies the translation which shall be performed on the displayed date in a date picker structured document tag when the current contents are saved into the associated custom XML data via the dataBinding element (§17.5.2.6).

If this element is omitted, then the value of the associated custom XML element shall be placed into the custom XML data part with no translation.

[*Example:* Consider the following date picker structured document tag:

```

<w:sdt>
  <w:sdtPr>
    <w:date w:fullDate="01-01-2006T06:30:00Z">
      <w:storeMappedDateAs w:val="text"/>
      ...
    </w:date>
  </w:sdtPr>
  <w:sdtContent>
    <w:r>
      <w:t>January 1</w:t>
    </w:r>
  </w:sdtContent>
</w:sdt>

```

The value of the storeMappedDateAs element's attribute value is text, therefore the current run contents must be sent to the mapped XML element without any translation (in this case, the value must be January 1). *end example]*

Attributes	Description
val (Date Storage Type)	<p>Specifies the date translation which shall be applied to the parent date picker structured document tag.</p> <p>If this attribute is omitted, this its value shall be assumed to be text.</p> <p>[<i>Example:</i> Consider the following date picker structured document tag:</p> <pre> <w:sdt> <w:sdtPr> <w:date ... > <w:storeMappedDateAs w:val="date"/> ... </w:date> </w:sdtPr> <w:sdtContent> <w:r> <w:t>January 1</w:t> </w:r> </w:sdtContent> </w:sdt> </pre> <p>The value of the val attribute is text, therefore the current run contents must be sent to the mapped XML element after being translated into xsd:date format (in this case, the value must be 01-01-2006). <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_SdtDateMappingType simple type (§17.18.76).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_SdtDateMappingType](#)) is located in §A.1. *end note*]

17.5.2.41 `tabIndex` (Structured Document Tag Navigation Order Index)

This element specifies the position of the current structured document tag in the navigation (tab) order used in the document. The index shall be stored on this element's `val` attribute and is analogous to the `tabIndex` attribute in HTML.

Objects that support tab index shall be navigated by consumers in the following order:

- Objects for which the XML specifies a non-zero `tabIndex` value are navigated first. Navigation proceeds with the element with the lowest resolved value of `tabIndex` to the element with the highest resolved value of `tabIndex`.
- Objects that specify identical resolved values of `tabIndex` is navigated in the lexical order in which the elements appear in the underlying WordprocessingML.
- Objects for which the XML does not specify an index or objects for which the XML specifies a resolved `tabIndex` value of 0 are navigated last. These objects are navigated in the lexical order in which they appear in the underlying WordprocessingML.

[Example: Consider the following two structured document tags where each structured document tag specifies a tab index:

```
<w:sdt>
  <w:sdtPr>
    <w:id w:val="5" />
    <w:tabIndex w:val="1" />
  </w:sdtPr>
  <w:sdtContent>
    <w:p>
      <w:r>
        <w:t>First Name</w:t>
      </w:r>
    </w:p>
  </w:sdtContent>
</w:sdt>
...
<w:sdt>
  <w:sdtPr>
    <w:id w:val="6" />
    <w:tabIndex w:val="2" />
  </w:sdtPr>
```

```

<w:sdtContent>
  <w:p>
    <w:r>
      <w:t>Last Name</w:t>
    </w:r>
  </w:p>
</w:sdtContent>
</w:sdt>

```

The `tabIndex` element specifies that the structured document tag with an identifier value of 5 must be the first content to be reached via tabbing, whereas the structured document tag with an identifier value of 6 must be the second content to be reached via tabbing. *end example*]

Attributes	Description
val (Positive Decimal Number Value)	<p>Specifies that the contents of this attribute contains a positive decimal number.</p> <p>The contents of this positive decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following numeric WordprocessingML property of type <code>ST_UnsignedDecimalNumber</code>:</p> <pre><... w:val="15" /></pre> <p>The value of the <code>val</code> attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_UnsignedDecimalNumber</code> simple type (§22.9.2.16).</p>

[*Note:* The W3C XML Schema definition of this element's content model (`CT_UnsignedDecimalNumber`) is located in §A.1. *end note*]

17.5.2.42 tag (Programmatic Tag)

This element specifies a programmatic tag associated with the current structured document tag. A *programmatic tag* is an arbitrary string which applications can associate with a structured document tag in order to identify it without providing a visible friendly name. The string representing the programmatic tag shall be stored on this element's `val` attribute.

If this element is omitted, then no programmatic tag shall be associated with the given structured document tag.

[*Example:* Consider the following properties on a structured document tag:

```
<w:sdtPr>
  <w:tag w:val="Clause_3246"/>
  ...
</w:sdtPr>
```

This set of properties specifies via the tag element that the programmatic tag for the nearest ancestor structured document tag must be `Clause_3246`. This information can then be used as needed by applications. *end example*

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the <code>val</code> attribute is the ID of the associated paragraph style's <code>styleId</code>.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the <code>val</code> attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_String](#)) is located in §A.1. *end note*]

17.5.2.43 temporary (Remove Structured Document Tag When Contents Are Edited)

This element specifies whether the nearest ancestor structured document tag shall be removed from the WordprocessingML document when the its contents are modified.

[*Note:* This setting is primarily intended for creating structured document tags whose sole purpose is one-time placeholder text, and which should not return once replaced with content. *end note*]

If this element is omitted, then the nearest ancestor structured document tag shall not be automatically removed when its contents are modified.

[*Example:* Consider the following plain text structured document tag:

```
<w:sdt>
  <w:sdtPr>
    <w:temporary/>
    <w:text/>
  </w:sdtPr>
  ...
</w:sdt>
```

This plain text structured document tag's properties contain a temporary element, specifying that the structured document tag itself must be deleted from the document whenever its contents are first modified. *end example]*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.5.2.44 text (Plain Text Structured Document Tag)

This element specifies that the nearest ancestor structured document tag shall be a plain text box when displayed in the document.

This setting specifies that the behavior for this structured document tag shall be as follows:

- Formatting applied to any part of this structured document tag's contents shall apply to its entire contents

As well, the structured document tag shall satisfy the following restraints or the document shall be considered non-conformant:

- The contents shall only be contain a single run (one set of formatting properties) with exceptions for soft carriage returns via the multiLine attribute on this element
- The contents shall not contain more than a single paragraph or table cell and shall not contain a table row or table

[*Example:* Consider the following structured document tag:

```
<w:sdt>
  <w:sdtPr>
    ...
    <w:text/>
  </w:sdtPr>
  ...
</w:sdt>
```

The text element in this structured document tag's properties specify that the kind of structured document tag is a plain text box. *end example*]

Attributes	Description
multiLine (Allow Soft Line Breaks)	<p>Specifies whether soft line breaks can be added to the contents of this structured document tag when this document is modified. This setting shall not affect the ability of the structured document tag to display existing soft line breaks (which shall be preserved) and shall only affect the ability to add line breaks when the document is modified by an application.</p> <p>If this attribute is omitted, then the parent plain text structured document control shall not allow soft line breaks to be added to its contents.</p> <p>[<i>Example</i>: Consider the following structured document tag:</p> <pre><w:sdt> <w:sdtPr> ... <w:text w:multiLine="true"/> </w:sdtPr> ... </w:sdt></pre> <p>The multiLine attribute on the text element in this structured document tag's properties specify that an application can allow soft line breaks to be added to the run contents of the structured document tag. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_SdtText](#)) is located in §A.1. *end note*]

17.6 Sections

WordprocessingML does not natively store the concept of pages, since it is based on paragraphs and runs (which are laid out on to pages by consumers of this content). However, although there is no concept of storing pages in the WordprocessingML format, it is often necessary to store information about a page or group of pages in a document, in order to store information that is to be used to format the pages on which a set of paragraphs appear. In WordprocessingML, this information is stored via the use of *sections*.

In WordprocessingML, *sections* are groupings of paragraphs that have a specific set of properties used to define the pages on which the text appears, as well as other section-level (applying to all paragraphs' appearance) properties.

[*Example*: Consider a document with four paragraphs of text that is to be printed on a page in landscape mode, followed by ten paragraphs of text that are to be printed in portrait mode. This requirement implies information

about the page(s) used to lay out each grouping of text—the first four paragraphs could require one page, or ten.

Therefore, rather than try to cache knowledge of the number of pages and their properties (which is likely to become incorrect if the XML is manipulated by a producer that does not understand page layout), this information is stored by breaking the document into two sections, as follows:

```
<w:p>
...
</w:p>
<w:p>
...
</w:p>
<w:p>
...
</w:p>
<w:p>
  <w:sectPr>
    ...
    (section one properties go here)
    <w:pgSz ... w:orient="landscape" />
    ...
  </w:sectPr>
  ...
</w:p>
...
<w:p>
  <w:sectPr>
    ...
    (section two properties go here)
    <w:pgSz ... w:orient="landscape" />
    ...
  </w:sectPr>
  ...
</w:p>
```

end example]

17.6.1 **bidirectional (Right to Left Section Layout)**

This element specifies that this section shall be presented using a right-to-left page direction. This property only affects section-level properties, and does not affect the layout of text within the contents of this section.

[*Example:* Consider a section with the `bidirectional` property set as follows:

```

<w:sectPr>
...
<w:bidirectional/>>
</w:sectPr>

```

This section direction is now right-to-left, which means that all section level properties are displayed right-to-left (e.g., page numbers are displayed on the right of text; columns are populated from right-to-left). However, the layout of text is determined by properties applied at the text level. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.6.2 bottom (Bottom Border)

This element specifies the presentation and display of the page border displayed at the bottom of each page in this section.

[*Example*: Consider a section in which all pages must have a bottom border consisting of a repeated image of an apple, like this:



This border would result in the following WordprocessingML:

```

<w:sectPr>
...
<w:pgBorders>
  <w:bottom w:val="apples" .../>
</w:pgBorders>
...
</w:sectPr>

```

Because the page only has a border at the bottom, only the bottom element is specified within the set of page borders. *end example*]

When a document has a bottom border that is relative to the page edges (using the `offsetFrom` attribute on `pgBorders`), it shall span the bottom edge of the page at the location defined by its properties, stopping when:

- It intersects with the corresponding left or right page border (if one is specified).
- It reaches the edge of the page.

[*Example*: In the example above, no left or right border was specified in the WordprocessingML, so a consumer must draw the border from one edge of the page to the other. *end example*]

When a document has a bottom border that is relative to the text (using the `offsetFrom` attribute on `pgBorders`), it shall span only the necessary width to satisfy the requirement of spanning the width of the text.

When a document has custom border art specified by the `bottomLeft`, `bottomRight`, and/or `id` attributes, it shall use the corresponding relationship part item as an image for the bottom left corner, bottom right corner, and/or bottom border, respectively. If the corresponding relationship part item cannot be located, the consumer shall use the border specified by the value of the `val` attribute. If the corresponding value of the `val` attribute cannot be resolved no bottom left corner, bottom right corner, or bottom border is present when the page is displayed.

When a document has a custom border art specified by the `id` attribute without specifying the `bottomRight` and/or `bottomLeft` attributes, the bottom border as resolved by the corresponding relationship part item of the `id` attribute shall span to the corners not specified by `bottomRight` and/or `bottomLeft` attributes.

Attributes	Description
<p><code>bottomLeft</code> (Custom Defined Bottom Left Border Relationship Reference)</p> <p>Namespace: <code>http://purl.oclc.org/ooxml/officeDocument/relationships</code></p>	<p>Specifies the relationship ID for the relationship which contains the custom bottom left border image for the parent element. This custom border image is contained in a separate part within the WordprocessingML package.</p> <p>The relationship explicitly targeted by this attribute shall be of type <code>http://purl.oclc.org/ooxml/officeDocument/relationships/image</code> or the document shall be considered non-conformant.</p> <p>If this attribute is omitted, then no custom bottom left border shall be used.</p> <p>[<i>Example</i>: Consider the following WordprocessingML markup for a custom bottom left border in a document:</p> <pre><w:bottom w:val="custom" r:bottomLeft="rIdCustomBottomLeftBorder" .../></pre> <p>The <code>id</code> attribute in the relationship reference namespace specifies that the relationship with relationship ID <code>rIdCustomBottomLeftBorder</code> must contain the custom bottom left border image for the document. <i>end example</i>]</p>

Attributes	Description
<p>bottomRight (Custom Defined Bottom Right Border Relationship Reference)</p> <p>Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships</p>	<p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p> <p>Specifies the relationship ID for the relationship which contains the custom bottom right border image for the parent element. This custom border image is contained in a separate part within the WordprocessingML package.</p> <p>The relationship explicitly targeted by this attribute shall be of type http://purl.oclc.org/ooxml/officeDocument/relationships/image or the document shall be considered non-conformant.</p> <p>If this attribute is omitted, then no custom bottom left border shall be used.</p> <p>[<i>Example</i>: Consider the following WordprocessingML markup for a custom bottom right border in a document:</p> <pre><w:bottom w:val="custom" r:bottomRight="rIdCustomBottomRightBorder" .../></pre> <p>The id attribute in the relationship reference namespace specifies that the relationship with relationship ID rIdCustomBottomRightBorder must contain the custom bottom right border image for the document. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
<p>color (Border Color)</p>	<p>Specifies the color for this border.</p> <p>This value can be defined as either:</p> <ul style="list-style-type: none"> A color value using the RGB color model whose red, green, and blue values are written as numbers in the range 0 to 255, hex encoded, and concatenated. [<i>Example</i>: Full intensity red would be 255 red, 0 green, 0 blue, encoded to FF, 00, 00, and concatenated to FF0000. <i>end example</i>] . RGB colors are specified in the sRGB color space. auto to allow a consumer to automatically determine the border color in order to make the document's text readable. [<i>Example</i>: A document with white text and a background color of auto might result in the use of a black background, in order to ensure legibility of the content. <i>end example</i>] <p>[<i>Example</i>: Consider a border color with value auto, as follows:</p> <pre><w:bottom ... w:color="auto"/></pre> <p>This color therefore can be automatically be modified by a consumer as appropriate, for example, in order to ensure that the border can be distinguished against the page's background color. <i>end example</i>]</p>

Attributes	Description
	<p>If the border style (the <code>val</code> attribute) specifies the use of an art border, this attribute is ignored. As well, if the border specifies the use of a theme color via the <code>themeColor</code> attribute, this value is superseded by the theme color value.</p> <p>The possible values for this attribute are defined by the <code>ST_HexColor</code> simple type (§17.18.38).</p>
<p>frame (Create Frame Effect)</p>	<p>Specifies whether the specified border should be modified to create a frame effect by reversing the border's appearance from the edge nearest the text to the edge furthest from the text.</p> <p>If this attribute is omitted, then the border is not given any frame effect.</p> <p>[<i>Example</i>: Consider a bottom border which must appear with a frame effect, which is specified in the following WordprocessingML:</p> <pre><w:bottom w:frame="true" ... /></pre> <p>This frame's <code>val</code> is <code>true</code>, indicating that the border frame effect must be applied. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_OnOff</code> simple type (§22.9.2.7).</p>
<p>id (Custom Defined Border Relationship Reference)</p> <p>Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships</p>	<p>Specifies the relationship ID for the relationship which contains the custom border image for the parent element. This custom border image is contained in a separate part within the WordprocessingML package.</p> <p>The relationship explicitly targeted by this attribute shall be of type http://purl.oclc.org/ooxml/officeDocument/relationships/image or the document shall be considered non-conformant.</p> <p>If this attribute is omitted, then no custom border shall be used.</p> <p>[<i>Example</i>: Consider the following WordprocessingML markup for a custom bottom border in a document:</p> <pre><w:bottom w:val="custom" r:id="rIdCustomBottomBorder" .../></pre> <p>The <code>id</code> attribute in the relationship reference namespace specifies that the relationship with relationship ID <code>rIdCustomBottomBorder</code> must contain the custom bottom border image for the document. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_RelationshipId</code> simple type (§22.8.2.1).</p>
<p>shadow (Border Shadow)</p>	<p>Specifies whether this border should be modified to create the appearance of a shadow.</p>

Attributes	Description
	<p>For the right and bottom borders, this is accomplished by duplicating the border below and right of the normal border location. For the right and top borders, this is accomplished by moving the order down and to the right of its original location.</p> <p>If this attribute is omitted, then the border is not given the shadow effect.</p> <p>[<i>Example</i>: Consider a top border which must appear with a shadow effect, resulting in the following WordprocessingML:</p> <pre><w:bottom w:shadow="true" ... /></pre> <p>This frame's val is true, indicating that the shadow effect must be applied to the border. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
space (Border Spacing Measurement)	<p>Specifies the spacing offset that shall be used to place this border on the parent object.</p> <p>When a document has a page border that is relative to the page edges (using a value of page in the offsetFrom attribute on pgBorders (§17.6.10)), it shall specify the distance between the edge of the page and the beginning of this border in points.</p> <p>When a document has a page border that is relative to the text extents (using a value of text in the offsetFrom attribute on pgBorders (§17.6.10)), or any other border type, it shall specify the distance between the edge of the object and the beginning of this border in points.</p> <p>[<i>Example</i>: Consider a document with a set of page borders all specified to appear 24 points from the edge of the page. The resulting WordprocessingML would be as follows:</p> <pre><w:pgBorders w:offsetFrom="page"> <w:bottom ... w:space="24" /> </w:pgBorders</pre> <p>The offsetFrom attribute specifies that the space value provides the offset of the page border from the page edge, and the value of the space attribute specifies that the page offset must be 24 points. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PointMeasure simple type (§17.18.68).</p>
sz (Border Width)	<p>Specifies the width of the current border.</p> <p>If the border style (val attribute) specifies a line border, the width of this border is specified in measurements of eighths of a point, with a minimum value of two (one-fourth of a point) and a maximum value of 96 (twelve points). Any values outside this range can be reassigned to a more appropriate value.</p>

Attributes	Description
	<p>If the border style (val attribute) specifies an art border, the width of this border is specified in measurements of points, with a minimum value of one and a maximum value of 31. Any values outside this range can be reassigned to a more appropriate value.</p> <p>[<i>Example:</i> Consider a document with a three point wide dashed line border on all sides, resulting in the following WordprocessingML markup:</p> <pre><w:top w:val="dashed" w:sz="24" .../> <w:left w:val="dashed" w:sz="24" .../> <w:bottom w:val="dashed" w:sz="24" .../> <w:right w:val="dashed" w:sz="24" .../></pre> <p>The border style is specified using the val attribute, and because that border style is a line border (dashed), the sz attribute specifies the size in eighths of a point (24 eighths of a point = 3 points). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_EighthPointMeasure simple type (§17.18.23).</p>
themeColor (Border Theme Color)	<p>Specifies the base theme color used to generate the border color. The border color is the RGB value associated with themeColor as further transformed by themeTint or themeShade (if one is present), else the background color is the RGB value associated with themeColor.</p> <p>The specified theme color is a reference to one of the predefined theme colors, located in the document's Theme part (§14.2.7 and §20.1.6.9), which allows color information to be set centrally in the document.</p> <p>To determine the color to display, the following actions are performed:</p> <ul style="list-style-type: none"> • Using the mapping specified in the ST_ThemeColor simple type (§17.18.97), the appropriate attribute on the clrSchemeMapping element (§17.15.1.20) is read. • Using that value and the mapping specified in the ST_ColorSchemeIndex simple type (§17.18.103), the appropriate element in the document's Theme part is read to get the base theme color. • The specified color is modified based on the presence of the themeTint or themeShade attribute. <p>[<i>Example:</i> Consider a set of borders configured to use the accent2 theme color, resulting in the following WordprocessingML markup:</p> <pre><w:top ... w:themeColor="accent2" w:themeTint="99" /> <w:bottom ... w:themeColor="accent2" w:themeTint="99" /> <w:left ... w:themeColor="accent2" w:themeTint="99" /> <w:right ... w:themeColor="accent2" w:themeTint="99" /></pre> <p>If the Settings part contained the following markup:</p>

Attributes	Description
	<p><code><w:clrSchemeMapping ... w:accent2="accent2"/></code></p> <p>and the Theme part contained the following XML markup:</p> <pre><a:accent2> <a:srgbClr val="4F81BD"/> </a:accent2></pre> <p>the resulting border color would be 95B3D7 (the result of a 60% tint applied to the original theme color; see the calculations in themeTint below for details). <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_ThemeColor simple type (§17.18.97).</p>
<p>themeShade (Border Theme Color Shade)</p>	<p>Specifies the shade value applied to the supplied theme color (if any) for this border instance. If the themeColor attribute is not present, then this attribute shall not be used.</p> <p>If the themeShade is supplied, then it is applied to the RGB value of the theme color (from the theme part) to determine the final color applied to this border.</p> <p>The themeShade value is stored as a hex encoding of the shade value (from 0–255) applied to the current border.</p> <p>[<i>Example:</i> Consider a shade of 40% applied to a border in a document. This shade is calculated as follows:</p> $ \begin{aligned} S_{xml} &= 0.4 * 255 \\ &= 102 \\ &= 66(hex) \end{aligned} $ <p>The resulting themeShade value in the file format would be 66. <i>end example</i>]</p> <p>Given an RGB color defined as three hex values in RRGGBB format, the shade is applied as follows:</p> <ul style="list-style-type: none"> • Convert the color to the HSL color format (values from 0 to 1) • Modify the luminance factor as follows: $L' = L * \text{Shade}_{\text{percentage}}$ <ul style="list-style-type: none"> • Convert the resultant HSL color to RGB <p>[<i>Example:</i> Consider a document with a background using the accent2 theme color, whose RGB value (in RRGGBB hex format) is C0504D.</p> <p>The equivalent HSL color value would be $\left(\frac{1}{360}, 0.48, 0.53\right)$.</p>

Attributes	Description
	<p>Applying the shade formula with a shade percentage of 75% to the luminance, we get:</p> $L' = 0.53 * 0.75$ $= 0.39698$ <p>Taking the resulting HSL color value of $\left(\frac{1}{360}, 0.48, 0.39698\right)$ and converting back to RGB, we get 943634.</p> <p>This transformed value can be seen in the resulting background's color attribute:</p> <pre><w:top w:val="single" w:sz="4" w:space="24" w:color="943634" w:themeColor="accent2" w:themeShade="BF"/></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_UcharHexNumber simple type (§17.18.98).</p>
themeTint (Border Theme Color Tint)	<p>Specifies the tint value applied to the supplied theme color (if any) for this border instance. If the themeColor attribute is not present, then this attribute shall not be used.</p> <p>If the themeTint is supplied, then it is applied to the RGB value of the theme color (from the theme part) to determine the final color applied to this border.</p> <p>The themeTint value is stored as a hex encoding of the tint value (from 0–255) applied to the current border.</p> <p>[<i>Example:</i> Consider a tint of 60% applied to a border in a document. This tint is calculated as follows:</p> $T_{xml} = 0.6 * 255$ $= 153$ $= 99(hex)$ <p>The resulting themeTint value in the file format would be 99. <i>end example]</i></p> <p>Given an RGB color defined as three hex values in RRGGBB format, the shade is applied as follows:</p> <ul style="list-style-type: none"> • Convert the color to the HSL color format (values from 0 to 1) • Modify the luminance factor as follows: $L' = L * Tint_{pct} + (1 - Tint_{pct})$ <ul style="list-style-type: none"> • Convert the resultant HSL color to RGB

Attributes	Description
	<p>[<i>Example</i>: Consider a document with a background using the accent2 theme color, whose RGB value (in RRGGBB hex format) is 4F81BD.</p> <p>The equivalent HSL color value would be $\left(\frac{213}{360}, 0.45, 0.53\right)$.</p> <p>Applying the tint formula with a tint percentage of 60% to the luminance, we get:</p> $L' = 0.53 * 0.6 + (1 - .6) = 0.71$ <p>Taking the resulting HSL color value of $\left(\frac{213}{360}, 0.45, 0.71\right)$ and converting back to RGB, we get 95B3D7.</p> <p>This transformed value can be seen in the resulting background's color attribute:</p> <pre><w:top w:val="single" w:sz="4" w:space="24" w:color="95B3D7" w:themeColor="accent2" w:themeTint="99"/></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_UcharHexNumber simple type (§17.18.98).</p>
val (Border Style)	<p>Specifies the style of border used on this object.</p> <p>This border can either be an art border (a repeated image along the borders - shall only be used for page borders) or a line border (a line format repeated along the borders) - see the simple type definition for a description of each border style.</p> <p>[<i>Example</i>: Consider a left border resulting in the following WordprocessingML:</p> <pre><w:left w:val="single" .../></pre> <p>This border's val is single, indicating that the border style is a single line. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Border simple type (§17.18.2).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_BottomPageBorder](#)) is located in §A.1. *end note*]

17.6.3 col (Single Column Definition)

This element specifies the properties for a single column of text within this section.

[*Example*: Consider a single column with a width of two inches, which also has a one-inch space after the column, resulting in the following WordprocessingML:

```
<w:cols ... >
  <w:col w:w="2880" w:space="1440"/>
  ...
</w:cols>
```

The resulting column specifies its width of 2,880 twentieths of a point and space following of 1,440 twentieths of a point. *end example*]

The contents of the col element are only used to calculate the number and size of columns if the fixedWidth attribute is set to false or omitted.

Attributes	Description
space (Space Before Following Column)	<p>Specifies the spacing (in twentieths of a point) between the current column and the next column.</p> <p>[<i>Example</i>: Consider a text column that is to have a one-inch space after it. This text column spacing would therefore be $1 \times 72 = 144$ points wide, which translates to 1,440 twentieths of a point. The resulting WordprocessingML specifies that spacing width in twentieths of a point:</p> <pre><w:col ... w:space="1440"/></pre> <p><i>end example</i>]</p> <p>For the last text column in the section, no spacing is allowed after the column, and, if present, any space value is ignored.</p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>
w (Column Width)	<p>Specifies the width (in twentieths of a point) of this text column.</p> <p>[<i>Example</i>: Consider a text column, which is to be two inches wide. This text column would therefore be $2 \times 72 = 144$ points wide, which translates to 2,880 twentieths of a point. The resulting WordprocessingML specifies that column width in twentieths of a point:</p> <pre><w:col ... w:w="2880"/></pre> <p><i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).

[Note: The W3C XML Schema definition of this element’s content model ([CT_Column](#)) is located in §A.1. *end note*]

17.6.4 cols (Column Definitions)

This element specifies the set of columns defined for this section in the document.

[Example: Consider a document in which a section defines two columns of 4.16" and 1.83", respectively, resulting in the following WordprocessingML:

```
<w:cols w:equalWidth="0">
  <w:col w:w="2640" w:space="720"/>
  <w:col w:w="6000"/>
</w:cols>
```

The cols element defines the set of columns defined for this section, which because equalWidth is 0, are defined by the number of col elements contained in the column definition. In this case, the first column is 2,640 twentieths of a point wide (as 2640/1440ths of an inch equals 1.83 inches) with one-half of an inch space after, and the second column is 6,000 twentieths of a point wide (4.16 inches). *end example*]

Based on the presence of the equalWidth attribute, a consumer shall render the columns using:

- If equalWidth is true, then the columns are defined using the data stored as attributes of the cols element (defined below).
- If equalWidth is false, then the columns are defined using the presence and data on each child col element (§17.6.3).

Attributes	Description
equalWidth (Equal Column Widths)	<p>Specifies whether all text columns in the current section are of equal width.</p> <p>If this attribute is present and its value is set to true or 1, then all columns for this text section are of an equal width and are calculated as follows:</p> <ul style="list-style-type: none">• Take width of page (from margin to margin)• Divide by number of columns specified in num attribute• For each column, leave space after as defined in the space attribute• Remaining width of each column is the text column width. <p>If this attribute is present and its value is set to false or 0, then all columns for this text section are of different widths and are defined by each col element as follows:</p> <ul style="list-style-type: none">• Each col element defines a single column• Each w attribute defines the text column width

Attributes	Description
	<ul style="list-style-type: none"> Each space attribute defines the space after the text column <p>[Example: Consider a section with column information defined as follows:</p> <pre><w:cols w:num="3" w:space="1440" w:equalWidth="1"> <w:col w:w="2880" w:space="2880" /> <w:col w:w="2880" w:space="1440" /> <w:col w:w="2880" /> </w:cols></pre> <p>This set of columns has a equalWidth value set to 1, therefore the col elements are ignored, and there are three equally sized columns (num value of 3), each with one inch (space value of 1440 twentieths of a point) of space after. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
num (Number of Equal Width Columns)	<p>Specifies the number of text columns in the current section.</p> <p>If all columns are not of equal width (the equalWidth attribute is not set), then this element is ignored, and the number of columns is defined by the number of col elements defined under the cols element.</p> <p>[Example: Consider a section with column information defined as follows:</p> <pre><w:cols w:num="3" w:space="1440" w:equalWidth="1"> ... </w:cols></pre> <p>This set of columns has a equalWidth value set to 1, therefore there are three equally sized columns, as the num attribute has a value of 3. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
sep (Draw Line Between Columns)	<p>Specifies if a vertical line is drawn between each of the text columns in this section.</p> <p>If set to true or 1, then a vertical line shall be drawn in the center of the spacing between each column in this section.</p> <p>[Example: Consider a section with column information defined as follows:</p> <pre><w:cols w:sep="1"> ... </w:cols></pre> <p>This set of columns has a sep value set to 1, therefore there must be a vertical line</p>

Attributes	Description
	<p>separating each column in this section. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
<p>space (Spacing Between Equal Width Columns)</p>	<p>Specifies the spacing between text columns in the current section.</p> <p>If all columns are not of equal width (the equalWidth attribute is not set), then this element is ignored, and the spacing after columns is defined by the space attribute on each of the col elements defined under the cols element.</p> <p>[<i>Example</i>: Consider a section with column information defined as follows:</p> <pre data-bbox="451 653 966 785"><w:cols w:num="3" w:space="1440" w:equalWidth="1"> ... </w:cols></pre> <p>This set of columns has a equalWidth value set to 1, therefore there are three equally sized columns, each with one inch (space value of 1440 twentieths of a point) of space after. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_Columns](#)) is located in §A.1. *end note*]

17.6.5 docGrid (Document Grid)

This element specifies the settings for the document grid, which enables precise layout of full-width East Asian language characters within a document by specifying the desired number of characters per line and lines per page for all East Asian text content in this section.

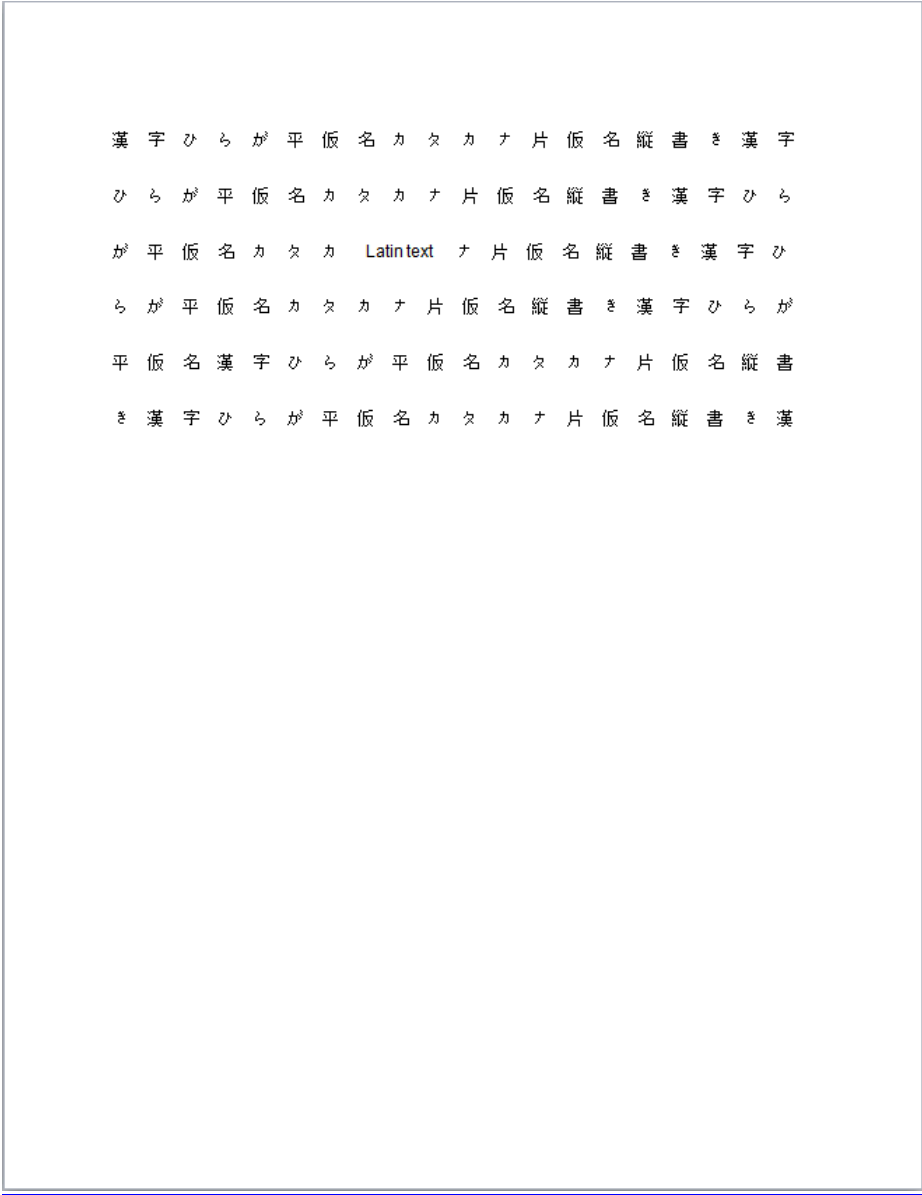
[*Example*: Consider a document with the document grid defined to allow 20 characters per line, and 20 lines per page by snapping characters to the grid (type attribute of snapToChars) as follows:

漢 字 ひ ら が 平 仮 名 カ タ カ ナ 片 仮 名 縦 書 き 漢 字
 ひ ら が 平 仮 名 カ タ カ ナ 片 仮 名 縦 書 き 漢 字 ひ ら
 が 平 仮 名 カ タ カ ナ 片 仮 名 縦 書 き 漢 字 ひ ら が 平
 仮 名 カ タ カ ナ 片 仮 名 縦 書 き 漢 字 ひ ら が 平 仮 名
 漢 字 ひ ら が 平 仮 名 カ タ カ ナ 片 仮 名 縦 書 き 漢 字
 ひ ら が 平 仮 名 カ タ カ ナ 片 仮 名 縦 書 き 漢 字 ひ ら
 が 平 仮 名 カ タ カ ナ 片 仮 名 縦 書 き 漢 字 ひ ら が 平
 仮 名 カ タ カ ナ 片 仮 名 縦 書 き 漢 字 ひ ら が 平 仮 名

As shown, this document allows for only 20 East Asian characters per line by adjusting the inter-character spacing to ensure that there are only 20 characters per line. *end example*]

If Latin text is interspersed on this line, then it is placed across the number of grid units needed to fit the content, but all other grid positions are unaffected.

[*Example*: Consider the example above with the addition of the text "Latin text" in English, as follows:



The Latin text spans two grid units, so it is placed in the center of those two units; no other grid positions are affected, so the text on the second line now spans two additional grid units. *end example*]

Attributes	Description
charSpace (Document Grid Character Pitch)	<p>Specifies the number of characters to be allowed on the document grid for each line in this section.</p> <p>This attribute's value shall be specified by multiplying the difference between the desired character pitch and the character pitch for that character in the font size of the Normal font by 4096. If this attribute is omitted, the default value is zero.</p> <p>This value shall then be used to add the character pitch for the specified point size to each character in the section [Note: This results in text in the Normal style having a</p>

Attributes	Description
	<p>specific number of characters per line. end note]</p> <p>[<i>Example:</i> Consider a section with a Normal font size of 11 points on which a 21 point pitch document grid has been defined.. The resulting WordprocessingML would be defined as follows:</p> <pre><w:docGrid w:charSpace="40960" .../></pre> <p>The charSpace attribute specifies a value of 40960, which means that the delta between the character pitch of each character in the grid and the Normal font is 10 points, resulting in a character pitch of 11+10 = 21 points for all characters in this section. <i>end example</i>]</p> <p>Individual runs of text can override the line pitch information specified for the document grid by specifying that the run text shall not snap to the document grid via the snapToGrid element (§17.3.2.34).</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
linePitch (Document Grid Line Pitch)	<p>Specifies the number of lines to be allowed on the document grid for the current page assuming all lines have equal line pitch applied to them. This line pitch shall not be added to any line which appears within a table cell unless the adjustLineHeightInTable element (§17.15.3.1) is present in the document's compatibility settings.</p> <p>This attribute is specified in twentieths of a point, and defines the pitch for each line of text on this page such that the desired number of single spaced lines of text fits on the current page.</p> <p>[<i>Example:</i> Consider a standard 8.5x11" page on which a 20 character wide, 20 line document grid has been defined. The resulting WordprocessingML would be defined as follows:</p> <pre><w:docGrid w:linePitch="684" .../></pre> <p>The linePitch attribute specifies that 34.2 points is to the amount of pitch allowed for each line on this page in order to maintain the specific document grid. <i>end example</i>]</p> <p>Individual paragraphs can override the line pitch information specified for the document grid by either:</p> <ul style="list-style-type: none"> • Specifying an exact line spacing value using the lineRule attribute of value exact on the spacing element (§17.3.1.33). • Specifying that the paragraph text shall not snap to the document grid via the snapToGrid element (§17.3.1.32). <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

Attributes	Description
type (Document Grid Type)	<p>Specifies the style of the current document grid, which defines the grid behavior.</p> <p>The grid can define a grid which snaps all East Asian characters to grid positions, but leaves Latin text with its default spacing; a grid which adds the specified character pitch to each character on each row; or a grid which affects only the line pitch for the current section.</p> <p>[Example: Consider the document discussed above with the document grid defined to allow 20 characters per line, and 20 lines per page by snapping characters to the grid as follows:</p> <div><p>漢 字 ひ ら が 平 仮 名 カ タ カ ナ 片 仮 名 縦 書 き 漢 字</p><p>ひ ら が 平 仮 名 カ タ カ ナ 片 仮 名 縦 書 き 漢 字 ひ ら</p><p>が 平 仮 名 カ タ カ ナ 片 仮 名 縦 書 き 漢 字 ひ ら が 平</p><p>仮 名 カ タ カ ナ 片 仮 名 縦 書 き 漢 字 ひ ら が 平 仮 名</p><p>漢 字 ひ ら が 平 仮 名 カ タ カ ナ 片 仮 名 縦 書 き 漢 字</p><p>ひ ら が 平 仮 名 カ タ カ ナ 片 仮 名 縦 書 き 漢 字 ひ ら</p><p>が 平 仮 名 カ タ カ ナ 片 仮 名 縦 書 き 漢 字 ひ ら が 平</p><p>仮 名 カ タ カ ナ 片 仮 名 縦 書 き 漢 字 ひ ら が 平 仮 名</p></div>

Attributes	Description
	<p>This document has a type attribute of <code>snapToChars</code>, which specifies that the grid must force East Asian characters to fit 20 to a line. <i>end example</i></p> <p>If this attribute is omitted, the value “default” shall be used.</p> <p>[<i>Note</i>: Disabling the document grid in this way rather than omitting the <code>docGrid</code> element allows for the preservation of document grid settings if and when the document grid is re-enabled. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_DocGrid</code> simple type (§17.18.14).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_DocGrid](#)) is located in §A.1. *end note*]

17.6.6 formProt (Only Allow Editing of Form Fields)

This element specifies that the contents of the current section shall be protected such that they cannot be edited by a user (if the consumer is displaying the document and allowing the user to make modification) except for the text contained in any form field or embedded control that is part of the current section.

[*Example*: Consider a section consisting of three paragraphs of text and a single text form field, located at the beginning of the second paragraph. If this section is protected in this manner, a user would only be permitted to edit the contents of the text form field, and all other contents would be locked to prevent user edits. *end example*]

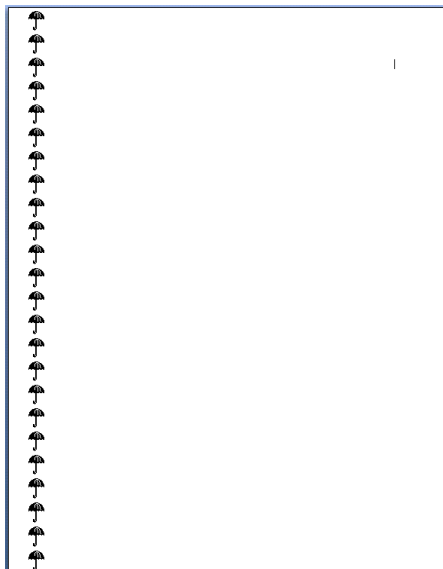
The enforcement of this property is determined by the `documentProtection` element (§17.15.1.29), as it is possible to specify protection without turning it on.

This element’s content model is defined by the common boolean property definition in §17.17.4.

17.6.7 left (Left Border)

This element specifies the presentation and display of the page border displayed at the left of each page in this section.

[*Example*: Consider a section in which all pages have a left border consisting of a repeated image of an umbrella, like this:



This border would result in the following WordprocessingML:

```
<w:sectPr>
...
<w:pgBorders>
  <w:left w:val="seattle" .../>
</w:pgBorders>
...
</w:sectPr>
```

Because the page only has a border at the left, only the left element is specified within the set of page borders. *end example]*

When a document has a left border that is relative to the page edges (using the `offsetFrom` attribute value of `page` on `pgBorders`), it shall span the left edge of the page at the location defined by its properties, stopping when:

- It intersects with the corresponding top or bottom page border (if one is specified).
- It reaches the edge of the page.

[*Example:* In the example above, no top or bottom border was specified in the WordprocessingML, so a consumer must draw the border from one edge of the page to the other. *end example]*

When a document has a left border that is relative to the text (using the `offsetFrom` attribute value of `text` on `pgBorders`), it shall span only the necessary width to satisfy the requirement of spanning the width of the text.

When a document has custom border art specified by the `id` attribute, it shall use the corresponding relationship part item as an image for the left border. If the corresponding relationship part item cannot be located, the consumer shall use the border specified by the value of the `val` attribute. If the corresponding value of the `val` attribute cannot be resolved, no left border is present when the page is displayed.

Attributes	Description
color (Border Color)	<p>Specifies the color for this border.</p> <p>This value can be defined as either:</p> <ul style="list-style-type: none"> • A color value using the RGB color model whose red, green, and blue values are written as numbers in the range 0 to 255, hex encoded, and concatenated. [Example: Full intensity red would be 255 red, 0 green, 0 blue, encoded to FF, 00, 00, and concatenated to FF0000. <i>end example</i>] . RGB colors are specified in the sRGB color space. • auto to allow a consumer to automatically determine the border color in order to make the document's text readable. [Example: A document with white text and a background color of auto might result in the use of a black background, in order to ensure legibility of the content. <i>end example</i>] <p>[Example: Consider a border color with value auto, as follows:</p> <pre><w:bottom ... w:color="auto"/></pre> <p>This color therefore can be automatically be modified by a consumer as appropriate, for example, in order to ensure that the border can be distinguished against the page's background color. <i>end example</i>]</p> <p>If the border style (the val attribute) specifies the use of an art border, this attribute is ignored. As well, if the border specifies the use of a theme color via the themeColor attribute, this value is superseded by the theme color value.</p> <p>The possible values for this attribute are defined by the ST_HexColor simple type (§17.18.38).</p>
frame (Create Frame Effect)	<p>Specifies whether the specified border should be modified to create a frame effect by reversing the border's appearance from the edge nearest the text to the edge furthest from the text.</p> <p>If this attribute is omitted, then the border is not given any frame effect.</p> <p>[Example: Consider a bottom border which must appear with a frame effect, which is specified in the following WordprocessingML:</p> <pre><w:bottom w:frame="true" ... /></pre> <p>This frame's val is true, indicating that the border frame effect must be applied. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
id (Custom Defined Border Relationship Reference)	<p>Specifies the relationship ID for the relationship which contains the custom border image for the parent element. This custom border image is contained in a separate part within the WordprocessingML package.</p>

Attributes	Description
<p>Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships</p>	<p>The relationship explicitly targeted by this attribute shall be of type http://purl.oclc.org/ooxml/officeDocument/relationships/image or the document shall be considered non-conformant.</p> <p>If this attribute is omitted, then no custom border shall be used.</p> <p>[<i>Example:</i> Consider the following WordprocessingML markup for a custom bottom border in a document:</p> <pre><w:bottom w:val="custom" r:id="rIdCustomBottomBorder" .../></pre> <p>The id attribute in the relationship reference namespace specifies that the relationship with relationship ID rIdCustomBottomBorder must contain the custom bottom border image for the document. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
<p>shadow (Border Shadow)</p>	<p>Specifies whether this border should be modified to create the appearance of a shadow.</p> <p>For the right and bottom borders, this is accomplished by duplicating the border below and right of the normal border location. For the right and top borders, this is accomplished by moving the order down and to the right of its original location.</p> <p>If this attribute is omitted, then the border is not given the shadow effect.</p> <p>[<i>Example:</i> Consider a top border which must appear with a shadow effect, resulting in the following WordprocessingML:</p> <pre><w:bottom w:shadow="true" ... /></pre> <p>This frame's val is true, indicating that the shadow effect must be applied to the border. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
<p>space (Border Spacing Measurement)</p>	<p>Specifies the spacing offset that shall be used to place this border on the parent object.</p> <p>When a document has a page border that is relative to the page edges (using a value of page in the offsetFrom attribute on pgBorders (§17.6.10)), it shall specify the distance between the edge of the page and the beginning of this border in points.</p> <p>When a document has a page border that is relative to the text extents (using a value of text in the offsetFrom attribute on pgBorders (§17.6.10)), or any other border type, it shall specify the distance between the edge of the object and the beginning of this border in points.</p>

Attributes	Description
	<p>[<i>Example:</i> Consider a document with a set of page borders all specified to appear 24 points from the edge of the page. The resulting WordprocessingML would be as follows:</p> <pre><w:pgBorders w:offsetFrom="page"> <w:bottom ... w:space="24" /> </w:pgBorders</pre> <p>The offsetFrom attribute specifies that the space value provides the offset of the page border from the page edge, and the value of the space attribute specifies that the page offset must be 24 points. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PointMeasure simple type (§17.18.68).</p>
sz (Border Width)	<p>Specifies the width of the current border.</p> <p>If the border style (val attribute) specifies a line border, the width of this border is specified in measurements of eighths of a point, with a minimum value of two (one-fourth of a point) and a maximum value of 96 (twelve points). Any values outside this range can be reassigned to a more appropriate value.</p> <p>If the border style (val attribute) specifies an art border, the width of this border is specified in measurements of points, with a minimum value of one and a maximum value of 31. Any values outside this range can be reassigned to a more appropriate value.</p> <p>[<i>Example:</i> Consider a document with a three point wide dashed line border on all sides, resulting in the following WordprocessingML markup:</p> <pre><w:top w:val="dashed" w:sz="24" .../> <w:left w:val="dashed" w:sz="24" .../> <w:bottom w:val="dashed" w:sz="24" .../> <w:right w:val="dashed" w:sz="24" .../></pre> <p>The border style is specified using the val attribute, and because that border style is a line border (dashed), the sz attribute specifies the size in eighths of a point (24 eighths of a point = 3 points). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_EighthPointMeasure simple type (§17.18.23).</p>
themeColor (Border Theme Color)	<p>Specifies the base theme color used to generate the border color. The border color is the RGB value associated with themeColor as further transformed by themeTint or themeShade (if one is present), else the background color is the RGB value associated with themeColor.</p> <p>The specified theme color is a reference to one of the predefined theme colors, located in the document's Theme part (§14.2.7 and §20.1.6.9), which allows color information to</p>

Attributes	Description
	<p>be set centrally in the document.</p> <p>To determine the color to display, the following actions are performed:</p> <ul style="list-style-type: none"> • Using the mapping specified in the ST_ThemeColor simple type (§17.18.97), the appropriate attribute on the clrSchemeMapping element (§17.15.1.20) is read. • Using that value and the mapping specified in the ST_ColorSchemeIndex simple type (§17.18.103), the appropriate element in the document's Theme part is read to get the base theme color. • The specified color is modified based on the presence of the themeTint or themeShade attribute. <p>[<i>Example:</i> Consider a set of borders configured to use the accent2 theme color, resulting in the following WordprocessingML markup:</p> <pre><w:top ... w:themeColor="accent2" w:themeTint="99" /> <w:bottom ... w:themeColor="accent2" w:themeTint="99" /> <w:left ... w:themeColor="accent2" w:themeTint="99" /> <w:right ... w:themeColor="accent2" w:themeTint="99" /></pre> <p>If the Settings part contained the following markup:</p> <pre><w:clrSchemeMapping ... w:accent2="accent2"/></pre> <p>and the Theme part contained the following XML markup:</p> <pre><a:accent2> <a:srgbClr val="4F81BD"/> </a:accent2></pre> <p>the resulting border color would be 95B3D7 (the result of a 60% tint applied to the original theme color; see the calculations in themeTint below for details). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ThemeColor simple type (§17.18.97).</p>
themeShade (Border Theme Color Shade)	<p>Specifies the shade value applied to the supplied theme color (if any) for this border instance. If the themeColor attribute is not present, then this attribute shall not be used.</p> <p>If the themeShade is supplied, then it is applied to the RGB value of the theme color (from the theme part) to determine the final color applied to this border.</p> <p>The themeShade value is stored as a hex encoding of the shade value (from 0–255) applied to the current border.</p> <p>[<i>Example:</i> Consider a shade of 40% applied to a border in a document. This shade is calculated as follows:</p>

Attributes	Description
	$S_{xml} = 0.4 * 255$ $= 102$ $= 66(hex)$ <p>The resulting themeShade value in the file format would be 66. <i>end example</i></p> <p>Given an RGB color defined as three hex values in RRGGBB format, the shade is applied as follows:</p> <ul style="list-style-type: none"> • Convert the color to the HSL color format (values from 0 to 1) • Modify the luminance factor as follows: $L' = L * \text{Shade}_{percentage}$ <ul style="list-style-type: none"> • Convert the resultant HSL color to RGB <p>[<i>Example:</i> Consider a document with a background using the accent2 theme color, whose RGB value (in RRGGBB hex format) is C0504D.</p> <p>The equivalent HSL color value would be $(\frac{1}{360}, 0.48, 0.53)$.</p> <p>Applying the shade formula with a shade percentage of 75% to the luminance, we get:</p> $L' = 0.53 * 0.75$ $= 0.39698$ <p>Taking the resulting HSL color value of $(\frac{1}{360}, 0.48, 0.39698)$ and converting back to RGB, we get 943634.</p> <p>This transformed value can be seen in the resulting background's color attribute:</p> <pre><w:top w:val="single" w:sz="4" w:space="24" w:color="943634" w:themeColor="accent2" w:themeShade="BF"/></pre> <p><i>end example</i></p> <p>The possible values for this attribute are defined by the ST_UcharHexNumber simple type (§17.18.98).</p>
themeTint (Border Theme Color Tint)	<p>Specifies the tint value applied to the supplied theme color (if any) for this border instance. If the themeColor attribute is not present, then this attribute shall not be used.</p> <p>If the themeTint is supplied, then it is applied to the RGB value of the theme color (from the theme part) to determine the final color applied to this border.</p> <p>The themeTint value is stored as a hex encoding of the tint value (from 0–255) applied to</p>

Attributes	Description
	<p>the current border.</p> <p>[<i>Example</i>: Consider a tint of 60% applied to a border in a document. This tint is calculated as follows:</p> $ \begin{aligned} T_{xml} &= 0.6 * 255 \\ &= 153 \\ &= 99(hex) \end{aligned} $ <p>The resulting themeTint value in the file format would be 99. <i>end example</i>]</p> <p>Given an RGB color defined as three hex values in RRGGBB format, the shade is applied as follows:</p> <ul style="list-style-type: none"> • Convert the color to the HSL color format (values from 0 to 1) • Modify the luminance factor as follows: $L' = L * Tint_{pct} + (1 - Tint_{pct})$ <ul style="list-style-type: none"> • Convert the resultant HSL color to RGB <p>[<i>Example</i>: Consider a document with a background using the accent2 theme color, whose RGB value (in RRGGBB hex format) is 4F81BD.</p> <p>The equivalent HSL color value would be $(\frac{213}{360}, 0.45, 0.53)$.</p> <p>Applying the tint formula with a tint percentage of 60% to the luminance, we get:</p> $ \begin{aligned} L' &= 0.53 * 0.6 + (1 - .6) \\ &= 0.71 \end{aligned} $ <p>Taking the resulting HSL color value of $(\frac{213}{360}, 0.45, 0.71)$ and converting back to RGB, we get 95B3D7.</p> <p>This transformed value can be seen in the resulting background's color attribute:</p> <pre> <w:top w:val="single" w:sz="4" w:space="24" w:color="95B3D7" w:themeColor="accent2" w:themeTint="99"/> </pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_UcharHexNumber simple type (§17.18.98).</p>
val (Border Style)	Specifies the style of border used on this object.

Attributes	Description
	<p>This border can either be an art border (a repeated image along the borders - shall only be used for page borders) or a line border (a line format repeated along the borders) - see the simple type definition for a description of each border style.</p> <p>[<i>Example:</i> Consider a left border resulting in the following WordprocessingML:</p> <pre data-bbox="451 464 870 495"><w:left w:val="single" .../></pre> <p>This border's val is single, indicating that the border style is a single line. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Border simple type (§17.18.2).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_PageBorder](#)) is located in §A.1. *end note*]

17.6.8 InNumType (Line Numbering Settings)

This element specifies the settings for line numbering to be displayed before each column of text in this section in the document.

[*Example:* Consider the line numbering used on each page of this document, which specifies: line numbering for each line, restarting at one at the top of each new page. This line-numbering scheme would be defined using the following WordprocessingML:

```
<w:sectPr>
...
  <w:lnNumType w:countBy="1" />
</w:sectPr>
```

This content specifies that line numbers shall be included on each line, restart on each page (the default), be placed automatically based on the text (the default), and shall restart at one (the default). *end example*]

Attributes	Description
countBy (Line Number Increments to Display)	<p>Specifies the line number increments to be displayed in the current document.</p> <p>Although each line has an associated line number, only lines which are an even multiple of this value shall be displayed.</p> <p>[<i>Example:</i> Consider a document in which only every fifth line must have a line number. The resulting WordprocessingML for this setting would be:</p> <pre data-bbox="451 1801 935 1833"><w:lnNumType ... w:countBy="5"/></pre>

Attributes	Description
	<p>This setting ensures that only lines whose number is a multiple of (e.g. 5, 10, and 15) has a line number displayed. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
distance (Distance Between Text and Line Numbering)	<p>Specifies the distance between the text margin and the edge of any line numbers appearing in that section.</p> <p>[<i>Example</i>: Consider a document in which the line numbering must appear one-half inch from the text margin. The WordprocessingML for this setting is:</p> <pre data-bbox="456 653 984 684"><w:lnNumType ... w:distance="720"/></pre> <p>The distance attribute specifies that there must be a 720 twip spacing between the text margin and the <i>line numbering</i>. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>
restart (Line Numbering Restart Setting)	<p>Specifies when the line numbering in this section shall be reset to the line number specified by the start attribute's value.</p> <p>The line numbering increments for each line (even if it is not displayed) until it reaches the restart point specified by this element.</p> <p>[<i>Example</i>: Consider the line numbering used on each page of this document, which specifies that line numbering must restart at the top of each new page. This line numbering setting would be defined using the following WordprocessingML:</p> <pre data-bbox="456 1272 1078 1402"><w:sectPr> ... <w:lnNumType w:restart="newPage" ... /> </w:sectPr></pre> <p>The value of newPage specifies that the line numbers must restart at the top of each page to the value specified by the start attribute. In this case, newPage is the default, so this value could have been omitted entirely. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_LineNumberRestart simple type (§17.18.47).</p>
start (Line Numbering Starting Value)	<p>Specifies the starting value used for the first line whenever the line numbering is restarted by use of the restart attribute.</p> <p>[<i>Example</i>: Consider a document in which line numbering must appear on every fifth line, but the first line must be treated as line number . This setting would require the following WordprocessingML syntax:</p>

Attributes	Description
	<p><code><w:lnNumType w:start="3" w:countBy="5"/></code></p> <p>The start attribute specifies that line numbers must be counted starting from the number 3. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_LineNumber](#)) is located in §A.1. *end note*]

17.6.9 paperSrc (Paper Source Information)

This element specifies printer-specific settings for the printer tray(s) that shall be used to print different pages in this section in the document.

[Example: Consider a section which must use the best possible tray when printing all pages in this section. This information is specified using the following WordprocessingML:

```
<w:paperSrc w:first="1" w:other="1" />
```

The attributes on the paperSrc element specify the printer codes for the trays to be used when printing this section. *end example*]

Attributes	Description
first (First Page Printer Tray Code)	<p>Specifies a printer-specific code that uniquely identifies a specific printer tray to be used to print the first page of this section in the document.</p> <p>A first value of 1 (the default) is specifically used to indicate that the printer shall automatically select the appropriate printer tray based on the printed page size.</p> <p>[Example: Consider a section which must use the best possible tray when printing the first page in this section. This information is specified using the following WordprocessingML:</p> <pre><w:paperSrc w:first="1" w:other="1" /></pre> <p>The first attribute on the paperSrc element specifies that the printer must automatically select the appropriate printer tray based on the printed page size when printing the first page in this section. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

Attributes	Description
other (Non-First Page Printer Tray Code)	<p>Specifies a printer-specific code that uniquely identifies a specific printer tray to be used to print the each subsequent (non-first) page of this section in the document.</p> <p>An value of 1 (the default) is specifically used to indicate that the printer shall automatically select the appropriate printer tray based on the printed page size.</p> <p>[<i>Example</i>: Consider a section which must use the best possible tray when printing the all pages in this section. This information is specified using the following WordprocessingML:</p> <pre data-bbox="456 569 1062 600"><w:paperSrc w:first="1" w:other="1" /></pre> <p>The other attribute on the paperSrc element specifies that the printer must automatically select the appropriate printer tray based on the printed page size when printing all pages after the first in this section. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_PaperSource](#)) is located in §A.1. *end note*]

17.6.10 pgBorders (Page Borders)

This element specifies the page borders for each page in this section. Each child element of the pgBorders element specifies a specific of border (left, right, bottom, or top).

[*Example*: Consider a page that specifies a dashed line border around each of the four sides of the page, as follows:



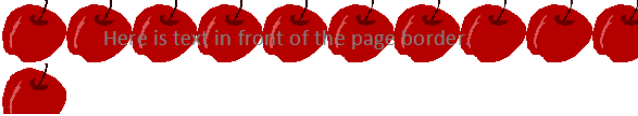
This page border setting would be specified using the following WordprocessingML:

```
<w:pgBorders w:offsetFrom="page">
  <w:top w:val="dashed" w:sz="4" w:space="24" w:color="auto" />
  <w:left w:val="dashed" w:sz="4" w:space="24" w:color="auto" />
  <w:bottom w:val="dashed" w:sz="4" w:space="24" w:color="auto" />
  <w:right w:val="dashed" w:sz="4" w:space="24" w:color="auto" />
</w:pgBorders>
```

The four page borders are each uniquely defined by the top, left, bottom, and right elements, respectively. Global settings that define the placement of all page borders are stored on the pgBorders element directly. *end example*]

Attributes	Description
display (Pages to Display Page Borders)	<p>Specifies the pages in this section on which the page border shall be printed.</p> <p>If this attribute is omitted, then the page borders shall be displayed on all pages in this section (equivalent to a value of allPages).</p> <p>[<i>Example</i>: Consider a section in a document for which the page border must only be printed on the first page. This setting is specified using the following WordprocessingML:</p> <pre><w:pgBorders w:display="firstPage"> ... </w:pgBorders></pre> <p>The display attribute specifies that only the first page must display the page border defined for this section. <i>end example</i>]</p>

Attributes	Description
	<p>The possible values for this attribute are defined by the ST_PageBorderDisplay simple type (§17.18.62).</p>
offsetFrom (Page Border Positioning)	<p>Specifies how the relative positioning of the page borders shall be calculated.</p> <p>If the value of this attribute is <code>page</code>, then the space attribute on each page border shall be interpreted as the distance from the edge of the page that shall be left before the page border.</p> <p>If the value of this attribute is <code>text</code>, then the space attribute on each page border shall be interpreted as the distance from the text margins that shall be left before the page border.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pgBorders w:offsetFrom="page"> <w:top w:val="dashed" w:space="24" /> <w:left w:val="dashed" w:space="24" /> <w:bottom w:val="dashed" w:space="24"/> <w:right w:val="dashed" w:space="24"/> </w:pgBorders></pre> <p>This fragment specifies that the page borders must be indented 24 points from the page extents.</p> <p>This is distinct from the following fragment with identical space attribute values:</p> <pre><w:pgBorders w:offsetFrom="text"> <w:top w:val="dashed" w:space="24" /> <w:left w:val="dashed" w:space="24" /> <w:bottom w:val="dashed" w:space="24"/> <w:right w:val="dashed" w:space="24"/> </w:pgBorders></pre> <p>In this case, the page borders is offset by 24 points, but in this case, that offset is calculated relative to the text margins. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PageBorderOffset simple type (§17.18.63).</p>
zOrder (Z-Ordering of Page Border)	<p>Specifies whether the page border is positioned above or below intersecting texts and objects in this document.</p> <p>[<i>Example:</i> Consider a document in which the page border must be displayed below any intersecting text as follows:</p>

Attributes	Description
	 <p>This setting is specified by setting the zOrder attribute to back, which specifies that the page border must be display behind all intersecting text and objects. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_PageBorderZOrder simple type (§17.18.64).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_PageBorders](#)) is located in §A.1. *end note*]

17.6.11 pgMar (Page Margins)

This element specifies the page margins for all pages in this section.

[Example: Consider a page with a one-inch margin on all sides. Specifying these margins requires the following WordprocessingML:

```
<w:sectPr>
  <w:pgMar w:header="720" w:bottom="1440" w:top="1440" w:right="1440"
w:left="1440" w:footer="720" w:gutter="0" _/>
  ...
</w:sectPr>
```

This section specifies page margins of 1,440 twentieths of a point (one inch) on all sides. *end example*

[Note: With reference to Fig. 48 of *Requirements for Japanese Text Layout*, typical positions (a), (b), (c), (d), and (f), but not (e), of running heads and page numbers for vertically set books with double running heads, and typical positions (a), (b), (c), and (d) of running heads and page numbers for horizontally set books with double running heads, can be represented using WordprocessingML. *end note*]

Attributes	Description
bottom (Page Bottom Spacing)	<p>Specifies the distance (in twentieths of a point) between the bottom of the text margins for the main document and the bottom of the page for all pages in this section.</p> <p>If the value of bottom is non-negative, then the text is placed at the greater of:</p> <ul style="list-style-type: none"> • The value of bottom • The extent of the footer text <p>[Example: Consider a document where the footer must start one inch of the bottom of</p>

Attributes	Description
	<p>the page extent, but the contents of the main document story specify that they must start one-half of an inch from the page extents. To specify these boundaries, the following page margins can be specified in the WordprocessingML:</p> <pre><w:pgMar ... w:bottom="720" w:footer="1440"/></pre> <p>This fragment specifies that the footer must start 1440 twentieths of a point from the bottom of the page, but the main document story must start 720 twentieths of a point from the bottom of the page. Since the footer extent is guaranteed to be greater in this case, the bottom text extent ends at the top of the footer region. <i>end example</i></p> <p>A negative value indicates that the contents of the main document shall be measured from the bottom of the page extent regardless of the footer for that document, and therefore shall overlap the footer text.</p> <p>[<i>Example:</i> Consider a document where the footer must start one inch from the bottom of the page extent, but the contents of the main document story must start one-half of an inch from the page extents. To specify these boundaries, the following page margins can be specified in the WordprocessingML:</p> <pre><w:pgMar ... w:bottom="-720" w:footer="1440"/></pre> <p>This fragment specifies that the footer must start 1440 twentieths of a point from the bottom of the page, and the main document story must start 720 twentieths of a point from the bottom of the page. Since the value of bottom is negative in this case, the bottom text extent starts one-half of an inch from the bottom of the page and overlaps any footer text. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_SignedTwipsMeasure simple type (§17.18.81).</p>
footer (Spacing to Bottom of Footer)	<p>Specifies the distance (in twentieths of a point) from the bottom edge of the page to the bottom edge of the footer.</p> <p>[<i>Example:</i> Consider a document where the footer must start one inch above the bottom of the page extent.</p> <p>To specify this boundary, the following page margins must be specified in the WordprocessingML:</p> <pre><w:pgMar ... w:footer="1440"/></pre> <p>This fragment specifies that the footer must start 1440 twentieths of a point from the bottom of the page. <i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).
gutter (Page Gutter Spacing)	<p>Specifies the page gutter for each page in the current section.</p> <p>The <i>page gutter</i> defines the amount of extra space added to the specified margin, above any existing margin values. [Note: This setting is typically used when a document is being created for binding, in order to ensure that the resulting margins are present after the binding gutter is consumed by the printed matter binding. <i>end note</i>]</p> <p>[Example: Consider a document where the margin must start one inch of the left edge of the page extent after one-half of an inch is hidden by the page binding.</p> <p>To specify this condition, a user could simply use a left margin of 1.5 inches, which would be lost if the margins are later changed, or could specify a one-half inch gutters follows in the WordprocessingML:</p> <pre><w:pgMar ... w:gutter="720"/></pre> <p>This fragment specifies that the gutter must span 720 twentieths of a point, after which any margin value must be added. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>
header (Spacing to Top of Header)	<p>Specifies the distance (in twentieths of a point) from the top edge of the page to the top edge of the header.</p> <p>[Example: Consider a document where the header must start two inches below the top of the page extent. To specify this boundary, the following page margins must specified in the WordprocessingML:</p> <pre><w:pgMar ... w:header="2880"/></pre> <p>This fragment specifies that the header must start 2880 twentieths of a point from the top of the page. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>
left (Left Margin Spacing)	<p>Specifies the distance (in twentieths of a point) between the left edge of the page and the left edge of the text extents for this document.</p> <p>[Example: Consider a document where the left text extent must start two inches inside the page extent. To specify this boundary, the following page margins must specified in the WordprocessingML:</p> <pre><w:pgMar ... w:left="2880"/></pre>

Attributes	Description
	<p>This fragment specifies that the left margin must span 2880 twentieths of a point from the left edge of the page. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>
right (Right Margin Spacing)	<p>Specifies the distance (in twentieths of a point) between the right edge of the page and the right edge of the text extents for this document.</p> <p>[<i>Example:</i> Consider a document where the right text extent must start one inch inside the page.</p> <p>To specify this boundary, the following page margins must specified in the WordprocessingML:</p> <pre data-bbox="456 793 886 825"><w:pgMar ... w:right="1440"/></pre> <p>This fragment specifies that the right margin must span 1440 twentieths of a point from the right edge of the page. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>
top (Top Margin Spacing)	<p>Specifies the distance (in twentieths of a point) between the top of the text margins for the main document and the top of the page for all pages in this section.</p> <p>If the value of top is non-negative, then the text is placed at the greater of:</p> <ul data-bbox="464 1199 862 1266" style="list-style-type: none"> • The value of top • The extent of the header text <p>[<i>Example:</i> Consider a document where the header must start one inch from the top of the page extent, but the contents of the main document story specify that they must start one-half of an inch from the page extents. To specify these boundaries, the following page margins can be specified in the WordprocessingML:</p> <pre data-bbox="456 1486 1094 1518"><w:pgMar ... w:top="720" w:header="1440"/></pre> <p>This fragment specifies that the header must start 1440 twentieths of a point from the top of the page, but the main document story must start 720 twentieths of a point from the top of the page. Since the header extent is guaranteed to be greater in this case, the main text extent ends at the bottom of the header region. <i>end example</i></p> <p>A negative value indicates that the contents of the main document shall be measured from the top of the page extent regardless of the header for that document, and therefore shall overlap the header text.</p>

Attributes	Description
	<p>[<i>Example</i>: Consider a document where the header must start one inch from the top of the page extent, but the contents of the main document story must start one-half of an inch from the page extents. To specify these boundaries, the following page margins can be specified in the WordprocessingML:</p> <pre><w:pgMar ... w:top="-720" w:header="1440"/></pre> <p>This fragment specifies that the header must start 1440 twentieths of a point from the top of the page, and the main document story must start 720 twentieths of a point from the top of the page. Since the value of top is negative in this case, the top text extent starts one-half of an inch from the top of the page and overlaps any header text. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_SignedTwipsMeasure simple type (§17.18.81).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_PageMar](#)) is located in §A.1. *end note*]

17.6.12 pgNumType (Page Numbering Settings)

This element specifies the page numbering settings for all page numbers that appear in the contents of the current section.

[*Example*: Consider a section in which the page numbers must start at page 25. The following WordprocessingML syntax specifies that requirement:

```
<w:sectPr>
...
<w:pgNumType w:start="25"/>
</w:sectPr>
```

The pgNumType element specifies that numbering on this section must start from page number 25. *end example*]

Attributes	Description
chapSep (Chapter Separator Character)	<p>Specifies the separator character that shall appear between the chapter and page number, if a chapter style has been set for page numbers in this section.</p> <p>If the chapStyle attribute is not present, or its specified heading level does not have an associated numbering format, then this value is ignored, since no chapter number is output by the field.</p> <p>[<i>Example</i>: Consider a section in a document in which the chapter must be separated from</p>

Attributes	Description
	<p>the page number using a colon character. This constraint would be specified using the following WordprocessingML:</p> <pre data-bbox="456 352 1240 386"><w:pgNumType w:chapSep="colon" w:chapStyle="1" /></pre> <p>The chapSep attribute declares that the chapter and page number must be separated by a colon (e.g. 1:1 for chapter one, page one). <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_ChapterSep simple type (§17.18.6).</p>
chapStyle (Chapter Heading Style)	<p>Specifies the one-based index of the heading style applied to chapter titles in the document which shall be used as chapter headings in all page numbers for this section, by locating the nearest heading of that style and extracting the numbering information.</p> <p>If the specified heading style does not exist in the current section, or does not have a numbering format, then any previous level heading format shall be used as needed as the specified chapter number. If no heading has numbering information and/or is used in the section, then the chapter and chapter separator shall be omitted from the page numbering data.</p> <p><i>[Example: Consider a page number in a section with page numbering properties that specify a chapStyle of 1 (Heading 1 style) and a chapSep of dash.</i></p> <p>This means that for each page number in this section, the numbering value of the nearest Heading 1 style is used for the chapter value, and is followed by a dash, then the page number in that section. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
fmt (Page Number Format)	<p>Specifies the number format that shall be used for all page numbering in this section.</p> <p><i>[Example: A fmt value of lowerLetter indicates that a consumer must use lowercase letters for each page in this section: a,b,c,... end example]</i></p> <p>The possible values for this attribute are defined by the ST_NumberFormat simple type (§17.18.59).</p>
start (Starting Page Number)	<p>Specifies the page number that appears on the first page of the section.</p> <p>If this value is omitted, numbering continues from the highest page number in the previous section.</p> <p><i>[Example: Consider the following WordprocessingML:</i></p> <pre data-bbox="456 1814 1000 1848"><w:pgNumType w:fmt="lowerLetter"/></pre>

Attributes	Description
	<p>Because the start value is omitted, the page numbers in this section begin at the value of the highest page in the previous section.</p> <p>This means that if the previous section ended in page 7, this section would start with page 8. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_PageNumber](#)) is located in §A.1. *end note*]

17.6.13 pgSz (Page Size)

This element specifies the properties (size and orientation) for all pages in the current section.

[*Example:* Consider a section that must be printed on A4 paper. The WordprocessingML for this paper size is as follows:

```
<w:pgSz w:w="11907" w:h="16839" />
```

This output states that all pages in this section must be 11907 twentieths of a point wide (11907 twentieths of a point = 8.269") and 16839 twentieths of a point high (16839 twentieths of a point = 11.694"). *end example*]

Attributes	Description
code (Printer Paper Code)	<p>Specifies an optional value which can be used to store an identifier for the current paper size.</p> <p>This code is stored solely to show a description for the current paper size. This setting should not be used to determine the target paper size (i.e. if the w and h attributes are omitted, this setting has no meaning).</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pgSz w:w="12240" w:h="15840" w:code="240" /></pre> <p>The code attribute specifies a value of 240, which is, since the w and h attributes specify a page size of 8.5 inches by 11 inches, can be used to determine the appropriate user label for this paper size – for example, “Letter” or “8.5 by 11”. The attribute code specifies that the producing application’s unique identifier value for this paper size was 240.</p> <p>This value does not itself determine the paper size, regardless of the presence of the w and h attributes. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type</p>

Attributes	Description
h (Page Height)	<p>(§17.18.10).</p> <p>Specifies the height (in twentieths of a point) for all pages in the current section.</p> <p>[<i>Example:</i> Consider the following WordprocessingML:</p> <pre><w:pgSz w:w="15840" w:h="12240" /></pre> <p>All pages in this section are displayed on a page that is 12240 twentieths of a point (8.5") tall. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>
orient (Page Orientation)	<p>Specifies the orientation of all pages in this section.</p> <p>This information is used to determine the actual paper size to use on the printer.</p> <p>[<i>Example:</i> Pages 11" wide by 8.5" long in landscape mode use 8.5"x11" paper, because the width and height are reversed for pages in this landscape section with respect to the printed page. <i>end example</i>]</p> <p>This implies that the actual paper size width and height are reversed for pages in this section. If this attribute is omitted, then portrait shall be implied.</p> <p>[<i>Example:</i> Consider the following WordprocessingML:</p> <pre><w:pgSz w:w="15840" w:h="12240" w:orient="landscape" /></pre> <p>Although the page width is 11", and page height is 8.5", according to the w and h attributes, because the orient attribute is set to landscape, pages in this section are printed on 8.5x11" paper in landscape mode. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PageOrientation simple type (§17.18.65).</p>
w (Page Width)	<p>This attribute indicates the width (in twentieths of a point) for all pages in the current section.</p> <p>[<i>Example:</i> Consider the following WordprocessingML:</p> <pre><w:pgSz w:w="15840" w:h="12240" /></pre> <p>All pages in this section are displayed on a page that is 15840 twentieths of a point (11") wide. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_PageSz](#)) is located in §A.1. *end note*]

17.6.14 printerSettings (Reference to Printer Settings Data)

This element specifies an explicit relationship to a Printer Settings part containing information about the printer settings used for this section.

If this element is omitted, than no additional settings are associated with this section.

[Example: Consider a producer which needed to store additional printer settings for each section. A document from such a producer would have the following section properties:

```
<w:sectPr>
...
  <w:printerSettings r:id="rId10" />
</w:sectPr>
```

The resulting Main Document part would a relationship to the appropriate Printer Settings part with a relationship ID of rId10. *end example*]

Attributes	Description
<p>id (Relationship to Part)</p> <p>Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships</p>	<p>Specifies the relationship ID to a specified part.</p> <p>The specified relationship shall match the relationship type required by the parent element:</p> <ul style="list-style-type: none"> • http://purl.oclc.org/ooxml/officeDocument/relationships/customXml for the contentPart element • http://purl.oclc.org/ooxml/officeDocument/relationships/footer for the footerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/header for the headerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/font for the embedBold, embedBoldItalic, embedItalic, or embedRegular elements • http://purl.oclc.org/ooxml/officeDocument/relationships/printerSettings for the printerSettings element • http://purl.oclc.org/ooxml/officeDocument/relationships/hyperlink for the longDesc or hyperlink element <p>[Example: Consider an XML element which has the following id attribute:</p> <pre><... r:id="rId10" /></pre> <p>The markup specifies the associated relationship part with relationship ID rId1 contains the corresponding relationship information for the parent XML element. <i>end example</i>]</p>

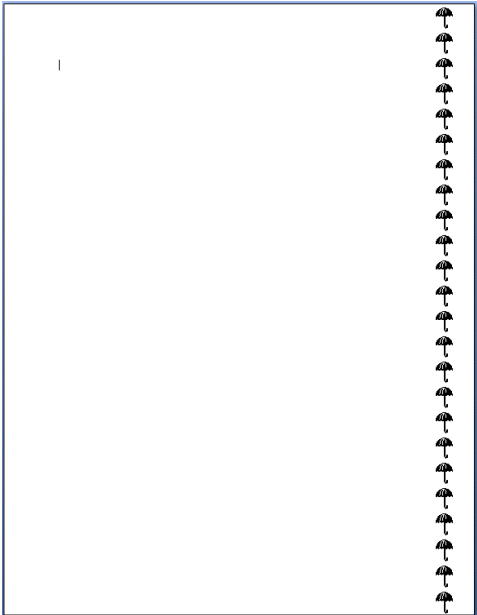
Attributes	Description
	The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

[Note: The W3C XML Schema definition of this element’s content model ([CT_Rel](#)) is located in §A.1. *end note*]

17.6.15 right (Right Border)

This element specifies the presentation and display of the page border displayed at the right of each page in this section.

[Example: Consider a section in which all pages must have a right border consisting of a repeated image of an umbrella, like this:



This border would result in the following WordprocessingML:

```
<w:sectPr>
...
<w:pgBorders>
  <w:right w:val="seattle" .../>
</w:pgBorders>
...
</w:sectPr>
```

Because the page has a border at the right only, only the right element is specified within the set of page borders. *end example*]

When a document has a right border that is relative to the page edges (using the `offsetFrom` attribute value of `pgBorders`), it shall span the right edge of the page at the location defined by its properties, stopping when:

- It intersects with the corresponding top or bottom page border (if one is specified)
- It reaches the edge of the page.

[*Example:* In the example above, no top or bottom border was specified in the WordprocessingML, so a consumer must draw the border from one edge of the page to the other. *end example*]

When a document has a right border that is relative to the text (using the `offsetFrom` attribute value of `text` on `pgBorders`), it shall only span the necessary width to satisfy the requirement of spanning the width of the text.

When a document has custom border art specified by the `id` attribute, it shall use the corresponding relationship part item as an image for the right border. If the corresponding relationship part item cannot be located, the consumer shall use the border specified by the value of the `val` attribute. If the corresponding value of the `val` attribute cannot be resolved, no right border is present when the page is displayed.

Attributes	Description
color (Border Color)	<p>Specifies the color for this border.</p> <p>This value can be defined as either:</p> <ul style="list-style-type: none"> • A color value using the RGB color model whose red, green, and blue values are written as numbers in the range 0 to 255, hex encoded, and concatenated. [<i>Example:</i> Full intensity red would be 255 red, 0 green, 0 blue, encoded to FF, 00, 00, and concatenated to FF0000. <i>end example</i>] . RGB colors are specified in the sRGB color space. • auto to allow a consumer to automatically determine the border color in order to make the document's text readable. [<i>Example:</i> A document with white text and a background color of auto might result in the use of a black background, in order to ensure legibility of the content. <i>end example</i>] <p>[<i>Example:</i> Consider a border color with value auto, as follows:</p> <pre><w:bottom ... w:color="auto"/></pre> <p>This color therefore can be automatically be modified by a consumer as appropriate, for example, in order to ensure that the border can be distinguished against the page's background color. <i>end example</i>]</p> <p>If the border style (the <code>val</code> attribute) specifies the use of an art border, this attribute is ignored. As well, if the border specifies the use of a theme color via the <code>themeColor</code> attribute, this value is superseded by the theme color value.</p> <p>The possible values for this attribute are defined by the ST_HexColor simple type (§17.18.38).</p>

Attributes	Description
<p>frame (Create Frame Effect)</p>	<p>Specifies whether the specified border should be modified to create a frame effect by reversing the border's appearance from the edge nearest the text to the edge furthest from the text.</p> <p>If this attribute is omitted, then the border is not given any frame effect.</p> <p>[<i>Example</i>: Consider a bottom border which must appear with a frame effect, which is specified in the following WordprocessingML:</p> <pre><w:bottom w:frame="true" ... /></pre> <p>This frame's val is true, indicating that the border frame effect must be applied. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
<p>id (Custom Defined Border Relationship Reference)</p> <p>Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships</p>	<p>Specifies the relationship ID for the relationship which contains the custom border image for the parent element. This custom border image is contained in a separate part within the WordprocessingML package.</p> <p>The relationship explicitly targeted by this attribute shall be of type http://purl.oclc.org/ooxml/officeDocument/relationships/image or the document shall be considered non-conformant.</p> <p>If this attribute is omitted, then no custom border shall be used.</p> <p>[<i>Example</i>: Consider the following WordprocessingML markup for a custom bottom border in a document:</p> <pre><w:bottom w:val="custom" r:id="rIdCustomBottomBorder" .../></pre> <p>The id attribute in the relationship reference namespace specifies that the relationship with relationship ID rIdCustomBottomBorder must contain the custom bottom border image for the document. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
<p>shadow (Border Shadow)</p>	<p>Specifies whether this border should be modified to create the appearance of a shadow.</p> <p>For the right and bottom borders, this is accomplished by duplicating the border below and right of the normal border location. For the right and top borders, this is accomplished by moving the order down and to the right of its original location.</p> <p>If this attribute is omitted, then the border is not given the shadow effect.</p> <p>[<i>Example</i>: Consider a top border which must appear with a shadow effect, resulting in</p>

Attributes	Description
	<p>the following WordprocessingML:</p> <pre><w:bottom w:shadow="true" ... /></pre> <p>This frame's val is true, indicating that the shadow effect must be applied to the border. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
space (Border Spacing Measurement)	<p>Specifies the spacing offset that shall be used to place this border on the parent object.</p> <p>When a document has a page border that is relative to the page edges (using a value of page in the offsetFrom attribute on pgBorders (§17.6.10)), it shall specify the distance between the edge of the page and the beginning of this border in points.</p> <p>When a document has a page border that is relative to the text extents (using a value of text in the offsetFrom attribute on pgBorders (§17.6.10)), or any other border type, it shall specify the distance between the edge of the object and the beginning of this border in points.</p> <p>[<i>Example:</i> Consider a document with a set of page borders all specified to appear 24 points from the edge of the page. The resulting WordprocessingML would be as follows:</p> <pre><w:pgBorders w:offsetFrom="page"> <w:bottom ... w:space="24" /> </w:pgBorders</pre> <p>The offsetFrom attribute specifies that the space value provides the offset of the page border from the page edge, and the value of the space attribute specifies that the page offset must be 24 points. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_PointMeasure simple type (§17.18.68).</p>
sz (Border Width)	<p>Specifies the width of the current border.</p> <p>If the border style (val attribute) specifies a line border, the width of this border is specified in measurements of eighths of a point, with a minimum value of two (one-fourth of a point) and a maximum value of 96 (twelve points). Any values outside this range can be reassigned to a more appropriate value.</p> <p>If the border style (val attribute) specifies an art border, the width of this border is specified in measurements of points, with a minimum value of one and a maximum value of 31. Any values outside this range can be reassigned to a more appropriate value.</p> <p>[<i>Example:</i> Consider a document with a three point wide dashed line border on all sides, resulting in the following WordprocessingML markup:</p>

Attributes	Description
	<pre> <w:top w:val="dashed" w:sz="24" .../> <w:left w:val="dashed" w:sz="24" .../> <w:bottom w:val="dashed" w:sz="24" .../> <w:right w:val="dashed" w:sz="24" .../> </pre> <p>The border style is specified using the <code>val</code> attribute, and because that border style is a line border (dashed), the <code>sz</code> attribute specifies the size in eighths of a point (24 eighths of a point = 3 points). <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_EighthPointMeasure</code> simple type (§17.18.23).</p>
themeColor (Border Theme Color)	<p>Specifies the base theme color used to generate the border color. The border color is the RGB value associated with <code>themeColor</code> as further transformed by <code>themeTint</code> or <code>themeShade</code> (if one is present), else the background color is the RGB value associated with <code>themeColor</code>.</p> <p>The specified theme color is a reference to one of the predefined theme colors, located in the document's Theme part (§14.2.7 and §20.1.6.9), which allows color information to be set centrally in the document.</p> <p>To determine the color to display, the following actions are performed:</p> <ul style="list-style-type: none"> • Using the mapping specified in the <code>ST_ThemeColor</code> simple type (§17.18.97), the appropriate attribute on the <code>clrSchemeMapping</code> element (§17.15.1.20) is read. • Using that value and the mapping specified in the <code>ST_ColorSchemeIndex</code> simple type (§17.18.103), the appropriate element in the document's Theme part is read to get the base theme color. • The specified color is modified based on the presence of the <code>themeTint</code> or <code>themeShade</code> attribute. <p>[Example: Consider a set of borders configured to use the <code>accent2</code> theme color, resulting in the following WordprocessingML markup:</p> <pre> <w:top ... w:themeColor="accent2" w:themeTint="99" /> <w:bottom ... w:themeColor="accent2" w:themeTint="99" /> <w:left ... w:themeColor="accent2" w:themeTint="99" /> <w:right ... w:themeColor="accent2" w:themeTint="99" /> </pre> <p>If the Settings part contained the following markup:</p> <pre> <w:clrSchemeMapping ... w:accent2="accent2"/> </pre> <p>and the Theme part contained the following XML markup:</p> <pre> <a:accent2> <a:srgbClr val="4F81BD"/> </pre>

Attributes	Description
	<p><code></a:accent2></code></p> <p>the resulting border color would be 95B3D7 (the result of a 60% tint applied to the original theme color; see the calculations in themeTint below for details). <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_ThemeColor simple type (§17.18.97).</p>
<p>themeShade (Border Theme Color Shade)</p>	<p>Specifies the shade value applied to the supplied theme color (if any) for this border instance. If the themeColor attribute is not present, then this attribute shall not be used.</p> <p>If the themeShade is supplied, then it is applied to the RGB value of the theme color (from the theme part) to determine the final color applied to this border.</p> <p>The themeShade value is stored as a hex encoding of the shade value (from 0–255) applied to the current border.</p> <p>[<i>Example:</i> Consider a shade of 40% applied to a border in a document. This shade is calculated as follows:</p> $ \begin{aligned} S_{xml} &= 0.4 * 255 \\ &= 102 \\ &= 66(hex) \end{aligned} $ <p>The resulting themeShade value in the file format would be 66. <i>end example</i>]</p> <p>Given an RGB color defined as three hex values in RRGGBB format, the shade is applied as follows:</p> <ul style="list-style-type: none"> Convert the color to the HSL color format (values from 0 to 1) Modify the luminance factor as follows: $L' = L * \text{Shade}_{\text{percentage}}$ <ul style="list-style-type: none"> Convert the resultant HSL color to RGB <p>[<i>Example:</i> Consider a document with a background using the accent2 theme color, whose RGB value (in RRGGBB hex format) is C0504D.</p> <p>The equivalent HSL color value would be $\left(\frac{1}{360}, 0.48, 0.53\right)$.</p> <p>Applying the shade formula with a shade percentage of 75% to the luminance, we get:</p> $ \begin{aligned} L' &= 0.53 * 0.75 \\ &= 0.39698 \end{aligned} $ <p>Taking the resulting HSL color value of $\left(\frac{1}{360}, 0.48, 0.39698\right)$ and converting back to RGB,</p>

Attributes	Description
	<p>we get 943634.</p> <p>This transformed value can be seen in the resulting background's color attribute:</p> <pre><w:top w:val="single" w:sz="4" w:space="24" w:color="943634" w:themeColor="accent2" w:themeShade="BF"/></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_UcharHexNumber simple type (§17.18.98).</p>
themeTint (Border Theme Color Tint)	<p>Specifies the tint value applied to the supplied theme color (if any) for this border instance. If the themeColor attribute is not present, then this attribute shall not be used.</p> <p>If the themeTint is supplied, then it is applied to the RGB value of the theme color (from the theme part) to determine the final color applied to this border.</p> <p>The themeTint value is stored as a hex encoding of the tint value (from 0–255) applied to the current border.</p> <p>[<i>Example:</i> Consider a tint of 60% applied to a border in a document. This tint is calculated as follows:</p> $ \begin{aligned} T_{xml} &= 0.6 * 255 \\ &= 153 \\ &= 99(hex) \end{aligned} $ <p>The resulting themeTint value in the file format would be 99. <i>end example]</i></p> <p>Given an RGB color defined as three hex values in RRGGBB format, the shade is applied as follows:</p> <ul style="list-style-type: none"> • Convert the color to the HSL color format (values from 0 to 1) • Modify the luminance factor as follows: $L' = L * \text{Tint}_{\text{pct}} + (1 - \text{Tint}_{\text{pct}})$ <ul style="list-style-type: none"> • Convert the resultant HSL color to RGB <p>[<i>Example:</i> Consider a document with a background using the accent2 theme color, whose RGB value (in RRGGBB hex format) is 4F81BD.</p> <p>The equivalent HSL color value would be $(\frac{213}{360}, 0.45, 0.53)$.</p> <p>Applying the tint formula with a tint percentage of 60% to the luminance, we get:</p>

Attributes	Description
	$L' = 0.53 * 0.6 + (1 - .6) = 0.71$ <p>Taking the resulting HSL color value of $\left(\frac{213}{360}, 0.45, 0.71\right)$ and converting back to RGB, we get 95B3D7.</p> <p>This transformed value can be seen in the resulting background's color attribute:</p> <pre><w:top w:val="single" w:sz="4" w:space="24" w:color="95B3D7" w:themeColor="accent2" w:themeTint="99"/></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_UcharHexNumber simple type (§17.18.98).</p>
val (Border Style)	<p>Specifies the style of border used on this object.</p> <p>This border can either be an art border (a repeated image along the borders - shall only be used for page borders) or a line border (a line format repeated along the borders) - see the simple type definition for a description of each border style.</p> <p>[<i>Example:</i> Consider a left border resulting in the following WordprocessingML:</p> <pre><w:left w:val="single" .../></pre> <p>This border's val is single, indicating that the border style is a single line. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Border simple type (§17.18.2).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_PageBorder](#)) is located in §A.1. *end note]*

17.6.16 rtlGutter (Gutter on Right Side of Page)

This element specifies that the page gutter shall be placed on the right side of the page for this section only. The *page gutter* defines the amount of extra space added to the specified margin, above any existing margin values.

[*Note:* This setting is typically used when a document is being created for binding, in order to ensure that the resulting margins are present after the binding gutter is consumed by the printed matter binding. *end note]*

If the gutter is set to the side of the page by the omission of the gutterAtTop element (§17.15.1.50), then each section's gutter is placed at the left by default, unless that default is overridden by the rtlGutter element.

[*Example*: Consider a document with three sections, with gutter properties defined as follows:

```
<w:p>
  <w:pPr>
    <w:sectPr>
      <w:pgMar w:gutter="1440" .../>
      ...
    </w:sectPr>
  </w:pPr>
</w:p>
...
<w:p>
  <w:pPr>
    <w:sectPr>
      <w:pgMar w:gutter="1440" .../>
      <w:rtlGutter w:val="0" />
      ...
    </w:sectPr>
  </w:pPr>
</w:p>
...
<w:p>
  <w:pPr>
    <w:sectPr>
      <w:pgMar w:gutter="1440" .../>
      <w:rtlGutter />
      ...
    </w:sectPr>
  </w:pPr>
</w:p>
```

The first and second sections both place the gutter on the left side, the first by omission of the `rtlGutter` attribute, and the second by explicitly turning it off. The third section, however, moves the gutter to the right side via the use of the `rtlGutter` attribute. *end example*]

If the `gutterAtTop` element (§17.15.1.50) is specified and true, then each section's gutter is at the top and this setting is ignored.

This element's content model is defined by the common boolean property definition in §17.17.4.

17.6.17 **sectPr (Document Final Section Properties)**

This element defines the section properties for the final section of the document. [*Note*: For any other section the properties are stored as a child element of the paragraph element corresponding to the last paragraph in the given section. *end note*]

[*Example*: Consider a document with multiple sections. For all sections except the final section, the sectPr element is stored as a child element of the last paragraph in the section. For the final section, this information is stored as the last child element of the body element, as follows:

```
<w:body>
  <w:p>
    ...
  </w:p>
  ...
  <w:sectPr>
    (final section's properties)
  </w:sectPr>
</w:body>
```

end example]

Attributes	Description
rsidDel (Section Deletion Revision ID)	<p>Specifies a unique identifier used to track the <i>editing session</i> when the section mark for this section was deleted from the document.</p> <p>All rsid* attributes throughout this document of an equal value, if present, shall indicate that those regions were modified during the same editing session.</p> <p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions (editing between save actions) to indicate the order of the saves performed.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>
rsidR (Section Addition Revision ID)	<p>Specifies a unique identifier used to track the <i>editing session</i> when the section mark for this section was added to the document.</p> <p>All rsid* attributes throughout this document of an equal value, if present, shall indicate that those regions were modified during the same editing session.</p> <p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions (editing between save actions) to indicate the order of the saves performed.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>
rsidRPr (Physical Section Mark Character Revision ID)	<p>Specifies a unique identifier used to track the editing session when the physical character representing this section mark was last formatted.</p> <p>All rsid* attributes throughout this document of an equal value, if present, shall indicate that those regions were modified during the same editing session.</p>

Attributes	Description
	<p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions (editing between save actions) to indicate the order of the saves performed.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>
rsidSect (Section Properties Revision ID)	<p>Specifies a unique identifier used to track the editing session when the physical character representing this section mark was last formatted.</p> <p>All rsid* attributes throughout this document of an equal value, if present, shall indicate that those regions were modified during the same editing session.</p> <p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions (editing between save actions) to indicate the order of the saves performed.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_SectPr](#)) is located in §A.1. *end note*]

17.6.18 sectPr (Section Properties)

This element defines the section properties for the a section of the document. [Note: For the last section in the document, the section properties are stored as a child element of the body element. *end note*]

[Example: Consider a document with multiple sections. For all sections except the final section, the sectPr element is stored as a child element of the last paragraph in the section, as follows:

```

<w:body>
  <w:p>
    <w:pPr>
      <w:sectPr>
        (final section's properties)
      </w:sectPr>
    </w:pPr>
  ...
</w:p>
...
<w:sectPr>
  (final section's properties)
</w:sectPr>
</w:body>

```

end example]

Attributes	Description
rsidDel (Section Deletion Revision ID)	<p>Specifies a unique identifier used to track the <i>editing session</i> when the section mark for this section was deleted from the document.</p> <p>All rsid* attributes throughout this document of an equal value, if present, shall indicate that those regions were modified during the same editing session.</p> <p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions (editing between save actions) to indicate the order of the saves performed.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>
rsidR (Section Addition Revision ID)	<p>Specifies a unique identifier used to track the <i>editing session</i> when the section mark for this section was added to the document.</p> <p>All rsid* attributes throughout this document of an equal value, if present, shall indicate that those regions were modified during the same editing session.</p> <p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions (editing between save actions) to indicate the order of the saves performed.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>
rsidRPr (Physical Section Mark Character Revision ID)	<p>Specifies a unique identifier used to track the editing session when the physical character representing this section mark was last formatted.</p> <p>All rsid* attributes throughout this document of an equal value, if present, shall indicate that those regions were modified during the same editing session.</p> <p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions (editing between save actions) to indicate the order of the saves performed.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>
rsidSect (Section Properties Revision ID)	<p>Specifies a unique identifier used to track the editing session when the physical character representing this section mark was last formatted.</p> <p>All rsid* attributes throughout this document of an equal value, if present, shall indicate that those regions were modified during the same editing session.</p> <p>A producer can choose to increment the revision save ID value to indicate subsequent</p>

Attributes	Description
	<p>editing sessions (editing between save actions) to indicate the order of the saves performed.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_SectPr](#)) is located in §A.1. *end note*]

17.6.19 sectPr (Previous Section Properties)

When specified as a child element of sectPrChange, the sectPr element specifies a set of section properties that were modified when the document was set to track all revisions.

[Example: If the page orientation was changed with revision tracking enabled, the following WordprocessingML defines the contents of that change:

```
<w:sectPr>
...
<w:sectPrChange ...>
  <w:sectPr>
    <w:pgSz w:w="15840" w:h="12240"/>
  </w:sectPr>
</w:sectPrChange>
</w:sectPr>
```

The properties that were changed as part of this revision are stored in this sectPr element. *end example*]

Attributes	Description
rsidDel (Section Deletion Revision ID)	<p>Specifies a unique identifier used to track the <i>editing session</i> when the section mark for this section was deleted from the document.</p> <p>All rsid* attributes throughout this document of an equal value, if present, shall indicate that those regions were modified during the same editing session.</p> <p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions (editing between save actions) to indicate the order of the saves performed.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>
rsidR (Section Addition Revision ID)	<p>Specifies a unique identifier used to track the <i>editing session</i> when the section mark for this section was added to the document.</p> <p>All rsid* attributes throughout this document of an equal value, if present, shall indicate</p>

Attributes	Description
	<p>that those regions were modified during the same editing session.</p> <p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions (editing between save actions) to indicate the order of the saves performed.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>
rsidRPr (Physical Section Mark Character Revision ID)	<p>Specifies a unique identifier used to track the editing session when the physical character representing this section mark was last formatted.</p> <p>All rsid* attributes throughout this document of an equal value, if present, shall indicate that those regions were modified during the same editing session.</p> <p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions (editing between save actions) to indicate the order of the saves performed.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>
rsidSect (Section Properties Revision ID)	<p>Specifies a unique identifier used to track the editing session when the physical character representing this section mark was last formatted.</p> <p>All rsid* attributes throughout this document of an equal value, if present, shall indicate that those regions were modified during the same editing session.</p> <p>A producer can choose to increment the revision save ID value to indicate subsequent editing sessions (editing between save actions) to indicate the order of the saves performed.</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_SectPrBase](#)) is located in §A.1. *end note*]

17.6.20 textDirection (Text Flow Direction)

This element specifies the direction of the text flow for this section.

[Example: Consider a document with a section in which text be oriented vertically, flowing from left to right horizontally on the page. This setting requires the following WordprocessingML:

```
<w:sectPr>
...
<w:textDirection w:val="lr" />
</w:sectPr>
```

The textDirection element specifies via the lr value in the val attribute that the text flow be oriented vertically, with subsequent lines stacked from left to right. *end example*]

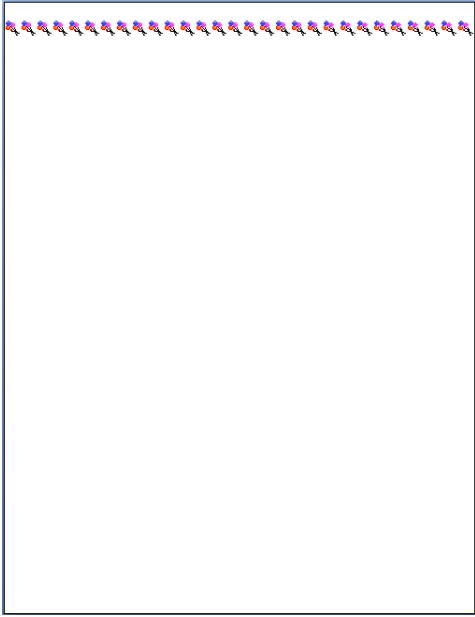
Attributes	Description
val (Direction of Text Flow)	<p>Specifies the direction of the text flow for this object.</p> <p>[<i>Example:</i> Consider a document with a section in which text must be oriented vertically, flowing from left to right horizontally on the page. This setting requires the following WordprocessingML:</p> <pre><w:sectPr> ... <w:textDirection w:val="lr" /> </w:sectPr></pre> <p>The textDirection element specifies via the lr value in the val attribute that the text flow must be oriented vertically, with subsequent lines stacked from left to right.<i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TextDirection simple type (§17.18.93).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_TextDirection](#)) is located in §A.1. *end note*]

17.6.21 top (Top Border)

This element specifies the presentation and display of the page border displayed at the top of each page in this section.

[*Example:* Consider a section in which all pages must have a top border consisting of a repeated image of balloons, like this:



This border would result in the following WordprocessingML:

```
<w:sectPr>
...
<w:pgBorders>
  <w:top w:val="balloons3Colors" .../>
</w:pgBorders>
...
</w:sectPr>
```

Because the page only has a border at the top, only the top element is specified within the set of page borders. *end example]*

When a document has a top border that is relative to the page edges (using an `offsetFrom` attribute value of `page` on `pgBorders`), it shall span the top edge of the page at the location defined by its properties, stopping when:

- It intersects with the corresponding left or right page border (if one is specified)
- It reaches the edge of the page.

[*Example:* In the example above, no left or right border was specified in the WordprocessingML, so a consumer must draw the border from one edge of the page to the other. *end example]*

When a document has a top border that is relative to the text (using the `offsetFrom` attribute value of `text` on `pgBorders`), it shall only span the necessary width to satisfy the requirement of spanning the width of the text.

When a document has custom border art specified by attributes `topLeft`, `topRight`, and/or `id`, it shall use the corresponding relationship part item as an image for the top left corner, top right corner, and/or top border,

respectively. If the corresponding relationship part item cannot be resolved the consumer shall use the border specified by the value of the val attribute. If the corresponding value of the val attribute cannot be resolved no top left corner, top right corner, or top border is present when the page is displayed.

When a document has a custom border art specified by attribute id without specifying either attributes topRight and/or topLeft, the top border as resolved by the corresponding relationship part item of attribute id shall span to the corners not specified by topRight and/or topLeft attributes.

Attributes	Description
color (Border Color)	<p>Specifies the color for this border.</p> <p>This value can be defined as either:</p> <ul style="list-style-type: none"> • A color value using the RGB color model whose red, green, and blue values are written as numbers in the range 0 to 255, hex encoded, and concatenated. <i>[Example: Full intensity red would be 255 red, 0 green, 0 blue, encoded to FF, 00, 00, and concatenated to FF0000. end example]</i> . RGB colors are specified in the sRGB color space. • auto to allow a consumer to automatically determine the border color in order to make the document's text readable. <i>[Example: A document with white text and a background color of auto might result in the use of a black background, in order to ensure legibility of the content. end example]</i> <p><i>[Example: Consider a border color with value auto, as follows:</i></p> <pre><w:bottom ... w:color="auto"/></pre> <p>This color therefore can be automatically be modified by a consumer as appropriate, for example, in order to ensure that the border can be distinguished against the page's background color. <i>end example]</i></p> <p>If the border style (the val attribute) specifies the use of an art border, this attribute is ignored. As well, if the border specifies the use of a theme color via the themeColor attribute, this value is superseded by the theme color value.</p> <p>The possible values for this attribute are defined by the ST_HexColor simple type (§17.18.38).</p>
frame (Create Frame Effect)	<p>Specifies whether the specified border should be modified to create a frame effect by reversing the border's appearance from the edge nearest the text to the edge furthest from the text.</p> <p>If this attribute is omitted, then the border is not given any frame effect.</p> <p><i>[Example: Consider a bottom border which must appear with a frame effect, which is specified in the following WordprocessingML:</i></p> <pre><w:bottom w:frame="true" ... /></pre>

Attributes	Description
	<p>This frame's val is true, indicating that the border frame effect must be applied. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
<p>id (Custom Defined Border Relationship Reference)</p> <p>Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships</p>	<p>Specifies the relationship ID for the relationship which contains the custom border image for the parent element. This custom border image is contained in a separate part within the WordprocessingML package.</p> <p>The relationship explicitly targeted by this attribute shall be of type http://purl.oclc.org/ooxml/officeDocument/relationships/image or the document shall be considered non-conformant.</p> <p>If this attribute is omitted, then no custom border shall be used.</p> <p>[<i>Example:</i> Consider the following WordprocessingML markup for a custom bottom border in a document:</p> <pre><w:bottom w:val="custom" r:id="rIdCustomBottomBorder" .../></pre> <p>The id attribute in the relationship reference namespace specifies that the relationship with relationship ID rIdCustomBottomBorder must contain the custom bottom border image for the document. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
<p>shadow (Border Shadow)</p>	<p>Specifies whether this border should be modified to create the appearance of a shadow.</p> <p>For the right and bottom borders, this is accomplished by duplicating the border below and right of the normal border location. For the right and top borders, this is accomplished by moving the border down and to the right of its original location.</p> <p>If this attribute is omitted, then the border is not given the shadow effect.</p> <p>[<i>Example:</i> Consider a top border which must appear with a shadow effect, resulting in the following WordprocessingML:</p> <pre><w:bottom w:shadow="true" ... /></pre> <p>This frame's val is true, indicating that the shadow effect must be applied to the border. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
<p>space (Border Spacing)</p>	<p>Specifies the spacing offset that shall be used to place this border on the parent object.</p>

Attributes	Description
Measurement)	<p>When a document has a page border that is relative to the page edges (using a value of page in the offsetFrom attribute on pgBorders (§17.6.10)), it shall specify the distance between the edge of the page and the beginning of this border in points.</p> <p>When a document has a page border that is relative to the text extents (using a value of text in the offsetFrom attribute on pgBorders (§17.6.10)), or any other border type, it shall specify the distance between the edge of the object and the beginning of this border in points.</p> <p>[<i>Example</i>: Consider a document with a set of page borders all specified to appear 24 points from the edge of the page. The resulting WordprocessingML would be as follows:</p> <pre><w:pgBorders w:offsetFrom="page"> <w:bottom ... w:space="24" /> </w:pgBorders</pre> <p>The offsetFrom attribute specifies that the space value provides the offset of the page border from the page edge, and the value of the space attribute specifies that the page offset must be 24 points. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PointMeasure simple type (§17.18.68).</p>
sz (Border Width)	<p>Specifies the width of the current border.</p> <p>If the border style (val attribute) specifies a line border, the width of this border is specified in measurements of eighths of a point, with a minimum value of two (one-fourth of a point) and a maximum value of 96 (twelve points). Any values outside this range can be reassigned to a more appropriate value.</p> <p>If the border style (val attribute) specifies an art border, the width of this border is specified in measurements of points, with a minimum value of one and a maximum value of 31. Any values outside this range can be reassigned to a more appropriate value.</p> <p>[<i>Example</i>: Consider a document with a three point wide dashed line border on all sides, resulting in the following WordprocessingML markup:</p> <pre><w:top w:val="dashed" w:sz="24" .../> <w:left w:val="dashed" w:sz="24" .../> <w:bottom w:val="dashed" w:sz="24" .../> <w:right w:val="dashed" w:sz="24" .../></pre> <p>The border style is specified using the val attribute, and because that border style is a line border (dashed), the sz attribute specifies the size in eighths of a point (24 eighths of a point = 3 points). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_EighthPointMeasure simple</p>

Attributes	Description
	type (§17.18.23).
themeColor (Border Theme Color)	<p>Specifies the base theme color used to generate the border color. The border color is the RGB value associated with themeColor as further transformed by themeTint or themeShade (if one is present), else the background color is the RGB value associated with themeColor.</p> <p>The specified theme color is a reference to one of the predefined theme colors, located in the document's Theme part (§14.2.7 and §20.1.6.9), which allows color information to be set centrally in the document.</p> <p>To determine the color to display, the following actions are performed:</p> <ul style="list-style-type: none"> • Using the mapping specified in the ST_ThemeColor simple type (§17.18.97), the appropriate attribute on the clrSchemeMapping element (§17.15.1.20) is read. • Using that value and the mapping specified in the ST_ColorSchemeIndex simple type (§17.18.103), the appropriate element in the document's Theme part is read to get the base theme color. • The specified color is modified based on the presence of the themeTint or themeShade attribute. <p>[<i>Example:</i> Consider a set of borders configured to use the accent2 theme color, resulting in the following WordprocessingML markup:</p> <pre><w:top ... w:themeColor="accent2" w:themeTint="99" /> <w:bottom ... w:themeColor="accent2" w:themeTint="99" /> <w:left ... w:themeColor="accent2" w:themeTint="99" /> <w:right ... w:themeColor="accent2" w:themeTint="99" /></pre> <p>If the Settings part contained the following markup:</p> <pre><w:clrSchemeMapping ... w:accent2="accent2"/></pre> <p>and the Theme part contained the following XML markup:</p> <pre><a:accent2> <a:srgbClr val="4F81BD"/> </a:accent2></pre> <p>the resulting border color would be 95B3D7 (the result of a 60% tint applied to the original theme color; see the calculations in themeTint below for details). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ThemeColor simple type (§17.18.97).</p>
themeShade (Border Theme Color Shade)	<p>Specifies the shade value applied to the supplied theme color (if any) for this border instance. If the themeColor attribute is not present, then this attribute shall not be used.</p> <p>If the themeShade is supplied, then it is applied to the RGB value of the theme color</p>

Attributes	Description
	<p>(from the theme part) to determine the final color applied to this border.</p> <p>The themeShade value is stored as a hex encoding of the shade value (from 0–255) applied to the current border.</p> <p>[<i>Example</i>: Consider a shade of 40% applied to a border in a document. This shade is calculated as follows:</p> $ \begin{aligned} S_{xml} &= 0.4 * 255 \\ &= 102 \\ &= 66(hex) \end{aligned} $ <p>The resulting themeShade value in the file format would be 66. <i>end example</i>]</p> <p>Given an RGB color defined as three hex values in RRGGBB format, the shade is applied as follows:</p> <ul style="list-style-type: none"> • Convert the color to the HSL color format (values from 0 to 1) • Modify the luminance factor as follows: $L' = L * \text{Shade}_{\text{percentage}}$ <ul style="list-style-type: none"> • Convert the resultant HSL color to RGB <p>[<i>Example</i>: Consider a document with a background using the accent2 theme color, whose RGB value (in RRGGBB hex format) is C0504D.</p> <p>The equivalent HSL color value would be $\left(\frac{1}{360}, 0.48, 0.53\right)$.</p> <p>Applying the shade formula with a shade percentage of 75% to the luminance, we get:</p> $ \begin{aligned} L' &= 0.53 * 0.75 \\ &= 0.39698 \end{aligned} $ <p>Taking the resulting HSL color value of $\left(\frac{1}{360}, 0.48, 0.39698\right)$ and converting back to RGB, we get 943634.</p> <p>This transformed value can be seen in the resulting background's color attribute:</p> <pre> <w:top w:val="single" w:sz="4" w:space="24" w:color="943634" w:themeColor="accent2" w:themeShade="BF"/> </pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_UcharHexNumber simple</p>

Attributes	Description
	type (§17.18.98).
themeTint (Border Theme Color Tint)	<p>Specifies the tint value applied to the supplied theme color (if any) for this border instance. If the themeColor attribute is not present, then this attribute shall not be used.</p> <p>If the themeTint is supplied, then it is applied to the RGB value of the theme color (from the theme part) to determine the final color applied to this border.</p> <p>The themeTint value is stored as a hex encoding of the tint value (from 0–255) applied to the current border.</p> <p>[<i>Example:</i> Consider a tint of 60% applied to a border in a document. This tint is calculated as follows:</p> $ \begin{aligned} T_{xml} &= 0.6 * 255 \\ &= 153 \\ &= 99(hex) \end{aligned} $ <p>The resulting themeTint value in the file format would be 99. <i>end example</i>]</p> <p>Given an RGB color defined as three hex values in RRGGBB format, the shade is applied as follows:</p> <ul style="list-style-type: none"> • Convert the color to the HSL color format (values from 0 to 1) • Modify the luminance factor as follows: $L' = L * \text{Tint}_{\text{pct}} + (1 - \text{Tint}_{\text{pct}})$ <ul style="list-style-type: none"> • Convert the resultant HSL color to RGB <p>[<i>Example:</i> Consider a document with a background using the accent2 theme color, whose RGB value (in RRGGBB hex format) is 4F81BD.</p> <p>The equivalent HSL color value would be $(\frac{213}{360}, 0.45, 0.53)$.</p> <p>Applying the tint formula with a tint percentage of 60% to the luminance, we get:</p> $ \begin{aligned} L' &= 0.53 * 0.6 + (1 - .6) \\ &= 0.71 \end{aligned} $ <p>Taking the resulting HSL color value of $(\frac{213}{360}, 0.45, 0.71)$ and converting back to RGB, we get 95B3D7.</p> <p>This transformed value can be seen in the resulting background's color attribute:</p> <pre><w:top w:val="single" w:sz="4" w:space="24" w:color="95B3D7" w:themeColor="accent2"</pre>

Attributes	Description
	<p><code>w:themeTint="99"/></code></p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_UcharHexNumber simple type (§17.18.98).</p>
<p>topLeft (Custom Defined Top Left Border Relationship Reference)</p> <p>Namespace: .../officeDocument/2006/relationships</p>	<p>Specifies the relationship ID for the relationship which contains the custom top left border image for the parent element. This custom border image is contained in a separate part within the WordprocessingML package.</p> <p>The relationship explicitly targeted by this attribute shall be of type http://schemas.openxmlformats.org/officeDocument/2006/relationships/image or the document shall be considered non-conformant.</p> <p>If this attribute is omitted, then no custom top left border shall be used.</p> <p>[Example: Consider the following WordprocessingML markup for a custom top left border in a document:</p> <pre><w:top w:val="custom" r:topLeft="rIdCustomTopLeftBorder" .../></pre> <p>The id attribute in the relationship reference namespace specifies that the relationship with relationship ID rIdCustomTopLeftBorder must contain the custom top left border image for the document. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
<p>topRight (Custom Defined Top Right Border Relationship Reference)</p> <p>Namespace: .../officeDocument/2006/relationships</p>	<p>Specifies the relationship ID for the relationship which contains the custom top right border image for the parent element. This custom border image is contained in a separate part within the WordprocessingML package.</p> <p>The relationship explicitly targeted by this attribute shall be of type http://schemas.openxmlformats.org/officeDocument/2006/relationships/image or the document shall be considered non-conformant.</p> <p>If this attribute is omitted, then no custom top left border shall be used when the parent element is instantiated.</p> <p>[Example: Consider the following WordprocessingML markup for a custom top right border in a document:</p> <pre><w:top w:val="custom" r:topRight="rIdCustomTopRightBorder" ... /></pre> <p>The id attribute in the relationship reference namespace specifies that the relationship with relationship ID rIdCustomTopRightBorder must contain the custom top right</p>

Attributes	Description
	border image for the document. <i>end example</i> The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).
val (Border Style)	Specifies the style of border used on this object. This border can either be an art border (a repeated image along the borders - shall only be used for page borders) or a line border (a line format repeated along the borders) - see the simple type definition for a description of each border style. [Example: Consider a left border resulting in the following WordprocessingML: <w:left w:val="single" .../> This border's val is single, indicating that the border style is a single line. <i>end example</i>] The possible values for this attribute are defined by the ST_Border simple type (§17.18.2).

[Note: The W3C XML Schema definition of this element's content model ([CT_TopPageBorder](#)) is located in §A.1. *end note*]

17.6.22 type (Section Type)

This element specifies the section type of the current section. The section type specifies how the contents of the current section shall be placed relative to the previous section.

WordprocessingML supports five distinct types of section breaks:

- *Next page section breaks* (the default if type is not specified), which begin the new section on the following page.
- *Odd page section breaks*, which begin the new section on the next odd-numbered page.
- *Even page section breaks*, which begin the new section on the next even-numbered page.
- *Continuous section breaks*, which begin the new section on the following paragraph. This means that continuous section breaks might not specify certain page-level section properties, since they shall be inherited from the following section. These breaks, however, can specify other section properties, such as line numbering and footnote/endnote settings.
- *Column section breaks*, which begin the new section on the next column on the page.

Attributes	Description
val (Section Type Setting)	Specifies the section type of the current section. [Example: Consider a section that must start on the next page in the document. The

Attributes	Description
	<p>WordprocessingML specifying this would look like:</p> <pre><w:sectPr> ... <w:type w:val="nextPage"/> </w:sectPr></pre> <p>The nextPage value specifies that this section starts on the next page. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_SectionMark simple type (§17.18.77).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_SectType](#)) is located in §A.1. *end note*]

17.6.23 vAlign (Vertical Text Alignment on Page)

This element specifies the vertical alignment for text on pages in the current section, relative to the top and bottom margins in the main document story on each page.

[Example: Consider a section used as a title page on which text must be vertically centered. In order to center the text vertically on the page, the following WordprocessingML is used:

```
<w:sectPr>
...
<w:vAlign w:val="center" />
</w:sectPr>
```

The vAlign value of center specifies that text must be laid out in the center of the top and bottom text margins for all pages in this section. *end example*]

Attributes	Description
val (Vertical Alignment Setting)	<p>Specifies the vertical alignment for text between the top and bottom margins of the parent container (page or table cell).</p> <p>[Example: Consider a region where the text must be vertically centered in the parent element. This would require a val value of center, in order to specify that all justification vertically must be centered relative to the parent. For a section, this setting would be specified as follows:</p> <pre><w:vAlign w:val="center" /></pre> <p>The val attribute of center specifies that the content is centered relative to its container (in this case, the page). <i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_VerticalJc simple type (§17.18.101).

[Note: The W3C XML Schema definition of this element’s content model ([CT_VerticalJc](#)) is located in §A.1. *end note*]

17.7 Styles

Within a WordprocessingML file, *styles* are predefined sets of table, numbering, paragraph, and/or character properties which can be applied to text within the document. This allows the formatting properties to be stored and managed independently from the content, allowing the look of document content to be changed in a single location (e.g. the look of all first-level headings is changed by changing the style with styleId `Heading1` rather than looking for and changing each paragraph in the document).

[Example: The Normal paragraph style in a word processing document can have any number of formatting properties, e.g. font face = Times New Roman; font size = 12pt; paragraph justification = left). All paragraphs which reference this paragraph style would automatically inherit these properties. *end example*]

Each style defined within a WordprocessingML document requires a *style definition*. The style definition contains all of the information needed by a consumer to store and display that style within a WordprocessingML document, and is defined using the style element. The style definition for any style in WordprocessingML can be divided into three segments. The complete definition of style properties can be found on the reference for the style element (§17.7.4.17):

- General style properties
- Style types
- Type specific formatting properties

Each of these three segments are discussed in the following subclauses.

17.7.1 Style Inheritance

In order to compile the complete set of paragraph and character properties specified by any given style (as appropriate), a consumer shall follow the rule of style inheritance to determine each property in that set.

Style inheritance states that styles of any given style type can inherit from other styles of that style type, and therefore a consumer shall ‘build up’ the style information by following the inheritance tree. This inheritance is defined via the `basedOn` element, which specifies the styleId of the parent style.

[Example: The “Tristan Test” paragraph style can inherit properties from the “Heading 1” paragraph style, which itself can inherit properties from the “Normal” paragraph style. *end example*]

To build up the resulting style, a consumer shall trace the hierarchy (following each `basedOn` value) back to a style which has no `basedOn` element (is not based on another style). The resulting style is then constructed by

following each level in the tree, applying the specified paragraph and/or character properties as appropriate. When properties conflict, they are overridden by each subsequent level (this includes turning OFF a property set at an earlier level). Properties which are not specified simply do not change those specified at earlier levels.

[*Example:* Consider a character style Green which specifies only that the text color is green, but inherits from another character style Base which defines a font face of Arial, as well as bold:

```
<w:style w:type="character" w:styleId="Green">
  <w:name w:val="Green" />
  <w:basedOn w:val="Base" />
  <w:rPr>
    <w:color w:val="22B14C" />
  </w:rPr>
</w:style>
...
<w:style w:type="character" w:styleId="Base">
  <w:name w:val="Base" />
  <w:rPr>
    <w:rFonts w:ascii="Arial" w:hAnsi="Arial" />
    <w:b />
  </w:rPr>
</w:style>
```

The definition of the Green character style has a basedOn element which specifies the Base style. This means that any use of the Green style is defined as bold, green, Arial text. *end example]*

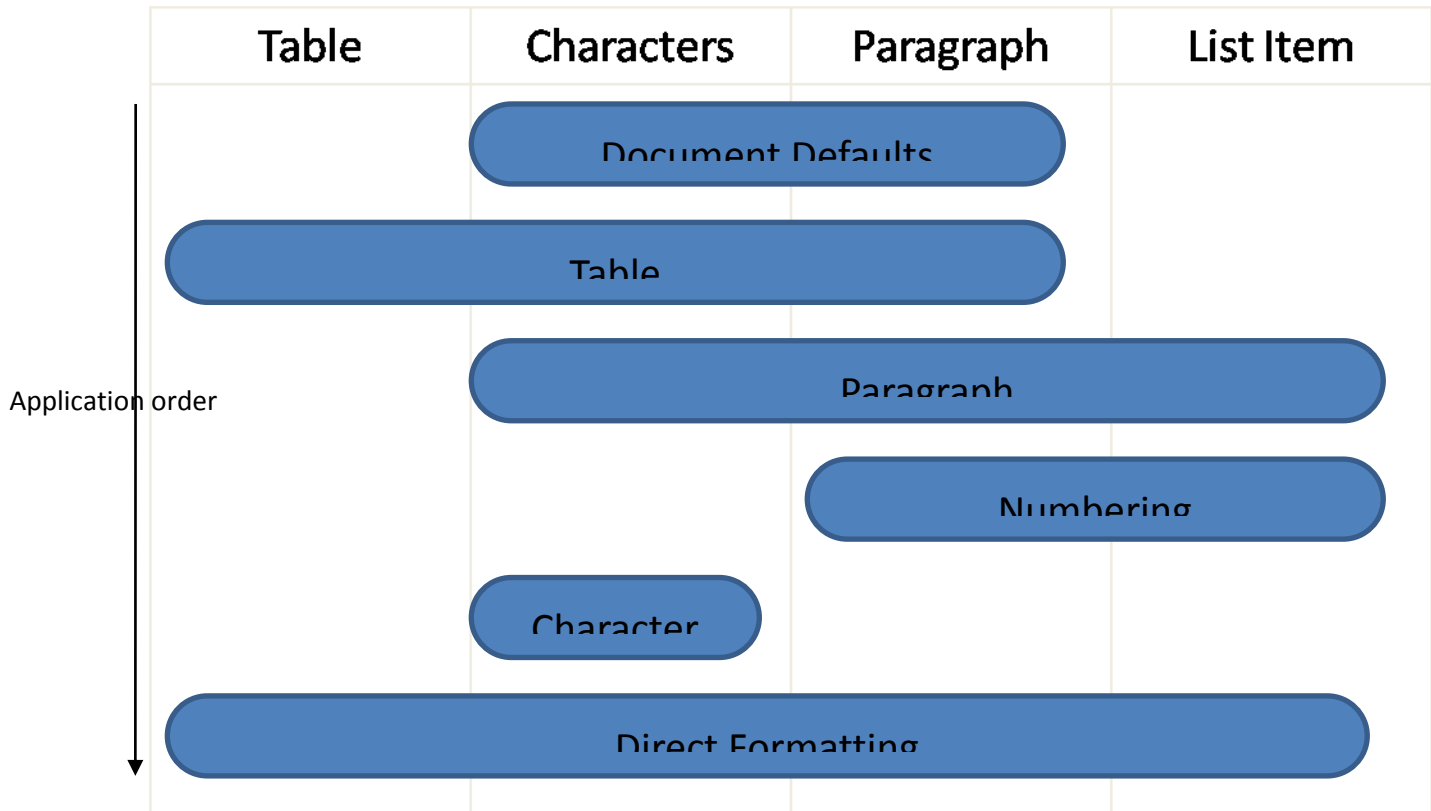
Conversely, a producer should not output any property on a style which has already been set by a previous level of the style hierarchy, as well as those which match the document defaults. This means that if the document defaults or any previous level in a style's hierarchy specify a property which is unchanged at this level, that property should not be part of the style definition in the resulting WordprocessingML.

[*Example:* If the document default font is Bauhaus 93 and the Heading 1 style also specifies the Bauhaus 93 font, then a producer should not output any rFonts element for the Heading 1 style definition, because that formatting is inherited from the document defaults. *end example]*

17.7.2 Style Hierarchy

With the various flavors of styles available (see each of the subclauses below), multiple style types can be applied to the same content within a file, which means that properties shall be applied in a specific deterministic order. As with inheritance, the resulting formatting properties set by one style type can be unchanged, removed, or altered by following style types.

The following table illustrates the order of application of these defaults, and which properties are impacted by each:



This process can be described as follows:

- First, the document defaults are applied to all runs and paragraphs in the document.
- Next, the table style properties are applied to each table in the document, following the conditional formatting inclusions and exclusions specified per table.
- Next, numbered item and paragraph properties are applied to each paragraph formatted with a numbering style.
- Next, paragraph and run properties are applied to each paragraph as defined by the paragraph style.
- Next, run properties are applied to each run with a specific character style applied.
- Finally, we apply direct formatting (paragraph or run properties not from styles). If this direct formatting includes numbering, that numbering + the associated paragraph properties are applied.

If the value of the rFonts element (§17.3.2.26) references a font which is not available, applications determine a suitable alternative font via a process called font substitution, which is defined in §17.8.2.

17.7.3 Toggle Properties

Certain character properties defined in §17.3.2 are specified as toggle properties. *[Example: the Bold and Italics properties are toggle properties. end example]* As indicated in the previous two sections (§17.7.1 and §17.7.2) several styles can affect the formatting applied to a given piece of content within a WordprocessingML document. When the same formatting property appears in one or more styles that affect the content applied to a run, the combined effect depends on whether or not the formatting property is a toggle property.

If the property is not a toggle property, then its values shall be applied in the order described in §17.7.1 and §17.7.2, and only its last value in that order shall be used.

If the property is a toggle property, then its values, which are limited to true and false (or the equivalent values 1 and 0) shall be combined as follows:

- If a toggle property is explicitly set in direct formatting applied to a given piece of content, then its value in the direct formatting shall be used.
- Otherwise, the instances of that toggle property in the styles that affect the content shall be combined in the following manner:
 - If multiple instances of the toggle property appear at the same level of the style hierarchy, then the first value encountered by the following algorithm shall be used (if no value is encountered, the property takes on its default value).
 - Attempt to read the value in the style.
 - If it does not exist and the style has a basedOn element with a non-empty value, repeat step 1 using the style specified by the basedOn element.
 - [Example: If a paragraph style sets no value for the bold property to false and the paragraph style specified by its basedOn element specifies that it is true, the result of applying the style definition sets the value of bold to true (the first value in the hierarchy). end example]
 - If the value of the toggle property appears at multiple levels of the style hierarchy (§17.7.2), their effective values shall be combined as follows:
 - If the value specified by the document defaults is true, the effective value is true.
 - Otherwise, the values are combined by a Boolean XOR as follows:
$$value_{effective} = val_{table} XOR val_{paragraph} XOR val_{character}$$
i.e., the effective value to be applied to the content shall be true if its effective value is true for an odd number of levels of the style hierarchy.

The following Boolean properties are toggle properties: §17.3.2.1 (Bold), §17.3.2.2 (Complex Script Bold), §17.3.2.5 (Display All Characters as Capital Letters), §17.3.2.13 (Embossing), §17.3.2.16 (Italics), §17.3.2.17 (Complex Script Italics), §17.3.2.18 (Imprinting), §17.3.2.23 (Display Character Outline), §17.3.2.31 (Shadow), §17.3.2.33 (Small Caps), §17.3.2.37 (Single Strikethrough), §17.3.2.41 (Hidden Text).

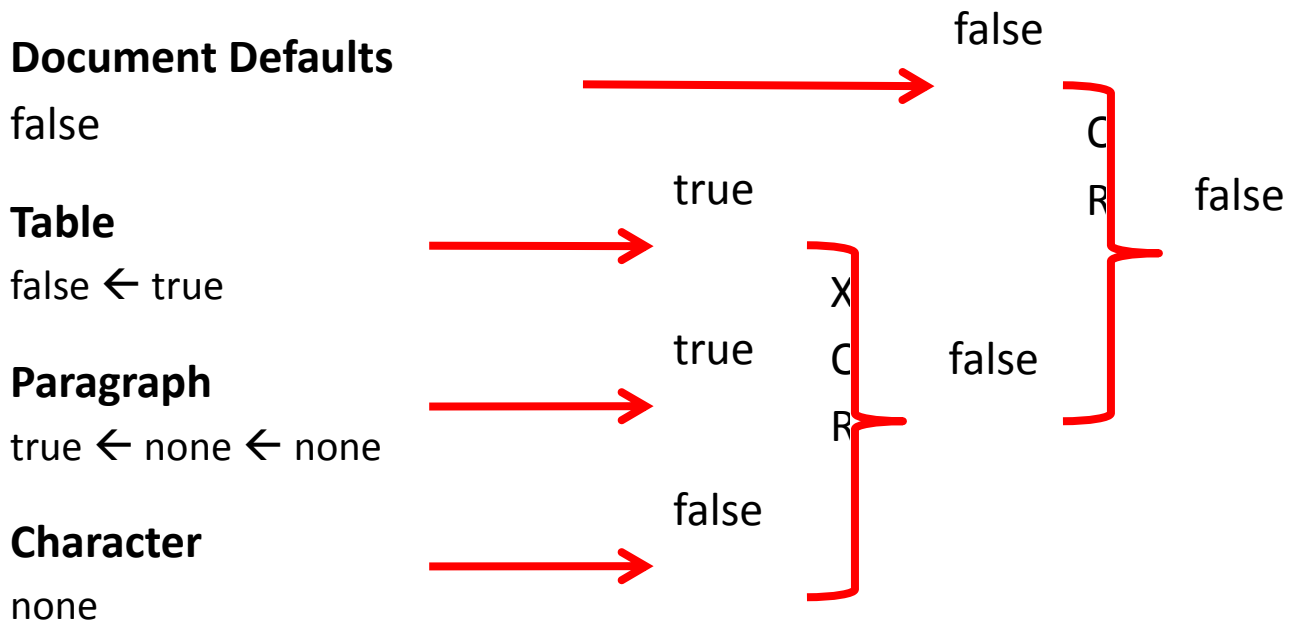
[Example: Consider a table style with two styles in its basedOn chain. If the resolved value of the bold property (a toggle property) within the basedOn chain of the table style is true, that specifies that this property should be applied to the contents of the table:

Cell 1,1	Cell 1,2
Cell 2,1	Cell 2,2

If a single paragraph within that table also has a paragraph style applied, with three styles in its basedOn chain that resolve to a value of true, the toggle property logic above would toggle the bold property, resulting in bold not being applied to its contents. Applying this to the paragraph in the first cell below, the resulting table would appear as follows:

Cell 1,1	Cell 1,2
Cell 2,1	Cell 2,2

The calculation which results in this value for the bold property is displayed below:



← symbolizes the traversal of a basedOn reference

end example]

17.7.4 General Style Properties

General style properties refer to the set of properties which can be used regardless of the type of style.

[*Example:* Within a style definition the style name, additional aliases for the style, a style ID (used by the document content to refer to the style), if style is hidden, if style is locked, etc. are general style properties. *end example]*

[*Example:* Consider a style called Heading 1 in a document as follows:

```
<w:style w:type="paragraph" w:styleId="Heading1">
  <w:name w:val="Heading 1"/>
  <w:basedOn w:val="Normal"/>
  <w:next w:val="Normal"/>
  <w:link w:val="Heading1Char"/>
  <w:uiPriority w:val="1"/>
  <w:qFormat/>
  <w:rsid w:val="00F303CE"/>
  ...
</w:style>
```

Above the formatting information specific to this style type are a set of general style properties which define information shared by all style types. *end example*]

17.7.4.1 aliases (Alternate Style Names)

This element specifies the set of alternative names for the parent style definition. These names can be used in an application's user interface as desired. The alternate names shall be stored in this element's val attribute, and each name shall be separated by one or more consecutive comma characters (Unicode character value 002C). All commas present shall be interpreted as separator character and never as part of an alternate style name.

If present, the alternate style names shall be used in the user interface in place of the built-in name specified in the name element (§17.7.4.9) when the appropriate value is set in the stylePaneFormatFilter element (§17.15.1.86).

If this element is omitted, then the style shall not have any alternate style names.

[*Example:* Consider a style with a primary name and two alternate names, defined using the name and aliases elements, as follows:

```
<w:style w:styleId="TestStyle" ... >
  <w:name w:val="GD20Complex"/>
  <w:aliases w:val="Regional Growth,Complex Growth"/>
  ...
</w:style>
```

This style specifies that it has the primary name GD20Complex using the name element (§17.7.4.9), as well as two alternate names Regional Growth and Complex Growth using the aliases element. *end example*]

Attributes	Description
val (String Value)	Specifies that its contents contain a string. The contents of this string are interpreted based on the context of the parent XML element.

Attributes	Description
	<p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_String](#)) is located in §A.1. *end note*]

17.7.4.2 autoRedefine (Automatically Merge User Formatting Into Style Definition)

This element specifies whether an application shall automatically modify this style when the contents of an entire paragraph in the document with this style applied are modified, ensuring that although only a single instance of text with this style was modified, that change is stored on the style and therefore propagated to all locations where the style is in use.

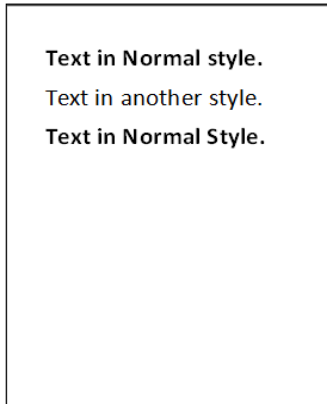
If this element is omitted, then formatting shall not automatically be merged back into the style definition.

[*Example:* Consider a style defined as follows in a WordprocessingML document:

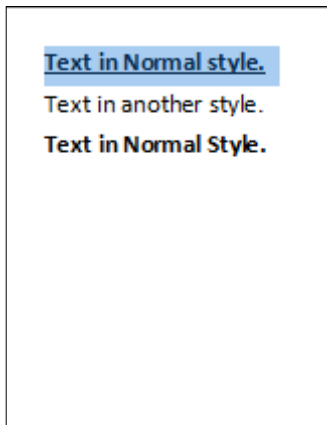
```
<w:style w:styleId="Normal" ... >
  <w:name w:val="Normal"/>
  <w:autoRedefine/>
  <w:rPr>
    <w:b/>
  </w:rPr>
  ...
</w:style>
```

This style specifies via the use of the `autoRedefine` element that any formatting applied to text which uses this style must be merged back into the style definition (assuming, of course, that this is a paragraph style).

For example, consider a document which uses the `Normal` style as defined above:



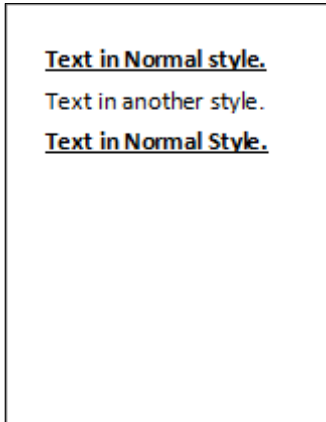
The first and third paragraphs use the `Normal` style, and hence have the bold property applied. If an application were to add the underline formatting to the entire first paragraph, as follows:



That property, rather than being saved as direct formatting, must be used to update the associated `Normal` style to add this property, specified using the `u` element (§17.3.2.40).

```
<w:style w:styleId="Normal" ... >
  <w:name w:val="Normal"/>
  <w:autoRedefine/>
  <w:rPr>
    <w:b/>
    <w:u/>
  </w:rPr>
  ...
</w:style>
```

Since this property is automatically merged into the style, it would also appear on the third paragraph (note that the step above would normally be automatically modified into the state shown below, and not discrete as shown above).



end example]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.7.4.3 basedOn (Parent Style ID)

This element specifies the style ID of the parent style from which this style inherits in the style inheritance. The *style inheritance* refers to a set of styles which inherit from one another to produce the resulting set of properties for a single style. The val attribute of this element specifies the styleId attribute for the parent style in the style inheritance.

If this element is omitted, then this style shall not be based on any other style in the current document (i.e. this element is the root of the style inheritance for a style). If no style in the current document specifies the styleId present in the val attribute, then this element shall be ignored (i.e. this element is the root of the style inheritance for a style).

If a style with this styleId is present, then it shall be subject to the following restrictions:

- If the current style is a table style, then the parent style shall also be a table style, or this element shall be ignored.
- If the current style is a paragraph style, then the parent style shall also be a paragraph style, or this element shall be ignored.
- If the current style is a character style, then the parent style shall also be a character style, or this element shall be ignored.
- If the current style is a numbering style, then this element shall be ignored.

[Example: Consider three WordprocessingML character styles defined as follows:

- A character style with a styleId value of Strong whose properties consist of the bold property
- A character style with a styleId value of Underline whose properties consist of the underline property

- A character style with a styleId value of `Emphasis` whose properties consist of the italics property

Each of these character styles defines a single character formatting property. If the `basedOn` values for each element were defined as follows:

```
<w:style w:styleId="Strong">
  <w:basedOn w:val="Underline"/>
  ...
  <w:rPr>
    <w:b/>
  </w:rPr>
</w:style>
<w:style w:styleId="Underline">
  <w:basedOn w:val="Emphasis"/>
  ...
  <w:rPr>
    <w:u/>
  </w:rPr>
</w:style>
<w:style w:styleId="Emphasis">
  ...
  <w:rPr>
    <w:i/>
  </w:rPr>
</w:style>
```

The `Strong` style is based on the `Underline` style which is in turn based on the `Emphasis` style. This means that the actual definition of the `Strong` style would be as follows:

- Bold
- Underline (inherited from `Underline`)
- Italics (inherited from `Emphasis`)

The style chain for the `Strong` style would be defined as follows:

- `Emphasis`
- `Underline`
- `Strong`

Similarly, the style chain for the `Underline` style would be defined as follows:

- `Emphasis`
- `Underline`

In each case, the style chain is the list of all styles which are combined in order to produce the entire set of properties for any given style. *end example*

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre data-bbox="451 499 954 604"><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre data-bbox="451 781 1084 919"><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_String](#)) is located in §A.1. *end note*]

17.7.4.4 hidden (Hide Style From User Interface)

This element specifies whether this style shall be hidden from any and all user interfaces when this document is loaded by an application. If this element is set, then this style can be used to format content (i.e. any content which references this style shall have its properties as normal), but the style shall be hidden from all user interface associated with that application. [*Note:* This setting is typically used to hide styles which are being used internally by an application which should not be used as formatting in a typical case. *end note*]

If this element is omitted, then the style shall not be required to be hidden from the user interface.

[*Example:* Consider a style with a primary name of InternalStyle that should not be displayed in any user interface. This requirement would be specified using the following WordprocessingML:

```
<w:style ... w:styleId="Style2">
  <w:name w:val="InternalStyle"/>
  <w:hidden/>
  ...
</w:style>
```

The hidden element specifies that this style definition shall be round-tripped with the file (since it is part of the document) but should not be displayed in any user interface associated with an application which processes this document. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.7.4.5 latentStyles (Latent Style Information)

This element specifies the properties which shall be applied to a set of latent styles for this document. *Latent styles* refer to any set of style definitions known to an application which have not been included in the current document. [*Example*: Latent styles can include additional styles known by a particular hosting application. *end example*]

When a style definition is embedded in a document, it specifies two distinct groups of properties:

- Behavior properties
- Formatting properties

Obviously, embedding all the styles known to a particular application in each document which it produces would drastically increase the file size. Latent styles provide a way to store pieces of information for the first group (behavior properties) which shall be specified for all styles known to an application without requiring the storage of the second group (formatting properties).

[*Example*: Consider a WordprocessingML document which contains text specified in one of two styles: Heading1 or Normal. Based on this, the document only needs to store the formatting properties for those two styles, saving the additional overhead which would be required to save all of the styles supported by the hosting application.

However, if the documentProtection element (§17.15.1.29) specifies that the hosting application shall prevent the use of any style whose locked element (§17.7.4.7) is set to false, then the locking state of all styles known to that application become useful and necessary to maintain the current state of the document. Using latent styles, this information can be stored without storing any formatting properties for those styles.

For example, if all styles which are not stored in the document must be locked except for the style with a primary name (§17.7.4.9) of Heading 2. This requirement would be specified using latent styles as follows:

```
<w:latentStyles ... w:defLockedState="true">
  <w:lsdException w:name="Heading 2" w:locked="false"/>
</w:latentStyles>
```


The `latentStyles` element specifies that all latent styles known to any hosting application must have a default locking state of `true` except for any style known to the hosting application with a primary name of `Heading 2`, whose latent style definition specifies that its locked state must be `false`. *end example*]

Attributes	Description
count (Latent Style Count)	<p>Specifies the number of known styles which shall be initialized to the current latent style defaults when this document is first processed. [<i>Note</i>: This property can be used by an application as needed to ensure that only the number of styles known when this document was created are initialized with the defaults on the parent element, and that all new known styles use their default values. <i>end note</i>]</p> <p>[<i>Example</i>: Consider a WordprocessingML document in which only the first 20 latent styles must be initialized. This requirement would be specified as follows:</p> <pre><w:latentStyles w:count="20" ... > ... </w:latentStyles></pre> <p>The count attribute specifies that 20 known styles must be initialized to the default settings when the document is first opened, and any additional styles should use the defaults defined by the application. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_DecimalNumber</code> simple type (§17.18.10).</p>
defLockedState (Default Style Locking Setting)	<p>Specifies the default setting for the locked element (§17.7.4.7) which shall be applied to any style made available by the hosting application which is not explicitly defined in the current document. This setting shall be overridden for every style for which a latent style exception (§17.7.4.8) exists.</p> <p>If this element is omitted, the default locked state for all latent styles in the current document shall be <code>false</code>.</p> <p>[<i>Example</i>: Consider a WordprocessingML document in which all styles which are not stored in the document must be locked. This requirement would be specified using latent styles as follows:</p> <pre><w:latentStyles ... w:defLockedState="true"> ... </w:latentStyles></pre> <p>The <code>defLockedState</code> attribute specifies that all latent styles in the current document must have a locked element setting of <code>true</code> by default. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_OnOff</code> simple type (§22.9.2.7).</p>
defQFormat (Default Primary	<p>Specifies the default setting for the <code>qFormat</code> element (§17.7.4.14) which shall be applied to any style made available by the hosting application which is not explicitly defined in</p>

Attributes	Description
Style Setting)	<p>the current document. This setting shall be overridden for every style for which a latent style exception (§17.7.4.8) exists.</p> <p>If this element is omitted, the default qFormat state for all latent styles in the current document shall be false.</p> <p>[<i>Example:</i> Consider a WordprocessingML document in which all styles which are not stored in the document must not be marked as primary styles. This requirement would be specified using latent styles as follows:</p> <pre><w:latentStyles ... w:defQFormat="false"> ... </w:latentStyles></pre> <p>The defQFormat attribute specifies that all latent styles in the current document must have a qFormat element setting of false by default. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
defSemiHidden (Default Semi- Hidden Setting)	<p>Specifies the default setting for the semiHidden element (§17.7.4.16) which shall be applied to any style made available by the hosting application which is not explicitly defined in the current document. This setting shall be overridden for every style for which a latent style exception (§17.7.4.8) exists.</p> <p>If this element is omitted, the default semiHidden state for all latent styles in the current document shall be false.</p> <p>[<i>Example:</i> Consider a WordprocessingML document in which all styles which are not stored in the document must not be marked as semi-hidden. This requirement would be specified using latent styles as follows:</p> <pre><w:latentStyles ... w:defSemiHidden="false"> ... </w:latentStyles></pre> <p>The defSemiHidden attribute specifies that all latent styles in the current document must have a semiHidden element setting of false by default. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
defUIPriority (Default User Interface Priority Setting)	<p>Specifies the default setting for the uiPriority element (§17.7.4.19) which shall be applied to any style made available by the hosting application which is not explicitly defined in the current document. This setting shall be overridden for every style for which a latent style exception (§17.7.4.8) exists.</p> <p>If this element is omitted, the default uiPriority state for all latent styles in the current document shall be 99.</p>

Attributes	Description
	<p>[<i>Example:</i> Consider a WordprocessingML document in which all styles which are not stored in the document must not be marked as semi-hidden. This requirement would be specified using latent styles as follows:</p> <pre><w:latentStyles ... w:defUIPriority="10"> ... </w:latentStyles></pre> <p>The defUIPriority attribute specifies that all latent styles in the current document must have a uiPriority element setting of 10 by default. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
defUnhideWhenUsed (Default Hidden Until Used Setting)	<p>Specifies the default setting for the unhideWhenUsed element (§17.7.4.20) which shall be applied to any style made available by the hosting application which is not explicitly defined in the current document. This setting shall be overridden for every style for which a latent style exception (§17.7.4.8) exists.</p> <p>If this element is omitted, the default unhideWhenUsed state for all latent styles in the current document shall be false.</p> <p>[<i>Example:</i> Consider a WordprocessingML document in which all styles which are not stored in the document must be hidden until they are used in the document's contents. This requirement would be specified using latent styles as follows:</p> <pre><w:latentStyles ... w:defUnhideWhenUsed="true"> ... </w:latentStyles></pre> <p>The defUnhideWhenUsed attribute specifies that all latent styles in the current document must have a unhideWhenUsed element setting of true by default. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_LatentStyles](#)) is located in §A.1. *end note*]

17.7.4.6 [link \(Linked Style Reference\)](#)

This element specifies the pairing of styles which comprise a linked style. A *linked style* is a grouping of a paragraph style and character style which is used in a user interface to allow the same set of formatting properties to be applied:

- To the contents of one or more entire paragraphs (i.e. as a paragraph style)

- To the contents of one or more runs within a paragraph (i.e. as a character style)

Each style continues to exist independently in the file format as there is both a paragraph and character style present within the styles element (§17.7.4.18), however these two styles shall be merged into one and applied appropriately based on whether they are applied to run(s) or paragraph(s), by referencing the styleId attribute of the paired linked style via this element's val attribute.

A style element without a child link element is not part of a linked style pairing. If no style in the current document specifies the styleId present in the val attribute, then this element shall be ignored.

If a style with this styleId is present, then it shall be subject to the following restrictions:

- If the parent style is a table style, then this element shall be ignored.
- If the parent style is a paragraph style, then this element's val attribute must refer to a character style, or this element shall be ignored.
- If the parent style is a character style, then this element's val attribute must refer to a paragraph style, or this element shall be ignored.
- If the parent style is a numbering style, then this element shall be ignored.

[Example: Consider a linked style defined as follows in a WordprocessingML document:

```
<w:style w:type="paragraph" w:styleId="TestParagraphStyle">
  <w:link w:val="TestCharacterStyle"/>
  ...
</w:style>
<w:style w:type="character" w:styleId="TestCharacterStyle">
  <w:link w:val="TestParagraphStyle"/>
  ...
</w:style>
```

This pairing of a paragraph style and a character style are linked via the link element, which is used to reference the styleId of the paragraph style from the character style definition and vice versa. Because this pairing is permitted based on the rules above, the resulting combination must be used as a linked style, which appears as one style in an application, but uses the character and/or paragraph style as appropriate. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[Example: Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /></pre>

Attributes	Description
	<p data-bbox="456 247 581 279"></w:pPr></p> <p data-bbox="415 317 1409 348">The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p data-bbox="415 388 924 420">However, consider the following fragment:</p> <pre data-bbox="456 462 1078 590"> <w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr> </pre> <p data-bbox="415 632 1474 737">In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i></p> <p data-bbox="415 777 1341 840">The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_String](#)) is located in §A.1. *end note*]

17.7.4.7 locked (Style Cannot Be Applied)

This element specifies whether an application shall prevent the use of this style when this document is loaded and/or modified. If this element is set, then this style can be used to format existing content (i.e. any content which references this style shall have its properties as normal), but new instances of the style shall be prevented from being applied via all mechanisms associated with that application.

If this element is omitted, then the use of the style shall not be prevented by an application processing this document.

[Example: Consider a style with a primary name of Test Style which should be locked, and prevented from being added to any content in a given document. This requirement would be specified using the following WordprocessingML:

```

<w:style ... w:styleId="TestStyle">
  <w:name w:val="Test Style"/>
  <w:locked/>
  ...
</w:style>

```

The presence of the locked element specifies that new instances of the style must be prevented from being applied via all mechanisms associated with that application. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.7.4.8 **lsdException (Latent Style Exception)**

This element specifies the properties which shall be applied a single latent style for this document. *Latent styles* refer to any set of known style definitions which have not been included in the current document.

[*Example:* Consider a WordprocessingML document which contains text specified in one of two styles: `Heading1` or `Normal`. Based on this, the document only needs to store the formatting properties for those two styles, saving the additional overhead which would be required to save all of the styles supported by the hosting application.

However, if the `documentProtection` element (§17.15.1.29) specifies that the hosting application must prevent the use of any style whose `locked` element (§17.7.4.7) is set to `false`, then the locking state of all styles known to that application become useful and necessary to maintain the current state of the document. Using latent styles, this information can be stored without storing any formatting properties for those styles.

For example, if all styles which are not stored in the document must be locked except for the style with a primary name (§17.7.4.9) of `Heading 2`. This requirement would be specified using latent styles as follows:

```
<w:latentStyles ... w:defLockedState="true">
  <w:lsdException w:name="Heading 2" w:locked="false"/>
</w:latentStyles>
```

The `lsdException` element specifies that the latent style with a primary name of `Heading 2` must have a locked state setting of `false`. *end example]*

Attributes	Description
locked (Latent Style Locking Setting)	<p>Specifies the default setting for the locked element (§17.7.4.7) which shall be applied to the latent style with the matching style name value.</p> <p>If this element is omitted, the default locked state for this latent style shall be determined by the <code>defLockedState</code> attribute on the parent <code>latentStyles</code> element.</p> <p>[<i>Example:</i> Consider a WordprocessingML document in which all styles which are not stored in the document must be locked except for the <code>TestStyle</code> style. This requirement would be specified using latent styles as follows:</p> <pre><w:latentStyles ... w:defLockedState="true"> <w:lsdException w:name="TestStyle" w:locked="false"/> </w:latentStyles></pre> <p>The <code>locked</code> attribute on the latent style exception specifies that the <code>TestStyle</code> style must have a locked element setting of <code>false</code> by default. <i>end example]</i></p> <p>The possible values for this attribute are defined by the <code>ST_OnOff</code> simple type (§22.9.2.7).</p>
name (Primary Style Name)	<p>Specifies the primary name for the style which shall inherit this set of latent style property exceptions.</p>

Attributes	Description
	<p>If the current application does not know of an internal primary style with the current name, then this set of latent style exceptions can be ignored.</p> <p>[<i>Example:</i> Consider a WordprocessingML document in which all styles which are not stored in the document must be locked except for the TestStyle style. This requirement would be specified using latent styles as follows:</p> <pre><w:latentStyles ... w:defLockedState="true"> <w:lsdException w:name="TestStyle" w:locked="false"/> </w:latentStyles></pre> <p>The name attribute on the latent style exception specifies that the TestStyle style must have this set of latent style properties (if the application knows of a style with this name). <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
qFormat (Latent Style Primary Style Setting)	<p>Specifies the default setting for the qFormat element (§17.7.4.14) which shall be applied to the latent style with the matching style name value.</p> <p>If this element is omitted, the default qFormat state for this latent style shall be determined by the defQFormat attribute on the parent latentStyles element.</p> <p>[<i>Example:</i> Consider a WordprocessingML document in which all styles which are not stored in the document must not be primary styles except for the TestStyle style. This requirement would be specified using latent styles as follows:</p> <pre><w:latentStyles ... w:defQFormat="false"> <w:lsdException w:name="TestStyle" w:qFormat="true"/> </w:latentStyles></pre> <p>The qFormat attribute on the latent style exception specifies that the TestStyle style must have a qFormat element setting of true by default. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
semiHidden (Semi hidden text override)	<p>Specifies the default setting for the semiHidden element (§17.7.4.16) which shall be applied to the latent style with the matching style name value.</p> <p>If this element is omitted, the default semiHidden state for this latent style shall be determined by the defSemiHidden attribute on the parent latentStyles element.</p> <p>[<i>Example:</i> Consider a WordprocessingML document in which all styles which are not stored in the document must not be semi-hidden except for the TestStyle style. This requirement would be specified using latent styles as follows:</p>

Attributes	Description
	<pre><w:latentStyles ... w:defSemiHidden="false"> <w:lsdException w:name="TestStyle" w:semiHidden="true"/> </w:latentStyles></pre> <p>The semiHidden attribute on the latent style exception specifies that the TestStyle style must have a semiHidden element setting of true by default. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
uiPriority (Override default sorting order)	<p>Specifies the default setting for the uiPriority element (§17.7.4.19) which shall be applied to the latent style with the matching style name value.</p> <p>If this element is omitted, the default uiPriority state for this latent style shall be determined by the defUIPriority attribute on the parent latentStyles element.</p> <p>[<i>Example:</i> Consider a WordprocessingML document in which all styles which are not stored in the document must have a priority value of 10 except for the TestStyle style. This requirement would be specified using latent styles as follows:</p> <pre><w:latentStyles ... w:defUIPriority="10"> <w:lsdException w:name="TestStyle" w:uiPriority="25"/> </w:latentStyles></pre> <p>The uiPriority attribute on the latent style exception specifies that the TestStyle style must have a uiPriority element setting of 25 by default. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
unhideWhenUsed (Unhide when used)	<p>Specifies the default setting for the unhideWhenUsed element (§17.7.4.20) which shall be applied to the latent style with the matching style name value.</p> <p>If this element is omitted, the default unhideWhenUsed state for this latent style shall be determined by the defUnhideWhenUsed attribute on the parent latentStyles element.</p> <p>[<i>Example:</i> Consider a WordprocessingML document in which all styles are to be hidden until used except for the TestStyle style. This requirement would be specified using latent styles as follows:</p> <pre><w:latentStyles ... w:defUnhideWhenUsed="true"> <w:lsdException w:name="TestStyle" w:unhideWhenUsed="false"/> </w:latentStyles></pre> <p>The unhideWhenUsed attribute on the latent style exception specifies that the TestStyle style must have an unhideWhenUsed element setting of false by default. <i>end example]</i></p>

Attributes	Description
	The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).

[Note: The W3C XML Schema definition of this element's content model ([CT_LsdException](#)) is located in §A.1.
end note]

17.7.4.9 name (Primary Style Name)

This element specifies the primary name for the current style in the document. This name can be used in an application's user interface as desired. The actual primary name for this style is stored in its val attribute.

If present, the alternate style names (§17.7.4.1) shall be used in the user interface in place of the built-in name specified when the appropriate value is set in the stylePaneFormatFilter element (§17.15.1.85).

If this element is omitted, then the style shall not have a primary style name.

[Example: Consider a style with a primary name and two alternate names, defined using the name and aliases elements, as follows:

```
<w:style w:styleId="TestStyle" ... >
  <w:name w:val="GD20Complex"/>
  <w:aliases w:val="Regional Growth,Complex Growth"/>
  ...
</w:style>
```

This style specifies that it has the primary name GD20Complex using the name element. end example]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[Example: Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ...</pre>

Attributes	Description
	<p></w:sdtPr></p> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element’s content model (CT_String) is located in §A.1. *end note*]

17.7.4.10 next (Style For Next Paragraph)

This element specifies the style which shall automatically be applied to a new paragraph created following a paragraph with the parent paragraph style applied. [Note: This setting is typically used when the use of the current style is limited to one paragraph at most, and it would typically be undesirable to apply this style to following paragraphs - for example, a title style might specify that its following paragraphs must return to regular text formatting. *end note*]

If this element is specified on a style of any style type other than a paragraph style, this element shall be ignored. If no style whose styleId matches the val attribute of this element exists or that style is not a paragraph style, this element shall be ignored.

If this element is omitted, then the following paragraph shall use the same paragraph style as the current paragraph.

[Example: Consider a style defined as follows in a WordprocessingML document:

```
<w:style w:styleId="TestParagraphStyle" ... >
  <w:name w:val="Test Paragraph Style"/>
  <w:next w:val="AnotherParagraphStyle"/>
  <w:rPr>
    <w:b/>
  </w:rPr>
  ...
</w:style>
```

This style specifies via the use of the next element that the style for the next paragraph in the document must be the paragraph style whose styleId attribute value is AnotherParagraphStyle (if such a paragraph style exists). *end example*

Attributes	Description
val (String Value)	Specifies that its contents contain a string.

Attributes	Description
	<p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_String](#)) is located in §A.1. *end note*]

17.7.4.11 personal (E-Mail Message Text Style)

This element specifies that the parent style, when in use in the context of an e-mail message, was used by default to format all message text from one or more users. [*Note:* This setting does not provide any additional semantic about the style, but can be used in the context of e-mail to automatically reformat the contents of the e-mail message while ignoring any content to which styles were deliberately applied (since this style was implicitly applied to message text without user interaction). *end note*]

If this element is specified on a style of any style type other than a character style, this element shall be ignored. If no style whose styleId matches the val attribute of this element exists or that style is not a character style, this element shall be ignored.

If this element is omitted, then the current style shall not be considered a message text style in the context of e-mail messages.

[*Example:* Consider a style defined as follows in a WordprocessingML document:

```

<w:style w:styleId="EmailText" w:type="character" >
  <w:name w:val="EmailText"/>
  <w:personal w:val="true" />
  <w:rPr>
    ...
  </w:rPr>
</w:style>

```

This style specifies via the use of the `personal` element that this style is a style used to format message text in the context of e-mail. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.7.4.12 `personalCompose` (E-Mail Message Composition Style)

This element specifies that the parent style, when in use in the context of an e-mail message, can be used by default to format new message text within the e-mail message. [*Note*: This setting does not provide any additional semantic about the style, but can be used in the context of e-mail to automatically format the contents of new text in the e-mail message. *end note*]

If this element is specified on a style of any style type other than a character style, this element shall be ignored. If no style whose `styleId` matches the `val` attribute of this element exists or that style is not a character style, this element shall be ignored.

If this element is omitted, then the current style shall not be considered a message composition text style in the context of e-mail messages.

[*Example*: Consider a style defined as follows in a WordprocessingML document:

```

<w:style w:styleId="EmailText" w:type="character" >
  <w:name w:val="EmailText"/>
  <w:personalCompose w:val="true" />
  <w:rPr>
    ...
  </w:rPr>
</w:style>

```

This style specifies via the use of the `personalCompose` element that this style is a style used to format new message text in the context of e-mail. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.7.4.13 `personalReply` (E-Mail Message Reply Style)

This element specifies that the parent style, when in use in the context of an e-mail message, can be used by default to format existing message text within the e-mail message when a new reply is generated. [*Note*: This

setting does not provide any additional semantic about the style, but can be used in the context of e-mail to automatically format the contents of existing text in the e-mail message. *end note*]

If this element is specified on a style of any style type other than a character style, this element shall be ignored. If no style whose styleId matches the val attribute of this element exists or that style is not a character style, this element shall be ignored.

If this element is omitted, then the current style shall not be considered a message reply text style in the context of e-mail messages.

[*Example:* Consider a style defined as follows in a WordprocessingML document:

```
<w:style w:styleId="EmailText" w:type="character" >
  <w:name w:val="EmailText"/>
  <w:personalReply w:val="true" />
  <w:rPr>
    ...
  </w:rPr>
</w:style>
```

This style specifies via the use of the personalReply element that this style is a style used to format existing message text in the context of e-mail. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.7.4.14 qFormat (Primary Style)

This element specifies whether this style shall be treated as a primary style when this document is loaded by an application. If this element is set, then this style has been designated as being particularly important for the current document, and this information can be used by an application in any means desired. [*Note:* This setting does not imply any behavior for the style, only that the style is of particular significance for this document. *end note*]

If this element is omitted, then the style shall not be considered a primary style for this document.

[*Example:* Consider a style with a primary name of PrimaryStyleExample that should be treated as a primary style for the document. This requirement would be specified using the following WordprocessingML:

```
<w:style ... w:styleId="PStyle">
  <w:name w:val="PrimaryStyleExample"/>
  <w:qFormat/>
  ...
</w:style>
```

The qFormat element specifies that this style definition must be treated as a primary style for this document. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.7.4.15 rsid (Revision Identifier for Style Definition)

This element specifies a unique four digit number which shall be used to determine the editing session in which this style definition was last modified. This value shall follow this following constraint: All document elements which specify the same rsid* values shall correspond to changes made during the same editing session. An *editing session* is defined as the period of editing which takes place between any two subsequent save actions. [Note: This setting does not imply any behavior for the style, only that the style was last modified during one particular editing session. This information can be interpreted by an application in any manner desired. *end note*]

If this element is omitted, then no revision identifier shall be associated with the parent style definition.

[Example: Consider a style with a primary name of PrimaryStyleExample that is defined as follows:

```
<w:style ... w:styleId="PStyle">
  <w:name w:val="PrimaryStyleExample"/>
  <w:rsid w:val="3E412D01"/>
  ...
</w:style>
```

The rsid element specifies that this style definition was last edited in the editing session corresponding to the value 3E412D01. *end example*]

Attributes	Description
val (Long Hexadecimal Number Value)	<p>Specifies a number value specified as a four digit hexadecimal number), whose contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[Example: Consider the following value for an attribute of simple type ST_LongHexNumber: 00BE2C6C.</p> <p>This value is permitted, as it contains four hexadecimal digits, each an encoding of an octet of the actual decimal number value. It can therefore be interpreted as desired in the context of the parent XML element, <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_LongHexNumber](#)) is located in §A.1. *end note*]

17.7.4.16 semiHidden (Hide Style From Main User Interface)

This element specifies whether this style shall be hidden from the main user interface when this document is loaded by an application. If this element is set, then this style can be used to format content (i.e. any content

which references this style shall have its properties as normal), but the style shall be hidden from the main user interface associated with that application.

[*Note:* The interpretation of a "main" user interface must not be dictated by ECMA-376, and can be defined by an application as appropriate.

This setting is intended to define a style property which allows styles to be seen and modified in an advanced user interface, without exposing the style in a less advanced setting, for example, the style which is used to format the contents of a comment should typically not be shown in a simple user interface (as it is uncommon to want to modify it), but would be inappropriate to hide completely using the hidden element (§17.7.4.4), as very advanced users might want to change its appearance. *end note*]

If this element is omitted, then the style shall not be required to be hidden from the main user interface.

[*Example:* Consider a style with a primary name of `Comment Style` that should not be displayed in the main user interface. This requirement would be specified using the following WordprocessingML:

```
<w:style ... w:styleId="CStyle">
  <w:name w:val="Comment Style"/>
  <w:semiHidden/>
  ...
</w:style>
```

The `semiHidden` element specifies that this style definition should not be displayed in any main user interface associated with an application which processes this document. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.7.4.17 style (Style Definition)

This element specifies the definition of a single style within a WordprocessingML document. A *style* is a predefined set of table, numbering, paragraph, and/or character properties which can be applied to regions within a document.

The style definition for any style definition can be divided into three segments:

- General style properties
- Style type
- Style type-specific properties

General style properties refers to the set of properties which can be used regardless of the style type; for example, the style name, additional aliases for the style, a style ID (used by the document content to refer to the style), if style is hidden, if style is locked, etc.

[*Example:* Consider a style called `Heading 1` in a document as follows:

```

<w:style w:type="paragraph" w:styleId="Heading1">
  <w:name w:val="Heading 1"/>
  <w:basedOn w:val="Normal"/>
  <w:next w:val="Normal"/>
  <w:link w:val="Heading1Char"/>
  <w:uiPriority w:val="1"/>
  <w:qFormat/>
  <w:rsid w:val="00F303CE"/>
  ...
</w:style>

```

Above the formatting information specific to this style type are a set of general style properties which define information shared by all style types. *end example*

Style types refers to the property on a style which defines the type of style created with this style definition. WordprocessingML supports six types of style definitions by the values for the style definition's type attribute:

- Paragraph styles
- Character styles
- Linked styles (paragraph + character) [*Note*: Accomplished via the link element (§17.7.4.6). *end note*]
- Table styles
- Numbering styles
- Default paragraph + character properties

[*Example*: Consider a style called Heading 1 in a document as follows:

```

<w:style w:type="paragraph" w:styleId="Heading1">
  <w:name w:val="Heading 1"/>
  <w:basedOn w:val="Normal"/>
  <w:next w:val="Normal"/>
  <w:link w:val="Heading1Char"/>
  <w:uiPriority w:val="1"/>
  <w:qFormat/>
  <w:rsid w:val="00F303CE"/>
  ...
</w:style>

```

The type attribute has a value of paragraph, which indicates that the following style definition is a paragraph style. *end example*

Style type-specific properties refers to the payload of the style: its formatting information as well as any properties which apply only to that style type.

[*Example*: Consider a table style with primary name Normal Table defined as follows:


```

<w:style w:type="table" w:default="1" w:styleId="TableNormal">
  <w:name w:val="Normal Table"/>
  ...
  <w:tblPr>
    <w:tblInd w:w="0" w:type="dxa"/>
    <w:tblCellMar>
      <w:top w:w="0" w:type="dxa"/>
      <w:start w:w="108" w:type="dxa"/>
      <w:bottom w:w="0" w:type="dxa"/>
      <w:end w:w="108" w:type="dxa"/>
    </w:tblCellMar>
  </w:tblPr>
</w:style>

```

The `tblPr` element contains the formatting payload for this table style, which is only applicable to a table style. *end example]*

Attributes	Description
customStyle (User-Defined Style)	<p>Specifies that this style is a user-defined style (i.e. it is not a style which was automatically generated by an application). This setting (specifically a value of <code>true</code> or its equivalents) shall not allow the formatting associated with the style to be changed automatically by an application, but can be used to specify that if the associated style ID is known, certain user interface behaviors can be applied to its definition. <i>[Example: The style's primary name can be localized to match the current user interface language. end example]</i></p> <p>If this attribute is omitted, then the style shall be assumed to be a built-in style.</p> <p><i>[Example: Consider a paragraph style defined as follows:</i></p> <pre> <w:style w:type="paragraph" w:styleId="MyStyle" w:customStyle="true"> <w:name w:val="My Paragraph Style"/> <w:rPr> <w:b/> </w:rPr> </w:style> </pre> <p><i>This paragraph style specifies that it is a user-defined style using the customStyle attribute's value of true. An application can therefore take action on the style if it has behaviors associated with the style ID MyStyle. end example]</i></p> <p>The possible values for this attribute are defined by the <code>ST_OnOff</code> simple type (§22.9.2.7).</p>
default (Default Style)	<p>Specifies that this style is the default for this style type.</p> <p>This property is used in conjunction with the <code>type</code> attribute to determine the style which is applied to objects that do not explicitly declare a style. <i>[Example: The paragraph style</i></p>

Attributes	Description
	<p>with the default attribute set is the paragraph style applied to all paragraphs which do not explicitly reference a paragraph style using the pStyle element (§17.3.1.27). <i>end example</i></p> <p>If this attribute is not specified for any style, then no properties shall be applied to objects of the specified style type. If this attribute is specified by multiple styles, then the last instance of a style with this property shall be used.</p> <p>[<i>Example:</i> Consider a paragraph style defined as follows:</p> <pre> <w:style w:type="paragraph" w:default="1" w:styleId="MyStyle" > <w:name w:val="My Paragraph Style"/> <w:rPr> <w:b/> </w:rPr> </w:style> </pre> <p>This paragraph style specifies that it is the default paragraph style, and therefore all paragraphs which do not explicitly reference a paragraph style must have this style applied.</p> <p>For example, consider the following paragraphs from the same WordprocessingML document:</p> <pre> <w:p> <w:pPr> <w:pStyle w:val="Normal"/> </w:pPr> ... </w:p> <w:p> ... </w:p> </pre> <p>The contents of the first paragraph must have the Normal paragraph style applied to them, while the contents of the second paragraph must have the MyStyle paragraph style applied, since it does not explicitly reference a paragraph style and therefore inherits the default. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
styleId (Style ID)	<p>Specifies a unique identifier for the parent style definition. This identifier shall be used in multiple contexts to uniquely reference this style definition within the document.</p> <p>[<i>Example:</i> The following are examples of elements which reference a style via its styleId attribute value:</p> <ul style="list-style-type: none"> • To reference a style from content using elements like the pStyle element

Attributes	Description
	<p>(§17.3.1.27), rStyle element (§17.3.2.29), and the tblStyle element (§17.4.62) for paragraphs, runs, and tables, respectively.</p> <ul style="list-style-type: none"> • To link the paragraph and character versions of a style via the link element (§17.7.4.6) • To reference the parent style for style inheritance via the basedOn element (§17.7.4.3) <p><i>end example]</i></p> <p>If multiple style definitions each declare the same value for their styleId, then the first such instance shall keep its current identifier with all other instances being reassigned in any manner desired. This reassignment shall not require references to those style definitions to be 'repaired' in the content (i.e. some content might lose its style definition information, since the document was ill-formed).</p> <p>If this attribute is not specified, then a style ID can be assigned in any manner desired.</p> <p>[Example: Consider a paragraph style defined as follows:</p> <pre> <w:style w:type="paragraph" w:styleId="MyStyle" > <w:name w:val="My Paragraph Style"/> <w:rPr> <w:b/> </w:rPr> </w:style> </pre> <p>This paragraph style specifies that its style identifier must be MyStyle using the styleId attribute.</p> <p>Now consider the following paragraphs from the same WordprocessingML document:</p> <pre> <w:p> <w:pPr> <w:pStyle w:val="MyStyle"/> </w:pPr> ... </w:p> <w:p> ... </w:p> </pre> <p>The contents of the first paragraph must have the bold paragraph property applied to them because their paragraph properties specify that they must inherit the paragraph style whose styleId is MyStyle therefore inheriting its properties using the rules of the style hierarchy. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_String simple type</p>

Attributes	Description
	(§22.9.2.13).
type (Style Type)	<p>Specifies the type of style definition defined by this element. WordprocessingML supports six types of style definitions:</p> <ul style="list-style-type: none"> • Paragraph styles • Character styles • Table styles • Numbering styles • Linked styles (paragraph + character) • Default paragraph + character properties <p>Each of the first four style types corresponds to a different value in this attribute, and therefore defines the style type of the current style. [Note: The last two style types are unique in that they are not simply a style type: a linked style is a pairing of a character and paragraph style via the link element (§17.7.4.6); and the document default properties are defined via the docDefaults element (§17.7.5.1). <i>end note</i>]</p> <p>If this attribute is not specified, then the default value shall be assumed to be paragraph.</p> <p>[Example: Consider a style defined as follows:</p> <pre> <w:style w:type="paragraph" ... > <w:name w:val="My Paragraph Style"/> <w:rPr> <w:b/> </w:rPr> </w:style> </pre> <p>The type attribute value of paragraph specifies that this style definition creates a paragraph style. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_StyleType simple type (§17.18.83).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Style](#)) is located in §A.1. *end note*]

17.7.4.18 styles (Style Definitions)

This element specifies all of the style information stored in the WordprocessingML document: style definitions as well as latent style information.

[Example: The Normal paragraph style in a word processing document can have any number of formatting properties, e.g. font face = Times New Roman; font size = 12pt; paragraph justification = left). All paragraphs which reference this paragraph style would automatically inherit these properties. *end example*]

[Note: The W3C XML Schema definition of this element's content model ([CT_Styles](#)) is located in §A.1. *end note*]

17.7.4.19 uiPriority (Optional User Interface Sorting Order)

This element specifies a number which can be used to sort the set of style definitions in a user interface when this document is loaded by an application and the recommended setting is specified in the stylePaneSortMethod element (§17.15.1.86). If this element is set, then this priority shall be used to sort all available styles in ascending value order.

If this element is omitted, then the style shall not have an associated priority value and shall be sorted to the end of the list of style definitions (more or less equivalent to a priority value of infinity) when the recommended sort order setting is specified.

[*Example:* Consider a style with a primary name of Comment Style that should have an associated priority value of ten. This requirement would be specified using the following WordprocessingML:

```
<w:style ... w:styleId="CStyle">
  <w:name w:val="Comment Style"/>
  <w:uiPriority w:val="10"/>
  ...
</w:style>
```

The uiPriority element specifies that this style definition should be sorted into the list of styles using a value of 10 when the styles are listed in recommended order using the stylePaneSortMethod element (§17.15.1.86).
end example]

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <pre><... w:val="1512645511" /></pre> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DecimalNumber](#)) is located in §A.1.
end note]

17.7.4.20 `unhideWhenUsed` (Remove Semi-Hidden Property When Style Is Used)

This element specifies whether the `semiHidden` property (§17.7.4.16) shall be removed when this style is used by the content of the document. If this element is set, then an application shall ensure that even if the `semiHidden` element is specified on a style, that this property is removed when the document is resaved if the style is referenced by any content in the document.

If this element is omitted, then the style shall not automatically lose the semi-hidden property when it is used in the document contents.

[*Example:* Consider a style with a primary name of `Test Paragraph Style` that should not be displayed in the main user interface until it is used. This requirement would be specified using the following `WordprocessingML`:

```
<w:style ... w:styleId="TestStyle">
  <w:name w:val="Test Paragraph Style"/>
  <w:semiHidden/>
  <w:unhideWhenUsed/>
  ...
</w:style>
```

The `unhideWhenUsed` element specifies that this style definition should not be displayed in any main user interface associated with an application which processes this document until it is referenced by document content. If a paragraph was added to the document which referenced this style:

```
<w:p>
  <w:pPr>
    <w:pStyle w:val="TestStyle"/>
  </w:pPr>
  ...
</w:p>
```

This style is now referenced by the document's contents and would have the `semiHidden` element removed on save. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.7.5 Document Defaults

The first formatting information which is applied to all regions of text in a `WordprocessingML` document when that document is displayed is the document defaults. The document defaults specify the default set of properties which shall be inherited by every paragraph and run of text within all stories of the current `WordprocessingML` document. If no other formatting information was referenced by that text, these properties would solely define the formatting of the resulting text.

[*Example:* Consider the following fragment from the main document part of a `WordprocessingML` document:

```

<w:body>
  <w:p>
    <w:r>
      <w:t>Hello, world</w:t>
    </w:r>
  </w:p>
</w:body>

```

This paragraph and run of text both specify no formatting information (i.e. the paragraph and run possess neither a pPr element nor an rPr element respectively). Therefore, the only formatting applied to this text shall be the formatting in the document defaults which is applied to all paragraphs and runs in the document.

Note that this does not imply that these properties are only applied to text with no formatting - they are rather applied to all text before all other formatting (and in this case, there is no other formatting). *end example*

17.7.5.1 docDefaults (Document Default Paragraph and Run Properties)

This element specifies the set of default paragraph and run properties which shall be applied to every paragraph and run in the current WordprocessingML document. These properties are applied first in the style hierarchy; therefore they are superseded by any further conflicting formatting, but apply if no further formatting is present.

If this element is omitted, then the document defaults shall be application-defined by the hosting application.

[*Example:* Consider the following definition for the document defaults for a WordprocessingML document:

```

<w:docDefaults>
  <w:rPrDefault>
    <w:rPr>
      <w:b/>
    </w:rPr>
  </w:rPrDefault>
  <w:pPrDefault>
    <w:pPr>
      <w:jc w:val="center"/>
    </w:pPr>
  </w:pPrDefault>
</w:docDefaults>

```

The child elements of docDefaults specify a default paragraph property of centered text and a default run property of bold text. Applying this formatting to the following fragment from the main document part of the same document:

```

<w:body>
  <w:p>
    <w:r>
      <w:t>Hello, world</w:t>
    </w:r>
  </w:p>
</w:body>

```

This paragraph contains no formatting properties, therefore, using the style hierarchy the document default paragraph and run properties are applied as specified within the docDefaults element and the resulting paragraph is centered as specified in the jc element (§17.3.1.13) as well as bold as specified via the b element (§17.3.2.1). *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT DocDefaults](#)) is located in §A.1. *end note*]

17.7.5.2 pPr (Paragraph Properties)

This element specifies the set of paragraph properties which comprise the default paragraph properties for the current WordprocessingML document. [*Rationale*: The reason that a pPr element is present within the pPrDefault element is to allow for easy repurposing of any set of paragraph properties within a WordprocessingML document - since the paragraph properties are always child elements of a single pPr element, that element can simply be relocated in its entirety to the desired new location without additional modifications. *end rationale*]

If this element is omitted, then the default paragraph properties for the current document are non-existent (i.e. there are no default paragraph properties, and the defaults are therefore application-defined).

[*Example*: Consider the following definition for the document defaults for a WordprocessingML document:

```

<w:docDefaults>
  <w:pPrDefault>
    <w:pPr>
      <w:jc w:val="center"/>
    </w:pPr>
  </w:pPrDefault>
  ...
</w:docDefaults>

```

The pPr element as a child of the pPrDefault element contains the set of default paragraph properties for this document - in this case, a justification value of center. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT PPrGeneral](#)) is located in §A.1. *end note*]

17.7.5.3 pPrDefault (Default Paragraph Properties)

This element specifies the presence of a set of default paragraph properties for the current document. The actual paragraph properties are stored within the pPr child element of the current element.

If this element is omitted, then the default paragraph properties for the current document are non-existent (i.e. there are no default paragraph properties in the document, and the defaults are therefore application-defined).

[*Example*: Consider the following definition for the document defaults for a WordprocessingML document:

```
<w:docDefaults>
  <w:pPrDefault>
    <w:pPr>
      <w:jc w:val="center"/>
    </w:pPr>
  </w:pPrDefault>
  ...
</w:docDefaults>
```

The pPrDefault element is a container for the set of default paragraph properties for this document. *end example*]

[*Note*: The W3C XML Schema definition of this element's content model ([CT_PPrDefault](#)) is located in §A.1. *end note*]

17.7.5.4 rPr (Run Properties)

This element specifies the set of run properties which comprise the default run properties for the current WordprocessingML document. [*Rationale*: The reason that an rPr element is present within the rPrDefault element is to allow for easy repurposing of any set of run properties within a WordprocessingML document - since the run properties are always child elements of a single rPr element, that element can simply be relocated in its entirety to the desired new location without additional modifications. *end rationale*]

If this element is omitted, then the default run properties for the current document are non-existent (i.e. there are no default run properties, and the defaults are therefore application-defined).

[*Example*: Consider the following definition for the document defaults for a WordprocessingML document:

```
<w:docDefaults>
  ...
  <w:rPrDefault>
    <w:rPr>
      <w:b/>
    </w:rPr>
  </w:rPrDefault>
</w:docDefaults>
```

The rPr element as a child of the rPrDefault element contains the set of default run properties for this document - in this case, bold text. *end example*]

The W3C XML Schema definition of this element's content model ([CT_RPr](#)) is located in §A.1. Each child element from the above table shall not occur more than once. [*Note: This restriction is not reflected in the element's content model due to limitations of W3C XML Schema language.* *end note*]

17.7.5.5 rPrDefault (Default Run Properties)

This element specifies the presence of a set of default run properties for the current document. The actual run properties are stored within the rPr child element of the current element.

If this element is omitted, then the default run properties for the current document are non-existent (i.e. there are no default run properties in the document, and the defaults are therefore application-defined).

[*Example:* Consider the following definition for the document defaults for a WordprocessingML document:

```
<w:docDefaults>
...
  <w:rPrDefault>
    <w:rPr>
      <w:b/>
    </w:rPr>
  </w:rPrDefault>
</w:docDefaults>
```

The rPrDefault element is a container for the set of default run properties for this document. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_RPrDefault](#)) is located in §A.1. *end note*]

17.7.6 Table Styles

Table styles are style definitions which apply to the contents of zero or more tables within a document. This definition can imply that the style can only define table properties (properties which apply to the table and its constituent rows and cells), however a table style can also define paragraph properties (properties which apply to the positioning and appearance of paragraphs) as well as character properties (properties which apply to runs) for all of the paragraphs and runs within the specified table in the document.

Table styles can only be referenced by tables within a document, and they shall be referenced by the tblStyle element (§17.4.62) within a table's table properties.

As discussed above, table styles can specify all of the properties that can be applied to a table, as well as paragraph and character properties for the table's contents. However, unlike other style definitions, table styles allow for the definition of conditional formats for different regions of the table.

These table conditional formats are applied to different regions of the table as follows:

Top left cell	Header row	Top right cell
First column	Table body	Last column
Bottom left cell	Footer row	Bottom right cell

All rows in the table can also have conditional formatting on an alternating row/column basis as well as follows:

<i>Banded column</i>	<i>even column stripe</i>	<i>Banded column</i>	<i>even column stripe</i>	
				banded row
				even row stripe
				banded row
				even row stripe

When specified, these conditional formats shall be applied in the following order (therefore subsequent formats override properties on previous formats):

- Whole table
- Banded columns, even column banding
- Banded rows, even row banding
- First row, last row
- First column, last column

- Top left, top right, bottom left, bottom right

[Example: Consider a table style Test Table Style defined as follows:

- All cells with 1pt table borders on all sides
- 0.1" cell margins on left and right of cells
- 0" cell margins on top and bottom of cells

As well as header row specific formatting of

- Red shading
- Bold text

```
<w:style w:type="table" w:styleId="TestTableStyle">
  <w:name w:val="Test Table Style"/>
  <w:basedOn w:val="TableNormal"/>
  <w:uiPriority w:val="99"/>
  <w:rsid w:val="00340CC4"/>
  <w:tblPr>
    <w:tblBorders>
      <w:top w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:start w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:bottom w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:end w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:insideH w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:insideV w:val="single" w:sz="4" w:space="0" w:color="auto"/>
    </w:tblBorders>
    <w:tblCellMar>
      <w:top w:w="0" w:type="dxa"/>
      <w:start w:w="108" w:type="dxa"/>
      <w:bottom w:w="0" w:type="dxa"/>
      <w:end w:w="108" w:type="dxa"/>
    </w:tblCellMar>
  </w:tblPr>
  <w:tblStylePr w:type="firstRow">
    <w:rPr>
      <w:b/>
    </w:rPr>
    <w:tcPr>
      <w:shd w:val="clear" w:color="auto" w:fill="ED1C24"/>
    </w:tcPr>
  </w:tblStylePr>
</w:style>
```

The `tblPr` element holds the formatting which is applied to the entire table, and the `tblStylePr` element with a `type` attribute value of `firstRow` holds the formatting for the first table row, specifically the bold run property and red cell shading. *end example*]

An individual instance of a table defines an association with a table style using the `tblStyle` element in the table's properties (`tblPr`), as discussed above. However, individual tables can choose whether to apply the following aspects of the table's conditional formats individually:

- First row
- Last row
- First column
- Last column
- Row banding
- Column banding

The use or omission of conditional formats shall be specified using the `tblLook` element, which contains a number of attributes that indicate which properties are applied and omitted.

[*Example:* Consider two tables using the table style `Style2`; one which specifies that it should only use the header row and footer row conditional formatting properties from the table style, and the other which specifies that it should use the header row, footer row, and banded row conditional formatting:

```
<w:tbl>
  <w:tblPr>
    <w:tblStyle w:val="Style2"/>
    <w:tblW w:w="0" w:type="auto"/>
    <w:tblLook w:firstRow="true" w:lastRow="true"
      w:noHBand="true" w:noVBand="true" />
  </w:tblPr>
  ...
</w:tbl>
...
<w:tbl>
  <w:tblPr>
    <w:tblStyle w:val="Style2"/>
    <w:tblW w:w="0" w:type="auto"/>
    <w:tblLook w:firstRow="true" w:lastRow="true"
      w:noVBand="true" />
  </w:tblPr>
  ...
</w:tbl>
```

The tables each specify the appropriate set of conditional formats using the `tblLook` element, as seen by the identical table styles in the `tblStyle` element, and different `tblLook` values. *end example*]

17.7.6.1 pPr (Table Style Conditional Formatting Paragraph Properties)

This element specifies the set of paragraph properties which shall be applied to all paragraphs within a table which match the conditional formatting type specified on the parent `tblStylePr` element. These properties are applied in the order specified via the style hierarchy.

[*Example:* Consider a table style which contains conditional formatting for its `firstRow`, defined as follows:

```
<w:style w:type="table" w:styleId="exampleTableStyle">
...
<w:tblStylePr w:type="firstRow">
  <w:pPr>
    <w:jc w:val="center"/>
  </w:pPr>
...
</w:tblStylePr>
</w:style>
```

The `pPr` element specified within the `tblStylePr` element specifies the set of paragraph properties which must be applied to all parts of the table which meet the criteria specified by the type value of `firstRow` - all of the header rows of the table. In this example, the single paragraph property applied is an alignment value of center via the `jc` element (§17.3.1.13). *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_PPrGeneral](#)) is located in §A.1. *end note*]

17.7.6.2 rPr (Table Style Conditional Formatting Run Properties)

This element specifies the set of run properties which shall be applied to all runs within a table which match the conditional formatting type specified on the parent `tblStylePr` element. These properties are applied in the order specified via the style hierarchy.

[*Example:* Consider a table style which contains conditional formatting for its `firstRow`, defined as follows:

```
<w:style w:type="table" w:styleId="exampleTableStyle">
...
<w:tblStylePr w:type="firstRow">
  <w:rPr>
    <w:i/>
  </w:rPr>
...
</w:tblStylePr>
</w:style>
```

The `rPr` element specified within the `tblStylePr` element specifies the set of run properties which must be applied to all parts of the table which meet the criteria specified by the type value of `firstRow` - all of the

header rows of the table. In this example, the single run property applied is italics via the `i` element (§17.3.2.16). *end example*

The W3C XML Schema definition of this element's content model (`CT_RPr`) is located in §A.1. Each child element from the above table shall not occur more than once. [*Note: This restriction is not reflected in the element's content model due to limitations of W3C XML Schema language.* *end note*]

17.7.6.3 `tblPr` (Table Style Conditional Formatting Table Properties)

This element specifies the set of table properties which shall be applied to all regions within a table which match the conditional formatting type specified on the parent `tblStylePr` element. These properties are applied in the order specified via the style hierarchy.

If the current conditional formatting type does not consist of one or more full table rows, then table properties which cannot be applied to a single cell or column [*Example: Table justification.* *end example*] can be ignored.

[*Example: Consider a table style which contains conditional formatting for its `firstRow`, defined as follows:*

```
<w:style w:type="table" w:styleId="exampleTableStyle">
...
<w:tblStylePr w:type="firstRow">
  <w:tblPr>
    <w:tblCellSpacing w:w="29" w:type="dxa"/>
  </w:tblPr>
...
</w:tblStylePr>
</w:style>
```

The `tblPr` element specified within the `tblStylePr` element specifies the set of table properties which must be applied to all parts of the table which meet the criteria specified by the type value of `firstRow` - all of the header rows of the table. In this example, the single table property applied is a default table cell spacing value of 0.02 inches via the `tblCellSpacing` element (§17.4.45). *end example*

[*Note: The W3C XML Schema definition of this element's content model (`CT_TblPrBase`) is located in §A.1.* *end note*]

17.7.6.4 `tblPr` (Style Table Properties)

This element specifies the set of table properties which shall be applied to the table. These properties are not conditional and shall always be applied (although they are applied before all conditional formatting properties).

[*Example: Consider a table style defined as follows:*

```
<w:style w:type="table" w:styleId="exampleTableStyle">
  <w:tblPr>
    <w:tblCellSpacing w:w="15" w:type="dxa"/>
  </w:tblPr>
```

```
...
<w:tblStylePr w:type="firstRow">-
  <w:tblPr>
    <w:tblCellSpacing w:w="29" w:type="dxa"/>
  </w:tblPr>
...
</w:tblStylePr>
</w:style>
```

The tblPr element specified within the style element specifies the set of table properties which must be applied to all parts of the table. In this example, the single table property applied is a default table cell spacing value of 0.01 inches via the tblCellSpacing element (§17.4.45). *end example*]

[Note: The W3C XML Schema definition of this element’s content model ([CT_TblPrBase](#)) is located in §A.1. *end note*]

17.7.6.5 **tblStyleColBandSize (Number of Columns in Column Band)**

This element specifies the number of columns which shall comprise each a table style column band for this table style. This element determines how many columns constitute each of the column bands for the current table, allowing column band formatting to be applied to groups of columns (rather than just single alternating columns) when the table is formatted.

If this element is omitted, then the default number of columns in a single column band shall be assumed to be 1.

[Example: Consider a table style defined as follows:

```
<w:style w:type="table" w:styleId="exampleTableStyle">
  <w:tblPr>
    <w:tblStyleRowBandSize w:val="3" />
    <w:tblStyleColBandSize w:val="2" />
  </w:tblPr>
...
</w:style>
```

The tblStyleColBandSize element specifies that the width of each column band must be 2 columns - therefore band1Vert column banding conditional formatting must be applied to columns 1 and 2, 5 and 6, etc. in the table. *end example*]

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[Example: Consider the following numeric WordprocessingML property of simple type</p>

Attributes	Description
	<p>ST_DecimalNumber:</p> <p><... w:val="1512645511" /></p> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

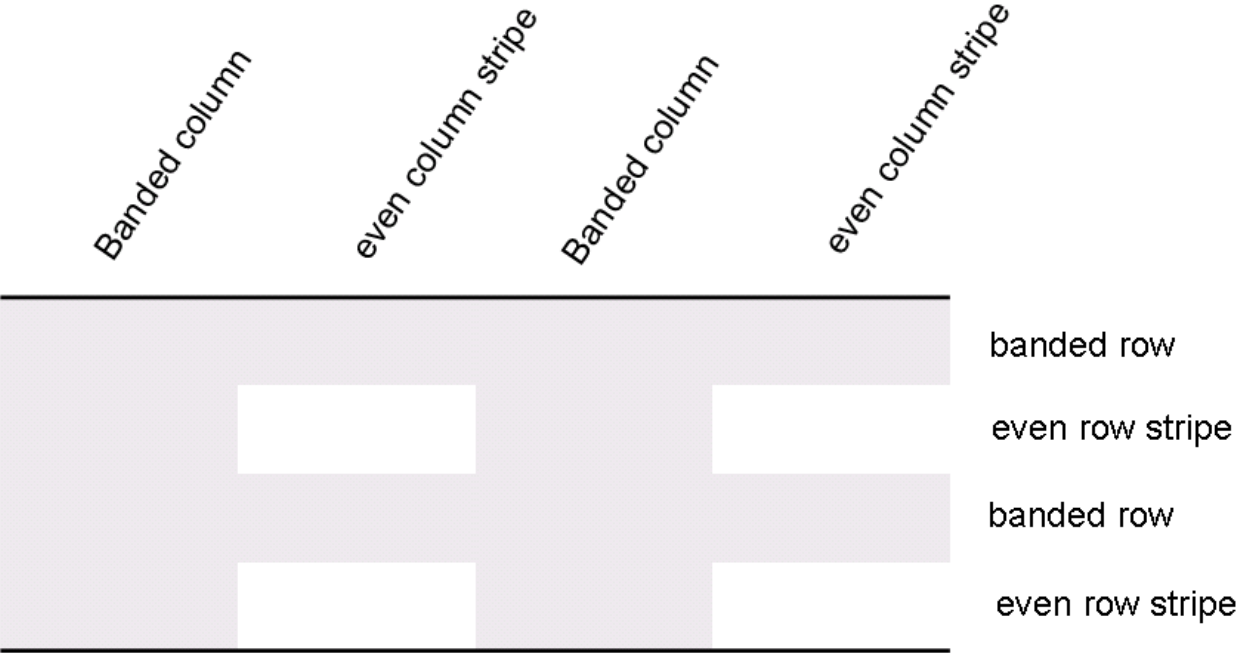
[Note: The W3C XML Schema definition of this element's content model ([CT_DecimalNumber](#)) is located in §A.1. *end note*]

17.7.6.6 **tblStylePr** (Style Conditional Table Formatting Properties)

This element specifies a set of formatting properties which shall be conditionally applied to the parts of a table which match the requirement specified on the `type` attribute. These table conditional formats are applied to different regions of the table as follows:

Top left cell	Header row	Top right cell
First column	Table body	Last column
Bottom left cell	Footer row	Bottom right cell

All rows in the table can also have conditional formatting on an alternating row/column basis as well as follows:



When specified, these conditional formats shall be applied in the following order (therefore subsequent formats override properties on previous formats):

- Whole table
- Banded columns, even column banding
- Banded rows, even row banding
- First row, last row
- First column, last column
- Top left, top right, bottom left, bottom right

[*Example:* Consider a table style which contains conditional formatting, defined as follows:

```
<w:style w:type="table" w:styleId="exampleTableStyle">
  ...
  <w:tblStylePr w:type="firstRow">
    <w:tblPr>
      <w:tblCellSpacing w:w="29" w:type="dxa"/>
    </w:tblPr>
  ...
</w:tblStylePr>
</w:style>
```

The `tblStylePr` element specifies a set of table properties which must be conditionally applied to all parts of the table which meet the criteria specified by the `type` attribute (in this case, all heading rows for the current table).
end example]

Attributes	Description
type (Table Style Conditional Formatting Type)	<p>Specifies the section of the table to which the current conditional formatting properties shall be applied.</p> <p>[<i>Example:</i> Consider a table style which contains conditional formatting, defined as follows:</p> <pre><w:style w:type="table" ...> ... <w:tblStylePr w:type="lastRow"> ... </w:tblStylePr> </w:style></pre> <p>The type attribute value of lastRow specifies that this set of conditional formatting properties must be applied to the last row of the table only. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TblStyleOverrideType simple type (§17.18.89).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TblStylePr](#)) is located in §A.1. *end note*]

17.7.6.7 [tblStyleRowBandSize](#) (Number of Rows in Row Band)

This element specifies the number of rows which shall comprise each a table style row band for this table style. This element determines how many rows constitute each of the row bands for the current table, allowing row band formatting to be applied to groups of rows (rather than just single alternating rows) when the table is formatted.

If this element is omitted, then the default number of rows in a single row band shall be assumed to be 1.

[*Example:* Consider a table style defined as follows:

```
<w:style w:type="table" w:styleId="exampleTableStyle">
  <w:tblPr>
    <w:tblStyleRowBandSize w:val="3" />
    <w:tblStyleColBandSize w:val="2" />
  </w:tblPr>
  ...
</w:style>
```

The `tblStyleRowBandSize` element specifies that the width of each row band must be 3 columns - therefore `band1Horiz` row banding conditional formatting must be applied to row 1 through 3, 7 through 9, etc. in the table. *end example*]

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <pre><... w:val="1512645511" /></pre> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_DecimalNumber](#)) is located in §A.1. *end note*]

17.7.6.8 tcPr (Table Style Conditional Formatting Table Cell Properties)

This element specifies the set of table cell properties which shall be applied to all regions within a table which match the conditional formatting type specified on the parent tblStylePr element. These properties are applied in the order specified via the style hierarchy.

[*Example:* Consider a table style which contains conditional formatting for its firstRow, defined as follows:

```
<w:style w:type="table" w:styleId="exampleTableStyle">
...
<w:tblStylePr w:type="firstRow">
  <w:tcPr>
    <w:tcBorders>
      <w:top w:val="nil" />
      <w:start w:val="nil" />
      <w:bottom w:val="nil" />
      <w:end w:val="nil" />
      <w:insideH w:val="nil" />
      <w:insideV w:val="nil" />
    </w:tcBorders>
  </w:tcPr>
...
</w:tblStylePr>
</w:style>
```

The `tcPr` element specified within the `tblStylePr` element specifies the set of table cell properties which must be applied to all parts of the table which meet the criteria specified by the type value of `firstRow` - all of the header rows of the table. In this example, the single table cell property applied is a set of table cell borders via the `tcBorders` element (§17.4.66). In this case, these cell borders simply reset any previous cell borders to `nil`. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_TcPr](#)) is located in §A.1. *end note*]

17.7.6.9 `tcPr` (Style Table Cell Properties)

This element specifies the set of table cell properties which shall be applied to the table. These properties are not conditional and shall always be applied (although they are applied before all conditional formatting properties).

[Example: Consider a table style defined as follows:

```
<w:style w:type="table" w:styleId="exampleTableStyle">
  <w:tcPr>
    <w:tcFitText/>
  </w:tcPr>
</w:style>
```

The `tcPr` element specified within the `style` element specifies the set of table cell properties which must be applied to all parts of the table. In this example, the single table cell property applied is the fit text setting via the `tcFitText` element (§17.4.67). *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_TcPr](#)) is located in §A.1. *end note*]

17.7.6.10 `trPr` (Table Style Conditional Formatting Table Row Properties)

This element specifies the set of table row properties which shall be applied to all rows within a table which match the conditional formatting type specified on the parent `tblStylePr` element. These properties are applied in the order specified via the style hierarchy.

[Example: Consider a table style which contains conditional formatting for its `firstRow`, defined as follows:

```
<w:style w:type="table" w:styleId="exampleTableStyle">
  ...
  <w:tblStylePr w:type="firstRow">
    <w:trPr>
      <w:tblHeader/>
      <w:cantSplit/>
    </w:trPr>
    ...
  </w:tblStylePr>
</w:style>
```

The trPr element specified within the tblStylePr element specifies the set of table row properties which must be applied to all rows of the table which meet the criteria specified by the type value of firstRow - all of the header rows of the table. In this example, the table row properties applied are the fact that these rows must be repeated on each page via the tblHeader element (§17.4.49) and the fact that these rows must not be split across pages using the cantSplit element (§17.4.6). *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_TrPr](#)) is located in §A.1. *end note*]

17.7.6.11 trPr (Style Table Row Properties)

This element specifies the set of table row properties which shall be applied to the table. These properties are not conditional and shall always be applied (although they are applied before all conditional formatting properties).

[Example: Consider a table style defined as follows:

```
<w:style w:type="table" w:styleId="exampleTableStyle">
  <w:trPr>
    <w:jc w:val="center"/>
  </w:trPr>
</w:style>
```

The trPr element specified within the style element specifies the set of table row properties which must be applied to all parts of the table. In this example, the single table row property applied is the alignment setting of center via the jc element (§17.4.27). *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_TrPr](#)) is located in §A.1. *end note*]

17.7.7 Numbering Styles

Numbering styles are style definitions which specify common style properties for a multi-level numbering format within a document. This means that a numbering style defines only a single paragraph property: a reference to a numbering definition stored in the document's numbering part, using the numPr element.

Unlike paragraph and character styles, numbering styles are never directly referenced by content in the document – instead, an abstract numbering definition (covered in the numbering section) specifies that it is actually the underlying numbering information for a numbering style.

[Example: Consider a numbering style “Test Numbering Style”:

```
<w:style w:type="numbering" w:styleId="TestNumberingStyle">
  <w:name w:val="Test Numbering Style" />
  <w:uiPriority w:val="99" />
  <w:rsid w:val="0045009F" />
  <w:pPr>
    <w:numPr>
      <w:numId w:val="1" />
    </w:numPr>
  </w:pPr>
```

```

    </w:numPr>
  </w:pPr>
</w:style>

```

The only information specified in the numbering style definition is a reference to the numbering definition for the numbering information which is defined by this numbering style. *end example*]

17.7.8 Paragraph Styles

Paragraph styles are styles which apply to the contents of an entire paragraph as well as the paragraph mark. This definition implies that the style can define both character properties (properties which apply to text within the document) as well as paragraph properties (properties which apply to the positioning and appearance of the paragraph). Paragraph styles cannot be referenced by runs within a document; they shall be referenced by the pStyle element (§17.3.1.27) within a paragraph's paragraph properties element.

A paragraph style has three defining style type-specific characteristics:

- The type attribute on the style has a value of *paragraph*, which indicates that the following style definition is a paragraph style.
- The next element defines an editing behavior which supplies the paragraph style to be automatically applied to the next paragraph when ENTER is pressed at the end of a paragraph of this style.
- The style specifies both paragraph-level and character-level properties using the pPr and rPr elements, respectively. In this case, the run properties are the set of properties applied to each run in the paragraph.

The paragraph style is then applied to paragraphs by referencing the styleId attribute value for this style in the paragraph properties' pStyle element.

[*Example:* Consider a paragraph style titled "Test Paragraph Style" which defines; font = Algerian, font size = 20; font color = red; paragraph spacing = double; paragraph indent = 1" (first line only). The resulting style definition would be:

```

<w:style w:type="paragraph" w:styleId="TestParagraphStyle">
  <w:name w:val="Test Paragraph Style"/>
  <w:qFormat/>
  <w:rsid w:val="00F85845"/>
  <w:pPr>
    <w:spacing w:line="480" w:lineRule="auto"/>
    <w:ind w:firstLine="1440"/>
  </w:pPr>
  <w:rPr>
    <w:rFonts w:ascii="Algerian" w:hAnsi="Algerian"/>
    <w:color w:val="ED1C24"/>
    <w:sz w:val="40"/>
  </w:rPr>
</w:style>

```

Notice that the character properties for the style are under the rPr element, and the paragraph properties are under the pPr element.

The document content for a paragraph of this style would be:

```

<w:p>
  <w:pPr>
    <w:pStyle w:val="TestParagraphStyle"/>
  </w:pPr>
  <w:r>
    <w:t xml:space="preserve">Here is some fancy Text</w:t>
  </w:r>
</w:p>

```

The pStyle element links the paragraph with the style definition. *end example*]

17.7.8.1 Numbering in Paragraph Styles

When a paragraph style references a numbering definition and level which shall also be applied, that reference shall be done in a way slightly different from the typical numbering reference as follows:

- When a numbering reference is created as direct formatting, that reference consists of a reference to the numbering definition instance + a numbering level

[*Example*: Consider a numbered paragraph in a WordprocessingML document whose numbering is a result of direct formatting (formatting not from a style). This numbered paragraph might be represented using the following WordprocessingML:


```

<w:p>
  <w:pPr>
    <w:numPr>
      <w:ilvl w:val="0" />
      <w:numId w:val="5" />
    </w:numPr>
  </w:pPr>
  <w:r>
    <w:t>Level one</w:t>
  </w:r>
</w:p>

```

The numPr element contains two pieces of information:

- The numId element (the numbering definition instance referenced)
- The ilvl element (the level within that numbering definition)

end example]

- When numbering is done as part of a paragraph style, that reference consists of a reference to the numbering definition only. The numbering definition then in turn has a reference to the paragraph style on the level which shall be associated with this style

[*Example:* Consider a numbered paragraph in a WordprocessingML document whose numbering is a result of a paragraph style. This numbered paragraph might be represented using the following WordprocessingML:

```

<w:p>
  <w:pPr>
    <w:pStyle w:val="TestParagraphStyle"/>
  </w:pPr>
  <w:r>
    <w:t>Level one</w:t>
  </w:r>
</w:p>

```

The paragraph references the style via its styleId attribute, which itself looks like this:

```

<w:style w:styleId="TestParagraphStyle" ... >
  <w:pPr>
    <w:numPr>
      <w:numId w:val="5" />
    </w:numPr>
  </w:pPr>
</w:style>

```

The numPr element contains one piece of information:

- The numId element (the numbering definition instance referenced)

Obviously, this is insufficient to apply the numbering since we need to know which level to apply, so this information is specified on the appropriate level using the pStyle element:

```
<w:abstractNum w:abstractNumId="1">
...
<w:lvl w:ilvl="0">
...
<w:pStyle w:val="TestParagraphStyle" />
<w:pPr>
  <w:tabs>
    <w:tab w:val="num" w:pos="720" />
  </w:tabs>
  <w:ind w:start="720" w:hanging="360" />
</w:pPr>
...
</w:lvl>
</w:abstractNum>
```

In this case, level 0 of the underlying abstract numbering definition specifies that it is associated with paragraph style TestParagraphStyle, so this level of the numbering must be applied along with the paragraph style. *end example]*

When numbering is referenced by a paragraph style, its properties shall be applied before the style's properties (the style's paragraph properties shall override the numbering level's paragraph properties).

17.7.8.2 pPr (Style Paragraph Properties)

This element specifies the set of paragraph properties which shall be applied to the paragraph.

[*Example:* Consider a paragraph style defined as follows:

```
<w:style w:type="paragraph" w:styleId="TestParaStyle">
  <w:pPr>
    <w:keepLines/>
  </w:pPr>
</w:style>
```

The pPr element specified within the style element specifies the set of paragraph properties which must be applied to the referencing paragraph. In this example, the single paragraph property applied is the fact that the paragraph must be displayed on a single page via the keepLines element (§17.3.1.14). *end example]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_PPrGeneral](#)) is located in §A.1. *end note]*

17.7.9 Run (Character) Styles

Character styles are styles which apply to the contents of one or more runs of text within a document's contents. This definition implies that the style can only define character properties (properties which apply to text within a paragraph) because it cannot be applied to paragraphs. Character styles can only be referenced by runs within a document, and they shall be referenced by the `rStyle` element within a run's run properties element.

A character style has two defining style type-specific characteristics:

- The type attribute on the style has a value of `character`, which indicates that the following style definition is a character style.
- The style specifies only character-level properties using the `rPr` element. In this case, the run properties are the set of properties applied to each run which is of this style.

The character style is then applied to runs by referencing the `styleId` attribute value for this style in the run properties' `rStyle` element.

[*Example:* Consider a character style titled "Test Character Style" which defines; font = Courier New, font color = yellow; underline. The resulting style definition would be:

```
<w:style w:type="character" w:styleId="TestCharacterStyle">
  <w:name w:val="Test Character Style"/>
  <w:uiPriority w:val="99"/>
  <w:qFormat/>
  <w:rsid w:val="00E77BF0"/>
  <w:rPr>
    <w:rFonts w:ascii="Courier New" w:hAnsi="Courier New"/>
    <w:color w:val="FFF200"/>
    <w:u w:val="single"/>
  </w:rPr>
</w:style>
```

Notice that the character properties applied using this style are under the `rPr` element. The document content for a paragraph with a run of this style would be:

```

<w:p>
  <w:r>
    <w:t xml:space="preserve">The following text is in the </w:t>
  </w:r>
  <w:r>
    <w:rPr>
      <w:rStyle w:val="TestCharacterStyle"/>
    </w:rPr>
    <w:t>character style</w:t>
  </w:r>
  <w:r>
    <w:t>.</w:t>
  </w:r>
</w:p>

```

The rStyle element in the second run links that run with the style definition, inheriting the formatting properties for that run. *end example*

17.7.9.1 rPr (Run Properties)

This element specifies the set of run properties which shall be applied to the run.

[*Example:* Consider a character style defined as follows:

```

<w:style w:type="character" w:styleId="TestCharStyle">
  <w:rPr>
    <w:dstrike/>
  </w:rPr>
</w:style>

```

The rPr element specified within the style element specifies the set of run properties which must be applied to the referencing run. In this example, the single run property applied is the fact that the paragraph must be displayed with double strikethrough via the dstrike element (§17.3.2.9). *end example*

The W3C XML Schema definition of this element's content model ([CT_RPr](#)) is located in §A.1. Each child element from the above table shall not occur more than once. [*Note:* This restriction is not reflected in the element's content model due to limitations of W3C XML Schema language.*end note*]

17.8 Fonts

The next component of a WordprocessingML document is storing information about the fonts used in the document. WordprocessingML stores two pieces of information about fonts:

- (optionally) Information about the font to enable font substitution. *Font substitution* is a process by which an application, when it cannot locate a specific font, attempts to locate the closest possible match to the intended appearance of the font

- (optionally) One or more embedded forms of the font for use on systems which do not have access to the font. When fonts are embedded, they are obfuscated to ensure that they are only used to view the contents of the document in which they are embedded, and for no other purpose.

[Example: Consider the following information stored in a document's font table part:

```
<w:fonts>
  <w:font w:name="Times New Roman">
    <w:panose1 w:val="02020603050405020304" />
    <w:charset w:val="00" />
    <w:family w:val="roman" />
    <w:pitch w:val="variable" />
    <w:sig w:usb0="20002A87" w:usb1="80000000" w:usb2="00000008"
w:usb3="00000000" w:csb0="000001FF" w:csb1="00000000" />
    <w:embedRegular r:id="rId10" w:fontKey="{302EE813-EB4A-4642-A93A-
89EF99B2457E}" />
  </w:font>
</w:fonts>
```

The font table contains information about the Times New Roman font; specifically, information used to locate a substitute font when it is not available and a relationship to the embedded form of the regular form of the font. *end example]*

17.8.1 Font Embedding

Within a WordprocessingML document, *font embedding* refers to a process in which the some or all of the fonts used in the current document are included in that document such that it can be guaranteed that they are available for use when the document is subsequently opened.

Embedded fonts are stored in an Embedded Font part within the package.

When a font is embedded within a WordprocessingML document, it shall be obfuscated to prevent it from being used outside of this document. This obfuscation shall be done using the following algorithm:

- Generate a GUID, which is used and stored as the obfuscation key
- Reverse the order of the bytes in the GUID (i.e. Big Endian ordering)
- XOR the value with the first 32 bytes of the binary: once against 0-15, once against 16-31
- Store the resulting file in the document, and store the obfuscation key in the fontKey attribute

[Example: Consider a font to be embedded whose first 32 bytes are as follows:

00	01	00	00	00	12	01	00	00	04	00	20	44	53	49	47
A3	0E	BF	F3	00	01	36	8C	00	00	14	DC	4C	54	53	48

To obfuscate this font for storage:

- Generate a GUID (e.g. 001B70DC-AA60-4AD5-90EC-18A0948E1EAE)
- Reverse its order (e.g. AE1E8E94-A018-EC90-D54A-60AADC701B00)
- XOR the GUID with the first and second 16 bytes

The resulting 32 bytes would be:

AE	1F	8E	94	A0	0A	ED	90	D5	4E	60	8A	98	23	52	47
0D	10	31	67	A0	19	DA	1C	D5	4A	74	76	90	24	48	48

end example]

To retrieve an obfuscated font for viewing the content of this document only, repeat the procedure above to retrieve the original font.

17.8.2 Font Substitution

The rFonts element (§17.3.2.26) references the font which is applied to each run of text within a WordprocessingML document. However, based on the availability of these fonts (for example, the use of a custom font), an application might not be able to locate the specified font. The process of finding a suitable alternative font is known as *font substitution*.

The exact algorithm which is used for font substitution is highly dependent on the characteristics which are most desirable when performing the substitution: similar appearance of each glyph (to maximize visual familiarity), similar physical characteristics (to minimize changes in line height and breaking), etc. ECMA-376 recommends that applications looking for the closest match to the following pieces of information (in descending priority) in order to determine a suitable alternative font; however, applications are free to apply more sophisticated logic in its place:

- sig (§17.8.3.16)
- charset (§17.8.3.2)
- panose1 (§17.8.3.13)
- pitch (§17.8.3.14)
- family (§17.8.3.9)
- altName (§17.8.3.1)
- notTrueType (§17.8.3.12)

17.8.3 Elements

The following elements comprise the content of the font table:

17.8.3.1 altName (Alternate Names for Font)

This element specifies a set of alternative names which can be used to locate the font specified by the parent element. This set of alternative names is stored in a comma-delimited list, with all adjacent commas ignored (i.e. a value of Name A, Name B is equivalent to Name A,,,,,,, Name B).

When an application cannot locate a font using the primary name stored on the font attribute of the font element (§17.8.3.10), it should use each alternate name in term to attempt to locate the font, and use the first font for which is locates a match.

Font names stored using this element shall be specified in the encoding specified by the Fonts part in its XML declaration; the name of the font will be interpreted by the XML parser. [Note: UTF-8 is not supported for font names within OpenType fonts, and is not always supported for file names in file systems. For example, older Japanese versions of Microsoft Windows use Windows-31J for filenames. To use extant font names in the values of this attribute, they should be converted to the character encoding appropriate for this standard and copying raw byte sequences from font files should be avoided. *end note*]

If this element is omitted, then no alternate names are present for the parent font.

[Example: Consider the following information stored for a single font:

```
<w:font w:name="SimSun">
  <w:altName w:val="Arial Unicode MS" />
  ...
</w:font>
```

The altName element specifies that when no font with a name of SimSun (the primary font name) can be located, that applications should attempt to locate a font with the name Arial Unicode MS before doing substitution based on the font metrics. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[Example: Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the val attribute is the caption of the nearest</p>

Attributes	Description
	<p>ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_String](#)) is located in §A.1. *end note*]

17.8.3.2 charset (Character Set Supported By Font)

This element specifies the character set which is supported by the parent font. This information can be used as defined in font substitution logic to locate an appropriate substitute font when this font is not available. This information is determined by querying the font when present and shall not be modified when the font is not available.

If this element is not present, then the character set for this font shall be assumed to be the ISO/IEC 8859-1 character set.

[Example: Consider the following information stored for a single font:

```
<w:font w:name="SimSun">
  <w:charset w:characterSet="GBK" />
  ...
</w:font>
```

The charset element specifies via its characterSet attribute value of GBK that this font uses the GBK character set. *end example*

Attributes	Description
characterSet (IANA Name of Character Set)	<p>Name of the character set associated with the font. The values allowed by this attribute are defined by the names and aliases listed in the IANA registration table.</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Charset](#)) is located in §A.1. *end note*]

17.8.3.3 embedBold (Bold Style Font Style Embedding)

This element specifies information about the embedded font storage for the bold form of a font, when it is embedded. This form is used when bold is applied to a text run.

If this element is omitted, then no bold form of the font is stored in the document. The relationship targeted by the `id` attribute shall be of the embedded font type, or the document shall be considered to be non-conformant.

[*Example:* Consider a WordprocessingML document in which the Arial font has been embedded in the file. This status would be specified using the following WordprocessingML:

```
<w:font w:name="Arial">
...
<w:embedBold r:id="rId10" />
</w:font>
```

The `embedBold` element specifies that the embedded font targeted with the relationship with ID `rId10` can be used to retrieve the bold form of the embedded Arial font. *end example*]

Attributes	Description
fontKey (Embedded Font Obfuscation Key)	<p>Specifies the key which was used to obfuscate this embedded font. This key can be used to retrieve the embedded font for the purposes of viewing this WordprocessingML document only, using the algorithm described in §17.8.1.</p> <p>If this attribute is omitted, then no key is provided for this font.</p> <p>[<i>Example:</i> Consider a WordprocessingML document in which the Arial font has been embedded in the file. This status would be specified using the following WordprocessingML:</p> <pre><w:font w:name="Arial"> ... <w:embedRegular r:id="rId10" w:fontKey="{302EE813-EB4A-4642-A93A-89EF99B2457E}" /> </w:font></pre> <p>The <code>fontKey</code> attribute has a value of <code>{302EE813-EB4A-4642-A93A-89EF99B2457E}</code>, therefore the embedded Arial font targeted with the relationship with ID <code>rId10</code> can be retrieved if needed by using this key and the algorithm above. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_Guid</code> simple type (§22.9.2.4).</p>
id (Relationship to Part) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	<p>Specifies the relationship ID to a specified part.</p> <p>The specified relationship shall match the relationship type required by the parent element:</p> <ul style="list-style-type: none"> • http://purl.oclc.org/ooxml/officeDocument/relationships/customXml for the <code>contentPart</code> element • http://purl.oclc.org/ooxml/officeDocument/relationships/footer for the <code>footerReference</code> element • http://purl.oclc.org/ooxml/officeDocument/relationships/header for the <code>headerReference</code> element

Attributes	Description
	<ul style="list-style-type: none"> • http://purl.oclc.org/ooxml/officeDocument/relationships/font for the embedBold, embedBoldItalic, embedItalic, or embedRegular elements • http://purl.oclc.org/ooxml/officeDocument/relationships/printerSettings for the printerSettings element • http://purl.oclc.org/ooxml/officeDocument/relationships/hyperlink for the longDesc or hyperlink element <p>[<i>Example:</i> Consider an XML element which has the following id attribute:</p> <pre><... r:id="rId10" /></pre> <p>The markup specifies the associated relationship part with relationship ID rId1 contains the corresponding relationship information for the parent XML element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
subsetting (Embedded Font Is Subsetting)	<p>Specifies that the embedded font targeted by the id attribute has been subsetting. <i>Subsetting</i> is a mechanism by which only the glyphs used in the contents of this WordprocessingML document are stored in an embedded font, in order to prevent the file from becoming unnecessarily large from the use of a small number of glyphs from a large embedded font.</p> <p>If this attribute is omitted, then the embedded font target by the id attribute shall not be handled as though it is subsetting.</p> <p>[<i>Example:</i> Consider a WordprocessingML document in which the Arial font has been embedded in the file after subsetting. This status would be specified using the following WordprocessingML:</p> <pre><w:font w:name="Arial"> ... <w:embedRegular r:id="rId10" w:subsetting="true" /> </w:font></pre> <p>The subsetting attribute has a value of true, therefore the embedded Arial font targeted with the relationship with ID rId10 must be treated as a subsetting font. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FontRel](#)) is located in §A.1. *end note*]

17.8.3.4 `embedBoldItalic` (Bold Italic Font Style Embedding)

This element specifies information about the embedded font storage for the bold italic form of a font, when it is embedded. This form is used when bold and italics are applied to a text run.

If this element is omitted, then no bold italic form of the font is stored in the document.

[*Example:* Consider a WordprocessingML document in which the Arial font has been embedded in the file. This status would be specified using the following WordprocessingML:

```
<w:font w:name="Arial">
...
  <w:embedBoldItalic r:id="rId11" />
</w:font>
```

The `embedBoldItalic` element specifies that the embedded font targeted with the relationship with ID `rId11` can be used to retrieve the bold italic form of the embedded Arial font. *end example*]

Attributes	Description
fontKey (Embedded Font Obfuscation Key)	<p>Specifies the key which was used to obfuscate this embedded font. This key can be used to retrieve the embedded font for the purposes of viewing this WordprocessingML document only, using the algorithm described in §17.8.1.</p> <p>If this attribute is omitted, then no key is provided for this font.</p> <p>[<i>Example:</i> Consider a WordprocessingML document in which the Arial font has been embedded in the file. This status would be specified using the following WordprocessingML:</p> <pre><w:font w:name="Arial"> ... <w:embedRegular r:id="rId10" w:fontKey="{302EE813-EB4A-4642-A93A-89EF99B2457E}" /> </w:font></pre> <p>The fontKey attribute has a value of {302EE813-EB4A-4642-A93A-89EF99B2457E}, therefore the embedded Arial font targeted with the relationship with ID <code>rId10</code> can be retrieved if needed by using this key and the algorithm above. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Guid simple type (§22.9.2.4).</p>
id (Relationship to Part)	<p>Specifies the relationship ID to a specified part.</p>
Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	<p>The specified relationship shall match the relationship type required by the parent element:</p> <ul style="list-style-type: none"> http://purl.oclc.org/ooxml/officeDocument/customXml http://purl.oclc.org/ooxml/officeDocument/relationships/customXml for the contentPart element

Attributes	Description
ps	<ul style="list-style-type: none"> • http://purl.oclc.org/ooxml/officeDocument/relationships/footer for the footerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/header for the headerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/font for the embedBold, embedBoldItalic, embedItalic, or embedRegular elements • http://purl.oclc.org/ooxml/officeDocument/relationships/printerSettings for the printerSettings element • http://purl.oclc.org/ooxml/officeDocument/relationships/hyperlink for the longDesc or hyperlink element <p>[<i>Example:</i> Consider an XML element which has the following id attribute:</p> <pre><... r:id="rId10" /></pre> <p>The markup specifies the associated relationship part with relationship ID rId1 contains the corresponding relationship information for the parent XML element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
subsetting (Embedded Font Is Subsetting)	<p>Specifies that the embedded font targeted by the id attribute has been subsetting. <i>Subsetting</i> is a mechanism by which only the glyphs used in the contents of this WordprocessingML document are stored in an embedded font, in order to prevent the file from becoming unnecessarily large from the use of a small number of glyphs from a large embedded font.</p> <p>If this attribute is omitted, then the embedded font target by the id attribute shall not be handled as though it is subsetting.</p> <p>[<i>Example:</i> Consider a WordprocessingML document in which the Arial font has been embedded in the file after subsetting. This status would be specified using the following WordprocessingML:</p> <pre><w:font w:name="Arial"> ... <w:embedRegular r:id="rId10" w:subsetting="true" /> </w:font></pre> <p>The subsetting attribute has a value of true, therefore the embedded Arial font targeted with the relationship with ID rId10 must be treated as a subsetting font. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FontRel](#)) is located in §A.1. *end note*]

17.8.3.5 `embedItalic` (Italic Font Style Embedding)

This element specifies information about the embedded font storage for the italic form of a font, when it is embedded. This form is used when italics are applied to a text run.

If this element is omitted, then no italic form of the font is stored in the document.

[*Example:* Consider a WordprocessingML document in which the Arial font has been embedded in the file. This status would be specified using the following WordprocessingML:

```
<w:font w:name="Arial">
...
  <w:embedItalic r:id="rId12" />
</w:font>
```

The `embedItalic` element specifies that the embedded font targeted with the relationship with ID `rId12` can be used to retrieve the italic form of the embedded Arial font. *end example*]

Attributes	Description
fontKey (Embedded Font Obfuscation Key)	<p>Specifies the key which was used to obfuscate this embedded font. This key can be used to retrieve the embedded font for the purposes of viewing this WordprocessingML document only, using the algorithm described in §17.8.1.</p> <p>If this attribute is omitted, then no key is provided for this font.</p> <p>[<i>Example:</i> Consider a WordprocessingML document in which the Arial font has been embedded in the file. This status would be specified using the following WordprocessingML:</p> <pre><w:font w:name="Arial"> ... <w:embedRegular r:id="rId10" w:fontKey="{302EE813-EB4A-4642-A93A-89EF99B2457E}" /> </w:font></pre> <p>The fontKey attribute has a value of {302EE813-EB4A-4642-A93A-89EF99B2457E}, therefore the embedded Arial font targeted with the relationship with ID <code>rId10</code> can be retrieved if needed by using this key and the algorithm above. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Guid simple type (§22.9.2.4).</p>
id (Relationship to Part) Namespace: <code>http://purl.oclc.org/ooxml/officeDocument/relationships</code>	<p>Specifies the relationship ID to a specified part.</p> <p>The specified relationship shall match the relationship type required by the parent element:</p> <ul style="list-style-type: none"> <code>http://purl.oclc.org/ooxml/officeDocument/relationships/customXml</code> for the contentPart element <code>http://purl.oclc.org/ooxml/officeDocument/relationships/footer</code> for the

Attributes	Description
ps	<p>footerReference element</p> <ul style="list-style-type: none"> • http://purl.oclc.org/ooxml/officeDocument/relationships/header for the headerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/font for the embedBold, embedBoldItalic, embedItalic, or embedRegular elements • http://purl.oclc.org/ooxml/officeDocument/relationships/printerSettings for the printerSettings element • http://purl.oclc.org/ooxml/officeDocument/relationships/hyperlink for the longDesc or hyperlink element <p>[<i>Example:</i> Consider an XML element which has the following id attribute:</p> <pre><... r:id="rId10" /></pre> <p>The markup specifies the associated relationship part with relationship ID rId1 contains the corresponding relationship information for the parent XML element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
subsetting (Embedded Font Is Subsetting)	<p>Specifies that the embedded font targeted by the id attribute has been subsetting. <i>Subsetting</i> is a mechanism by which only the glyphs used in the contents of this WordprocessingML document are stored in an embedded font, in order to prevent the file from becoming unnecessarily large from the use of a small number of glyphs from a large embedded font.</p> <p>If this attribute is omitted, then the embedded font target by the id attribute shall not be handled as though it is subsetting.</p> <p>[<i>Example:</i> Consider a WordprocessingML document in which the Arial font has been embedded in the file after subsetting. This status would be specified using the following WordprocessingML:</p> <pre><w:font w:name="Arial"> ... <w:embedRegular r:id="rId10" w:subsetting="true" /> </w:font></pre> <p>The subsetting attribute has a value of true, therefore the embedded Arial font targeted with the relationship with ID rId10 must be treated as a subsetting font. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FontRel](#)) is located in §A.1. *end note*]

17.8.3.6 `embedRegular` (Regular Font Style Embedding)

This element specifies information about the embedded font storage for the regular form of a font, when it is embedded. This form is used when neither bold nor italics is applied to a text run.

If this element is omitted, then no regular form of the font is stored in the document.

[*Example:* Consider a WordprocessingML document in which the Arial font has been embedded in the file. This status would be specified using the following WordprocessingML:

```
<w:font w:name="Arial">
...
  <w:embedRegular r:id="rId13" />
</w:font>
```

The `embedRegular` element specifies that the embedded font targeted with the relationship with ID `rId13` can be used to retrieve the regular form of the embedded Arial font. *end example*]

Attributes	Description
fontKey (Embedded Font Obfuscation Key)	<p>Specifies the key which was used to obfuscate this embedded font. This key can be used to retrieve the embedded font for the purposes of viewing this WordprocessingML document only, using the algorithm described in §17.8.1.</p> <p>If this attribute is omitted, then no key is provided for this font.</p> <p>[<i>Example:</i> Consider a WordprocessingML document in which the Arial font has been embedded in the file. This status would be specified using the following WordprocessingML:</p> <pre><w:font w:name="Arial"> ... <w:embedRegular r:id="rId10" w:fontKey="{302EE813-EB4A-4642-A93A-89EF99B2457E}" /> </w:font></pre> <p>The fontKey attribute has a value of {302EE813-EB4A-4642-A93A-89EF99B2457E}, therefore the embedded Arial font targeted with the relationship with ID <code>rId10</code> can be retrieved if needed by using this key and the algorithm above. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Guid simple type (§22.9.2.4).</p>
id (Relationship to Part)	<p>Specifies the relationship ID to a specified part.</p> <p>The specified relationship shall match the relationship type required by the parent element:</p> <ul style="list-style-type: none"> http://purl.oclc.org/ooxml/officeDocument/relationships/customXml for the contentPart element http://purl.oclc.org/ooxml/officeDocument/relationships/footer for the
Namespace: http://purl.oclc.org/ooxml/officeDocument/relationshi	

Attributes	Description
ps	<p>footerReference element</p> <ul style="list-style-type: none"> • http://purl.oclc.org/ooxml/officeDocument/relationships/header for the headerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/font for the embedBold, embedBoldItalic, embedItalic, or embedRegular elements • http://purl.oclc.org/ooxml/officeDocument/relationships/printerSettings for the printerSettings element • http://purl.oclc.org/ooxml/officeDocument/relationships/hyperlink for the longDesc or hyperlink element <p>[<i>Example:</i> Consider an XML element which has the following id attribute:</p> <pre><... r:id="rId10" /></pre> <p>The markup specifies the associated relationship part with relationship ID rId1 contains the corresponding relationship information for the parent XML element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
subsetting (Embedded Font Is Subsetting)	<p>Specifies that the embedded font targeted by the id attribute has been subsetting. <i>Subsetting</i> is a mechanism by which only the glyphs used in the contents of this WordprocessingML document are stored in an embedded font, in order to prevent the file from becoming unnecessarily large from the use of a small number of glyphs from a large embedded font.</p> <p>If this attribute is omitted, then the embedded font target by the id attribute shall not be handled as though it is subsetting.</p> <p>[<i>Example:</i> Consider a WordprocessingML document in which the Arial font has been embedded in the file after subsetting. This status would be specified using the following WordprocessingML:</p> <pre><w:font w:name="Arial"> ... <w:embedRegular r:id="rId10" w:subsetting="true" /> </w:font></pre> <p>The subsetting attribute has a value of true, therefore the embedded Arial font targeted with the relationship with ID rId10 must be treated as a subsetting font. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FontRel](#)) is located in §A.1. *end note*]

17.8.3.7 `embedSystemFonts` (Embed Common System Fonts)

This element specifies that applications shall embed common system fonts when they are in use and font embedding is enabled for this document using the `embedTrueTypeFonts` element (§17.8.3.8). *Common system fonts* refer to a set of fonts which are typically always present on a machine, and are not defined by ECMA-376.

If this element is omitted, then the set of fonts defined as common system fonts should not be embedded in the current document when font embedded is turned on. If the `embedTrueTypeFonts` element is omitted or `false`, then this setting has no effect.

[*Example:* Consider a WordprocessingML document that specifies that it must embed fonts, including common system fonts. This requirement would be specified using the following WordprocessingML in the document settings part:

```
<w:embedTrueTypeFonts w:val="true" />
<w:embedSystemFonts w:val="true"/>
```

The `embedSystemFonts` element's `val` attribute has a value of `true` specifying that common system fonts should be included in this document when they are used. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.8.3.8 `embedTrueTypeFonts` (Embed TrueType Fonts)

This element specifies that applications shall embed the fonts in use in this document when it is saved. These fonts shall be embedded subject to the algorithm specified in §17.8.1.

If this element is omitted, then fonts in use should not be embedded in the current document.

[*Example:* Consider a WordprocessingML document that specifies that it shall embed fonts, including common system fonts. This requirement would be specified using the following WordprocessingML in the document settings part:

```
<w:embedTrueTypeFonts w:val="true" />
<w:embedSystemFonts w:val="true"/>
```

The `embedTrueType` element's `val` attribute has a value of `true` specifying that fonts should be embedded in this document when they are used. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.8.3.9 `family` (Font Family)

This element specifies the font family of the current font. This information can be used as defined in font substitution logic to locate an appropriate substitute font when this font is not available. This information is determined by querying the font when present and shall not be modified when the font is not available.

If this element is omitted, then its value shall be assumed to be `auto`.

[*Example*: Consider the following information stored for a single font:

```
<w:font w:name="Calibri">
  <w:family w:val="swiss" />
  ...
</w:font>
```

The family element specifies via its val attribute value of swiss that this font is part of the Swiss family. *end example*]

Attributes	Description
val (Font Family Value)	<p>Specifies the font family for the parent font.</p> <p>[<i>Example</i>: Consider the following information stored for a single font:</p> <pre><w:font w:name="Times New Roman"> <w:family w:val="roman" /> ... </w:font></pre> <p>The val attribute value of swiss that this font is part of the Roman family. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_FontFamily simple type (§17.18.30).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_FontFamily](#)) is located in §A.1. *end note*]

17.8.3.10 font (Properties for a Single Font)

This element specifies the properties for one of the fonts used in this document. A font element shall be written out for each font face used in the document, and includes:

- The name of the font as used in the document's stories
- (optionally) Font metrics allowing other applications to locate appropriate substitute fonts as needed
- (optionally) Embedded forms of the font

[*Example*: Consider the following information stored for a single font:

```

<w:font w:name="Times New Roman">
  <w:panose1 w:val="02020603050405020304" />
  <w:charset w:val="00" />
  <w:family w:val="roman" />
  <w:pitch w:val="variable" />
  <w:sig w:usb0="20002A87" w:usb1="80000000" w:usb2="00000008" w:usb3="00000000"
w:csb0="000001FF" w:csb1="00000000" />
</w:font>

```

The font element contains information about the Times New Roman font; specifically, information used to locate a substitute font if it is not available. *end example*]

Attributes	Description
name (Primary Font Name)	<p>Specifies the primary name of the current font. This name shall be used to link the information stored in this element with uses of this value in the rFonts element (§17.3.2.26) in document content.</p> <p>[<i>Example:</i> Consider the following information stored for a single font:</p> <pre> <w:font w:name="Times New Roman"> ... </w:font> </pre> <p>The name attribute specifies that the information contained in this element must be used to look up information about all uses of the Times New Roman font in the document contents. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Font](#)) is located in §A.1. *end note*]

17.8.3.11 fonts (Font Table Root Element)

This element specifies the root element for a font table part within a WordprocessingML document, and specifies information about the fonts used in this document, each contained within a child font element.

[*Example:* Consider the following information stored in a font table part:

```

<w:fonts>
  <w:font w:name="Times New Roman">
    ...
  </w:font>
  <w:font w:name="Arial">
    ...
  </w:font>
</w:fonts>

```

The fonts element contains information about all fonts used in the document - in this example, the Times New Roman and Arial fonts. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FonTSList](#)) is located in §A.1. *end note*]

17.8.3.12 notTrueType (Not a TrueType outline Font)

This element specifies that this font is not a font including TrueType outline in a format conforming to ISO/IEC 14496-22:2007. This information can be used in font substitution logic to locate an appropriate substitute font when this font is not available. This information is determined by querying the font when present and shall not be modified when the font is not available.

If this element is omitted, then the font shall be assumed to be a font including TrueType outline in a format conforming to ISO/IEC 14496-22:2007.

[*Example:* Consider the following information stored for a single font:

```

<w:font w:name="JonsFont">
  <w:notTrueType w:val="true" />
  ...
</w:font>

```

The notTrueType element specifies via its val attribute value of true that this font is not a font including TrueType outline. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.8.3.13 panose1 (Panose-1 Typeface Classification Number)

This element specifies the Panose-1 classification number shown in §5.2.7.17 of ISO/IEC 14496-22. This information can be used as defined in font substitution logic to locate an appropriate substitute font when this font is not available. This information is determined by querying the font when present and shall not be modified when the font is not available.

If this element is omitted, then no Panose-1 information is available.

[*Example:* Consider the following information stored for a single font:

```
<w:font w:name="Times New Roman">
  <w:panose1 w:val="02020603050405020304" />
  ...
</w:font>
```

The panose1 element specifies its Panose-1 number via its val attribute value of 02020603050405020304. *end example]*

Attributes	Description
val (Value)	<p>Specifies the Panose-1 classification number for the font, stored as a series of two digit hexadecimal encodings of each digits of the Panose number.</p> <p>[<i>Example:</i> Consider the following information stored for a single font:</p> <pre><w:panose1 w:val="020F0603050405020304" /></pre> <p>The val attribute specifies that the digits in the Panose-1 number are: 2,15,6,3,5,2,3,4. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Panose simple type (§22.9.2.8).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Panose](#)) is located in §A.1. *end note]*

17.8.3.14 pitch (Font Pitch)

This element specifies the font pitch of the current font. This information can be used as defined in font substitution logic to locate an appropriate substitute font when this font is not available. This information is determined by querying the font when present and shall not be modified when the font is not available.

If this element is omitted, then its value shall be assumed to be default.

[*Example:* Consider the following information stored for a single font:

```
<w:font w:name="Courier New">
  <w:pitch w:val="fixed" />
  ...
</w:font>
```

The pitch element specifies via its val attribute value of fixed that this is a fixed width font. *end example]*

Attributes	Description
val (Value)	<p>Specifies the font pitch for the font.</p> <p>[<i>Example:</i> Consider the following information stored for a single font:</p>

Attributes	Description
	<p><code><w:pitch w:val="variable" /></code></p> <p>The <code>val</code> attribute value of <code>variable</code> specifies that this is a variable width font. <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_Pitch</code> simple type (§17.18.66).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_Pitch](#)) is located in §A.1. *end note*]

17.8.3.15 saveSubsetFonts (Subset Fonts When Embedding)

This element specifies that applications shall subset fonts when font embedding is enabled for this document using the `embedTrueTypeFonts` element (§17.8.3.8). *Subsetting* is a mechanism by which only the glyphs used in the contents of this WordprocessingML document are stored in an embedded font, in order to prevent the file from becoming unnecessarily large from the use of a small number of glyphs from a large embedded font.

If this element is omitted, then the set of fonts should not be subsetted in the current document when font embedded is turned on. If the `embedTrueTypeFonts` element is omitted or `false`, then this setting has no effect.

[Example: Consider a WordprocessingML document that specifies that it must subset embedded fonts. This requirement would be specified using the following WordprocessingML in the document settings part:

```
<w:embedTrueTypeFonts w:val="true" />
<w:saveSubsetFonts w:val="true"/>
```

The `embedSystemFonts` element's `val` attribute has a value of `true` specifying fonts should be subsetted in this document when they are embedded. *end example*]

This element’s content model is defined by the common boolean property definition in §17.17.4.

17.8.3.16 sig (Supported Unicode Subranges and Code Pages)

This element specifies information identifying the code pages and Unicode subranges for which the parent font provides glyphs using the mechanism defined in §5.2.7.18 and §5.2.7.28 of ISO/IEC 14496-22. This information can be used as defined in font substitution logic to locate an appropriate substitute font when this font is not available. This information is determined by querying the font when present and shall not be modified when the font is not available.

When storing Unicode subrange information, the appropriate bit in the bitfield shall only be set if the entire subrange is supported by that font.

If this element is omitted, then no supported code page/Unicode subrange information is available.

[*Example*: Consider the following information stored for a single font:

```
<w:font w:name="Times New Roman">
  <w:sig w:usb0="20002A87" w:usb1="80000000" w:usb2="00000008" w:usb3="00000000"
w:csb0="000001FF" w:csb1="00000000" />
  ...
</w:font>
```

The sig element specifies the supported code pages and Unicode sub ranges via its attributes. For example, the code pages supported are:

- Latin 1
- Latin 2: Eastern Europe
- Cyrillic
- Greek
- Turkish
- Baltic

end example]

Attributes	Description
csb0 (Lower 32 Bits of Code Page Bit Field)	<p>Specifies a four digit hexadecimal encoding of the first 32 bits of the 64-bit code-page bit field that identifies which specific character sets or code pages are supported by the parent font using the format defined by ulCodePageRange1 in §5.2.7.28 of ISO/IEC 14496-22.</p> <p>[<i>Example</i>: Consider font information specified as follows:</p> <pre><w:font w:name="Lucida Console"> <w:sig w:csb0="000001F" ... /> ... </w:font></pre> <p>The csb0 attribute value of 000001F specifies that the following code pages are supported by this font:</p> <ul style="list-style-type: none"> • Latin 1 • Latin 2: Eastern Europe • Cyrillic • Greek • Turkish <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>
csb1 (Upper 32 Bits	Specifies a four digit hexadecimal encoding of the upper 32 bits of the 64-bit code-page

Attributes	Description
of Code Page Bit Field)	<p>bit field that identifies which specific character sets or code pages are supported by the parent font using the format defined by ulCodePageRange2 in §5.2.7.28 of ISO/IEC 14496-22.</p> <p>[<i>Example:</i> Consider font information specified as follows:</p> <pre><w:font w:name="Lucida Console"> <w:sig w:csb1="00000000" ... /> ... </w:font></pre> <p>The csb1 attribute value of 00000000 specifies that none of the specified code pages are supported by this font. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>
usb0 (First 32 Bits of Unicode Subset Bitfield)	<p>Specifies the first 32 bits of the 128-bit Unicode subset bit field (USB) as defined by ulUnicodeRange1 of §5.2.7.18 of ISO/IEC 14496-22.</p> <p>[<i>Example:</i> Consider font information specified as follows:</p> <pre><w:font w:name="Times New Roman"> <w:sig w:usb0="20002A87" ... /> ... </w:font></pre> <p>The usb0 attribute value of 20002A87 specifies that the first 32 bits of the bitfield are 00100000000000000010101010000111, which corresponds to:</p> <ul style="list-style-type: none"> • Basic Latin • Latin-1 Supplement • Latin Extended-A • Basic Greek • Cyrillic • Basic Hebrew • Basic Arabic • Latin Extended Additional <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>
usb1 (Second 32 Bits of Unicode Subset Bitfield)	<p>Specifies the second 32 bits of the 128-bit Unicode subset bit field (USB) as defined by ulUnicodeRange2 of §5.2.7.18 of ISO/IEC 14496-22.</p> <p>[<i>Example:</i> Consider font information specified as follows:</p>

Attributes	Description
	<pre> <w:font w:name="Times New Roman"> <w:sig w:usb1="80000000" ... /> ... </w:font> </pre> <p>The usb0 attribute value of 80000000 specifies that the first 32 bits of the bitfield are 10000000000000000000000000000000, which corresponds to:</p> <ul style="list-style-type: none"> Arabic Presentation Forms-A <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>
usb2 (Third 32 Bits of Unicode Subset Bitfield)	<p>Specifies the third 32 bits of the 128-bit Unicode subset bit field (USB) as defined by ulUnicodeRange3 of §5.2.7.18 of ISO/IEC 14496-22.</p> <p>[<i>Example:</i> Consider font information specified as follows:</p> <pre> <w:font w:name="Times New Roman"> <w:sig w:usb2="00000008" ... /> ... </w:font> </pre> <p>The usb0 attribute value of 80000000 specifies that the first 32 bits of the bitfield are 00000000000000000000000000001000, which corresponds to:</p> <ul style="list-style-type: none"> Arabic Presentation Forms-B <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>
usb3 (Fourth 32 Bits of Unicode Subset Bitfield)	<p>Specifies the fourth 32 bits of the 128-bit Unicode subset bit field (USB) as defined by ulUnicodeRange4 of §5.2.7.18 of ISO/IEC 14496-22.</p> <p>[<i>Example:</i> Consider font information specified as follows:</p> <pre> <w:font w:name="Times New Roman"> <w:sig w:usb3="00000000" ... /> ... </w:font> </pre> <p>The usb3 attribute value of 00000000 specifies that the first 32 bits of the bitfield are 00000000000000000000000000000000, which corresponds to no subranges. <i>end example]</i></p>

Attributes	Description
	The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FontSig](#)) is located in §A.1. *end note*]

17.9 Numbering

Numbering refers to symbols - Arabic numerals, Roman numerals, symbol characters ("bullets"), text strings, etc. - in WordprocessingML that are used to label individual paragraphs of text.

[*Example:* The following two paragraphs each contain numbering as defined by WordprocessingML: the first uses an Arabic numeral, the second a symbol character:

- 7. This is a paragraph with numbering information.
- This is also a paragraph with numbering information.

end example]

The basis for all numbering in WordprocessingML is specified via two structures:

- abstract numbering definitions
- numbering definition instances

Abstract numbering definitions define the appearance and behavior of a specific set of numbered paragraphs in a document. Because this construct is abstract, they are not be directly referenced by document content, but rather they shall be inherited by a *numbering definition instance*, which itself is referenced by document content.

[*Example:* Consider the following example of an abstract numbering definition in a WordprocessingML document:

```

<w:abstractNum w:abstractNumId="4">
  <w:nsid w:val="FFFFFFF7F" />
  <w:multiLevelType w:val="singleLevel" />
  <w:lvl w:ilvl="0">
    <w:start w:val="1" />
    <w:lvlText w:val="%1." />
    <w:lvlJc w:val="start" />
    <w:pPr>
      <w:tabs>
        <w:tab w:val="num" w:pos="720" />
      </w:tabs>
      <w:ind w:start="720" w:hanging="360" />
    </w:pPr>
  </w:lvl>
</w:abstractNum>

```

This abstractNum element defines an abstract numbering definition which defines a set of numbering properties. It is inherited by any numbering definition instance which inherits from an abstractNumId equal to 4:

```

<w:num w:numId="2">
  <w:abstractNumId w:val="4" />
</w:num>

```

This num element defines an numbering definition instance which can define overrides to the abstract numbering definition (in this case it does not), and is used by any paragraphs with a numId equal to 2:

```

<w:p>
  <w:pPr>
    <w:numPr>
      <w:ilvl w:val="0" />
      <w:numId w:val="2" />
    </w:numPr>
  </w:pPr>
  <w:r>
    <w:t>Level one</w:t>
  </w:r>
</w:p>

```

The resulting paragraph inherits the properties of level 0 in the numbering definition instance of 2 which is simply a instance of the abstract numbering definition of 4. *end example*]

17.9.1 abstractNum (Abstract Numbering Definition)

This element specifies a set of properties which shall dictate the appearance and behavior of a set of numbered paragraphs in a WordprocessingML document. These properties are collectively called an *abstract numbering definition*, and are the basis for all numbering information in a WordprocessingML document.

Although an abstract numbering definition contains a complete set of numbering, it shall not be directly referenced by content (hence the use of *abstract*). Instead, these properties shall be inherited by a numbering definition instance using the num element (§17.9.15), which can then itself be referenced by content.

[Example: Consider the following example of an abstractNum in a WordprocessingML document:

```
<w:abstractNum w:abstractNumId="4">
  <w:nsid w:val="FFFFFF7F" />
  <w:multiLevelType w:val="singleLevel" />
  <w:lvl w:ilvl="0">
    <w:start w:val="1" />
    <w:lvlText w:val="%1." />
    <w:lvlJc w:val="start" />
    <w:pPr>
      <w:tabs>
        <w:tab w:val="num" w:pos="720" />
      </w:tabs>
      <w:ind w:start="720" w:hanging="360" />
    </w:pPr>
  </w:lvl>
</w:abstractNum>
```

This abstractNum element defines an abstract numbering definition which must be inherited by any numbering definition instance which inherits from abstract numbering definition with an abstractNumId equal to 4. *end example*]

Attributes	Description
abstractNumId (Abstract Numbering Definition ID)	<p>Specifies a unique number which shall be used as the identifier for this abstract numbering definition. This unique number shall be referenced by any numbering definition instance in order to inherit the properties specified by this abstract numbering definition.</p> <p>[Example: Consider the WordprocessingML for an abstract numbering definition with an abstractNumId attribute of 4:</p> <pre><w:abstractNum w:abstractNumId="4"> <w:nsid w:val="FFFFFF7F" /> <w:multiLevelType w:val="singleLevel" /> <w:lvl w:ilvl="0"> <w:start w:val="1" /></pre>

Attributes	Description
	<pre> <w:lvlText w:val="%1." /> <w:lvlJc w:val="start" /> <w:pPr> <w:tabs> <w:tab w:val="num" w:pos="720" /> </w:tabs> <w:ind w:left="720"/> </w:pPr> </w:lvl> </w:abstractNum> </pre> <p>The abstractNumId attribute serves as a unique identifier for the abstract numbering definition, allowing numbering definition instances (§17.9.15) with a abstractNumId element with a matching attribute value to inherit the abstract numbering definition properties, for example:</p> <pre> <w:numbering> ... <w:num w:numId="2"> <w:abstractNumId w:val="0" /> </w:num> <w:num w:numId="3"> <w:abstractNumId w:val="1" /> </w:num> <w:num w:numId="4"> <w:abstractNumId w:val="4" /> </w:num> <w:num w:numId="5"> <w:abstractNumId w:val="4" /> </w:num> </w:numbering> </pre> <p>In this case, the final two numbering definition instances both inherit from the abstract numbering definition with a abstractNumId of 4. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_AbstractNum](#)) is located in §A.1. *end note*]

17.9.2 abstractNumId (Abstract Numbering Definition Reference)

This element specifies the abstract numbering definition information whose properties shall be inherited by the parent numbering definition instance.

[*Example:* Consider the WordprocessingML for a document with two numbering definition instances, each referencing a different abstract numbering definition:

```
<w:numbering>
  <w:abstractNum w:abstractNumId="0">
    ...
  </w:abstractNum>
  <w:abstractNum w:abstractNumId="1">
    ...
  </w:abstractNum>
  ...
  <w:num w:numId="1">
    <w:abstractNumId w:val="0" />
  </w:num>
  <w:num w:numId="2">
    <w:abstractNumId w:val="1" />
  </w:num>
  ...
</w:numbering>
```

The two numbering definition instances reference the abstract numbering definitions with abstractNumId attribute values of 0 and 1 respectively, via their abstractNumId elements. *end example]*

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <div><... w:val="1512645511" /></div> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_DecimalNumber](#)) is located in §A.1. *end note]*

17.9.3 **ilvl (Numbering Level Reference)**

This element specifies the numbering level of the numbering definition instance which shall be applied to the parent paragraph.

This numbering level is specified on either the abstract numbering definition's `ilvl` element (§17.9.6), and can be overridden by a numbering definition instance level override's `ilvl` element (§17.9.5).

[*Example:* Consider the following numbered paragraphs in a WordprocessingML document:

1. Level one
 - a. Level two

These numbered paragraphs might be represented using the following WordprocessingML:

```
<w:p>
  <w:pPr>
    <w:numPr>
      <w:ilvl w:val="0" />
      <w:numId w:val="5" />
    </w:numPr>
  </w:pPr>
  <w:r>
    <w:t>Level one</w:t>
  </w:r>
</w:p>
<w:p>
  <w:pPr>
    <w:numPr>
      <w:ilvl w:val="1" />
      <w:numId w:val="5" />
    </w:numPr>
  </w:pPr>
  <w:r>
    <w:t>Level two</w:t>
  </w:r>
</w:p>
```

The WordprocessingML above specifies that the first numbered paragraph references the numbering level of 0, within the numbering definition of the `num` element (§17.9.15) with a `numId` attribute equal to 5.

The second numbered paragraph references the numbering of 1, within the same numbering definition instance. The WordprocessingML referenced by the `ilvl` elements above is given below:

```
<w:num w:numId="5">
  <w:abstractNumId w:val="0" />
</w:num>
...
<w:abstractNum w:abstractNumId="0">
  <w:nsid w:val="FFFFFFF7F" />
  <w:multiLevelType w:val="singleLevel" />
  <w:lvl w:ilvl="0">
    ...
  </w:lvl>
  <w:lvl w:ilvl="1">
    ...
  </w:lvl>
</w:abstractNum>
```

In this case, the resulting paragraphs would inherit the properties of the abstract numbering definition levels with ilvl attributes of 0 and 1, respectively. *end example*]

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <div><... w:val="1512645511" /></div> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_DecimalNumber](#)) is located in §A.1. *end note*]

17.9.4 isLgl (Display All Levels Using Arabic Numerals)

This element specifies whether or not all levels displayed for a given numbering level's text shall be displayed using the decimal number format, regardless of the actual number format of that level in the list. [*Note:* This numbering style is often referred to as the legal numbering style. *end note*]

If this element is present, then all numbering levels present in the `lvlTxt` element (§17.9.11) shall be converted to their decimal equivalents when they are displayed in this level in the numbering format. If this element is omitted, then each level is displayed using the `numFmt` (§17.9.17) of that level.

[*Example:* Consider the numbering set below. In this set of blank numbered paragraphs, three numbering levels have been used and the third has the `isLgl` property applied, resulting in the following:

```
A
  A.a
  A.b
    1.2.1
    1.2.2
B
  B.a
    2.1.1
```

As shown above, each number in the third level in the list has been converted to its decimal equivalent. The WordprocessingML necessary to turn on the legal numbering rule for the third numbering level is given below:

```
<w:lvl w:ilvl="2">
  ...
  <w:isLgl />
  ...
</w:lvl>
```

end example]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.9.5 `lvl` (Numbering Level Override Definition)

This element specifies the appearance and behavior of a specific numbering level within a given numbering level definition override defined using the `lvlOverride` element (§17.9.8).

A numbering level override definition is identical to a numbering level definition, except for the fact that it is defined as part of a numbering definition instance using the `num` element (§17.9.15) rather than as part of an abstract numbering definition using the `abstractNum` element (§17.9.1).

[*Example:* Consider a numbering definition instance which inherits its information from the abstract numbering definition with `abstractNumId` of 4, but should use a different set of properties for level 0 of the numbering definition. The resulting WordprocessingML would look like:

```

<w:num w:numId="6">
  <w:abstractNumId w:val="4" />
  <w:lvlOverride w:ilvl="0">
    <w:lvl w:ilvl="0">
      <w:start w:val="4" />
      <w:lvlText w:val="%1)" />
      <w:lvlJc w:val="start" />
      <w:pPr>
        <w:ind w:start="360" w:hanging="360" />
      </w:pPr>
    </w:lvl>
  </w:lvlOverride>
</w:num>

```

This numbering definition instance overrides level 0 of the list with the specified numbering level override definition, replacing those in the abstract numbering level definition. *end example]*

[*Note:* The ability to set level overrides optimizes use of numbering in WordprocessingML as it prevents writing out redundant abstract numbering definitions if numbering sets only slightly differ.

Consider using WordprocessingML to create two numbered sets that only differ only in the appearance and style of the first numbering level. Both could use the same abstract numbering definition as long as each references a different numbering definition instance with one of the numbering definition instances leveraging a level override for the first numbering level. Below is WordprocessingML that illustrates this:

```

<w:num w:numId="5">
  <w:abstractNumId w:val="4" />
</w:num>
<w:num w:numId="6">
  <w:abstractNumId w:val="4" />
  <w:lvlOverride w:ilvl="0">
    <w:lvl w:ilvl="0">
      <w:start w:val="4" />
      <w:lvlText w:val="%1)" />
      <w:lvlJc w:val="start" />
      <w:pPr>
        <w:ind w:start="360" w:hanging="360" />
      </w:pPr>
    </w:lvl>
  </w:lvlOverride>
</w:num>

```

end note]

Attributes	Description
ilvl (Numbering Level)	<p>Specifies the numbering level definition that is to be defined by this set of numbering properties.</p> <p>This override is a zero-based index of the number of list levels in the document. <i>[Example: A value of 2 is the 3rd list level in the document. end example]</i></p> <p><i>[Example: Consider the following WordprocessingML for a numbering definition instance:</i></p> <pre> <w:num w:numId="6"> <w:abstractNumId w:val="4" /> <w:lvlOverride w:ilvl="0"> ... </w:lvlOverride> </w:num> </pre> <p><i>In this example, the first numbering level definition (with an ilvl of 0) within the referenced abstract numbering definition is overridden. end example]</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
tentative (Tentative Numbering)	<p>Specifies that a given numbering level was been saved by a producer but was not used in the parent document. This means that this numbering level can be redefined by a future consumer without changing the actual content of the document.</p> <p>A value of 1 or true for this attribute value specifies that the numbering level is not used in the current document's contents.</p> <p>A value of 0 or false for this attribute value specifies that the numbering level is used in the parent document and cannot be redefined without changing its contents. This is the default value for this attribute, and is implied when this attribute is omitted.</p> <p><i>[Example: Consider the following WordprocessingML numbering level:</i></p> <pre> <w:lvl w:ilvl="0" w:tentative="true" > ... </w:lvl> </pre> <p><i>This level has the tentative attribute set to true, therefore the contents of this numbering level have not been used in the document and can be redefined by a consumer as desired. end example]</i></p> <p>If this attribute is equal to 1 or true, the WordprocessingML for a given document contains the numbering level information associated with this numbering level, but the 'tentative' numbering level(s) shall not be represented in any of the hosting application's user interface pertaining to numbering levels.</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).
tplc (Template Code)	<p>Specifies a unique hexadecimal value which can be used to specify a location within an application's user interface in which this numbering level shall be displayed. The method by which this value is interpreted shall be application-defined.</p> <p>If this attribute is omitted, then this numbering can be displayed in any location chosen by the consumer.</p> <p>[<i>Example:</i> Consider the following abstract numbering definition:</p> <pre><w:abstractNum w:abstractNumId="1" > ... </w:abstractNum></pre> <p>In this example the abstractNum element with attribute abstractNumId equal to 1, would appear in the area within a consumer's application user interface specified by the template code 04090019 .<i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Lvl](#)) is located in §A.1. *end note*]

17.9.6 lvl (Numbering Level Definition)

This element specifies the appearance and behavior of a numbering level within a given abstract numbering definition. A numbering level contains a set of properties for the display of the numbering for a given numbering level within an abstract numbering definition.

A numbering level definition is identical to a numbering level override definition, except for the fact that it is defined as part of a numbering definition instance using the abstractNum element (§17.9.1) rather than as part of an abstract numbering definition using the num element (§17.9.15).

[*Example:* Consider the WordprocessingML below:

```

<w:abstractNum w:abstractNumId="4">
  <w:nsid w:val="1DE04504" />
  <w:multilevelType w:val="hybridMultilevel" />
  <w:lvl w:ilvl="0" w:tplc="0409000F">
    ...
  </w:lvl>
  <w:lvl w:ilvl="1" w:tplc="04090019">
    ...
  </w:lvl>
  <w:lvl w:ilvl="2" w:tplc="04090019">
    ...
  </w:lvl>
  <w:lvl w:ilvl="3" w:tplc="0409000F">
    ...
  </w:lvl>
  ...
</w:abstractNum>

```

This example shows that any paragraph whose numbering properties use the `ilvl` elements with the attribute `val` set equal to 0, 1, 2, or 3 has the appearance and behavior of their first four numbered levels specified by the `lvl` elements given above (assuming that no level overrides have been specified). *end example*

Attributes	Description
<code>ilvl</code> (Numbering Level)	<p>Specifies the numbering level definition that is to be defined by this set of numbering properties.</p> <p>This override is a zero-based index of the number of list levels in the document. <i>[Example: A value of 2 is the 3rd list level in the document. end example]</i></p> <p><i>[Example: Consider the following WordprocessingML for a numbering definition instance:</i></p> <pre> <w:num w:numId="6"> <w:abstractNumId w:val="4" /> <w:lvlOverride w:ilvl="0"> ... </w:lvlOverride> </w:num> </pre> <p><i>In this example, the first numbering level definition (with an <code>ilvl</code> of 0) within the referenced abstract numbering definition is overridden. end example]</i></p> <p>The possible values for this attribute are defined by the <code>ST_DecimalNumber</code> simple type (§17.18.10).</p>
<code>tentative</code> (Tentative Numbering)	<p>Specifies that a given numbering level was been saved by a producer but was not used in the parent document. This means that this numbering level can be redefined by a future</p>

Attributes	Description
	<p>consumer without changing the actual content of the document.</p> <p>A value of 1 or true for this attribute value specifies that the numbering level is not used in the current document's contents.</p> <p>A value of 0 or false for this attribute value specifies that the numbering level is used in the parent document and cannot be redefined without changing its contents. This is the default value for this attribute, and is implied when this attribute is omitted.</p> <p>[<i>Example:</i> Consider the following WordprocessingML numbering level:</p> <pre><w:lvl w:ilvl="0" w:tentative="true" > ... </w:lvl></pre> <p>This level has the tentative attribute set to true, therefore the contents of this numbering level have not been used in the document and can be redefined by a consumer as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
tplc (Template Code)	<p>Specifies a unique hexadecimal value which can be used to specify a location within an application's user interface in which this numbering level shall be displayed. The method by which this value is interpreted shall be application-defined.</p> <p>If this attribute is omitted, then this numbering can be displayed in any location chosen by the consumer.</p> <p>[<i>Example:</i> Consider the following abstract numbering definition:</p> <pre><w:abstractNum w:abstractNumId="1" > ... </w:abstractNum></pre> <p>In this example the abstractNum element with attribute abstractNumId equal to 1, would appear in the area within a consumer's application user interface specified by the template code 04090019. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Lvl](#)) is located in §A.1. *end note*]

17.9.7 **lvJc (Justification)**

This element specifies the type of justification used on a numbering level's text within a given numbering level. This justification is applied relative to the text margin of the parent numbered paragraph in the document.

If omitted, the paragraph shall have left justification relative to the text margin in left-to-right paragraphs, and right justification relative to the text margin in right-to-left paragraphs.

[*Example:* Consider the numbering level defined below:

```
<w:lvl w:ilvl="8" w:tplc="756C1446" w:tentative="1">
  <w:start w:val="1" />
  <w:numFmt w:val="bullet" />
  <w:lvlText w:val="•" />
  <w:lvJc w:val="start" />
  ...
</w:lvl>
```

In this numbering level, the given numbering symbol is left justified with respect to the text margin, therefore the numbering extends left from the text margin towards the text (assuming a left-to-right paragraph). *end example]*

A numbering level's text is the numeral, symbol, character, graphic, etc. used to create a numbered paragraph as defined by the `lvlText` element (§17.9.11).

[*Example:* Consider the numbered paragraphs below:

- 1) Example one
- a. Example two
- Example three

The numbering symbol in these three numbered paragraphs are "1", "a", and "•", respectively. *end example]*

Attributes	Description
val (Alignment Type)	<p>Specifies the justification which should be applied to the parent object within a document.</p> <p>The possible values (see below) for this attribute are always specified with left specifying justification relative to the leading edge of the paragraph, and therefore change semantic between right-to-left and left-to-right documents.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment for a paragraph in a document:</p> <pre><w:pPr></pre>

Attributes	Description
	<p><code><w:jc w:val="end" /></code> <code></w:pPr></code></p> <p>This paragraph is now right justified on the page for a left-to-right paragraph, left justified for a right-to-left paragraph. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_Jc simple type (§17.18.44).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Jc](#)) is located in §A.1. *end note*]

17.9.8 lvlOverride (Numbering Level Definition Override)

This element specifies an optional override which shall be applied in place of zero or more levels from the abstract numbering definition for a given numbering definition instance. Each instance of this element is used to override the appearance and behavior of a given numbering level definition within the given abstract numbering definition.

[Example: Consider a numbering definition instance which inherits its information from the abstract numbering definition with abstractNumId of 4, but wishes to use a different set of properties for level 0 and level 1 of the numbering definition. The resulting WordprocessingML would look like:

```
<w:num w:numId="6">
  <w:abstractNumId w:val="4" />
  <w:lvlOverride w:ilvl="0">
    <w:lvl w:ilvl="0">
      <w:start w:val="4" />
      <w:lvlText w:val="%1)" />
      <w:lvlJc w:val="start" />
      <w:pPr>
        <w:ind w:start="360" w:hanging="360" />
      </w:pPr>
    </w:lvl>
  </w:lvlOverride>
```



```

<w:lvlOverride w:ilvl="1">
  <w:lvl w:ilvl="1">
    <w:start w:val="5" />
    <w:lvlText w:val="%Test)" />
    <w:lvlJc w:val="start" />
    <w:pPr>
      <w:ind w:start="360" w:hanging="360" />
    </w:pPr>
  </w:lvl>
</w:lvlOverride>
</w:num>

```

end example]

[Note: The ability to set level overrides optimizes use of numbering in WordprocessingML as it prevents writing out redundant abstract numbering definitions if numbering sets only slightly differ.

Consider using WordprocessingML to create two numbered sets that only differ only in the appearance and style of the first numbering level. Both could use the same abstract numbering definition as long as each references a different numbering definition instance with one of the numbering definition instances leveraging a level override for the first numbering level. Below is WordprocessingML that illustrates this:

```

<w:num w:numId="5">
  <w:abstractNumId w:val="4" />
</w:num>
<w:num w:numId="6">
  <w:abstractNumId w:val="4" />
  <w:lvlOverride w:ilvl="0">
    <w:lvl w:ilvl="0">
      <w:start w:val="4" />
      <w:lvlText w:val="%1)" />
      <w:lvlJc w:val="start" />
      <w:pPr>
        <w:ind w:start="360" w:hanging="360" />
      </w:pPr>
    </w:lvl>
  </w:lvlOverride>
</w:num>

```

end note]

Attributes	Description
ilvl (Numbering Level ID)	Specifies the numbering level of a given abstract numbering definition to be overridden. If this number conflicts with the ilvl of the child lvl element, then the latter shall be

Attributes	Description
	<p>ignored.</p> <p>[<i>Example:</i> Consider a numbering definition instance which inherits its information from the abstract numbering definition with abstractNumId of 4, but wishes to use a different set of properties for level 0 of the numbering definition. The resulting WordprocessingML would look like:</p> <pre><w:num w:numId="6"> <w:abstractNumId w:val="4" /> <w:lvlOverride w:ilvl="0"> <w:lvl w:ilvl="0"> <w:start w:val="4" /> <w:lvlText w:val="%1)" /> <w:lvlJc w:val="start" /> <w:pPr> <w:ind w:left="360" /> </w:pPr> </w:lvl> </w:lvlOverride> </w:num></pre> <p>This level overrides level 0 of the abstract numbering definition's level properties with the specified set of numbering properties, replacing those in the abstract numbering definition. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_NumLvl](#)) is located in §A.1. *end note]*

17.9.9 **lvlPicBulletId (Picture Numbering Symbol Definition Reference)**

This element specifies a picture which shall be used as a numbering symbol for a given numbering level by referring to a picture numbering symbol definition's numPictBullet element (§17.9.20). This reference is made through this element's val attribute.

The picture shall be added to the numbering level by replacing each character in the lvlText with one instance of this image.

[*Example:* Consider the WordprocessingML below illustrating how the lvlPicBulletId references a picture numbering symbol definition through its val attribute:

```
<w:numPicBullet w:numPicBulletId="1">
  <w:drawing>
    ...
```

```

    </w:drawing>
  </w:numPicBullet>
  ...
  <w:abstractNum w:abstractNumId="7">
    <w:nsid w:val="71A06359" />
    <w:multilevelType w:val="hybridMultilevel" />
    <w:tpl w:val="10643FE6" />
    <w:lvl w:ilvl="0" w:tplc="B7663E56">
      <w:start w:val="1" />
      <w:numFmt w:val="bullet" />
      <w:lvlText w:val="AA" />
      <w:lvlPicBulletId w:val="1" />
    </w:lvl>
  </w:abstractNum>

```

The resulting numbering must consist of two instances of the image specified using the numPicBullet element.
end example]

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <pre><... w:val="1512645511" /></pre> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DecimalNumber](#)) is located in §A.1.
end note]

17.9.10 lvlRestart (Restart Numbering Level Symbol)

This element specifies a one-based index which determines when a numbering level should restart to its start value (§17.9.25). A numbering level restarts when an instance of the specified numbering level, which shall be higher (earlier than this level) or any earlier level is used in the given document's contents. [*Example:* If this value is 2, then both level two and level one reset this value. *end example]*

If this element is omitted, the numbering level shall restart each time the previous numbering level or any earlier level is used. If the specified level is higher than the current level, then this element shall be ignored. As well, a value of 0 shall specify that this level shall never restart.

[*Example:* Consider a set of numbered paragraphs in a WordprocessingML document where numbering level with `ilvl` of 2 is set to never restart:

```
<w:lvl w:ilvl="0">
  <w:start w:val="1" />
  <w:lvlText w:val="%1)" />
  <w:lvlJc w:val="start" />
  <w:pPr>
    <w:ind w:start="360" w:hanging="360" />
  </w:pPr>
  <w:rPr>
    <w:rFonts w:hint="default" />
  </w:rPr>
</w:lvl>
<w:lvl w:ilvl="1">
  <w:start w:val="1" />
  <w:numFmt w:val="upperLetter" />
  <w:lvlText w:val="%2)" />
  <w:lvlJc w:val="start" />
  <w:pPr>
    <w:ind w:start="720" w:hanging="360" />
  </w:pPr>
  <w:rPr>
    <w:rFonts w:hint="default" />
  </w:rPr>
</w:lvl>
<w:lvl w:ilvl="2">
  <w:start w:val="1" />
  <w:numFmt w:val="lowerRoman" />
  <w:lvlRestart w:val="0">
  <w:lvlText w:val="%3)" />
  <w:lvlJc w:val="start" />
  <w:pPr>
    <w:ind w:start="1080" w:hanging="360" />
  </w:pPr>
  <w:rPr>
    <w:rFonts w:hint="default" />
  </w:rPr>
</w:lvl>
```

Since the `lvlRestart` element is omitted in numbering level 1 (a,b,...), the numbering level restarts after numbering level 0 (1,2,...) is used. Numbering level two (i, ii, iii ...) never restarts as `lvlRestart` has a `val` equal to 0. An example of the resulting content would be as follows:

- 1) Level one
 - a) Level two
 - i) Level three
 - ii) Level three
- 2) Level one
 - a) Level two
 - iii) Level three
 - iv) Level four

The resulting set of paragraphs has level two restarting to its start value after each level one (after 2), the next level two is again a)), but level three never restarts and continues at iii) even after the use of a level two and one. *end example*]

Attributes	Description
<code>val</code> (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following numeric WordprocessingML property of simple type <code>ST_DecimalNumber</code>:</p> <pre><... w:val="1512645511" /></pre> <p>The value of the <code>val</code> attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_DecimalNumber</code> simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model (`CT_DecimalNumber`) is located in §A.1. *end note*]

17.9.11 lvlText (Numbering Level Text)

This element specifies the textual content which shall be displayed when displaying a paragraph with the given numbering level.

All text in this element's val attribute shall be taken as literal text to be repeated in each instance of this numbering level, except for any use of the percent symbol (%) followed by a number, which shall be used to indicate the one-based index of the number to be used at this level. Any number of a level higher than this level shall be ignored.

When the % syntax is used, the number shall be incremented for each subsequent paragraph of that level (sequential or not), until the restart level is seen between two subsequent paragraphs of this level.

[Example: Consider the following WordprocessingML for a numbering level:

```
<w:lvl w:ilvl="1">
  ...
  <w:lvlText w:val="StringA %2 StringB %1 StringC %3"/>
  ...
</w:lvl>
```

This specifies that three strings (StringA, StringB, StringC) must be used as string literals in the numbering for level two (ilvl of 1) along with the numbering symbol used for level one and level zero. Although level two is also referenced here, it is ignored as it is a higher level than the current numbering level.

Therefore, assuming the numbering symbol used by numbering level zero is an Arabic numeral, and the numbering symbol used by numbering level one is a Roman numeral, a set of numbered paragraphs using this WordprocessingML numbering set must be output as:

```
1
StringA I StringB 1 StringC
StringA II StringB 1 StringC
StringA III StringB 1 StringC
2
StringA I StringB 2 StringC
StringA II StringB 2 StringC
```

with the %1 and %2 values corresponding to the current numbering symbol value for numbering level zero and one, respectively. end example]

Attributes	Description
null (Level Text Is Null Character)	Specifies that a null character shall be used as the numbering symbol for a given numbering level. If the val attribute contains any content, then this attribute shall be ignored.

Attributes	Description
	<p>If this attribute is omitted, then the null string shall not be used in place of the empty string. [Note: A null character is different from an empty string. <i>end note</i>]</p> <p>[Example: Consider the WordprocessingML below:</p> <pre data-bbox="454 430 885 598"><w:lvl w:ilvl="1"> ... <w:lvlText w:null="on" /> ... </w:lvl></pre> <p>This level text consists of a single null character, and not the empty string, as the null attribute is set. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
val (Level Text)	<p>Specifies the actual text to be used for the numbering level when it is referenced in the document's content.</p> <p>If this attribute is not specified, then the empty string shall be used as the level's text.</p> <p>[Example: Consider the WordprocessingML below:</p> <pre data-bbox="454 1039 901 1207"><w:lvl w:ilvl="1"> ... <w:lvlText w:val="test" /> ... </w:lvl></pre> <p>Here the val attribute specifies that the literal string <code>test</code> is to be surfaced as the text for the given numbering level, regardless of its position. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_LevelText](#)) is located in §A.1. *end note*]

17.9.12 multiLevelType (Abstract Numbering Definition Type)

This element specifies the type of numbering defined by a given abstract numbering type. This information shall only be used by a consumer to determine user interface behaviors for this numbering definition, and shall not be used to limit the behavior of the list (i.e. a list with multiple levels marked as `singleLevel` shall not be prevented from using levels 2 through 9).

If this element is omitted, then the list shall be assumed to be of any numbering type desired by the consumer.

[Example: Consider the WordprocessingML below:

```
<w:abstractNum w:abstractNumId="8">
...
<w:multiLevelType w:val="singleLevel" />
...
</w:abstractNum>
```

This abstract numbering definition is specified to be of the `singleLevel` numbering type by the `multiLevelType` element. *end example*]

Attributes	Description
val (Abstract Numbering Definition Type)	<p>Specifies the specific type of numbering enabled by a given abstract numbering definition.</p> <p>[Example: Consider the WordprocessingML below:</p> <pre><w:abstractNum w:abstractNumId="8"> ... <w:multiLevelType w:val="multilevel" /> ... </w:abstractNum></pre> <p>This abstract numbering definition is specified to be of the <code>multilevel</code> numbering type, which can be used by consumers to place this numbering correctly within a user interface. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_MultiLevelType</code> simple type (§17.18.58).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_MultiLevelType](#)) is located in §A.1. *end note*]

17.9.13 name (Abstract Numbering Definition Name)

This element specifies the name of a given abstract numbering definition. This name can be surfaced in order to provide a user friendly alias for a given numbering definition, but shall not influence the behavior of the list - two identical definitions with different name elements shall behave identically.

If this element is omitted, then this abstract numbering definition shall have no name.

[Example: Consider the WordprocessingML below:

```
<w:abstractNum w:abstractNumId="4">
  <w:nsid w:val="5C294B5B" />
  <w:multiLevelType w:val="multilevel" />
```



```

<w:tpl w:val="6F8A81B0" />
<w:name w:val="Example Name" />
...
</w:abstractNum>

```

In this example, the given abstract numbering definition is named `Example Name` by use of the `name` element. *end example*

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre> <w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr> </pre> <p>The value of the <code>val</code> attribute is the ID of the associated paragraph style's <code>styleId</code>.</p> <p>However, consider the following fragment:</p> <pre> <w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr> </pre> <p>In this case, the decimal number in the <code>val</code> attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model (`CT_String`) is located in §A.1. *end note*]

17.9.14 nsid (Abstract Numbering Definition Identifier)

This element associates a unique hexadecimal ID to the parent abstract numbering definition. This number shall be identical for two abstract numbering definitions that are based from the same initial numbering definition - if a document is repurposed and the underlying numbering definition is changed, it shall maintain its original `nsid`.

If this element is omitted, then the list shall have no `nsid` and one can be added by a producer arbitrarily.

[*Note:* This element can be used to determine the abstract numbering definition to be applied to a numbered paragraph copied from one document and pasted into another. Consider a case in which a given numbered paragraph associated with a abstract numbering definition with nsid FFFFFF23, is pasted among numbered paragraphs associated with a completely different appearance and an abstract numbering definition with an nsid of FFFFFF23. Here, because of the distinction enabled by the identical nsid values, the hosting application would not have to arbitrarily keep the pasted numbered paragraph associated with its original abstract numbering definition, as it might use the information provided by the abstract numbering definition's identical nsid values to know that those two numbering sets are identical, and merge the paragraphs into the target numbering format. *end note*]

[*Example:* Consider the WordprocessingML for an abstract numbering definition below:

```
<w:abstractNum w:abstractNumId="3">
  <w:nsid w:val="FFFFFF89" />
  <w:multiLevelType w:val="singleLevel" />
  <w:tmpl w:val="D9842532" />
  ...
</w:abstractNum>
```

In this example, the given abstract numbering definition is associated with the unique hexadecimal ID FFFFFFF89. *end example*]

Attributes	Description
val (Long Hexadecimal Number Value)	<p>Specifies a number value specified as a four digit hexadecimal number), whose contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following value for an attribute of simple type ST_LongHexNumber: 00BE2C6C.</p> <p>This value is permitted, as it contains four hexadecimal digits, each an encoding of an octet of the actual decimal number value. It can therefore be interpreted as desired in the context of the parent XML element, <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_LongHexNumber](#)) is located in §A.1. *end note*]

17.9.15 num (Numbering Definition Instance)

This element specifies a unique instance of numbering information that can be referenced by zero or more paragraphs within the parent WordprocessingML document.

This instance requires the referencing of a base abstract numbering definition through the abstractNumId child element (§17.9.2). This element also can be used to specify a set of optional overrides applied to zero or more levels from the abstract numbering definition inherited by this instance second through the optional lvlOverride child elements (§17.9.8).

[*Example:* Consider the WordprocessingML for a document with four numbering definition instances, two of which reference the same underlying abstract numbering definition:

```
<w:numbering>
...
<w:num w:numId="2">
  <w:abstractNumId w:val="0" />
</w:num>
<w:num w:numId="3">
  <w:abstractNumId w:val="1" />
</w:num>
<w:num w:numId="4">
  <w:abstractNumId w:val="4" />
</w:num>
<w:num w:numId="5">
  <w:abstractNumId w:val="4" />
</w:num>
</w:numbering>
```

As shown above, the first two numbering definition instances reference abstractNumId values of 0 and 1 respectively, and the last two both reference the abstract numbering definition with an abstractNumId of 4. *end example]*

[*Example:* Consider a numbering definition instance which inherits its information from the abstract numbering definition with abstractNumId of 4, but wishes to use a different set of properties for level 0 of the numbering definition. The resulting WordprocessingML would look like:

```
<w:num w:numId="6">
  <w:abstractNumId w:val="4" />
  <w:lvlOverride w:ilvl="0">
    <w:lvl w:ilvl="0">
      <w:start w:val="4" />
      <w:lvlText w:val="%1)" />
      <w:lvlJc w:val="start" />
      <w:pPr>
        <w:ind w:start="360" w:hanging="360" />
      </w:pPr>
    </w:lvl>
  </w:lvlOverride>
</w:num>
```

The lvlOverride element specifies an override for level 0 of the abstract numbering definition. *end example*]

Attributes	Description
numId (Numbering Definition Instance ID)	<p>Specifies a unique ID which any numbered paragraph which wishes to inherit these numbering properties shall reference using the numPr element (§17.3.1.19).</p> <p>[<i>Example:</i> Consider the WordprocessingML below for an example numbered paragraph:</p> <pre><w:p> <w:pPr> <w:numPr> <w:ilvl w:val="0" /> <w:numId w:val="5" /> </w:numPr> </w:pPr> ... </w:p></pre> <p>This paragraph references a numbering definition instance with a numId attribute of 5:</p> <pre><w:num w:numId="5"> <w:abstractNumId w:val="4" /> </w:num></pre> <p>The numbering definition instance with a numId attribute of 5 correlates with the numbered paragraph with the numbering definition instance referent element with a val of 5, so the numbered paragraph inherits its properties. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element’s content model (CT_Num) is located in §A.1. *end note*]

17.9.16 numbering (Numbering Definitions)

This element specifies the formatting, display, and functionality of numbering - Arabic numerals, Roman numerals, symbol characters ("bullets"), text strings, etc. - in WordprocessingML documents, which are used to label individual paragraphs of text.

[*Example:* The following two paragraphs each contain numbering as defined by WordprocessingML: the first uses an Arabic numeral, the second a symbol character:

- 8. This is a paragraph with numbering information.
- This is also a paragraph with numbering information.

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Numbering](#)) is located in §A.1. *end note]*

17.9.17 numFmt (Numbering Format)

This element specifies the number format that shall be used to display all numbering at this level in the numbering definition. This information is used to replace the level text string %x, where x is a particular one-based level index, with the appropriate value unless the numFmt value is bullet, in which case the literal text of the level text string is used. This value shall be calculated by counting the number of paragraphs at this level since the last restart using the numbering system defined in the val attribute.

When a document has a custom number format specified by the format attribute, it shall use the referenced number format. If the referenced number format cannot be resolved as a number format the consumer shall use the number format specified by the value of the val attribute. If the corresponding value of the val attribute is custom, the result is implementation-defined.

If this element is omitted, the level shall be assumed to be of level type decimal.

[*Example:* Consider the following WordprocessingML fragment for a numbering level in a numbering definition:

```
<w:lvl w:ilvl="2">
  <w:start w:val="1" />
  <w:numFmt w:val="lowerRoman" />
  <w:lvlRestart w:val="0" />
  <w:lvlText w:val="%3)" />
  <w:lvlJc w:val="start" />
  <w:pPr>
    <w:ind w:start="1080" w:hanging="360" />
  </w:pPr>
  <w:rPr>
    <w:rFonts w:hint="default" />
  </w:rPr>
```

</w:lvl>

A numFmt value of lowerLetter indicates that a consumer must use lowercase letters for all numbering of this level: a,b,c... *end example*]

Attributes	Description
format (Custom Defined Number Format)	<p>Specifies a custom number format using the syntax defined by the XSLT format attribute. This format shall be used for all numbering in the parent object.</p> <p>[<i>Example:</i> A value of &#x30A2; indicates that a consumer must use Katakana numbering. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
val (Numbering Format Type)	<p>Specifies the number format that shall be used for all numbering in the parent object.</p> <p>[<i>Example:</i> A value of lowerLetter indicates that a consumer must use lowercase letters for each number in this grouping: a,b,c... <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_NumberFormat simple type (§17.18.59).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_NumFmt](#)) is located in §A.1. *end note*]

17.9.18 numId (Numbering Definition Instance Reference)

This element specifies the numbering definition instance which shall be used for the given parent numbered paragraph in the WordprocessingML document.

A value of 0 for the val attribute shall never be used to point to a numbering definition instance, and shall instead only be used to designate the removal of numbering properties at a particular level in the style hierarchy (typically via direct formatting).

[*Example:* Consider the WordprocessingML below for an example numbered paragraph:

```
<w:p>
  <w:pPr>
    <w:numPr>
      <w:ilvl w:val="0" />
      <w:numId w:val="5" />
    </w:numPr>
  </w:pPr>
  ...
</w:p>
```

This paragraph references a numbering definition instance with a numId attribute of 5, as follows:

```
<w:num w:numId="5">
  <w:abstractNumId w:val="4" />
</w:num>
```

The numbering definition instance reference specifies the given numbering definition instance to be applied to the given paragraph, which itself inherits its properties from abstract numbering definition with abstractNumId of 4. *end example*]

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <pre><... w:val="1512645511" /></pre> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model (CT_DecimalNumber) is located in §A.1. *end note*]

17.9.19 numIdMacAtCleanup (Last Reviewed Abstract Numbering Definition)

This element specifies to a consumer the progress in the last attempt made by the application to remove unused abstract numbering definitions from a given document. If a legacy document is opened by a consumer, it can choose to remove abstract numbering definition which are 'orphaned' (have no associated numbering definition instances). This element is used by those consumers to indicate their progress (if not complete) in reviewing existing abstract numbering definitions. [*Note:* Removing unused abstract numbering definition from a document reduces the file size, but is not required. *end note*]

If omitted, then all abstract numbering definitions shall be considered reviewed.

[*Example:* Consider a document with 32 abstract numbering definitions, with abstractNumId values ranging from 0 to 85. If an application has only reviewed those abstract numbering definitions with abstractNumId values lower than 25 at save time, it would indicate that state as follows:

```
<w:numIdMacAtCleanup w:val="25"/>
```

This value specifies that all abstract numbering definitions with an abstractNumId value higher than 25 have not yet been reviewed. *end example*]

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example</i>: Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <div><... w:val="1512645511" /></div> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_DecimalNumber](#)) is located in §A.1. *end note*]

17.9.20 numPicBullet (Picture Numbering Symbol Definition)

This element specifies the appearance and behavior of a specific picture to be used as the numbering symbol within a numbering level definition in a document, and is the basis for all picture numbering symbol information in a WordprocessingML document.

This element is not used directly within abstract numbering definitions but rather is referenced through its numPicBulletId attribute by the lvlPicBulletId element (§17.9.9) used within numbering level definitions.

[*Example*: Consider the WordprocessingML fragment below which illustrates how a numPicBullet definition is referenced by a picture numbering symbol definition reference through its numPicBulletId attribute:

```
<w:numPicBullet w:numPicBulletId="1">
  <w:drawing>
    ...
  </w:drawing>
</w:numPicBullet>
...
<w:abstractNum w:abstractNumId="7">
  <w:nsid w:val="71A06359" />
  <w:multilevelType w:val="hybridMultilevel" />
  <w:tmpl w:val="10643FE6" />
```



```

<w:lvl w:ilvl="0" w:tplc="B7663E56">
  <w:start w:val="1" />
  <w:numFmt w:val="bullet" />
  <w:lvlText w:val="☐" />
  <w:lvlPicBulletId w:val="1" />
</w:lvl>
</w:abstractNum>

```

The lvlPicBulletId element references a numPicBullet element, which defines the size and appearance of all picture bullets of this picture bullet type within the document. It is important to note that this picture bullet can be referenced by multiple levels of various numbering definitions. *end example*]

Attributes	Description
numPicBulletId (Picture Numbering Symbol ID)	<p>Specifies a unique ID for this picture bullet definition which shall be used to reference this picture bullet from a numbering level definition.</p> <p>[<i>Example:</i> Consider the WordprocessingML fragment below which illustrates how a numPicBullet definition is referenced by a picture numbering symbol definition reference through its numPicBulletId attribute:</p> <pre> <w:numPicBullet w:numPicBulletId="1"> ... </w:numPicBullet> ... <w:abstractNum w:abstractNumId="7"> <w:lvl w:ilvl="0" w:tplc="B7663E56"> ... <w:lvlPicBulletId w:val="1" /> </w:lvl> </w:abstractNum> </pre> <p>The lvlPicBulletId element references the ID in the numPicBulletId attribute directly. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_NumPicBullet](#)) is located in §A.1. *end note*]

17.9.21 numStyleLink (Numbering Style Reference)

This element specifies an abstract numbering that does not contain the actual numbering properties for its numbering type, but rather serves as a reference to a numbering style stored in the document, which shall be applied when this abstract numbering definition is referenced, and itself points at the actual underlying abstract numbering definition to be used.

The numbering style that is to be applied when this abstract numbering definition is referenced is identified by the string contained in numStyleLink's val attribute.

[Example: Consider the abstract numbering definition below:

```
<w:abstractNum w:abstractNumId="0">
  <w:nsid w:val="38901FA4" />
  <w:multiLevelType w:val="multilevel" />
  <w:numStyleLink w:val="TestNumberingStyle" />
</w:abstractNum>
```

This abstract numbering definition references the numbering style with a styleId attribute equal to TestNumberingStyle, as follows below:

```
<w:style w:type="numbering" w:styleId="TestNumberingStyle">
  ...
</w:style>
```

Therefore, this numbering style must be applied whenever the base abstract numbering definition is inherited by a numbered paragraph. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[Example: Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type</p>

Attributes	Description
	(§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([CT_String](#)) is located in §A.1. *end note*]

17.9.22 pPr (Numbering Level Associated Paragraph Properties)

This element specifies the paragraph properties which shall be applied as part of a given numbering level within the parent numbering definition. These paragraph properties are applied to any numbered paragraph that references the given numbering definition and numbering level.

Paragraph properties specified on the numbered paragraph itself override the paragraph properties specified by pPr elements within a numbering lvl element (§17.9.5, §17.9.6).

[Example: Consider the WordprocessingML below which specifies numbering level paragraph properties:

```
<w:abstractNum w:abstractNumId="1">
...
<w:lvl w:ilvl="0">
...
  <w:pPr>
    <w:tabs>
      <w:tab w:val="num" w:pos="720" />
    </w:tabs>
    <w:ind w:start="720" w:hanging="360" />
  </w:pPr>
</w:lvl>
</w:abstractNum>
```

Each of the paragraph properties specified inside the pPr element are applied to any numbered paragraph which inherits this numbering level definition as part of the numbering properties in the order defined by the style hierarchy. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_PPrGeneral](#)) is located in §A.1. *end note*]

17.9.23 pStyle (Paragraph Style's Associated Numbering Level)

This element specifies the name of a paragraph style which shall automatically this numbering level when applied to the contents of the document. When a paragraph style is defined to include a numbering definition, any numbering level defined by the numPr element (§17.3.1.19) shall be ignored, and instead this element shall specify the numbering level associated with that paragraph style.

If this element references a style which does not exist, or is not a paragraph style, then it can be ignored.

[Example: Consider the WordprocessingML below which specifies that the paragraph style with styleId example, when applied to paragraphs in the document, must also apply the first numbering level of the abstract numbering definition with an abstractNumId equal to 1, as follows:

```
<w:abstractNum w:abstractNumId="1">
  ...
  <w:lvl w:ilvl="0">
    ...
    <w:pStyle w:val="example" />
    <w:pPr>
      <w:tabs>
        <w:tab w:val="num" w:pos="720" />
      </w:tabs>
      <w:ind w:start="720" w:hanging="360" />
    </w:pPr>
    ...
  </w:lvl>
</w:abstractNum>
```

The style definition for the paragraph style would only include the numId of the numbering definition instance, and not its level:

```
<w:style w:styleId="example" w:type="paragraph">
  ...
  <w:pPr>
    <w:numPr>
      <w:numId w:val="0" />
    </w:numPr>
  </w:pPr>
</w:style>
```

end example]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[Example: Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre>

Attributes	Description
	<p>The value of the <code>val</code> attribute is the ID of the associated paragraph style's <code>styleId</code>.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the <code>val</code> attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model (`CT_String`) is located in §A.1. *end note*]

17.9.24 rPr (Numbering Symbol Run Properties)

This element specifies the run properties which shall be applied to the numbering level's text specified in the `lvlText` element (§17.9.11) when it is applied to paragraphs in this document.

These run properties are applied to all numbering level text used by a given abstract numbering definition and numbering level. It should be noted that run properties specified on a numbered paragraph itself, or on text runs within a numbered paragraph, are separate from the run properties specified by `rPr` elements within a numbering level, as the latter affects only the numbering text itself, not the remainder of runs in the numbered paragraph.

[Example: Consider the WordprocessingML below which uses the `rPr` element to specify that the numbering symbol used within a given numbering level should be bold and of a 16 point font size:

```
<w:lvl1 w:ilvl="1">
  ...
  <w:rPr>
    <w:b />
    <w:sz w:val="32" />
  </w:rPr>
</w:lvl1>
```

The resulting paragraph uses its regular paragraph formatting, but the numbering level text itself must be specifically formatted as bold in 16 point font. *end example*

The W3C XML Schema definition of this element's content model (CT_RPr) is located in §A.1. Each child element from the above table shall not occur more than once. [*Note: This restriction is not reflected in the element's content model due to limitations of W3C XML Schema language. end note*]

17.9.25 start (Starting Value)

This element specifies the starting value for the numbering used by the parent numbering level within a given numbering level definition. This value is used when this level initially starts in a document, as well as whenever it is restarted via the properties set in the lvlRestart element (§17.9.10).

If this element is omitted, then the starting value shall be zero (0).

[*Example: Consider the following WordprocessingML fragment for an abstract numbering definition:*

```
<w:abstractNum w:abstractNumId="1">
  ...
  <w:lvl w:ilvl="0">
    <w:start w:val="2" />
    <w:numFmt w:val="upperLetter"/>
    ...
  </w:lvl>
</w:abstractNum>
```

In this example, since upper case Western letters (upperLetter) are being used as numbering symbols for this numbering level, the first instance of a numbering paragraph associated with this abstract numbering definition and numbering level would have the numbering symbol B, the second letter in the number format.

Subsequent numbered paragraphs with this abstract numbering definition and at this level would have their numbering symbols incremented from B (the starting value for this numbering level). *end example*]

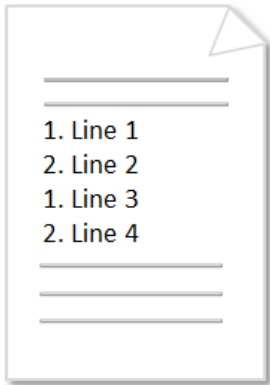
Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example: Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</i></p> <div><... w:val="1512645511" /></div> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_DecimalNumber](#)) is located in §A.1. end note]

17.9.26 startOverride (Numbering Level Starting Value Override)

This element specifies the number that the specified level override shall begin with. This value is used to reset the numbering in a given level.

[Example: Consider using WordprocessingML to override the numbering of a particular list item and make the list look as follows:



Firstly, create two w:num instances that reference the same abstract numbering definition. One of the w:num instance overrides the numbering value for the first level. Below is the Wordprocessing ML that illustrates this:

```
<w:num w:numId="5">
  <w:abstractNumId w:val="4"/>
</w:num>

<w:num w:numId="6">
  <w:abstractNumId w:val="4"/>
  <w:lvlOverride w:ilvl="0">
    <w:startOverride w:val = "1"/>
  </w:lvlOverride>
</w:num>
```

Then, in the main document, number the first and the second paragraph as "1" and "2" respectively by using numId 5, and reset the numbering of the third paragraph to "1" by using numId 6. In turn, the numbering of the fourth paragraph becomes "2", because it is incremented based on the new reset value. Below is the WordprocessingML that illustrates this:

```
<w:p>
  <w:pPr>
    <w:numPr>
      <w:ilvl w:val="0"/>
      <w:numId w:val="5"/>
    </w:numPr>
  </w:pPr>
<w:r>
```

```

    <w:t> Line 1 </w:t>
  </w:r>
</w:p>
<w:p>
  <w:pPr>
    <w:numPr>
      <w:ilvl w:val="0"/>
      <w:numId w:val="5"/>
    </w:numPr>
  </w:pPr>
  <w:r>
    <w:t> Line 2 </w:t>
  </w:r>
</w:p>
<w:p>
  <w:pPr>
    <w:numPr>
      <w:ilvl w:val="0"/>
      <w:numId w:val="6"/>
    </w:numPr>
  </w:pPr>
  <w:r>
    <w:t> Line 3 </w:t>
  </w:r>
</w:p>
<w:p>
  <w:pPr>
    <w:numPr>
      <w:ilvl w:val="0"/>
      <w:numId w:val="5"/>
    </w:numPr>
  </w:pPr>
  <w:r>
    <w:t> Line 4 </w:t>
  </w:r>
</w:p>
end example]
```

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <p style="text-align: center;"><... w:val="1512645511" /></p> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example]</i></p>

Attributes	Description
	The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DecimalNumber](#)) is located in §A.1. *end note*]

17.9.27 styleLink (Numbering Style Definition)

This element specifies that the parent abstract numbering definition is the base numbering definition for the specified numbering style referenced in its val attribute.

If this element is omitted, or it references a style which does not exist, then this numbering definition shall not be the underlying properties for a numbering style.

[*Note:* Numbering styles are never directly referenced by paragraphs or runs in the document – instead, an abstract numbering definition specifies that it contains the underlying numbering information for a numbering style, and one or more numbering definition instances reference a numbering definition which inherits from it. The numbering style itself is just a friendly name on an abstract numbering definition. *end note*]

[*Example:* Consider the WordprocessingML fragment below, representing an abstract numbering definition which defines the properties for a numbering style:

```
<w:numbering>
...
  <w:abstractNum w:abstractNumId="5">
    ...
    <w:styleLink w:val="ExampleNumberingStyle" />
    ...
  </w:abstractNum>
</w:numbering>
...
<w:styles>
...
  <w:style w:type="numbering" w:styleId="ExampleNumberingStyle">
    <w:name w:val="ExampleNumberingStyle" />
    ...
    <w:pPr>
      <w:numPr>
        <w:numId w:val="6" />
      </w:numPr>
    </w:pPr>
  </w:style>
...
```

</w:styles>

The styleLink element specifies that the abstract numbering definition defines the properties for a numbering style whose styleId matches its val attribute, and is defined in the styles element of the WordprocessingML. *end example*

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element’s content model (CT_String) is located in §A.1. *end note*]

17.9.28 suff (Content Between Numbering Symbol and Paragraph Text)

This element specifies the content which shall be added between a given numbering level's text and the text of every numbered paragraph which references that numbering level.

If this element is omitted, then its value shall be assumed to be tab.

[*Example:* Consider the numbered paragraph below:

1. Test

In this example, a space exists between the numbering symbol 1. and the numbered paragraph text Test. The space would be specified in WordprocessingML as follows:

```
<w:lvl w:ilvl="0">
...
<w:suff w:val="space" />
...
</w:lvl>
```

The suff element with an attribute value of space specifies that the character between the numbering's level text and the paragraph text must be a space. *end example*

Attributes	Description
val (Character Type Between Numbering and Text)	<p>Specifies the character which shall follow the list number.</p> <p>[<i>Example:</i> Consider a numbered for which a tab exists between the numbering symbol and the numbered paragraph's text. The tab would be specified in WordprocessingML as follows:</p> <pre><w:lvl w:ilvl="0"> ... <w:suff w:val="tab" /> ... </w:lvl></pre> <p>The val attribute with a value of tab specifies that the character between the numbering's level text and the paragraph text must be a tab. This tab follows normal tab stop rules. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_LevelSuffix simple type (§17.18.46).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_LevelSuffix](#)) is located in §A.1. *end note*]

17.9.29 **tmpl (Numbering Template Code)**

This element specifies a unique hexadecimal code which can be used to determine a location within application user interface in which this abstract numbering definition shall be displayed.

If this element is omitted, then this abstract numbering definition can be displayed in any location chosen by the consumer.

[*Example:* Consider the following abstract numbering definition:

```
<w:abstractNum w:abstractNumId="1">
```

```
...  
<w:tmpl w:val="CA48B6BA" />  
...  
</w:abstractNum>
```

In this example the abstractNum element with attribute abstractNumId equal to 1, would appear in the area within a consumer's application user interface specified by the template code CA48B6BA. *end example*

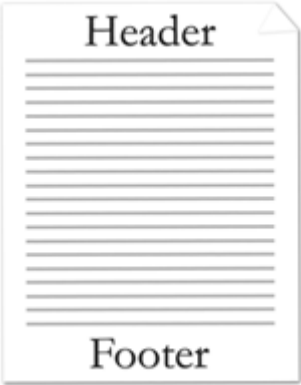
Attributes	Description
val (Long Hexadecimal Number Value)	<p>Specifies a number value specified as a four digit hexadecimal number), whose contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following value for an attribute of simple type ST_LongHexNumber: 00BE2C6C.</p> <p>This value is permitted, as it contains four hexadecimal digits, each an encoding of an octet of the actual decimal number value. It can therefore be interpreted as desired in the context of the parent XML element, <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_LongHexNumber](#)) is located in §A.1. *end note*]

17.10 Headers and Footers

Headers and footers refer to text, graphics or data (such as page number, date, document title, and so on) that can appear at the top or bottom of each page in a WordprocessingML document.

A header appears in the top margin (above the main document content on the page), while a footer appears in the bottom margin of a document page (below the main document content on the page).



Since WordprocessingML is a flow-based format, headers and footers are applied by specifying the headers and footers for all pages in a particular section of a document.

Within each section of a document there can be up to three different types of headers and footers:

- First page header/footer
- Odd page header/footer
- Even page header/footer

First page headers and footers specify a unique header or footer which shall appear on the first page of a section. Odd page headers and footers specify a unique header and footer which shall appear on all odd numbered pages for a given section. Even page headers and footers specify a unique header and footer which shall appear on all even numbered pages in a given section.

17.10.1 **evenAndOddHeaders (Different Even/Odd Page Headers and Footers)**

This element specifies whether sections in this document shall have different headers and footers for even and odd pages (an odd page header/footer and an even page header/footer).

If the `val` attribute is set to `true`, then each section in the document shall use an odd page header for all odd numbered pages in the section, and an even page header for all even numbered pages in the section (counting from the starting value of page numbering for the parent section to determine if the first page is even or odd, as specified with the `start` attribute on the `pgNumType` element). If the `val` attribute is set to `false`, then all pages in a section shall use the odd page header.

This setting does not affect the presence of a first page header on each section, which is specified using the `titlePg` element (§17.10.6). If a first page header is specified, then all subsequent pages shall have this setting applied, including the first page in the odd/even page count.

If this element is set to `false` and an even page header/footer is specified, then it shall be ignored and only the odd page header/footer shall be displayed. Conversely, if this element is set to `true` and either header/footer type is omitted for a given section, the appropriate header/footer should be inherited from the previous section; if this is the first section in the document, then a blank header/footer shall be created as needed (another header/footer type shall not be used in its place).

If this element is omitted, then its value shall be assumed to be `false`.

[*Example:* Consider a document which must have a different even and odd page header for each section in its contents. This requirement must be specified using the following WordprocessingML:

```
<w:settings>
...
  <w:evenAndOddHeaders />
...
</w:settings>
```

Since the `evenAndOddHeaders` property is set (and its default value is `true`), this document now has different headers and footers for even and odd pages. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.10.2 footerReference (Footer Reference)

This element specifies a single footer which shall be associated with the current section in the document. This footer shall be referenced via the `id` attribute, which specifies an explicit relationship to the appropriate Footer part in the WordprocessingML package.

If the relationship type of the relationship specified by this element is not `http://purl.oclc.org/ooxml/officeDocument/relationships/footer`, is not present, or does not have a `TargetMode` attribute value of `Internal`, then the document shall be considered non-conformant.

Within each section of a document there can be up to three different types of footers:

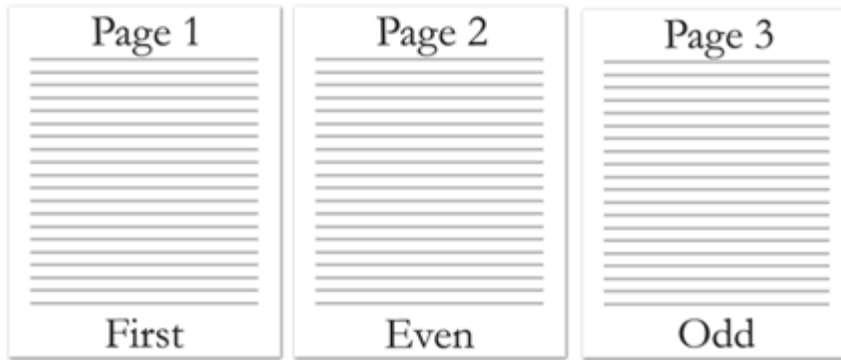
- First page footer
- Odd page footer
- Even page footer

The footer type specified by the current footerReference is specified via the `type` attribute.

If any type of footer is omitted for a given section, then the following rules shall apply.

- If no footerReference for the first page footer is specified and the `titlePg` element is specified, then the first page footer shall be inherited from the previous section or, if this is the first section in the document, a new blank footer shall be created. If the `titlePg` element is not specified, then no first page footer shall be shown, and the odd page footer shall be used in its place.
- If no footerReference for the even page footer is specified and the `evenAndOddHeaders` element is specified, then the even page footer shall be inherited from the previous section or, if this is the first section in the document, a new blank footer shall be created. If the `evenAndOddHeaders` element is not specified, then no even page footer shall be shown. and the odd page footer shall be used in its place.
- If no footerReference for the odd page footer is specified then the odd page footer shall be inherited from the previous section or, if this is the first section in the document, a new blank footer shall be created.

[Example: Consider a three page document with different first, odd, and even page footers defined as follows:



This document defines three footers, each of have a relationship from the document part with a unique relationship ID, as shown in the following packaging markup:

```
<Relationships
  xmlns="http://schemas.openxmlformats.org/package/2006/relationships">
  ...
  <Relationship Id="rId6"
Type="http://purl.oclc.org/ooxml/officeDocument/relationships/footer" Target="footer1.xml"
/>
  <Relationship Id="rId7"
Type="http://purl.oclc.org/ooxml/officeDocument/relationships/footer" Target="footer2.xml"
/>
  <Relationship Id="rId10"
Type="http://purl.oclc.org/ooxml/officeDocument/relationships/footer" Target="footer3.xml"
/>
  ...
</Relationships>
```

These relationships are then referenced in the section's properties using the following WordprocessingML:

```
<w:sectPr>
  ...
  <w:footerReference r:id="rId6" w:type="first" />
  <w:footerReference r:id="rId7" w:type="default" />
  <w:footerReference r:id="rId10" w:type="even" />
  ...
</w:sectPr>
```

The resulting section must use the footer part with relationship id rId6 for the first page, the footer part with relationship id rId10 for all subsequent even pages, and the footer part with relationship id rId7 for all subsequent odd pages. *end example*

Attributes	Description
<p>id (Relationship to Part)</p> <p>Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships</p>	<p>Specifies the relationship ID to a specified part.</p> <p>The specified relationship shall match the relationship type required by the parent element:</p> <ul style="list-style-type: none"> • http://purl.oclc.org/ooxml/officeDocument/relationships/customXml for the contentPart element • http://purl.oclc.org/ooxml/officeDocument/relationships/footer for the footerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/header for the headerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/font for the embedBold, embedBoldItalic, embedItalic, or embedRegular elements • http://purl.oclc.org/ooxml/officeDocument/relationships/printerSettings for the printerSettings element • http://purl.oclc.org/ooxml/officeDocument/relationships/hyperlink for the longDesc or hyperlink element <p>[Example: Consider an XML element which has the following id attribute:</p> <pre><... r:id="rId10" /></pre> <p>The markup specifies the associated relationship part with relationship ID rId1 contains the corresponding relationship information for the parent XML element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
<p>type (Header or Footer Type)</p>	<p>Specifies the type of header or footer specified by the target relationship ID. This header/footer type determines the page(s) on which the current header or footer shall be displayed.</p> <p>If any section contains more than a single header or footer of each type, then the document shall be considered non-conformant.</p> <p>[Example: Consider a document with the following WordprocessingML:</p> <pre><w:sectPr> ... <w:footerReference r:id="rId6" w:type="first" /> <w:footerReference r:id="rId7" w:type="first" /> <w:footerReference r:id="rId10" w:type="even" /> ... </w:sectPr></pre> <p>The resulting section has two footers of type first, and therefore is non-conformant. <i>end example</i>]</p>

Attributes	Description
	<p>[<i>Example:</i> Consider a WordprocessingML section which specifies the following header reference:</p> <pre data-bbox="451 352 1240 386"><w:headerReference r:id="rId10" w:type="first" /></pre> <p>The resulting section must use the specified header part for the first page. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_HdrFtr simple type (§17.18.36).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_HdrFtrRef](#)) is located in §A.1. *end note*]

17.10.3 ftr (Footer)

This element specifies the content for a single footer for use within one or more sections of a WordprocessingML document.

Within the ftr element, the content of the element is similar to the content of the body (§17.2.2) element, and contains what is referred to as *block-level markup* - markup which can exist as a sibling element to paragraphs in a WordprocessingML document.

[*Example:* Consider the following simple one page document with one footer:

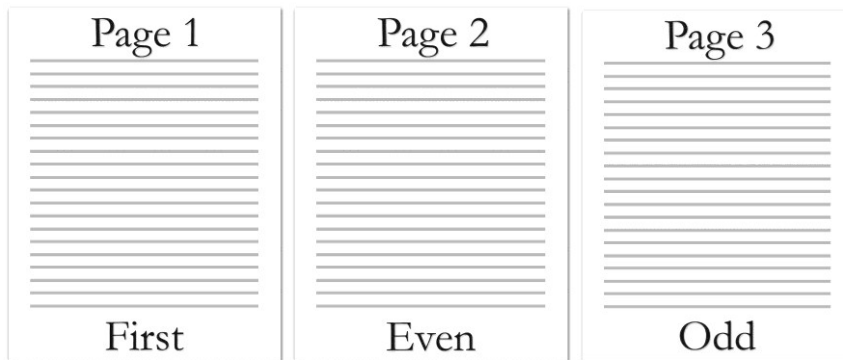


This document defines one footer with the text footer. The footer contents are stored in a unique footer part. The resulting footer is represented by the following WordprocessingML:

```
<w:fttr>
  <w:p>
    <w:r>
      <w:t>Footer</w:t>
    </w:r>
  </w:p>
</w:fttr>
```

Since footers are containers of block level contents, all block level elements can be used within them. In this particular example, the content is a single paragraph. *end example*

[*Example:* Consider a more complex three page document with different first, odd, and even page footers defined:



This document defines three footers stored in three different footer parts. The resulting footers are represented by the following WordprocessingML:

First page footer part:

```
<w:fttr>
  <w:p>
    <w:r>
      <w:t>First</w:t>
    </w:r>
  </w:p>
</w:fttr>
```

Even page footer part:

```

<w:fttr>
  <w:p>
    <w:r>
      <w:t>Even</w:t>
    </w:r>
  </w:p>
</w:fttr>

```

Odd page footer part:

```

<w:fttr>
  <w:p>
    <w:r>
      <w:t>Odd</w:t>
    </w:r>
  </w:p>
</w:fttr>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_HdrFtr](#)) is located in §A.1. *end note*]

17.10.4 **hdr (Header)**

This element specifies the content for a single header for use within one or more sections of a WordprocessingML document.

Within the `hdr` element, the content of the element is similar to the content of the body (§17.2.2) element, and contains what is referred to as *block-level markup* - markup which can exist as a sibling element to paragraphs in a WordprocessingML document.

[*Example:* Consider the following simple one page document with one header:

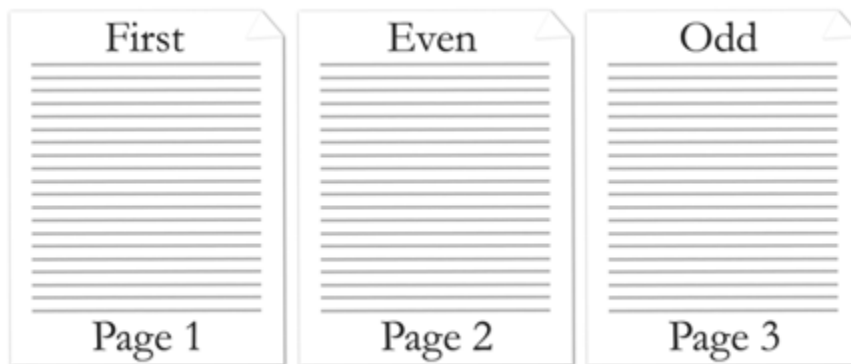


This document defines one header with the text `Header`. The header's contents is stored in a unique Header part. The resulting header is represented by the following WordprocessingML:

```
<w:hdr>
  <w:p>
    <w:r>
      <w:t>Header</w:t>
    </w:r>
  </w:p>
</w:hdr>
```

Since headers are containers of block level contents, all block level elements can be used within them. In this particular example, the content is a single paragraph. *end example*

[*Example:* Consider a more complex three page document with different first, odd, and even page headers defined:



This document defines three headers stored in three different header parts. The resulting headers are represented by the following WordprocessingML:

First page header part:

```
<w:hdr>
  <w:p>
    <w:r>
      <w:t>First</w:t>
    </w:r>
  </w:p>
</w:hdr>
```

Even page header part:

```

<w:hdr>
  <w:p>
    <w:r>
      <w:t>Even</w:t>
    </w:r>
  </w:p>
</w:hdr>

```

Odd page header part:

```

<w:hdr>
  <w:p>
    <w:r>
      <w:t>Odd</w:t>
    </w:r>
  </w:p>
</w:hdr>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_HdrFtr](#)) is located in §A.1. *end note*]

17.10.5 headerReference (Header Reference)

This element specifies a single header which shall be associated with the current section in the document. This header shall be referenced via the `id` attribute, which specifies an explicit relationship to the appropriate Header part in the WordprocessingML package.

If the relationship type of the relationship specified by this element is not <http://purl.oclc.org/ooxml/officeDocument/relationships/header>, is not present, or does not have a `TargetMode` attribute value of `Internal`, then the document shall be considered non-conformant.

Within each section of a document there can be up to three different types of headers:

- First page header
- Odd page header
- Even page header

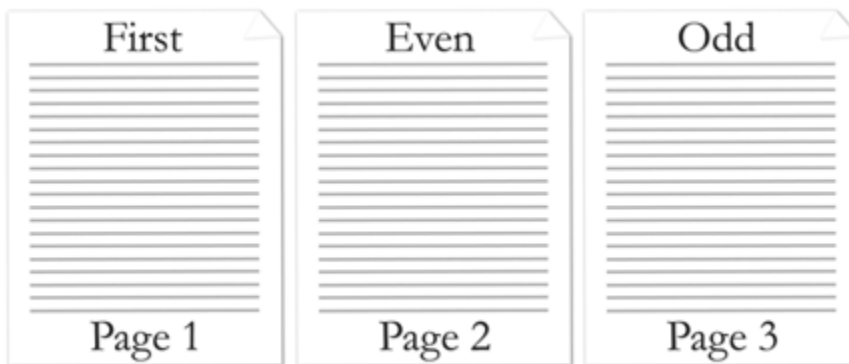
The header type specified by the current `headerReference` is specified via the `type` attribute.

If any type of header is omitted for a given section, then the following rules shall apply.

- If no `headerReference` for the first page header is specified and the `titlePg` element is specified, then the first page header shall be inherited from the previous section or, if this is the first section in the document, a new blank header shall be created. If the `titlePg` element is not specified, then no first page header shall be shown, and the odd page header shall be used in its place.

- If no headerReference for the even page header is specified and the evenAndOddHeaders element is specified, then the even page header shall be inherited from the previous section or, if this is the first section in the document, a new blank header shall be created. If the evenAndOddHeaders element is not specified, then no even page header shall be shown, and the odd page header shall be used in its place.
- If no headerReference for the odd page header is specified then the odd page header shall be inherited from the previous section or, if this is the first section in the document, a new blank header shall be created.

[Example: Consider a three page document with different first, odd, and even page header defined as follows:



This document defines three headers, each of have a relationship from the document part with a unique relationship ID, as shown in the following packaging markup:

```
<Relationships
  xmlns="http://schemas.openxmlformats.org/package/2006/relationships">
  ...
  <Relationship Id="rId2"
    Type="http://purl.oclc.org/ooxml/officeDocument/relationships/header"
    Target="header1.xml" />
  <Relationship Id="rId3"
    Type="http://purl.oclc.org/ooxml/officeDocument/relationships/header"
    Target="header2.xml" />
  <Relationship Id="rId5"
    Type="http://purl.oclc.org/ooxml/officeDocument/relationships/header"
    Target="header3.xml" />
  ...
</Relationships>
```

These relationships are then referenced in the section's properties using the following WordprocessingML:

```
<w:sectPr>
  ...
  <w:headerReference r:id="rId3" w:type="first" />
```

```

<w:headerReference r:id="rId5" w:type="default" />
<w:headerReference r:id="rId2" w:type="even" />
...
</w:sectPr>

```

The resulting section must use the header part with relationship id rId3 for the first page, the header part with relationship id rId2 for all subsequent even pages, and the header part with relationship id rId5 for all subsequent odd pages. *end example*]

Attributes	Description
<p>id (Relationship to Part)</p> <p>Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships</p>	<p>Specifies the relationship ID to a specified part.</p> <p>The specified relationship shall match the relationship type required by the parent element:</p> <ul style="list-style-type: none"> • http://purl.oclc.org/ooxml/officeDocument/relationships/customXml for the contentPart element • http://purl.oclc.org/ooxml/officeDocument/relationships/footer for the footerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/header for the headerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/font for the embedBold, embedBoldItalic, embedItalic, or embedRegular elements • http://purl.oclc.org/ooxml/officeDocument/relationships/printerSettings for the printerSettings element • http://purl.oclc.org/ooxml/officeDocument/relationships/hyperlink for the longDesc or hyperlink element <p>[<i>Example</i>: Consider an XML element which has the following id attribute:</p> <pre><... r:id="rId10" /></pre> <p>The markup specifies the associated relationship part with relationship ID rId1 contains the corresponding relationship information for the parent XML element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
<p>type (Header or Footer Type)</p>	<p>Specifies the type of header or footer specified by the target relationship ID. This header/footer type determines the page(s) on which the current header or footer shall be displayed.</p> <p>If any section contains more than a single header or footer of each type, then the document shall be considered non-conformant.</p> <p>[<i>Example</i>: Consider a document with the following WordprocessingML:</p> <pre><w:sectPr></pre>

Attributes	Description
	<pre> ... <w:footerReference r:id="rId6" w:type="first" /> <w:footerReference r:id="rId7" w:type="first" /> <w:footerReference r:id="rId10" w:type="even" /> ... </w:sectPr> </pre> <p>The resulting section has two footers of type <code>first</code>, and therefore is non-conformant. <i>end example</i></p> <p>[<i>Example:</i> Consider a WordprocessingML section which specifies the following header reference:</p> <pre> <w:headerReference r:id="rId10" w:type="first" /> </pre> <p>The resulting section must use the specified header part for the first page. <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_HdrFtr</code> simple type (§17.18.36).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_HdrFtrRef](#)) is located in §A.1. *end note*]

17.10.6 titlePg (Different First Page Headers and Footers)

This element specifies whether the parent section in this document shall have a different header and footer for its first page.

If the `val` attribute is set to `true`, then the parent section in the document shall use a first page header for the first page in the section. If the `val` attribute is set to `false`, then the first page in the parent section shall use the starting value of page numbering for the parent section to determine if the first page should use the even or odd header/footer, as specified with the `start` attribute on the `pgNumType` element.

This setting does not affect the presence of even and odd page header on all sections, which is specified using the `evenAndOddHeaders` element (§17.10.1).

If this element is set to `false` and a first page header/footer is specified , then it shall be ignored and only the odd page header/footer shall be displayed. Conversely, if this element is set to `true` and the first page header/footer type is omitted for the given section, the first page header/footer should be inherited from the previous section; if this is the first section in the document, then a blank header/footer shall be created (another header/footer type shall not be used in its place).

If this element is omitted, then its value shall be assumed to be `false`.

[*Example:* Consider a section which must have a different first page header. This requirement is specified using the following WordprocessingML:

```
<w:sectPr>
...
<w:titlePg />
...
</w:sectPr>
```

Since the titlePg property is present (and its default attribute value is true), this document now has a different header and footer for its first page. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.11 Footnotes and Endnotes

Footnotes and *endnotes* are separate text stories used in documents and books to show the source of borrowed material or to enter explanatory or supplementary information which does not interrupt the normal reading flow of the document.

Footnotes are typically located at the bottom of a page or beneath text being referenced, and *endnotes* are typically placed at the end of a document or at the end of a section. If document has been divided up into one or more sections, each section of a document can contain endnotes.

Both footnotes and endnotes consist of two parts:

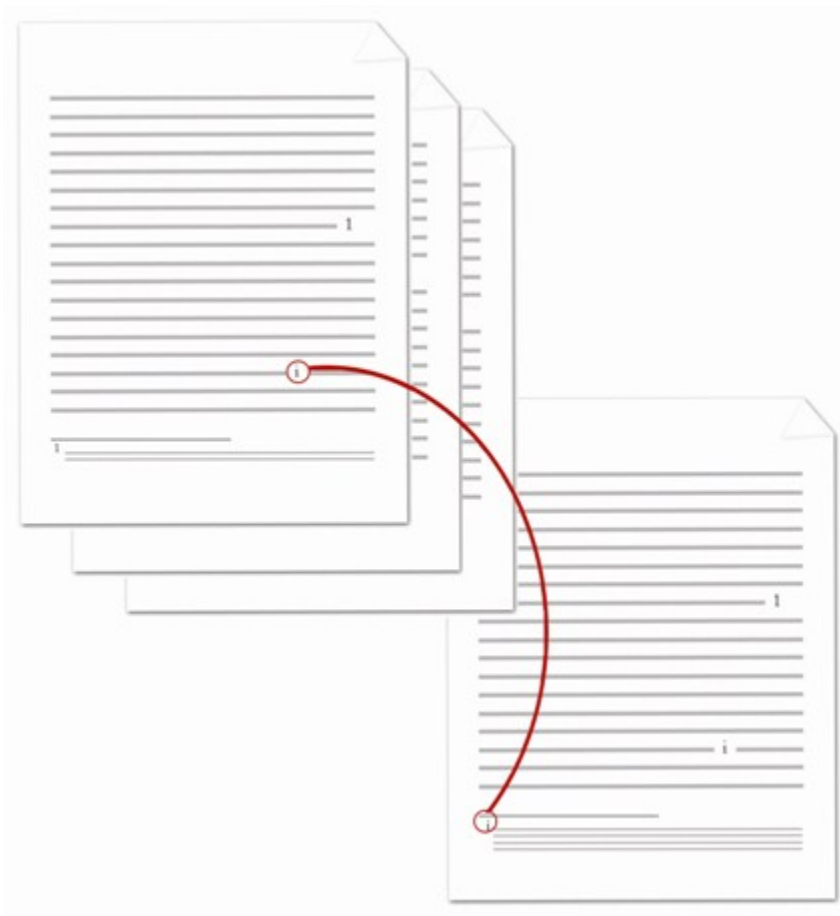
- A note reference mark in the body text to indicate that additional information is in a footnote or endnote, with a numbering system used for each to tell readers whether to look for the note at the end of the page or the end of the document or section.
- The actual footnote or endnote story content.

[*Example:* Example of a footnote applied to text in a document:



The note reference mark follows the noted text and specifies that there is associated footnote information, and the footnote itself is at the bottom of the current page. *end example*]

[*Example:* Consider the following example of an endnote applied to text in a document:



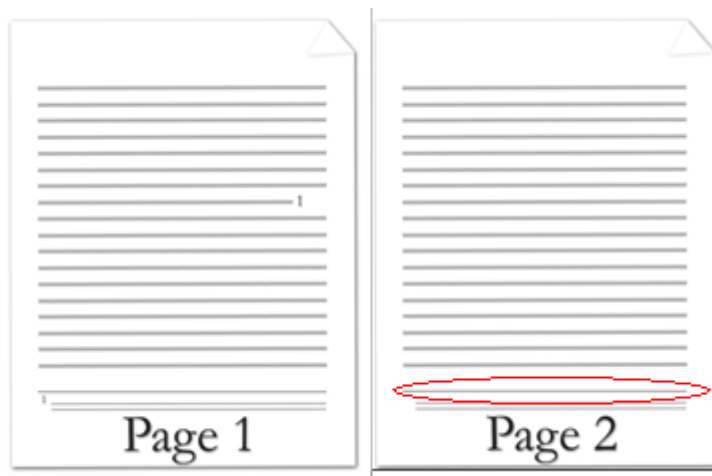
The note reference mark follows the noted text and specifies that there is associated endnote information, and the endnote itself is at the end of the current section. *end example*]

17.11.1 continuationSeparator (Continuation Separator Mark)

This element specifies the presence of a continuation separator mark within the current run. A continuation separator mark is a horizontal line which spans the width of the main story's text extents.

[*Note:* The continuation separator mark is typically used within the context of continuation separator footnotes or endnotes. These footnote and endnote types define the footnote/endnote used to separate the contents of the main document story from continuation of footnotes or endnotes which began on a previous page. *end note*]

[*Example:* Consider the following two pages in a document, where some text is referenced by a footnote that extends to the next page (with the continuation separator circled in red):



The line separating the document text from the footnote that is continued on the next page is represented by the following WordprocessingML:

```
<w:footnote w:type="continuationSeparator" w:id="1">
  <w:p>
    <w:r>
      <w:continuationSeparator />
    </w:r>
  </w:p>
</w:footnote>
```

In this example, the footnote has a content which consists of a single continuationSeparator, which is displayed as a horizontal line across the text extents. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.1. *end note*]

17.11.2 endnote (Endnote Content)

This element specifies the content of a single endnote within a WordprocessingML document. Each endnote shall be represented by a single endnote element, which can contain any *block-level content*.

[Example: Consider a document with a single endnote, identified by an endnote element, defined in the endnotes part:

```
<w:endnotes>
  <w:endnote w:id="2">
    <w:p>
      <w:pPr>
        <w:pStyle w:val="EndnoteText" />
      </w:pPr>
      <w:r>
        <w:rPr>
          <w:rStyle w:val="EndnoteReference" />
        </w:rPr>
        <w:endnoteRef />
      </w:r>
      <w:r>
        <w:t xml:space="preserve">This is an endnote</w:t>
      </w:r>
    </w:p>
  </w:endnote>
</w:endnotes>
```

This endnote contains an endnote reference mark, as well as the endnote text *This is an endnote.* *end example]*

Attributes	Description
id (Footnote/Endnote ID)	<p>Specifies a unique ID which shall be used to match the contents of a footnote or endnote to the associated footnote/endnote reference mark in the document using the footnoteRef or endnoteRef element, as appropriate.</p> <p>If this attribute is omitted, then this footnote or endnote shall have no ID. If more than one footnote shares the same ID, then this document shall be considered non-conformant. If more than one endnote shares the same ID, then this document shall be considered non-conformant.</p> <p>[Example: Consider the following footnote as defined in the footnotes part:</p> <pre><w:footnotes> <w:footnote w:type="normal" w:id="0"> ... </w:footnote></pre>

Attributes	Description
	<p>...</p> <p></w:footnotes></p> <p>The contents of this footnote are associated with the footnoteReference with a matching ID, as follows:</p> <pre><w:p> <w:r> <w:footnoteReference w:id="0" /> </w:r> </w:p></pre> <p>The resulting paragraph has a footnote reference mark which references the footnote number value of the footnote with an id of 0. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
type (Footnote/Endnote Type)	<p>Specifies the type of footnote or endnote contained within the current footnote or endnote content definition.</p> <p>If this attribute is omitted, then it shall be considered to be of style normal. If a footnote or endnote is not of style normal, then it shall not be referenced by a footnoteReference or endnoteReference element within the main document story.</p> <p>[<i>Example:</i> Consider the following example of a footnote defined in a WordprocessingML document as follows:</p> <pre><w:footnote w:type="continuationSeparator" w:id="1"> <w:p> <w:r> <w:continuationSeparator /> </w:r> </w:p> </w:footnote></pre> <p>In this example, the footnote is of style continuationSeparator and must be used by a consumer to separate continued footnotes from the main document contents (see simple type for full details). <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_FtnEdn simple type (§17.18.33).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FtnEdn](#)) is located in §A.1. *end note]*

17.11.3 endnote (Special Endnote List)

This element specifies the ID for all endnotes which are located in the current document that are not of style `normal`. Each other type of endnote shall be referenced in this list, or it shall not be loaded. If an endnote is not listed beneath this element, and it is required by the document content, then the document shall be considered non-conformant.

[Example: Consider a document that has three endnotes represented by the following WordprocessingML:

```
<w:endnotes ...>
  <w:endnote w:type="separator" w:id="0">
    ...
  </w:endnote>
  <w:endnote w:type="continuationSeparator" w:id="1">
    ...
  </w:endnote>
  <w:endnote w:id="2">
    ...
  </w:endnote>
</w:endnotes>
```

Each of the endnotes which are not of style `normal` must be specified in the `endnotePr` element, as follows:

```
<w:endnotePr>
  <w:endnote w:id="0" />
  <w:endnote w:id="1" />
</w:endnotePr>
```

This indicates to the consumer that the endnotes with an `id` attribute value of 0 and 1 are special endnotes, and should be treated accordingly. *end example]*

Attributes	Description
id (Footnote/Endnote ID)	<p>Specifies a unique ID that shall be used to match the contents of a footnote or endnote to the associated footnote/endnote reference mark in the document using the <code>footnoteReference</code> or <code>endnoteReference</code> element, as appropriate.</p> <p>If more than one footnote shares the same ID, then this document shall be considered non-conformant. If more than one endnote shares the same ID, then this document shall be considered non-conformant.</p> <p>[Example: Consider the following footnote as defined in the footnotes part:</p> <pre><w:footnotes> <w:footnote w:type="normal" w:id="0"> ... </w:footnote></pre>

Attributes	Description
	<p data-bbox="412 262 678 315">... </w:footnotes></p> <p data-bbox="412 352 1484 420">The contents of this footnote are associated with the footnoteReference with a matching ID, as follows:</p> <pre data-bbox="451 464 1029 625"><w:p> <w:r> <w:footnoteReference w:id="0" /> </w:r> </w:p></pre> <p data-bbox="412 667 1435 735">The resulting paragraph has a footnote reference mark which references the footnote number value of the footnote with an id of 0. <i>end example</i>]</p> <p data-bbox="412 772 1471 840">The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

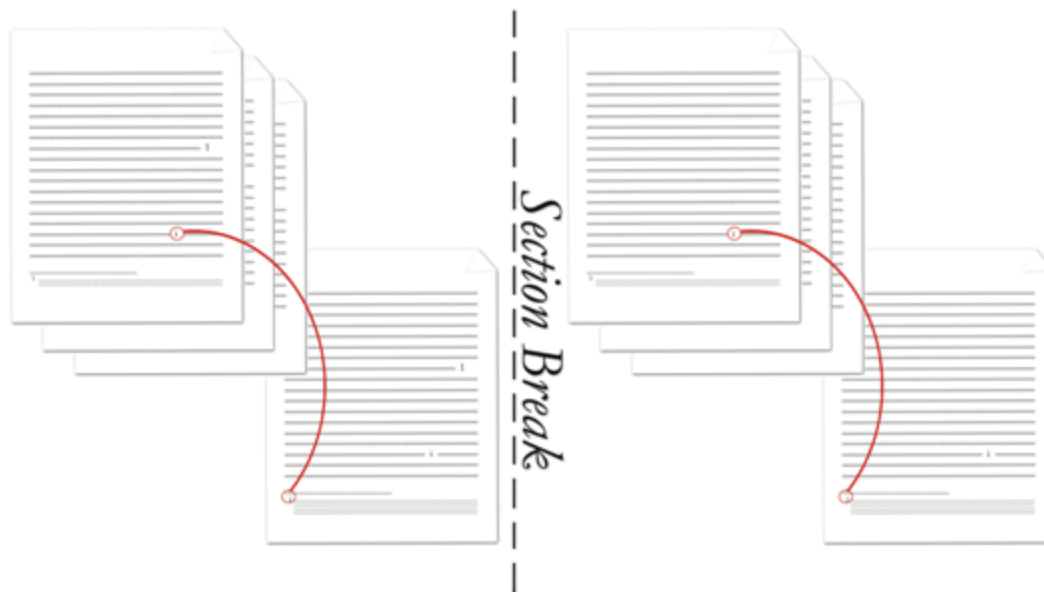
[*Note:* The W3C XML Schema definition of this element's content model ([CT_FtnEdnSepRef](#)) is located in §A.1. *end note*]

17.11.4 endnotePr (Document-Wide Endnote Properties)

This element specifies the endnote properties for the current document. Each of these properties are stored as a child element within the endnotePr element.

These properties can be overridden for a specific section via the section-wide endnotePr element (§17.11.5).

[*Example:* Consider the following document with two sections, where the endnotes for each section appears at the end of that section and use lower case roman numerals:



Since both sections are identical, the endnote properties are specified as document-wide level properties (this is not necessary but is most efficient) as follows:

```
<w:settings>
...
<w:endnotePr>
  <w:pos w:val="sectEnd"/>
  <w:numFmt w:val="lowerRoman" />
</w:endnotePr>
...
</w:settings>
```

Note that the `pos` element could have been omitted since it is using its default value. *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_EdnDocProps](#)) is located in §A.1. *end note*]

17.11.5 **endnotePr (Section-Wide Endnote Properties)**

This element specifies the endnote properties for the current section. Each of these properties are an override of the document-wide endnote properties (§17.11.4) and are stored as a child element within the `endnotePr` element.

If this element is omitted for a given section, then that section shall use the endnote properties defined at the document-wide level.

[*Example:* Consider a document consisting of three sections, which has endnotes in the first section which use lowercase roman numerals, and endnotes in the third section which use the Chicago Manual of Style format. The WordprocessingML for each section would be specified as follows:

```
<w:sectPr>
  <w:endnotePr>
    <w:numFmt w:val="lowerRoman" />
  </w:endnotePr>
</w:sectPr>
...
<w:sectPr>
  ...
</w:sectPr>
...
<w:sectPr>
  ...
</w:sectPr>
```

This assumes that the document-wide endnote settings are specified to use the Chicago Manual of Style format, as follows:

```
<w:settings>
  <w:endnotePr>
    <w:numFmt w:val="chicago" />
  </w:endnotePr>
</w:settings>
```

The resulting document would override the endnote numbering format for the first section to lowerRoman, but would use the chicago endnote numbering format for section three (and would also use it for section two if that section had endnotes. *end example*]

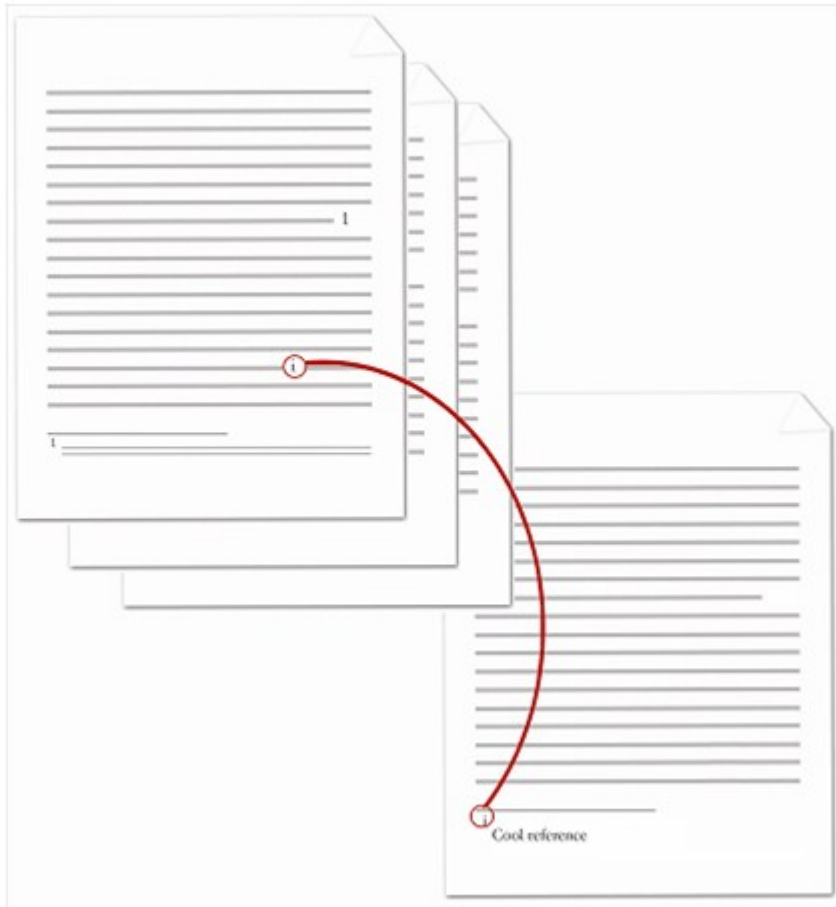
[*Note:* The W3C XML Schema definition of this element's content model ([CT_EdnProps](#)) is located in §A.1. *end note*]

17.11.6 endnoteRef (Endnote Reference Mark)

This element specifies the presence of an endnote reference mark. An *endnote reference mark* is a run of automatically numbered text which follows the numbering format set forth via the numFmt element (§17.11.17).

If an endnote reference mark is specified within a run which is not part of an endnote, then that endnote reference mark can be ignored.

[*Example:* Consider the following document where some text is referenced by an endnote at the end of the document:



The endnote reference mark is the lower case roman numeral within the actual endnote itself in the diagram above. The contents of the endnote (including the endnote reference mark) are represented by the following WordprocessingML:

```
<w:endnote w:id="2">
  <w:p>
    <w:pPr>
      <w:pStyle w:val="EndnoteText" />
    </w:pPr>
    <w:r>
      <w:rPr>
        <w:rStyle w:val="EndnoteReference" />
      </w:rPr>
      <w:endnoteRef />
    </w:r>
    <w:r>
      <w:t>Cool reference</w:t>
    </w:r>
  </w:p>
</w:endnote>
```

The resulting endnote contains the literal endnote content of Cool reference, preceding by an automatically numbered endnote reference mark. Since this is the first endnote in the document, that automatically numbered reference mark uses the lower case roman numeral i. *end example*]

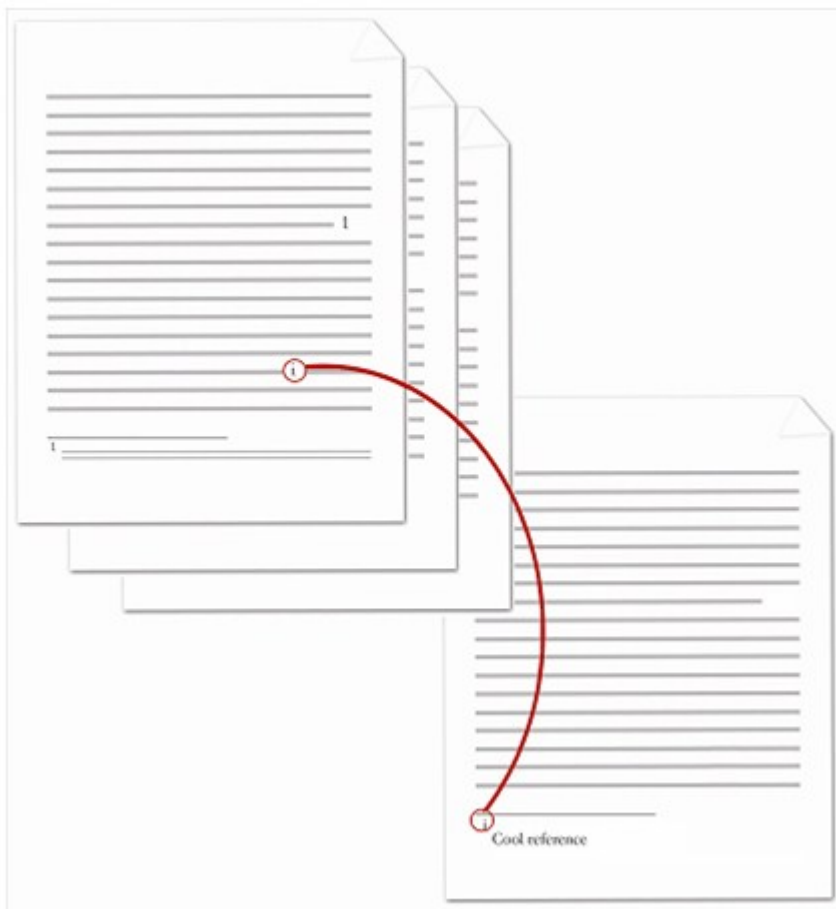
[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.1. *end note*]

17.11.7 endnoteReference (Endnote Reference)

This element specifies the presence of an endnote reference. An *endnote reference* is a run of automatically numbered text which references a particular endnote within the parent document, and inherits the endnote reference mark's numbering.

If an endnote reference is specified within a footnote or endnote, then the document shall be considered non-conformant.

[*Example:* Consider the following document where some text is referenced by an endnote at the end of the document:



The endnote reference is the lower case roman numeral within the document content in the diagram above. The contents of the paragraph which contains the endnote reference are represented by the following WordprocessingML:

```
<w:p>
  <w:r>
    <w:t>This text is followed by an endnote</w:t>
  </w:r>
  <w:r>
    <w:rPr>
      <w:rStyle w:val="EndnoteReference" />
    </w:rPr>
    <w:endnoteReference w:id="2" />
  </w:r>
  <w:r>
    <w:t>.</w:t>
  </w:r>
</w:p>
```

The resulting paragraph contains the literal text content of *This text is followed by an endnote*, followed by an automatically numbered endnote reference. Since this is the first endnote in the document, that automatically numbered reference inherits the lower case roman numeral *i* from the endnote reference mark. *end example]*

Attributes	Description
customMarkFollows (Suppress Footnote/Endnote Reference Mark)	<p>Specifies that the current footnote or endnote shall not have an associated footnote or endnote reference mark, as appropriate.</p> <p>This attribute shall be used to specify that a particular footnote or endnote shall not increment the numbering for its associated footnote/endnote numbering format, so that the use of a footnote with a custom footnote mark does not cause a missing value in the footnote/endnote values. The display of the mark is specified via the footnoteRef/endnoteRef elements, as appropriate.</p> <p>If this attribute is omitted, then the footnote or endnote reference mark shall not be skipped when incrementing over this footnote or endnote.</p> <p>[Example: Consider a footnote with an id value of 1 that uses a custom footnote mark:</p> <pre><w:footnotes> <w:footnote w:id="0"> ... </w:footnote> <w:footnote w:id="2"> ... </w:footnote> <w:footnote w:id="2"> ... </w:footnote> </w:footnotes></pre>

Attributes	Description
	<p>If the numbering format for footnotes in this document is upperRoman, then the first footnote must be I, the second is suppressed, and the third is II, noticing that the second does not increment the numbering sequence. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
id (Footnote/Endnote ID Reference)	<p>Specifies the footnote or endnote which is being referenced by the current footnote or endnote reference in the document.</p> <p>If the resulting footnote or endnote ID is not present in the footnotes or endnote part (as appropriate), then this document shall be considered non-conformant.</p> <p>[<i>Example:</i> Consider a paragraph with an endnote reference, represented by the following WordprocessingML:</p> <pre> <w:p> <w:r> <w:t>This text is followed by an endnote</w:t> </w:r> <w:r> <w:endnoteReference w:id="2" /> </w:r> <w:r> <w:t>.</w:t> </w:r> </w:p> </pre> <p>This text references the endnote in the document's endnotes part which has an id value of 2. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FtnEdnRef](#)) is located in §A.1. *end note*]

17.11.8 endnotes (Document Endnotes)

This element specifies the set of all endnotes in the document, including endnote separators and continuation notices. This element is the root node for the Endnotes part.

[*Example:* Consider the following example of the contents of the endnotes part:

```

<w:endnotes>
  <w:endnote w:type="separator" w:id="0">
    ...
  </w:endnote>
  <w:endnote w:type="continuationSeparator" w:id="1">
    ...
  </w:endnote>
  <w:endnote w:id="2">
    ...
  </w:endnote>
</w:endnotes>

```

The endnotes part contains the definition for one normal endnote, as well as the separator and continuation separator endnote for this document. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Endnotes](#)) is located in §A.1. *end note*]

17.11.9 footnote (Special Footnote List)

This element specifies the ID for all footnotes which are located in the current document that are not of style `normal`. Each other type of footnote shall be referenced in this list, or it shall not be loaded. This means that if a special footnote is not listed beneath this element, and it is required by the document content, then the document shall be considered non-conformant.

[*Example:* Consider a document that has three footnotes represented by the following WordprocessingML:

```

<w:footnotes>
  <w:footnote w:type="separator" w:id="0">
    ...
  </w:footnote>
  <w:footnote w:type="continuationSeparator" w:id="1">
    ...
  </w:footnote >
  <w:footnote w:id="2">
    ...
  </w:footnote>
</w:footnotes>

```

Each of the footnotes which are not of style `normal` must be specified in the `footnotePr` element, as follows:

```

<w:footnotePr>
  <w:footnote w:id="0" />
  <w:footnote w:id="1" />
</w:footnotePr>

```

This indicates to the consumer that the footnotes with an id attribute value of 0 and 1 are special footnotes, and should be treated accordingly. *end example]*

Attributes	Description
id (Footnote/Endnote ID)	<p>Specifies a unique ID which shall be used to match the contents of a footnote or endnote to the associated footnote/endnote reference mark in the document using the footnoteRef or endnoteRef element, as appropriate.</p> <p>If more than one footnote shares the same ID, then this document shall be considered non-conformant. If more than one endnote shares the same ID, then this document shall be considered non-conformant.</p> <p>[<i>Example:</i> Consider the following footnote as defined in the footnotes part:</p> <pre><w:footnotes> <w:footnote w:type="normal" w:id="0"> ... </w:footnote> ... </w:footnotes></pre> <p>The contents of this footnote are associated with the footnoteReference with a matching ID, as follows:</p> <pre><w:p> <w:r> <w:footnoteReference w:id="0" /> </w:r> </w:p></pre> <p>The resulting paragraph has a footnote reference mark which references the footnote number value of the footnote with an id of 0. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FtnEdnSepRef](#)) is located in §A.1. *end note]*

17.11.10 footnote (Footnote Content)

This element specifies the content of a single footnote within a WordprocessingML document. Each footnote shall be represented by a single footnote element, which can contain any *block-level content*.

[*Example:* Consider a document with a single footnote, identified by a footnote element, defined in the footnotes part as follows:

```

<w:footnotes>
  <w:footnote w:id="2">
    <w:p>
      <w:pPr>
        <w:pStyle w:val="FootnoteText" />
      </w:pPr>
      <w:r>
        <w:rPr>
          <w:rStyle w:val="FootnoteReference" />
        </w:rPr>
        <w:footnoteRef />
      </w:r>
      <w:r>
        <w:t xml:space="preserve">This is a sample footnote</w:t>
      </w:r>
    </w:p>
  </w:footnote>
</w:footnotes>

```

This footnote contains an footnote reference mark, as well as the endnote text *This is a sample footnote. end example*]

Attributes	Description
id (Footnote/Endnote ID)	<p>Specifies a unique ID that shall be used to match the contents of a footnote or endnote to the associated footnote/endnote reference mark in the document using the footnoteReference or endnoteReference element, as appropriate.</p> <p>If this attribute is omitted, then this footnote or endnote shall have no ID. If more than one footnote shares the same ID, then this document shall be considered non-conformant. If more than one endnote shares the same ID, then this document shall be considered non-conformant.</p> <p>[Example: Consider the following footnote as defined in the footnotes part:</p> <pre> <w:footnotes> <w:footnote w:type="normal" w:id="0"> ... </w:footnote> ... </w:footnotes> </pre> <p>The contents of this footnote are associated with the footnoteReference with a matching ID, as follows:</p> <pre> <w:p> <w:r> </pre>

Attributes	Description
	<pre><w:footnoteReference w:id="0" /> </w:r> </w:p></pre> <p>The resulting paragraph has a footnote reference mark which references the footnote number value of the footnote with an id of 0. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
type (Footnote/Endnote Type)	<p>Specifies the type of footnote or endnote contained within the current footnote or endnote content definition.</p> <p>If this attribute is omitted, then it shall be considered to be of style normal. If a footnote or endnote is not of style normal, then it shall not be referenced by a footnoteReference or endnoteReference element within the main document story.</p> <p>[<i>Example:</i> Consider the following example of a footnote defined in a WordprocessingML document as follows:</p> <pre><w:footnote w:type="continuationSeparator" w:id="1"> <w:p> <w:r> <w:continuationSeparator /> </w:r> </w:p> </w:footnote></pre> <p>In this example, the footnote is of style continuationSeparator and must be used by a consumer to separate continued footnotes from the main document contents (see simple type for full details). <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_FtnEdn simple type (§17.18.33).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FtnEdn](#)) is located in §A.1. *end note]*

17.11.11 footnotePr (Section-Wide Footnote Properties)

This element specifies the footnote properties for the current section. Each of these properties are an override of the document-wide footnote properties (§17.11.12) and are stored as a child element within the footnotePr element.

If this element is omitted for a given section, then that section shall use the footnote properties defined at the document-wide level.

[*Example:* Consider a document consisting of three sections, which has footnotes in the first section which appear below text, and footnotes in the third section which appear at the bottom of the page. The WordprocessingML for each section would be specified as follows:

```
<w:sectPr>
  <w:footnotePr>
    <w:pos w:val="beneathText" />
  </w:footnotePr>
</w:sectPr>
...
<w:sectPr>
  ...
</w:sectPr>
...
<w:sectPr>
  ...
</w:sectPr>
```

This assumes that the document-wide footnote settings are specified as the default positioning at the bottom of the page by omitting the pos element (§17.11.21), as follows:

```
<w:settings>
  <w:footnotePr>
    ...
  </w:footnotePr>
</w:settings>
```

The resulting document would override the footnote positioning for the first section to beneathText, but would use the pageBottom footnote positioning for section three (and would also use it for section two if that section had footnotes. *end example*)

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FtnProps](#)) is located in §A.1. *end note*]

17.11.12 footnotePr (Document-Wide Footnote Properties)

This element specifies the footnote properties for this document. Each property is stored as a unique element within the footnotePr element.

These properties can be overridden for a specific section via the section-wide footnotePr element (§17.11.11).

[*Example:* Consider the following one page document, where the footnote appears beneath the text it references:



Since the document consists of a single footnote, the footnote properties can be stored in either the section-wide or document-wide footnote properties. Assuming that they are stored in the latter, the footnote properties are represented by the following WordprocessingML:

```
<w:settings>
...
<w:footnotePr>
  <w:pos w:val="beneathText" />
</w:footnotePr>
...
</w:settings>
```

The footnote properties specify that footnotes appear below the noted text *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FtnDocProps](#)) is located in §A.1. *end note*]

17.11.13 footnoteRef (Footnote Reference Mark)

This element specifies the presence of a footnote reference mark. A *footnote reference mark* is a run of automatically numbered text which follows the numbering format set forth via the footnote numFmt element (§17.11.18).

If a footnote reference mark is specified within a run which is not part of a footnote, then that footnote reference mark can be ignored.

[*Example:* Consider the following document where some text is referenced by a footnote at the end of the page:



The footnote reference mark is the decimal number within the actual footnote itself in the image above. The contents of the footnote (including the footnote reference mark) are represented by the following WordprocessingML:

```
<w:footnote w:id="2">
  <w:p>
    <w:pPr>
      <w:pStyle w:val="FootnoteText" />
    </w:pPr>
    <w:r>
      <w:rPr>
        <w:rStyle w:val="FootnoteReference" />
      </w:rPr>
      <w:footnoteRef />
    </w:r>
    <w:r>
      <w:t>Cool reference</w:t>
    </w:r>
  </w:p>
</w:footnote>
```

The resulting footnote contains the literal endnote content of Cool reference, preceding by an automatically numbered footnote reference mark. Since this is the first footnote in the document, that automatically numbered reference mark uses the first decimal number 1. It is also important to note that the use of styles FootnoteText and FootnoteReference is not required, these can simply be added by a particular producer automatically to give the footnote contents are particular style (just like any other use of styles). *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.1. *end note*]

17.11.14 footnoteReference (Footnote Reference)

This element specifies the presence of a footnote reference. A *footnote reference* is a run of automatically numbered text which references a particular footnote within the parent document, and inherits the footnote reference mark's numbering.

If an footnote reference is specified within a footnote or endnote, then the document shall be considered non-conformant.

[*Example:* Consider the following document where some text is referenced by a footnote at the bottom of the page:



The footnote reference is the superscript decimal number within the document content in the diagram above. The contents of the paragraph which contains the footnote reference are represented by the following WordprocessingML:

```
<w:p>
  <w:r>
    <w:t>Some referenced text.</w:t>
  </w:r>
  <w:r>
    <w:rPr>
      <w:rStyle w:val="FootnoteReference" />
    </w:rPr>
    <w:footnoteReference w:id="2" />
  </w:r>
</w:p>
```

The resulting paragraph contains the literal text content of `Some referenced text.`, followed by an automatically numbered footnote reference. Since this is the first footnote in the document, that automatically numbered reference inherits the decimal number 1 from the footnote reference mark. *end example]*

Attributes	Description
customMarkFollows (Suppress Footnote/Endnote Reference Mark)	<p>Specifies that the current footnote or endnote shall not have an associated footnote or endnote reference mark, as appropriate.</p> <p>This attribute shall be used to specify that a particular footnote or endnote shall not increment the numbering for its associated footnote/endnote numbering format, so that the use of a footnote with a custom footnote mark does not cause a missing value in the footnote/endnote values. The display of the mark is specified via the footnoteRef/endnoteRef elements, as appropriate.</p> <p>If this attribute is omitted, then the footnote or endnote reference mark shall not be skipped when incrementing over this footnote or endnote.</p> <p>[Example: Consider a footnote with an id value of 1 that uses a custom footnote mark:</p> <pre><w:footnotes> <w:footnote w:id="0"> ... </w:footnote> <w:footnote w:id="2"> ... </w:footnote> <w:footnote w:id="2"> ... </w:footnote> </w:footnotes></pre> <p>If the numbering format for footnotes in this document is upperRoman, then the first footnote must be I, the second is suppressed, and the third is II, noticing that the second does not increment the numbering sequence. <i>end example]</i></p>

Attributes	Description
	The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).
id (Footnote/Endnote ID Reference)	<p>Specifies the footnote or endnote which is being referenced by the current footnote or endnote reference in the document.</p> <p>If the resulting footnote or endnote ID is not present in the footnotes or endnote part (as appropriate), then this document shall be considered non-conformant.</p> <p>[<i>Example:</i> Consider a paragraph with an endnote reference, represented by the following WordprocessingML:</p> <pre> <w:p> <w:r> <w:t>This text is followed by an endnote</w:t> </w:r> <w:r> <w:endnoteReference w:id="2" /> </w:r> <w:r> <w:t>.</w:t> </w:r> </w:p> </pre> <p>This text references the endnote in the document's endnotes part which has an id value of 2. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FtnEdnRef](#)) is located in §A.1. *end note*]

17.11.15 footnotes (Document Footnotes)

This element specifies the set of all footnotes in the document, including footnote separators and continuation notices. This element is the root node for the Footnotes part.

[*Example:* Consider the following example of the contents of the footnotes part:

```

<w:footnotes>
  <w:footnote w:type="separator" w:id="0">
    ...
  </w:footnote >
  <w:footnote w:type="continuationSeparator" w:id="1">
    ...
  </w:footnote>
  <w:footnote w:id="2">
    ...
  </w:footnote>
</w:footnotes>

```

The footnotes part contains the definition for one normal footnote, as well as the separator and continuation separator footnotes for this document. *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Footnotes](#)) is located in §A.1. *end note*]

17.11.16 noEndnote (Suppress Endnotes In Document)

This element specifies that all endnotes in this document shall not be displayed or printed. If this element is placed on any section break other than the first section break in the document, it shall be ignored.

If this element is omitted, endnotes shall not be suppressed in the current document.

[*Example:* Consider a document in which in the first section endnotes are marked to be hidden:

```

<w:sectPr>
  <w:noEndnote />
</w:sectPr>

```

In this example, this document does not display endnotes. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.11.17 numFmt (Endnote Numbering Format)

This element specifies the numbering format that shall be used to determine the endnote reference mark value for all automatically numbered endnote reference marks (those without the suppressRef attribute set).

If this element is omitted, then the numbering format shall be assume to be decimal.

[*Example:* Consider the following footnote reference with the number format set to upper case letters:



This footnote numbering format is specified by the following WordprocessingML:

```
<w:footnotePr>
  <w:numFmt w:val="upperLetter" />
</w:footnotePr>
```

end example]

Attributes	Description
format (Custom Defined Number Format)	<p>Specifies a custom number format using the syntax defined by the XSLT format attribute. This format shall be used for all numbering in the parent object.</p> <p><i>[Example: A value of &#x30A2; indicates that a consumer must use Katakana numbering. end example]</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
val (Numbering Format Type)	<p>Specifies the number format that shall be used for all numbering in the parent object.</p> <p><i>[Example: A value of lowerLetter indicates that a consumer must use lowercase letters for each number in this grouping: a,b,c... end example]</i></p> <p>The possible values for this attribute are defined by the ST_NumberFormat simple type (§17.18.59).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_NumFmt](#)) is located in §A.1. end note]

17.11.18 numFmt (Footnote Numbering Format)

This element specifies the numbering format that shall be used to determine the footnote reference mark value for all automatically numbered footnote reference marks (those without the suppressRef attribute set).

If this element is omitted, then the numbering format shall be assume to be decimal.

[Example: Consider the following footnote reference with the number format set to upper case letters:



This footnote numbering format is specified by the following WordprocessingML:

```
<w:footnotePr>  
  <w:numFmt w:val="upperLetter" />  
</w:footnotePr>
```

end example]

Attributes	Description
format (Custom Defined Number Format)	<p>Specifies a custom number format using the syntax defined by the XSLT format attribute. This format shall be used for all numbering in the parent object.</p> <p>[Example: A value of &#x30A2; indicates that a consumer must use Katakana numbering. end example]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
val (Numbering Format Type)	<p>Specifies the number format that shall be used for all numbering in the parent object.</p> <p>[Example: A value of lowerLetter indicates that a consumer must use lowercase letters for each number in this grouping: a,b,c... end example]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_NumberFormat simple type (§17.18.59).

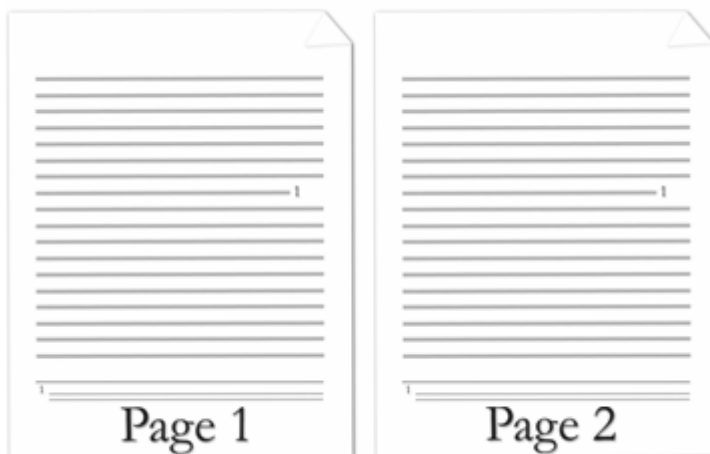
[*Note:* The W3C XML Schema definition of this element's content model ([CT_NumFmt](#)) is located in §A.1. *end note*]

17.11.19 numRestart (Footnote and Endnote Numbering Restart Location)

This element specifies when all automatic numbering for the footnote or endnote reference marks shall be restarted. When restarted, the next automatically numbered footnote or endnote in the document (each footnote/endnote type is handled independently) shall restart to the specified numStart value (§17.11.20).

If this element is omitted, then automatic numbering shall not be restarted between each page or section (a value of continuous).

[*Example:* Consider the following two page document where the numbering must be reset after each page to its starting value:



The footnote automatic restarting of the numbering is represented by the following WordprocessingML:

```
<w:footnotePr>
  <w:numRestart w:val="eachPage" />
</w:footnotePr>
```

end example]

Attributes	Description
val (Automatic Numbering Restart Value)	Specifies when the automatic numbering shall be restarted for the current set of footnotes or endnotes.

Attributes	Description
	<p>[<i>Example:</i> Consider a WordprocessingML document where the numbering for its endnotes must be restarted after each section must be restarted after each page. This setting is represented by the following WordprocessingML:</p> <pre><w:footnotePr> <w:numRestart w:val="eachSect" /> </w:footnotePr></pre> <p>The val attribute value of eachSect specifies that numbering shall be restarted after each section. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_RestartNumber simple type (§17.18.74).</p>

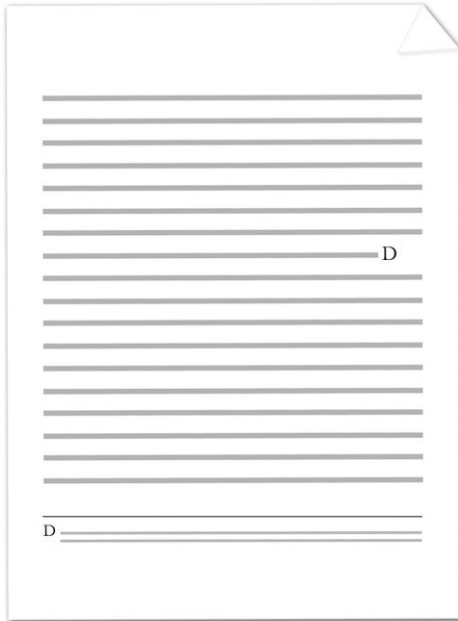
[*Note:* The W3C XML Schema definition of this element’s content model ([CT_NumRestart](#)) is located in §A.1. *end note*]

17.11.20 numStart (Footnote and Endnote Numbering Starting Value)

This element specifies the starting number or character for the first automatically numbered footnotes or endnote in the document, as well as the first automatically numbered footnotes after each restart point specified by the numRestart element (§17.11.19). This value shall be specified in decimal number units, then translated accordingly to the appropriate numbering format.

If this element is omitted, then the starting value shall be 1.

[*Example:* Consider the following footnote reference with the number format set to upper case letters and starting character set to D:



The number format is specified by the following WordprocessingML:

```
<w:footnotePr>
  <w:numFmt w:val="upperLetter" />
  <w:numStart w:val="4" />
</w:footnotePr>
```

Since D is the fourth letter in the alphabet, the starting character is set to 4. *end example*

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example</i>: Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <pre><... w:val="1512645511" /></pre> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DecimalNumber](#)) is located in §A.1.
end note]

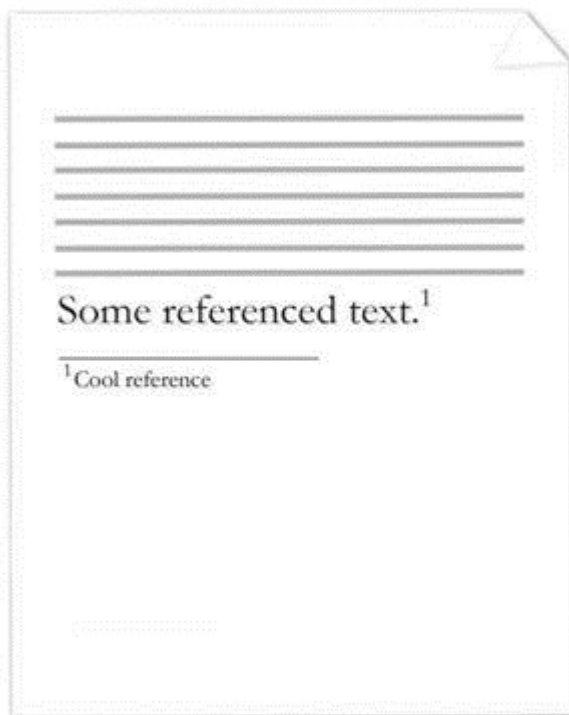
17.11.21 pos (Footnote Placement)

This element specifies where footnotes shall be placed on the page when they are referenced by text in the current document.

If this element is present at the section level, then it shall be ignored.

If this element is omitted at the document level, then footnotes shall be located at the bottom of the current page.

[*Example:* Consider the following one page document, where the footnote appears beneath the text that it is referencing:



The footnote references the text reading Some reference text. and is represented by the following WordprocessingML:

```

<w:p>
  <w:r>
    <w:t>Some referenced text</w:t>
  </w:r>
  <w:r>
    <w:rPr>
      <w:rStyle w:val="FootnoteReference" />
    </w:rPr>
    <w:footnoteReference w:id="2" />
  </w:r>
</w:p>

```

Since the footnote location must be beneath the current text, the section properties must be declared as follows:

```

<w:sectPr>
  ...
  <w:footnotePr>
    <w:pos w:val="beneathText" />
  </w:footnotePr>
  ...
</w:sectPr>

```

The footnote references the footnote in the footnotes part with an id attribute value equal to 2. Within the section properties of the document, the position of footnotes is specified to be beneath the page's text. *end example*]

Attributes	Description
val (Footnote Position Type)	<p>Specifies the position of footnotes in the document.</p> <p>[<i>Example</i>: Consider a document in which footnotes must be positioned beneath their text. The footnote properties for this document must be declared as follows:</p> <pre> <w:sectPr> <w:footnotePr> <w:pos w:val="beneathText" /> </w:footnotePr> ... </w:sectPr> </pre> <p>The val attribute is beneathText, therefore the position of footnotes is specified to be beneath the page's text. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_FtnPos simple type (§17.18.34).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FtnPos](#)) is located in §A.1. *end note*]

17.11.22 pos (Endnote Placement)

This element specifies where endnotes shall be placed on the page when they are referenced by text in the current document.

If this element is present at the section level, then it shall be ignored.

If this element is omitted at the document level, then endnotes shall be located at the end of the document.

[*Example:* Consider the following multi-page, multi-section document, where the endnote appears at the end of the section in which it is referenced:



The endnote setting is the same for all sections, and is represented by the following WordprocessingML at the document level:

```
<w:settings>
...
<w:endnotePr>
  <w:pos w:val="sectEnd" />
...
</w:endnotePr>
...
</w:settings>
```


Within the properties of the document, the position of endnotes is specified to be at the end of each section.
end example]

Attributes	Description
val (Endnote Position Type)	<p>Specifies the position of endnotes on the parent section or the document.</p> <p>[<i>Example:</i> Consider a document in which endnotes must be positioned at the end of the section. The section properties for this section must be declared as follows:</p> <pre><w:settings> <w:endnotePr> <w:pos w:val="sectEnd" /> </w:endnotePr> ... </w:settings></pre> <p>The val attribute is endSect, therefore the position of endnotes is specified to be at the end of the section. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_EdnPos simple type (§17.18.22).</p>

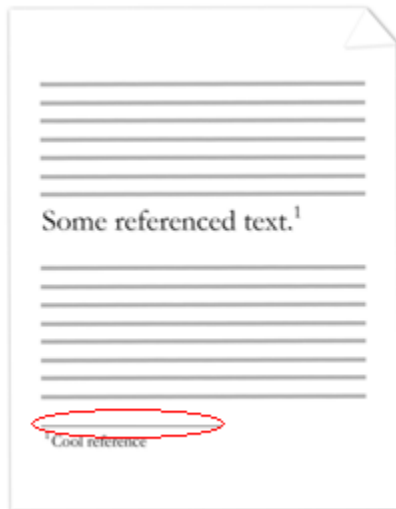
[*Note:* The W3C XML Schema definition of this element's content model ([CT_EdnPos](#)) is located in §A.1. *end note]*

17.11.23 separator (Footnote/Endnote Separator Mark)

This element specifies the presence of a separator mark within the current run. A *separator mark* is a horizontal line which spans part of the width text extents.

[*Note:* The separator mark is typically used within the context of separator footnotes or endnotes. These footnote and endnote types define the footnote/endnote used to separate the contents of the main document story from the contents of footnotes or endnotes on that page. *end note]*

[*Example:* Consider the following page in a document, where some text is referenced by a footnote that is located at the bottom of the current page (with the separator circled in red):



The line separating the document text from the normal footnotes is the footnote separator, and is represented by the following WordprocessingML:

```
<w:footnote w:type="separator" w:id="0">
  <w:p>
    <w:r>
      <w:separator />
    </w:r>
  </w:p>
</w:footnote>
```

In this example, the footnote has a content which consists of a single separator, which is displayed as a horizontal line across part of the text extents. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.1. *end note*]

17.12 Glossary Document

Within a WordprocessingML file, the *glossary document* is a supplemental storage location for additional document content which shall travel with the document, but which shall not be displayed for printed as part of the main document until it is explicitly added to that document by deliberate action.

The glossary document shall also be afforded a separate instance of all of the relationships which are provided on the main document part - this means that the glossary document shall have its own style definitions, numbering definitions, comments, headers, footers, etc. within the WordprocessingML document.

[*Example:* Consider a document which must include ten optional clauses that can be inserted through a user interface. It is clearly not desirable to have these ten clauses appear in the main document story's contents before they are explicitly inserted, therefore each of them can be stored in the glossary document and inserted via the user interface as needed. *end example*]

Within the glossary document, each distinct region of document content is referred to as a *glossary document entry*, and is defined via the docPart element (§17.12.5). These document parts can contain any block-level WordprocessingML element, and can also have a set of classifications and behaviors applied to them via the glossary document entry's properties.

[*Example:* Consider the following definition for the contents of a glossary document part within a WordprocessingML document:

```
<w:glossaryDocument>
  <w:docParts>
    <w:docPart>
      <w:docPartPr>
        ...
      </w:docPartPr>
      <w:docPartBody>
        <w:p>
          <w:r>
            <w:t>Sample entry.</w:t>
          </w:r>
        </w:p>
      </w:docPartBody>
    </w:docPart>

    <w:docPart>
      ...
    </w:docPart>
  </w:docParts>
</w:glossaryDocument>
```

The glossaryDocument element (§17.12.10) defines the contents of the glossary document part. Within the glossary document, each docPart element contains the definition for one glossary document entry: in this case, there are two entries in the glossary document, the first of which contains a single paragraph with a single run of text. *end example*]

17.12.1 behavior (Entry Insertion Behavior)

This element specifies a single behavior which shall be applied to the contents of the parent glossary document entry (§17.12.5) when it is added to the main document story of a WordprocessingML document. These behaviors shall be used to format the surrounding WordprocessingML around insertion, and do not require the presence of a user interface (i.e. applications without a user interface shall also utilize these settings).

[*Example:* Consider the WordprocessingML fragment for a glossary document entry containing a single run, defined as follows:

```

<w:docPart>
  <w:docPartPr>
    <w:behaviors>
      <w:behavior w:val="p"/>
    </w:behaviors>
    ...
  </w:docPartPr>
  <w:docPartBody>
    <w:p>
      <w:r>
        <w:t>Sample entry.</w:t>
      </w:r>
    </w:p>
  </w:docPartBody>
</w:docPart>

```

The behavior element has a value of p, which specifies that the contents of the parent glossary document entry must be inserted in their own paragraph when they are added to the contents of a document. If the document content to which they are added is defined as follows (and the part is added between the two text runs):

```

<w:body>
  <w:p>
    <w:r>
      <w:t>After this text</w:t>
    </w:r>
    <w:r>
      <w:t>Before this text</w:t>
    </w:r>
  </w:p>
</w:body>

```

This setting specifies that although the part would normally be inserted between the two existing runs in the paragraph, that behavior must ensure that the part is inserted into its own paragraph, resulting in the following WordprocessingML:

```

<w:body>
  <w:p>
    <w:r>
      <w:t>After this text</w:t>
    </w:r>
  </w:p>
  <w:p>
    <w:r>
      <w:t>Sample entry.</w:t>
    </w:r>
  </w:p>
  <w:p>
    <w:r>
      <w:t>Before this text</w:t>
    </w:r>
  </w:p>
</w:body>

```

end example]

Attributes	Description
val (Insertion Behavior Value)	<p>Specifies the insertion behavior which shall be associated with the current glossary document entry.</p> <p>[<i>Example:</i> Consider the WordprocessingML fragment for a glossary document entry's properties, defined as follows:</p> <pre> <w:docPartPr> <w:behaviors> <w:behavior w:val="content"/> </w:behaviors> </w:docPartPr> </pre> <p>The val attribute value of content specifies that the insertion of this glossary document entry must include only the content (the last paragraph in the part must be merged into the current paragraph in the document). <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_DocPartBehavior simple type (§17.18.15).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DocPartBehavior](#)) is located in §A.1. *end note]*

17.12.2 behaviors (Entry Insertion Behaviors)

This element specifies the set of behaviors which shall be applied to the contents of the parent glossary document entry (§17.12.5) when it is added to the main document story of a WordprocessingML document. Since multiple behaviors can be specified for a single part, the sum total of all behaviors shall be used to insert the parent entry into the contents of the WordprocessingML document.

[*Example:* Consider the WordprocessingML fragment for a glossary document entry containing a single run, defined as follows:

```
<w:docPart>
  <w:docPartPr>
    <w:behaviors>
      <w:behavior w:val="p" />
      <w:behavior w:val="pg" />
    </w:behaviors>
    ...
  </w:docPartPr>
  <w:docPartBody>
    <w:p>
      <w:r>
        <w:t>Sample entry.</w:t>
      </w:r>
    </w:p>
  </w:docPartBody>
</w:docPart>
```

The behaviors element contains the set of behaviors which must be applied to this entry when it is inserted into the document, in this case:

- The entry must be inserted into its own paragraph in the document
- The entry must be inserted onto a new page in the document (i.e. it must be preceded by a page break)

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DocPartBehaviors](#)) is located in §A.1. *end note]*

17.12.3 category (Entry Categorization)

This element specifies the categorization for the parent glossary document entry. This categorization shall not imply any behaviors around the entry, and is only used to organize the set of glossary document entries within an application or user interface (i.e. to disambiguate between two entries with the same entry name (§17.12.13)).

[*Example*: Consider the following WordprocessingML fragment for the properties of a single glossary document entry:

```
<w:docPartPr>
  <w:category>
    ...
  </w:category>
  ...
</w:docPartPr>
```

The category element specifies the categorization applied to the current entry, for the purposes of classification or user interface sorting, for example. *end example*]

[*Note*: The W3C XML Schema definition of this element's content model ([CT_DocPartCategory](#)) is located in §A.1. *end note*]

17.12.4 description (Description for Entry)

This element specifies a description for the contents of this glossary document entry. This description can contain any string content, and allows the entry to have additional information contained within the definition for this glossary document entry. [*Note*: This description can be surfaced in a user interface, for example. *end note*]

[*Example*: Consider the following WordprocessingML fragment for the properties of a single glossary document entry:

```
<w:docPartPr>
  ...
  <w:name w:val="Sample Entry" />
  <w:description w:val="This is an example of a glossary document entry for
example purposes." />
  ...
</w:docPartPr>
```

The description element specifies that the long description associated with the parent entry must be This is an example of a glossary document entry for example purposes. This value can be used as needed by an application, for example, to display in a user interface. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example</i>: Consider the following WordprocessingML fragment:</p>

Attributes	Description
	<pre data-bbox="451 247 954 346"><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p data-bbox="414 384 1409 415">The value of the <code>val</code> attribute is the ID of the associated paragraph style's <code>styleId</code>.</p> <p data-bbox="414 457 922 489">However, consider the following fragment:</p> <pre data-bbox="451 527 1079 661"><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p data-bbox="414 699 1453 804">In this case, the decimal number in the <code>val</code> attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p data-bbox="414 842 1339 909">The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_String](#)) is located in §A.1. *end note*]

17.12.5 docPart (Glossary Document Entry)

This element specifies the details for a single glossary document entry contained in the document. This glossary document entry can consist of one or both of the following:

- The glossary document entry's properties, which define its name, categorization, and behaviors
- The glossary document entry's contents, which consists of one or more block-level elements of WordprocessingML content

Each of these two components is specified by one of the child elements of this element, as seen in the child elements table below.

[Example: Consider the following definition for the contents of a Glossary Document part within a WordprocessingML document:


```

<w:glossaryDocument>
  <w:docParts>
    <w:docPart>
      ...
    </w:docPart>
    <w:docPart>
      ...
    </w:docPart>
  </w:docParts>
</w:glossaryDocument>

```

The docPart element uniquely defines one glossary document entry within the glossary document part, therefore there are two unique entries stored in the current example of a glossary document part. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_DocPart](#)) is located in §A.1. *end note*]

17.12.6 docPartBody (Contents of Glossary Document Entry)

This element specifies the contents of the parent glossary document entry (§17.12.5). These contents shall consist of one or more block-level elements, analogous to the body element (§17.2.2) of the main document story for the current document.

[Example: Consider the WordprocessingML fragment for a glossary document entry containing a single run, defined as follows:

```

<w:docPart>
  ...
  <w:docPartBody>
    <w:p>
      <w:r>
        <w:t>Sample entry.</w:t>
      </w:r>
    </w:p>
  </w:docPartBody>
</w:docPart>

```

The docPartBody element specifies the block-level elements which comprise the contents of the current glossary document entry, in this case, a single paragraph using the p element (§17.3.1.22). *end example*

When the contents of a glossary document entry are added to a document, the styles, numbering definitions, and all other related parts for this entry shall be taken from the relationships from the Glossary Document part and not from the main document part. These references shall be moved to their main document equivalents when the entry is added to the document.

When the part is inserted, it shall be inserted as though its last paragraph mark does not exist (the content of the final paragraph mark shall be merged with the contents of the paragraph into which this entry is being added).

[*Example:* Consider the WordprocessingML fragment for a glossary document entry containing a single run, defined as follows:

```
<w:docPart>
  <w:docPartPr>
    <w:behaviors>
      <w:behavior w:val="p"/>
    </w:behaviors>
    ...
  </w:docPartPr>
  <w:docPartBody>
    <w:p>
      <w:r>
        <w:t>Sample entry.</w:t>
      </w:r>
    </w:p>
  </w:docPartBody>
</w:docPart>
```

If this entry is inserted into document content to which is defined as follows (and the part is added between the two text runs):

```
<w:body>
  <w:p>
    <w:r>
      <w:t>After this text</w:t>
    </w:r>
    <w:r>
      <w:t>Before this text</w:t>
    </w:r>
  </w:p>
</w:body>
```

This entry has only a single paragraph, which is removed before insertion, and barring any special insertion behaviors (§17.12.2), only the text run is inserted, resulting in the following WordprocessingML:

```

<w:body>
  <w:p>
    <w:r>
      <w:t>After this text</w:t>
    </w:r>
    <w:r>
      <w:t>Sample entry.</w:t>
    </w:r>
    <w:r>
      <w:t>Before this text</w:t>
    </w:r>
  </w:p>
</w:body>

```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_Body](#)) is located in §A.1. *end note*]

17.12.7 docPartPr (Glossary Document Entry Properties)

This element specifies the set of properties which shall be applied to the parent glossary document entry. These properties define its name, categorization, and behaviors.

[Example: Consider the WordprocessingML fragment for a glossary document entry containing a single run, defined as follows:

```

<w:docPart>
  <w:docPartPr>
    <w:name w:val="Sample Entry" />
    ...
  </w:docPartPr>
  ...
</w:docPart>

```

The docPartPr element specifies the set of properties which have been specified for the parent glossary document entry, the only one visible above being the entry's name of Sample Entry. *end example]*

[Note: The W3C XML Schema definition of this element's content model ([CT_DocPartPr](#)) is located in §A.1. *end note*]

17.12.8 docParts (List of Glossary Document Entries)

This element specifies the collection of glossary document entries which are stored in the current Glossary Document part.

[Example: Consider the following definition for the contents of a glossary document part within a WordprocessingML document:

```
<w:glossaryDocument>
  <w:docParts>
    <w:docPart>
      ...
    </w:docPart>
    <w:docPart>
      ...
    </w:docPart>
  </w:docParts>
</w:glossaryDocument>
```

The docParts element defines the set of entries which are stored in the glossary document part. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_DocParts](#)) is located in §A.1. *end note*]

17.12.9 gallery (Gallery Associated With Entry)

This element specifies the predefined gallery into which the current glossary document part shall be classified. This classification, although its enumeration values can be interpreted to imply semantics around the contents of the parent glossary document entry, shall only be used to classify and sort this entry (via an application or a user interface).

[Example: Consider the following WordprocessingML fragment for the properties of a single glossary document entry:

```
<w:docPartPr>
  <w:category>
    <w:name w:val="Internal Memo Covers" />
    <w:gallery w:val="coverPg" />
  </w:category>
  ...
</w:docPartPr>
```

The gallery element with a value of coverPg specifies that the gallery categorization applied to the current entry, for the purposes of classification or user interface sorting, puts this entry into the Cover Pages classification. *end example*

Attributes	Description
val (Gallery Value)	<p>Specifies the classification of gallery which shall be associated with the parent glossary document entry.</p> <p>[Example: Consider the following WordprocessingML fragment for a single glossary document entry:</p> <pre><w:gallery w:val="custom1" /></pre>

Attributes	Description
	<p>The val attribute with a value of custom1 specifies that the gallery categorization applied to the current entry is the Custom 1 classification. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DocPartGallery simple type (§17.18.16).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_DocPartGallery](#)) is located in §A.1. *end note*]

17.12.10 glossaryDocument (Glossary Document Root Element)

This element specifies the root element for a glossary document part within a WordprocessingML document. A glossary document is an supplementary document story in a WordprocessingML that shall be afforded all of the relationships of the Main Document part, such as:

- Style definitions
- Numbering definitions
- Comments
- Headers/footers
- Etc.

The entries stored in this part shall have all of its implicit relationships target these parts, rather than their analogues stored off of the main document part.

[*Example*: Consider the following definition for the contents of a glossary document part within a WordprocessingML document:

```
<w:glossaryDocument>
  <w:docParts>
    <w:docPart>
      ...
    </w:docPart>
    <w:docPart>
      ...
    </w:docPart>
  </w:docParts>
</w:glossaryDocument>
```

The glossaryDocument element defines the contents of the glossary document part. *end example*

[*Note*: The W3C XML Schema definition of this element's content model ([CT_GlossaryDocument](#)) is located in §A.1. *end note*]

17.12.11 guid (Entry ID)

This element specifies a unique identifier (specified using a 128-bit GUID stored on the val attribute) that uniquely identifies this document building block. *[Note: This unique identifier can be used by an application to uniquely reference a single document building block regardless of different naming, for example when the same part has different names for localization purposes. end note]*

[Example: Consider the following WordprocessingML fragment for the properties of a single glossary document entry:

```
<w:docPartPr>
...
<w:guid w:val="{00000000-5BD2-4BC8-9F70-7020E1357FB2}" />
...
</w:docPartPr>
```

The guid element specifies that the unique identifier associated with the parent entry must be {00000000-5BD2-4BC8-9F70-7020E1357FB2}. This value can be used as needed by an application, for example, to uniquely identify a part regardless of its name. *end example]*

Attributes	Description
val (GUID Value)	<p>Specifies a 128-bit globally unique identifier (GUID) value as defined by the simple type referenced below. The contents of this GUID shall be interpreted based on the context of the parent XML element.</p> <p>If this attribute is omitted, its value shall be assumed to be null (i.e. no GUID shall be associated with the parent XML element).</p> <p><i>[Example: Consider the following WordprocessingML element:</i></p> <pre><... w:val="{6A9B8B6F-5BD2-4BC8-9F70-7020E1357FB2}"/></pre> <p>The val attribute value of {6A9B8B6F-5BD2-4BC8-9F70-7020E1357FB2} must be associated with the context of the parent XML element. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Guid simple type (§22.9.2.4).</p>

[Note: The W3C XML Schema definition of this element’s content model (CT_Guid) is located in §A.1. end note]

17.12.12 name (Category Associated With Entry)

This element specifies the category into which the current glossary document part shall be classified. This classification can consist of any string value as determined by its contents, and shall only be used to classify and sort this entry (via an application or a user interface).

[*Example:* Consider the following WordprocessingML fragment for the properties of a single glossary document entry:

```
<w:docPartPr>
  <w:category>
    <w:name w:val="Internal Memo Covers" />
    <w:gallery w:val="coverPg" />
  </w:category>
  ...
</w:docPartPr>
```

The name element with a value of `Internal Memo Covers` specifies that the category grouping applied to the current entry, for the purposes of classification or user interface sorting, puts this entry into the `Internal Memo Covers` classification. This category can be used as desired. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's <code>styleId</code>.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model (`CT_String`) is located in §A.1. *end note*]

17.12.13 name (Entry Name)

This element specifies a name for the contents of this glossary document entry. This name can contain any string content, and allows the entry to have a friendly identifier contained within the definition for this glossary document entry. [Note: This name can be surfaced in a user interface, for example. *end note*]

[Example: Consider the following WordprocessingML fragment for the properties of a single glossary document entry:

```
<w:docPartPr>
...
  <w:name w:val="Sample Entry" />
  <w:description w:val="This is an example of a glossary document entry for
example purposes." />
...
</w:docPartPr>
```

The name element specifies that the friendly name associated with the parent entry must be Sample Entry. This value can be used as needed by an application, for example, to display in a user interface. *end example*]

Attributes	Description
decorated (Built-In Entry)	<p>Specifies that the name for the current entry is a built-in entry which should not be displayed in the user interface. [Note: This information can be used by an application as needed, for example, to disambiguate an entry from one with the same name, ensuring that the built-in entry can be uniquely identified by the application. <i>end note</i>]</p> <p>If this attribute is omitted, its value shall be assumed to be false.</p> <p>[Example: Consider the following WordprocessingML fragment for the name of a single glossary document entry:</p> <pre><w:name w:decorated="true" w:val=":-)" /></pre> <p>The decorated attribute specifies that the parent entry is a built-in entry, and must be treated as such. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
val (Name Value)	<p>Specifies a string value which contains the name of the current glossary document entry.</p> <p>[Example: Consider the following WordprocessingML fragment for the name of a single glossary document entry:</p> <pre><w:name w:val="Sample Entry" /></pre> <p>The val attribute specifies that the name of the parent entry is Sample Entry. <i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([CT_DocPartName](#)) is located in §A.1. *end note*]

17.12.14 style (Associated Paragraph Style Name)

This element specifies the style ID for a paragraph style which shall be associated with the current glossary document entry. This paragraph style associated shall not imply anything about the formatting or content of the glossary document entry, and shall only be used to filter and/or sort this entry (via an application or a user interface). [Note: One example of the level of classification offered by this element is to only show it as available when the formatting of the paragraph matches the specified style. *end note*]

[Example: Consider the following WordprocessingML fragment for the properties of a single glossary document entry:

```
<w:docPartPr>
  <w:style w:val="Heading1" />
  ...
</w:docPartPr>
```

The style element with a val attribute value of Heading1 specifies that the paragraph style associated with the current glossary document entry must be the style whose style ID is equal to Heading1. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[Example: Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /></pre>

Attributes	Description
	<p>...</p> <p></w:sdtPr></p> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_String](#)) is located in §A.1. *end note*]

17.12.15 type (Entry Type)

This element specifies an entry type which shall be applied to the properties of the parent glossary document entry (§17.12.5). Each of these entry types can, based on their values, influence the visibility and behavior of the parent glossary document entry as defined by the associated simple type information.

[Example: Consider the following WordprocessingML fragment for the properties of a single glossary document entry:

```
<w:docPartPr>
  <w:types>
    <w:type w:val="bbPlcHdr" />
  </w:types>
  ...
</w:docPartPr>
```

The type element with a value of bbPlcHdr specifies that the parent glossary document entry must be treated as if it was the placeholder text for one or more structured document tags in the document. *end example*]

Attributes	Description
val (Type Value)	<p>Specifies the value for the current entry type.</p> <p>[Example: Consider the following WordprocessingML fragment for the properties of a single glossary document entry:</p> <p><w:type w:val="bbPlcHdr" /></p> <p>The val attribute value of bbPlcHdr specifies that the parent glossary document entry must be treated as if it was the placeholder text for one or more structured document tags in the document. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DocPartType simple type</p>

Attributes	Description
	(§17.18.17).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DocPartType](#)) is located in §A.1.
end note]

17.12.16 types (Entry Types)

This element specifies the set of entry types which shall be applied to the properties of the parent glossary document entry (§17.12.5). Each of these entry types can, based on their values, influence the visibility and behavior of the parent glossary document entry.

[*Example:* Consider the following WordprocessingML fragment for the properties of a single glossary document entry:

```
<w:docPartPr>
  <w:types>
    ...
  </w:types>
  ...
</w:docPartPr>
```

The types element specifies the set of entry types which must be associated with the parent glossary document entry. *end example*]

Attributes	Description
all (Entry Is Of All Types)	<p>Specifies that the current glossary document is all entry types. This attribute shall override any information specified as child elements of this element and shall ensure that the current entry is associated with all available entry types.</p> <p>If this attribute is omitted, then its default value shall be assumed to be <code>false</code>.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment for the properties of a single glossary document entry:</p> <pre><w:docPartPr> <w:types w:all="true"> <w:type w:val="autoExp" /> </w:types> ... </w:docPartPr></pre> <p>The types element contains a single entry type definition, but because the all attribute is present with a value of <code>true</code>, that entry type is augmented to place the parent entry into all possible entry types. <i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).

[*Note*: The W3C XML Schema definition of this element's content model ([CT_DocPartTypes](#)) is located in §A.1. *end note*]

17.13 Annotations

Within a WordprocessingML document, *annotations* refer to various types of supplementary markup which can be stored inside or around a region of text within the document's contents. [*Example*: The types of supplementary information stored within a document can include: comments, revisions, spelling and/or grammatical errors, bookmark information and optional editing permissions. *end example*]

Within a document's contents, annotations are stored in one of three different methods:

- Inline
- "Cross Structure"
- Properties

These three forms are needed in order to maintain compatibility with both the legacy annotations functionality of current word processing applications and the requirements of an XML-based format (i.e. wellformedness of the resulting XML markup). These three forms are referenced within the individual annotation types described in the following sub clauses.

17.13.1 Inline Annotations

Inline annotations describe all annotations which do not require special handling in order to maintain the XML wellformedness requirements of the resulting WordprocessingML output. In these cases, a single XML element shall encapsulate the entire contents of the document content which is being annotated.

[*Example*: Consider the following WordprocessingML markup for a paragraph which reads The quick brown fox jumps over the jet lagged dog., where jet lagged replaced the previous text lazy when the editing application was tracking revisions:

```

<w:p>
  <w:r>
    <w:t xml:space="preserve">The quick brown fox jumps over the </w:t>
  </w:r>
  <w:del ... >
    <w:r>
      <w:delText>lazy</w:delText>
    </w:r>
  </w:del>
  <w:ins ... >
    <w:r>
      <w:t>jet lagged</w:t>
    </w:r>
  </w:ins>
  <w:r>
    <w:t xml:space="preserve"> dog.</w:t>
  </w:r>
</w:p>

```

The del and ins elements (§17.13.5.14; §17.13.5.18) each fully encapsulate the extent of their respective annotations (a marked deletion and insertion, respectively), as they are inline annotations. *end example*

17.13.2 "Cross Structure" Annotations

"Cross structure" annotations describe the class of annotations which can span portions of WordprocessingML markup [*Example*: Cross structure annotations can span parts of multiple paragraphs, one half of a custom XML markup element's contents, etc. *end example*]. In these cases, the annotation's region is delimited by two elements: a start element and an end element. These two elements mark the start and end points of the annotated content, but do not contain it. The pairing of the start and end marker are linked via a common value for their id attributes.

[*Example*: Consider the following WordprocessingML markup for two paragraphs, each reading *Example Text*, where a bookmark has been added spanning the second word in paragraph one and the first word in paragraph two:

```

<w:p>
  <w:r>
    <w:t>Example</w:t>
  </w:r>
  <w:bookmarkStart w:id="0" w:name="sampleBookmark" />
  <w:r>
    <w:t xml:space="preserve"> text.</w:t>
  </w:r>
</w:p>
<w:p>
  <w:r>
    <w:t>Example</w:t>
  </w:r>
  <w:bookmarkEnd w:id="0" />
  <w:r>
    <w:t xml:space="preserve"> text.</w:t>
  </w:r>
</w:p>

```

The bookmarkStart and bookmarkEnd elements (§17.13.6.2; §17.13.6.1) specify the location where the bookmark starts and ends, but cannot contain it because it spans part of two paragraphs. They are part of one group because the id attribute value specifies 0 for both. *end example*]

17.13.3 Property Annotations

Property annotations describe the class of annotations which are stored as a property on an object [*Example*: Property annotations can appear on paragraph properties, run properties, table rows, etc. *end example*] In these cases, the annotation's semantics are defined by the property, as they can affect content and/or formatting.

[*Example*: Consider the following WordprocessingML markup for a paragraph reading **Example** Text, where the first word had the bold property applied when the editing application was tracking revisions:

```

<w:p>
  <w:r>
    <w:rPr>
      <w:b/>
      <w:rPrChange ... >
        <w:rPr/>
      </w:rPrChange>
    </w:rPr>
    <w:t>Example</w:t>
  </w:r>
  <w:r>
    <w:t xml:space="preserve"> text.</w:t>
  </w:r>
</w:p>

```

The `rPrChange` element (§17.13.5.31; §17.13.5.30) contains the set of previously applied revision properties associated with a particular author at a particular time. It is stored itself as a property on the parent run which was modified. *end example*]

17.13.4 Comments

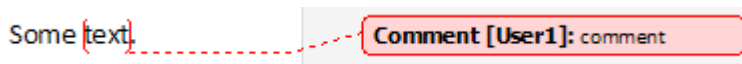
Comments describe annotations which are anchored to a region of document content, but which contain an arbitrary amount of block-level content stored in their own separate document stories. Within a WordprocessingML document, comments are stored in a separate Comments part within the document package.

A comment in a WordprocessingML document is divided into two components:

- The comment anchor (the text on which the comment applies)
- The comment content (the contents of the comment)

The *comment anchor* is the cross structure annotation which defines the region of text on which the comment is anchored. The *comment content* is the content stored in the comments part which contains the actual content of the comment.

[*Example:* Consider a paragraph in a WordprocessingML document whose second word is annotated with a comment:



The first component to this comment is the document content which defines the extents of the comment and references the specific comment in the comments part:

```

<w:p>
  <w:r>
    <w:t xml:space="preserve">Some </w:t>
  </w:r>
  <w:commentRangeStart w:id="0" />
  <w:r>
    <w:t>text.</w:t>
  </w:r>
  <w:commentRangeEnd w:id="0" />
  <w:r>
    <w:commentReference w:id="0" />
  </w:r>
</w:p>

```

The commentRangeStart and commentRangeEnd elements (§17.13.4.4; §17.13.4.3) delimit the run content to which the comment with an id of 0 applies (in this case, the single run of text). The following commentReference element (§17.13.4.5) links the preceding run content with a comment in the comments part with an id of 0. Without all three of these elements, the range and comment cannot be linked (although the first two elements are optional, in which case the comment must be anchored at the comment reference mark)

The second component to this comment is the comment content which defines the text in the comment:

```

<w:comment w:id="0" w:author="Joe Smith" w:date="2006-04-06T13:50:00Z"
w:initials="User">
  <w:p>
    <w:pPr>
      <w:pStyle w:val="CommentText" />
    </w:pPr>
    <w:r>
      <w:rPr>
        <w:rStyle w:val="CommentReference" />
      </w:rPr>
      <w:annotationRef />
    </w:r>
    <w:r>
      <w:t>comment</w:t>
    </w:r>
  </w:p>
</w:comment>

```

In this example, the comment specifies that it was inserted by author Joe Smith with the initials User via the author and date attributes. It is linked to the run content via the id attribute, which matches the value of 0 specified using the commentReference element above. The block-level content of the comment specifies that

its text is comment and the style of the comment content is based off of the character style with the name CommentReference. *end example*]

17.13.4.1 annotationRef (Comment Information Block)

This element specifies the presence of an annotation reference mark at the current location in the comment. An *annotation reference mark* is an information block that represents the metadata about the current comment within the document. This annotation reference mark should typically consist of the initials and a unique integer associated with its position in the document, but can be displayed in any desired format.

If this element is omitted from a single comment's contents, then an annotation reference mark can be added at the start of the comment in reading order (right in a right-to-left paragraph or left in a left-to-right paragraph). As well, an annotation reference mark can be relocated as desired within a comment's content.

[*Example:* Consider a document with text with an annotated comment as follows:

Some text(User1).

This comment is represented as the following WordprocessingML fragment:

```
<w:comment ... w:initials="User">
  <w:p>
    <w:r>
      <w:annotationRef />
    </w:r>
  ...
</w:p>
</w:comment>
```

The annotationRef element specifies that the comment must start with an annotation reference mark. In this example, this mark is displayed as a combination of the user initial, User, and a unique sequential number, 1. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.1. *end note*]

17.13.4.2 comment (Comment Content)

This element specifies the content of a single comment stored in the Comments part of a WordprocessingML document.

If a comment is not referenced by document content via a matching id attribute on a correct use of the commentReference element (§17.13.4.5), as defined by the WordprocessingML schema, then it can be ignored when loading the document. If more than one comment shares the same value for the id attribute, then only one comment shall be loaded and the others can be ignored.

[*Example:* Consider a document with text with an annotated comment as follows:

Some (text[User1]).

This comment is represented as the following WordprocessingML fragment:

```
<w:comment w:id="1" w:initials="User" w:author="Dan Battagin">
...
</w:comment>
```

The comment element specifies the presence of a single comment within the comments part. *end example*]

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example</i>: Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ... </...></pre> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[<i>Example</i>: Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DateTime simple type</p>

Attributes	Description
id (Annotation Identifier)	<p>(§17.18.9).</p> <p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
initials (Initials of Comment Author)	<p>Specifies the initials of the author of the current comment. [<i>Note:</i> This information can be used to format and present the associated comment information block (§17.13.4.1), or in any user interface supported by an application. If there is more than one author with the same initials, it might be more useful to display the author name. <i>end note</i>]</p> <p>If this attribute is omitted, then no author shall be associated with the current comment in the document.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre><w:comment w:id="1" w:initials="KB" w:author="Krista Bendig"> ... </w:comment></pre> <p>The initials attribute specifies that the initials of the author of the current comment are KB, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Comment](#)) is located in §A.1. *end note*]

17.13.4.3 commentRangeEnd (Comment Anchor Range End)

This element specifies the end of the range around which a comment is anchored in the content of the WordprocessingML document. The id attribute on this element shall be used to link the corresponding comment anchor range start element and comment reference.

The following restrictions shall be applied to this element:

- If this element occurs without a corresponding commentRangeStart element (§17.13.4.4) with a matching id attribute value, then it shall be considered the single anchor point for the associated comment reference.
- If this element appears without a corresponding commentReference element (§17.13.4.5) in the current document story with a matching id attribute value, then the document is non-conformant.
- If this element appears in a comment content story (§17.13.4.2), then the document is non-conformant .

[Example: Consider a paragraph in a WordprocessingML document whose second word is annotated with a comment:

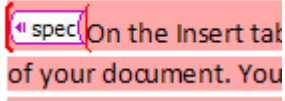
Some text^{User1}.

The WordprocessingML fragment for this comment is defined as follows:

```
<w:p>
  <w:r>
    <w:t xml:space="preserve">Some </w:t>
  </w:r>
  <w:commentRangeStart w:id="0" />
  <w:r>
    <w:t>text.</w:t>
  </w:r>
  <w:commentRangeEnd w:id="0" />
  <w:r>
    <w:commentReference w:id="0" />
  </w:r>
</w:p>
```

The commentRangeEnd element specifies that the end of the comment range for the comment with an id of 0 is after the end of the run containing the word text. *end example*]

Attributes	Description
displacedByCustomXml (Annotation Marker Relocated For Custom XML	Specifies that the parent annotation's placement shall be directly linked with the location of the physical presentation of a custom XML element in the document. This element only has an effect when the custom XML element is block-level (i.e. surrounds an entire paragraph), as in this scenario the logical and physical placement of the annotation and

Attributes	Description
Markup)	<p>custom XML element can differ.</p> <p>Specifically, in this case, the custom XML is presented <i>around</i> the block-level object it encloses (the paragraph, table, table row, or table cell), but is physically represented within that same object (i.e. within the paragraph, table, table row or table cell). This requirement stems from the fact that there is no location for the location of the annotation within the document at its logical location (around a table, for example).</p> <p>If this element is omitted, then the annotation shall be anchored inside of all block-level custom XML elements in the paragraph. If this element is present, but no block-level custom XML tag is located at the position it specifies (before or after), then it shall be ignored.</p> <p>[<i>Example:</i> Consider a paragraph with block level custom XML markup and two comment anchor annotations (one before and one after the custom XML element's physical representation), as follows:</p>  <p>Since all three of these items are around the entire paragraph, they are stored outside of the paragraph. However, in order to ensure that their relative positions are stored correctly, any annotation which must be displaced by the physical custom XML element specifies this information, resulting in the following WordprocessingML:</p> <pre> ... <w:commentRangeStart w:id="0" /> <w:commentRangeStart w:id="1" w:displaced byCustomXml="next" /> <w:customXml w:element="spec" ... /> <w:p> ... </w:p> ... </pre> <p>The displacedByCustomXml attribute specifies that even though all three of these items are around the paragraph and is moved inside the paragraph to be represented physically, the comment with ID 0 must be inside the custom XML, but the comment with ID 1 must be displaced to stay outside of the relative location of the next custom XML element (the spec element). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DisplacedByCustomXml simple type (§17.18.13).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p>

Attributes	Description
	<p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 426 695 525"><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_MarkupRange](#)) is located in §A.1. *end note*]

17.13.4.4 commentRangeStart (Comment Anchor Range Start)

This element specifies the start of the range around which a comment is anchored in the content of the WordprocessingML document. The id attribute on this element shall be used to link the corresponding comment anchor range end element and comment reference.

The following restrictions shall be applied to this element:

- If this element occurs without a corresponding commentRangeEnd element (§17.13.4.3) with a matching id attribute value, then it shall be considered the single anchor point for the associated comment reference.
- If this element appears without a corresponding commentReference element (§17.13.4.5) in the current document story with a matching id attribute value, then the document is non-conformant .
- If this element appears in a comment content story (§17.13.4.2), then the document is non-conformant .

[*Example:* Consider a paragraph in a WordprocessingML document whose second word is annotated with a comment:

Some {text}User1.

The WordprocessingML fragment for this comment is defined as follows:

```

<w:p>
  <w:r>
    <w:t xml:space="preserve">Some </w:t>
  </w:r>
  <w:commentRangeStart w:id="0" />
  <w:r>
    <w:t>text.</w:t>
  </w:r>
  <w:commentRangeEnd w:id="0" />
  <w:r>
    <w:commentReference w:id="0" />
  </w:r>
</w:p>

```

The commentRangeStart element specifies that the start of the comment range for the comment with an id of 0 is after the end of the run containing the word *Some*. *end example*]

Attributes	Description
displacedByCustomXml (Annotation Marker Relocated For Custom XML Markup)	<p>Specifies that the parent annotation's placement shall be directly linked with the location of the physical presentation of a custom XML element in the document. This element only has an effect when the custom XML element is block-level (i.e. surrounds an entire paragraph), as in this scenario the logical and physical placement of the annotation and custom XML element can differ.</p> <p>Specifically, in this case, the custom XML is presented <i>*around*</i> the block-level object it encloses (the paragraph, table, table row, or table cell), but is physically represented within that same object (i.e. within the paragraph, table, table row or table cell). This requirement stems from the fact that there is no location for the location of the annotation within the document at its logical location (around a table, for example).</p> <p>If this element is omitted, then the annotation shall be anchored inside of all block-level custom XML elements in the paragraph. If this element is present, but no block-level custom XML tag is located at the position it specifies (before or after), then it shall be ignored.</p> <p>[<i>Example:</i> Consider a paragraph with block level custom XML markup and two comment anchor annotations (one before and one after the custom XML element's physical representation), as follows:</p> <div data-bbox="451 1654 732 1755" data-label="Image"> <p>The image shows a document snippet with a red comment range box. Inside the box, the text 'spec' is followed by 'On the Insert tab of your document. You'. The text 'spec' is highlighted in blue, and 'On the Insert tab of your document. You' is highlighted in red. The entire comment range is enclosed in a red box.</p> </div> <p>Since all three of these items are around the entire paragraph, they are stored outside of the paragraph. However, in order to ensure that their relative positions are stored correctly, any annotation which must be displaced by the physical custom XML element</p>

Attributes	Description
	<p>specifies this information, resulting in the following WordprocessingML:</p> <pre>... <w:commentRangeStart w:id="0" /> <w:commentRangeStart w:id="1" w:displaced byCustomXml="next" /> <w:customXml w:element="spec" ... /> <w:p> ... </w:p> ...</pre> <p>The displacedByCustomXml attribute specifies that even though all three of these items are around the paragraph and is moved inside the paragraph to be represented physically, the comment with ID 0 must be inside the custom XML, but the comment with ID 1 must be displaced to stay outside of the relative location of the next custom XML element (the spec element). <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DisplacedByCustomXml simple type (§17.18.13).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_MarkupRange](#)) is located in §A.1. *end note*]

17.13.4.5 commentReference (Comment Content Reference Mark)

This element specifies the presence of a comment content reference mark, which links the comment content (§17.13.4.2) with the contents of a document story. This link is established by matching the comment whose id

attribute matches the id attribute on this element. The resulting comment is anchored to the range with comment range elements with the same id attribute values (if present) as follows:

- If both of the commentRangeStart and commentRangeEnd elements (§17.13.4.4; §17.13.4.3) are present, then the comment reference shall anchor the comment to the resulting range.
- If only one of the commentRangeStart and commentRangeEnd elements (§17.13.4.4; §17.13.4.3) is present, then the document is non-conformant.
- If neither element is present, then the comment reference shall anchor the comment to its current location.

If this element appears in a comment content story (§17.13.4.2), then it can be ignored. If no comment exists with an id attribute which matches the id attribute on this element, then this document is non-conformant.

[*Example:* Consider a paragraph in a WordprocessingML document whose second word is annotated with a comment:

Some {text[User1]}.

The WordprocessingML fragment for this comment is defined as follows:

```
<w:p>
  <w:r>
    <w:t xml:space="preserve">Some </w:t>
  </w:r>
  <w:commentRangeStart w:id="0" />
  <w:r>
    <w:t>text.</w:t>
  </w:r>
  <w:commentRangeEnd w:id="0" />
  <w:r>
    <w:commentReference w:id="0" />
  </w:r>
</w:p>
```

The commentReference element specifies that the associated comment in the comments part must be the comment whose id attribute value is 0. As well, since a start and end marker exist with a matching ID, this comment is anchored to that region of the document. *end example]*

Attributes	Description
id (Annotation Identifier)	Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element. If this attribute is omitted, then the document is non-conformant.

Attributes	Description
	<p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 394 695 489"><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Markup](#)) is located in §A.1. *end note*]

17.13.4.6 comments (Comments Collection)

This element specifies all of the comments defined in the current document. It is the root element of the Comments part of a WordprocessingML document.

[*Example:* Consider the following WordprocessingML fragment for the content of a comments part in a WordprocessingML document:

```
<w:comments>
  <w:comment ... >
  ...
</w:comment>
</w:comments>
```

The comments element contains the single comment specified by this document in this example. *end example*]

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Comments](#)) is located in §A.1. *end note*]

17.13.5 Revisions

Revisions in WordprocessingML provide a mechanism for storing information about the evolution of the document (i.e. the set of modifications made to a document by one of more authors). When an application adds revisions to the content of a WordprocessingML document, they are specifying this by storing either (depending on the revision type):

- The current state of the document (a deletion stores the current state of the text as deleted, and implies that its original state was the content used to exist)

- The initial state of the document (a run's initial properties are explicitly stored in a previous run properties block, as the current run properties are always those that are the child of the rPr element (§17.7.9.1))

A revision consists of two required pieces of information:

- The revision type (specified via the name of the revision element)
- A unique revision identifier (used to uniquely identify revisions)

As well as optional information:

- The author of the revision
- The date and time of the revision

[*Example:* Consider a paragraph of text in a WordprocessingML document in which one word has been inserted, as follows:

Some text

This paragraph has the word `text` marked inserted as a revision, and is represented as the following WordprocessingML:

```
<w:p>
  <w:r>
    <w:t>Some</w:t>
  </w:r>
  <w:ins w:id="0" w:author="Joe Smith" w:date="2006-03-31T12:50:00Z">
    <w:r>
      <w:t>text</w:t>
    </w:r>
  </w:ins>
</w:p>
```

The `ins` element contains both the required information: all of the content which must be treated as revision marked as inserted (the word `text`); a unique revision identifier of `0`.

The element also stores the optional information about the revision: the word `text` was inserted by `Joe Smith` on March 31, 2006 at 12:50pm. *end example*]

Within a WordprocessingML document, the following types of revisions can be used to track the changes to a document:

- Insertions
- Deletions
- Moves

- Changes to run/paragraph/table/numbering/section properties
- Changes to custom XML markup

17.13.5.1 cellDel (Table Cell Deletion)

This element specifies that the parent table cell shall be treated as though it was deleted from the document while revisions were being recorded. This means that although the table cell element exists in the structure of the table, the table cell technically no longer exists in the document.

[Example: Consider a document with a two row by two columns table as follows:

One	Two
Three	Four

If this table has each cell in its final column deleted and this is tracked as a revision, the resulting WordprocessingML would show each of these cells as deleted as follows:

```
<w:tbl>
...
<w:tr>
  <w:tc>
    <w:r>
      <w:t>One</w:t>
    </w:r>
  </w:tc>
  <w:tc>
    <w:tcPr>
      <w:cellDel w:id="0" ... />
    </w:tcPr>
    <w:r>
      <w:t>Two</w:t>
    </w:r>
  </w:tc>
</w:tr>
<w:tr>
  <w:tc>
    <w:r>
      <w:t>Three</w:t>
    </w:r>
  </w:tc>
```

```

<w:tc>
  <w:tcPr>
    <w:cellDel w:id="1" ... />
  </w:tcPr>
  <w:r>
    <w:t>Four</w:t>
  </w:r>
</w:tc>
</w:tr>
</w:tbl>

```

The cellDel elements in the table cell properties of the cells with text Two and Four specify that each of those cells have been deleted from the document. Their attributes (omitted) can optionally provide information about the time at which this deletion took place. *end example*]

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example</i>: Consider a comment represented using the following WordprocessingML fragment:</p> <pre> <... w:id="1" w:author="Example Author"> ... </...> </pre> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[<i>Example</i>: Consider a comment represented using the following WordprocessingML fragment:</p> <pre> <... w:id="1" w:date="2006-01-01T10:00:00"> ... </...> </pre>

Attributes	Description
	<p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example</i>: Consider an annotation represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_TrackChange](#)) is located in §A.1. *end note*]

17.13.5.2 cellIns (Table Cell Insertion)

This element specifies that the parent table cell shall be treated as though it was inserted into the document while revisions were being recorded.

[*Example*: Consider a document with a two row by two columns table as follows:

One	Two
Three	Four

If this table has two cells added by appending an additional column, and this is tracked as a revision, the resulting WordprocessingML would show each of these cells as inserted as follows:

```

<w:tbl>
...
<w:tr>
  <w:tc>
    <w:r>
      <w:t>One</w:t>
    </w:r>
  </w:tc>
  <w:tc>
    <w:r>
      <w:t>Two</w:t>
    </w:r>
  </w:tc>
  <w:tc>
    <w:tcPr>
      <w:cellIns w:id="0" ... />
    </w:tcPr>
    <w:r>
      <w:t>New</w:t>
    </w:r>
  </w:tc>
</w:tr>
<w:tr>
  <w:tc>
    <w:r>
      <w:t>Three</w:t>
    </w:r>
  </w:tc>
  <w:tc>
    <w:r>
      <w:t>Four</w:t>
    </w:r>
  </w:tc>
  <w:tc>
    <w:tcPr>
      <w:cellIns w:id="1" ... />
    </w:tcPr>
    <w:r>
      <w:t>New</w:t>
    </w:r>
  </w:tc>
</w:tr>
</w:tbl>

```

The cellIns elements in the table cell properties of the cells with text New specify that each of those cells have been inserted into the document. Their attributes (omitted) can optionally provide information about the insertion of these cells (author, date, etc.). *end example*

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example</i>: Consider a comment represented using the following WordprocessingML fragment:</p> <pre data-bbox="456 751 1062 848"><... w:id="1" w:author="Example Author"> ... </...></pre> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[<i>Example</i>: Consider a comment represented using the following WordprocessingML fragment:</p> <pre data-bbox="456 1402 1110 1499"><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p>

Attributes	Description
	<p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 394 695 491"><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TrackChange](#)) is located in §A.1. *end note*]

17.13.5.3 cellMerge (Vertically Merged/Split Table Cells)

This element specifies that the vertical merge state of the parent table cell has been modified while revisions were being tracked for the document. The vmerge and vmergeOrig attributes on this element specify the original and revised vertical merge states of the table cell.

[*Example:* Consider a document with a two row by two columns table as follows:

One	Two
Three	Four

If this table has the two cells in the second column merged into one and this modification is tracked as a revision, as follows:

One	Two
Three	Four

The resulting WordprocessingML for the revision would appear as follows:

```
<w:tbl>
...
<w:tr>
  <w:tc>
    <w:r>
      <w:t>One</w:t>
    </w:r>
  </w:tc>
  <w:tc>
    <w:r>
      <w:t>Two</w:t>
    </w:r>
  </w:tc>
</w:tr>
<w:tr>
  <w:tc>
    <w:r>
      <w:t>Three</w:t>
    </w:r>
  </w:tc>
  <w:tc>
    <w:tcPr>
      <w:cellMerge w:id="0" w:vMerge="cont"/>
    </w:tcPr>
    <w:r>
      <w:t>Four</w:t>
    </w:r>
  </w:tc>
</w:tr>
</w:tbl>
```

The cellMerge element specifies that changes were made to the vertical merge settings of the last cell in the table, specifically; the cell was vertically merged with the cell above it (gaining a revised vmerge attribute value of cont). *end example*]

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p>

Attributes	Description
	<p><... w:id="1" w:author="Example Author"> ... </...></p> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[Example: Consider a comment represented using the following WordprocessingML fragment:</p> <p><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></p> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[Example: Consider an annotation represented using the following WordprocessingML fragment:</p> <p><... w:id="1" ... > ... </...></p> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
vMerge (Revised)	Specifies the vertical merge setting which was applied to the parent table cell by this

Attributes	Description
Vertical Merge Setting)	<p>revision.</p> <p>If this attribute is omitted, then no revised vertical merge setting is supplied for this revision (if neither this nor the vmergeOrig attribute is specified, the revision can be ignored).</p> <p>[<i>Example:</i> Consider a two row by two column table in which the cells in the second column are merged, and this change is tracked as a revision. The annotation on the last cell in the table would appear as follows:</p> <pre><w:tc> <w:tcPr> <w:cellMerge ... w:vMerge="cont" /> </w:tcPr> ... </w:tc></pre> <p>The vmerge attribute value of cont specifies that the revision on the table cell resulted in it being merged with the previous set of vertically merged cells above it (whether that was one cell or many). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_AnnotationVMerge simple type (§17.18.1).</p>
vMergeOrig (Vertical Merge Setting Removed by Revision)	<p>Specifies the vertical merge setting which was removed from the parent table cell by this revision.</p> <p>If this attribute is omitted, then the original vertical merge setting shall be assumed to be rest (not merged).</p> <p>[<i>Example:</i> Consider a two row by two column table in which the merged cells in the second column are split, and this change is tracked as a revision. The annotation on the last cell in the table would appear as follows:</p> <pre><w:tc> <w:tcPr> <w:cellMerge ... w:vMergeOrig="cont" /> </w:tcPr> ... </w:tc></pre> <p>The vmergeOrig attribute value of cont specifies that the revision on the table cell resulted in it having its vertical merge property removed. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_AnnotationVMerge simple type (§17.18.1).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CellMergeTrackChange](#)) is located in §A.1. *end note*]

17.13.5.4 customXmlDelRangeEnd (Custom XML Markup Deletion End)

This element specifies the end of a region in which custom XML markup has been deleted and tracked as a revision. The id attribute on this element shall be used to link this element with the corresponding custom XML markup deletion start marker in the document.

Providing a physical representation of custom XML markup results in regions which can be inserted and deleted, but cannot be encapsulated by a single revision element, since their representation in WordprocessingML is the start or end XML tag for the custom XML markup which it represents. Therefore, the start/end "cross structure" annotation format surrounds the WordprocessingML region to which this deletion applies.

The following restrictions shall be applied to this element:

- If this element occurs without a corresponding customXmlDelRangeStart element (§17.13.5.5) with a matching id attribute value, then the document is non-conformant .
- If this element and its paired start encapsulate a range with no custom XML markup, then the document is non-conformant .
- If multiple end elements exist with the same id attribute value, then the document is non-conformant .

[*Example:* Consider a document with two inline custom XML markup elements, as follows:

```
<w:p>
  <w:customXml ... >
    <w:customXml ... >
      <w:r>
        <w:t>Text.</w:t>
      </w:r>
    </w:customXml>
  </w:customXml>
  <w:r>
    <w:t>More text.</w:t>
  </w:r>
</w:p>
```

Now, if each custom XML markup element's start and end tag have a physical representation, imagine that the region from the start of the paragraph until the point between the two end points is deleted with revisions enabled. This revision cannot be encapsulated by one del element, since it starts outside of the first custom XML markup element and ends just inside of it, so it must be done using the custom XML markup revision "cross structure" syntax, as follows:

```
<w:p>
```

```
<w:customXmlDelRangeStart w:id="0" w:author="Devan" />
<w:customXml ... >
  <w:customXml ... >
    <w:del ... >
      <w:r>
        <w:delText>Text.</w:delText>
      </w:r>
    </w:del>
  </w:customXml>
  <w:customXmlDelRangeEnd w:id="0" />
</w:customXml>
<w:r>
  <w:t>More text.</w:t>
</w:r>
</w:p>
```

The customXmlDelRangeEnd element delimits the end of the region in which all custom XML elements have been deleted with revisions enabled, and the del element (§17.13.5.14) handles the deletion of the text performed by this revision. Since the end of the outer customXml element was not in the deleted range, it is not revision marked deleted, but the corresponding physical character for the start element is. *end example*]

Attributes	Description
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Markup](#)) is located in §A.1. *end note*]

17.13.5.5 customXmlDelRangeStart (Custom XML Markup Deletion Start)

This element specifies the beginning of a region in which all custom XML markup has been deleted and tracked as a revision. The id attribute on this element shall be used to link this element with the corresponding custom XML markup deletion end marker in the document.

Providing a physical representation of custom XML markup results in regions which can be inserted and deleted, but cannot be encapsulated by a single revision element, since their representation in WordprocessingML is the start or end XML tag for the custom XML markup which it represents. Therefore, the start/end "cross structure" annotation format surrounds the WordprocessingML region to which this deletion applies.

The following restrictions shall be applied to this element:

- If this element occurs without a corresponding customXmlDelRangeEnd element (§17.13.5.4) with a matching id attribute value, then the document is non-conformant .
- If this element and its paired end encapsulate a range with no custom XML markup, then the document is non-conformant .
- If multiple start elements exist with the same id attribute value, then the document is non-conformant .

[Example: Consider a document with two inline custom XML markup elements, as follows:

```
<w:p>
  <w:customXml ... >
    <w:customXml ... >
      <w:r>
        <w:t>Text.</w:t>
      </w:r>
    </w:customXml>
  </w:customXml>
  <w:r>
    <w:t>More text.</w:t>
  </w:r>
</w:p>
```

Now, if each custom XML markup element's start and end tag have a physical representation, imagine that the region from the start of the paragraph until the point between the two end points is deleted with revisions enabled. This revision cannot be encapsulated by one del element, since it starts outside of the first custom XML markup element and ends just inside of it, so it must be done using the custom XML markup revision "cross structure" syntax, as follows:

```
<w:p>
```

```
<w:customXmlDelRangeStart w:id="0" w:author="Jamie" />
<w:customXml ... >
  <w:customXml ... >
    <w:del ... >
      <w:r>
        <w:delText>Text.</w:delText>
      </w:r>
    </w:del>
  </w:customXml>
  <w:customXmlDelRangeEnd w:id="0" />
</w:customXml>
<w:r>
  <w:t>More text.</w:t>
</w:r>
</w:p>
```

The customXmlDelRangeStart element delimits the start of the region in which all custom XML elements have been deleted with revisions enabled, and the del element (§17.13.5.14) handles the deletion of the text performed by this revision. Since the end of the outer customXml element was not in the deleted range, it is not revision marked deleted, but the corresponding physical character for the start element is. *end example*]

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[Example: Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ... </...></pre> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p>

Attributes	Description
	<p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 352 1112 457"><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 968 695 1073"><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TrackChange](#)) is located in §A.1. *end note*]

17.13.5.6 customXmlInsRangeEnd (Custom XML Markup Insertion End)

This element specifies the end of a region within which all custom XML markup has been inserted and tracked as a revision. The id attribute on this element shall be used to link this element with the corresponding custom XML markup insertion start marker in the document.

Providing a physical representation of the start and end tags of custom XML markup results in regions which can be inserted and deleted independently, but cannot be encapsulated by a single revision element, since their representation in WordprocessingML is the start or end XML tag for the custom XML markup which it represents. Therefore, the start/end "cross structure" annotation format surrounds the WordprocessingML region to which this insertion applies.

The following restrictions shall be applied to this element:

- If this element occurs without a corresponding customXmlInsRangeStart element (§17.13.5.7) with a matching id attribute value, then the document is non-conformant .
- If this element and its paired start encapsulate a range with no custom XML markup, then the document is non-conformant .
- If multiple end elements exist with the same id attribute value, then the document is non-conformant .

[Example: Consider a document with two inline custom XML markup elements, as follows:

```
<w:p>
  <w:customXml ... >
    <w:customXml ... >
      <w:r>
        <w:t>Text.</w:t>
      </w:r>
    </w:customXml>
  </w:customXml>
  <w:r>
    <w:t>More text.</w:t>
  </w:r>
</w:p>
```

If each custom XML markup element's start and end tag have a physical representation, consider that the inner XML element (but not its content) is inserted with revisions enabled. This revision cannot be encapsulated by one ins element, since the text in the element is not an insertion, so it must be done using the custom XML markup revision "cross structure" syntax, as follows:

```
<w:p>
  <w:customXml ... >
    <w:customXmlInsRangeStart w:id="0" />
    <w:customXml ... >
      <w:r>
        <w:t>Text.</w:t>
      </w:r>
    </w:customXml>
    <w:customXmlInsRangeEnd w:id="0" />
  </w:customXml>
  <w:r>
    <w:t>More text.</w:t>
  </w:r>
</w:p>
```

The customXmlInsRangeEnd element delimits the end of the region in which all custom XML elements have been inserted with revisions enabled. Since this element only affects custom XML, the text is not revision marked inserted, but the corresponding physical characters for the custom XML element are. *end example*

Attributes	Description
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 682 695 781"><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Markup](#)) is located in §A.1. *end note*]

17.13.5.7 customXmlInsRangeStart (Custom XML Markup Insertion Start)

This element specifies the beginning of a region in which all custom XML markup has been inserted and tracked as a revision. The id attribute on this element shall be used to link this element with the corresponding custom XML markup insertion end marker in the document.

Providing a physical representation of custom XML markup start and end tags results in regions which can be inserted and deleted independently, but cannot be encapsulated by a single revision element, since their representation in WordprocessingML is the start or end XML tag for the custom XML markup which it represents. Therefore, the start/end "cross structure" annotation format surrounds the WordprocessingML region to which this deletion applies.

The following restrictions shall be applied to this element:

- If this element occurs without a corresponding customXmlInsRangeEnd element (§17.13.5.6) with a matching id attribute value, then the document is non-conformant .
- If this element and its paired end encapsulate a range with no custom XML markup, then the document is non-conformant .
- If multiple start elements exist with the same id attribute value, then the document is non-conformant .

This element specifies the end of a region within which all custom XML markup has been inserted and tracked as a revision. The `id` attribute on this element shall be used to link this element with the corresponding custom XML markup insertion start marker in the document.

Providing a physical representation of the start and end tags of custom XML markup results in regions which can be inserted and deleted independently, but cannot be encapsulated by a single revision element, since their representation in WordprocessingML is the start or end XML tag for the custom XML markup which it represents. Therefore, the start/end "cross structure" annotation format surrounds the WordprocessingML region to which this insertion applies.

The following restrictions shall be applied to this element:

- If this element occurs without a corresponding `customXmlInsRangeStart` element (§17.13.5.7) with a matching `id` attribute value, then it shall be ignored and no insertions shall be present in the document.
- If this element and its paired start encapsulate a range with no custom XML markup, then they shall be ignored and can be omitted when the document is subsequently saved.
- If multiple end elements exist with the same `id` attribute value, then the first instance in the document shall be used and subsequent elements should be treated as unmatched (no corresponding start).

[Example: Consider a document with two inline custom XML markup elements, as follows:

```
<w:p>
  <w:customXml ... >
    <w:customXml ... >
      <w:r>
        <w:t>Text.</w:t>
      </w:r>
    </w:customXml>
  </w:customXml>
  <w:r>
    <w:t>More text.</w:t>
  </w:r>
</w:p>
```

If each custom XML markup element's start and end tag have a physical representation, consider that the inner XML element (but not its content) is inserted with revisions enabled. This revision cannot be encapsulated by one `ins` element, since the text in the element is not an insertion, so it must be done using the custom XML markup revision "cross structure" syntax, as follows:

```

<w:p>
  <w:customXml ... >
    <w:customXmlInsRangeStart w:id="0" />
    <w:customXml ... >
      <w:r>
        <w:t>Text.</w:t>
      </w:r>
    </w:customXml>
    <w:customXmlInsRangeEnd w:id="0" />
  </w:customXml>
  <w:r>
    <w:t>More text.</w:t>
  </w:r>
</w:p>

```

The customXmlInsRangeStart element delimits the start of the region in which all custom XML elements have been inserted with revisions enabled. Since this element only affects custom XML, the text is not revision marked inserted, but the corresponding physical characters for the custom XML element are. *end example*

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[Example: Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ... </...></pre> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[Example: Consider a comment represented using the following WordprocessingML fragment:</p>

Attributes	Description
	<p><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></p> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <p><... w:id="1" ... > ... </...></p> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_TrackChange](#)) is located in §A.1. *end note*]

17.13.5.8 customXmlMoveFromRangeEnd (Custom XML Markup Move Source End)

This element specifies the end of a region within which all custom XML markup was moved to another location in the document and this move was tracked as a revision. The id attribute on this element shall be used to link this element with the corresponding custom XML move source start marker in the document.

Providing a physical representation of the start and end tags of custom XML markup results in regions which can be inserted and deleted independently, but cannot be encapsulated by a single revision element, since their representation in WordprocessingML is the start or end XML tag for the custom XML markup which it represents. Therefore, the start/end "cross structure" annotation format surrounds the WordprocessingML region to which this move source applies.

The following restrictions shall be applied to this element:

- If this element occurs without a corresponding customXmlMoveFromRangeStart element (§17.13.5.9) with a matching id attribute value, then the document is non-conformant .
- If this element and its paired start encapsulate a range with no custom XML markup, then the document is non-conformant .
- If this element and its paired start occur outside of a well-formed move source container (§17.13.5.24; §17.13.5.23) with a matching move destination container (§17.13.5.28; §17.13.5.27), then the document is non-conformant.
- If multiple end elements exist with the same id attribute value, then the document is non-conformant .

[Example: Consider a three-paragraph document with a single block-level custom XML markup element, as follows:

```
<w:body>
  <w:p/>
  <w:customXml ... >
    <w:p/>
  </w:customXml>
  <w:p/>
</w:body>
```

If the second paragraph is moved to the end of the document with revisions enabled. This revision must therefore be stored using the custom XML markup revision "cross structure" syntax, as follows:

```
<w:body>
  <w:p/>
  <w:moveFromRangeStart w:id="0" w:name="move1" w:displacedByCustomXml="next"
w:author="Luna"/>
  <w:customXmlMoveFromRangeStart w:id="1"/>
  <w:customXml ... >
    <w:p/>
  </w:customXml>
  <w:customXmlMoveFromRangeEnd w:id="1"/>
  <w:moveFromRangeEnd w:id="0" w:displacedByCustomXml="prev"/>
  <w:p/>
  <w:moveToRangeStart w:id="2" w:name="move1" w:displacedByCustomXml="next"/>
  <w:customXmlMoveToRangeStart w:id="3"/>
  <w:customXml ... >
    <w:p/>
  </w:customXml>
  <w:customXmlMoveToRangeEnd w:id="3"/>
  <w:moveFromRangeEnd w:id="2" w:displacedByCustomXml="prev"/>
</w:body>
```

The customXmlMoveFromRangeEnd element delimits the end of the region in which all custom XML elements have been moved from this location with revisions enabled. Since this element only affects custom XML, any text in the region is not revision marked moved by this element when present, but the corresponding physical characters for the custom XML element are. *end example*]

Attributes	Description
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Markup](#)) is located in §A.1. *end note*]

17.13.5.9 customXmlMoveFromRangeStart (Custom XML Markup Move Source Start)

This element specifies the start of a region within which all custom XML markup was moved to another location in the document and this move was tracked as a revision. The id attribute on this element shall be used to link this element with the corresponding custom XML move source end marker in the document.

Providing a physical representation of the start and end tags of custom XML markup results in regions which can be inserted and deleted independently, but cannot be encapsulated by a single revision element, since their representation in WordprocessingML is the start or end XML tag for the custom XML markup which it represents. Therefore, the start/end "cross structure" annotation format surrounds the WordprocessingML region to which this move source applies.

The following restrictions shall be applied to this element:

- If this element occurs without a corresponding customXmlMoveFromRangeStart element (§17.13.5.9) with a matching id attribute value, then the document is non-conformant .
- If this element and its paired start encapsulate a range with no custom XML markup, then the document is non-conformant .

- If this element and its paired end occur outside of a well-formed move source container (§17.13.5.24; §17.13.5.23) with a matching move destination container (§17.13.5.28; §17.13.5.27), then the document is non-conformant.
- If multiple start elements exist with the same id attribute value, then the document is non-conformant.

[*Example:* Consider a three-paragraph document with a single block-level custom XML markup element, as follows:

```
<w:body>
  <w:p/>
  <w:customXml ... >
    <w:p/>
  </w:customXml>
  <w:p/>
</w:body>
```

If the second paragraph is moved to the end of the document with revisions enabled. This revision must therefore be stored using the custom XML markup revision "cross structure" syntax, as follows:

```
<w:body>
  <w:p/>
  <w:moveFromRangeStart w:id="0" w:name="move1" w:displacedByCustomXml="next"
w:author="Luke"/>
  <w:customXmlMoveFromRangeStart w:id="1"/>
  <w:customXml ... >
    <w:p/>
  </w:customXml>
  <w:customXmlMoveFromRangeEnd w:id="1"/>
  <w:moveFromRangeEnd w:id="0" w:displacedByCustomXml="prev"/>
  <w:p/>
  <w:moveToRangeStart w:id="2" w:name="move1" w:displacedByCustomXml="next"/>
  <w:customXmlMoveToRangeStart w:id="3"/>
  <w:customXml ... >
    <w:p/>
  </w:customXml>
  <w:customXmlMoveToRangeEnd w:id="3"/>
  <w:moveFromRangeEnd w:id="2" w:displacedByCustomXml="prev"/>
</w:body>
```

The customXmlMoveFromRangeStart element delimits the start of the region in which all custom XML elements have been moved from this location with revisions enabled. Since this element only affects custom XML, any text in the region is not revision marked moved by this element when present, but the corresponding physical characters for the custom XML element are. *end example*]

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ... </...></pre> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" ... > ... </...></pre>

Attributes	Description
	<p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TrackChange](#)) is located in §A.1. *end note*]

17.13.5.10 [customXmlMoveToRangeEnd \(Custom XML Markup Move Destination Location End\)](#)

This element specifies the end of a region within which all custom XML markup was moved to this location in the document and this move was tracked as a revision. The id attribute on this element shall be used to link this element with the corresponding custom XML move destination start marker in the document.

Providing a physical representation of the start and end tags of custom XML markup results in regions which can be inserted and deleted independently, but cannot be encapsulated by a single revision element, since their representation in WordprocessingML is the start or end XML tag for the custom XML markup which it represents. Therefore, the start/end "cross structure" annotation format surrounds the WordprocessingML region to which this move destination applies.

The following restrictions shall be applied to this element:

- If this element occurs without a corresponding customXmlMoveToRangeStart element (§17.13.5.11) with a matching id attribute value, then the document is non-conformant.
- If this element and its paired start encapsulate a range with no custom XML markup, then the document is non-conformant.
- If this element and its paired start occur outside of a well-formed move source container (§17.13.5.24; §17.13.5.23) with a matching move destination container (§17.13.5.28; §17.13.5.27), then the document is non-conformant.
- If multiple end elements exist with the same id attribute value, then the document is non-conformant .

[*Example:* Consider a three-paragraph document with a single block-level custom XML markup element, as follows:

```
<w:body>
  <w:p/>
  <w:customXml ... >
    <w:p/>
  </w:customXml>
  <w:p/>
</w:body>
```

If the second paragraph is moved to the end of the document with revisions enabled. This revision must therefore be stored using the custom XML markup revision "cross structure" syntax, as follows:

```
<w:body>
  <w:p/>
  <w:moveFromRangeStart w:id="0" w:name="move1" w:displacedByCustomXml="next"
w:author="Example Author"/>
  <w:customXmlMoveFromRangeStart w:id="1"/>
  <w:customXml ... >
    <w:p/>
  </w:customXml>
  <w:customXmlMoveFromRangeEnd w:id="1"/>
  <w:moveFromRangeEnd w:id="0" w:displacedByCustomXml="prev"/>
  <w:p/>
  <w:moveToRangeStart w:id="2" w:name="move1" w:displacedByCustomXml="next"/>
  <w:customXmlMoveToRangeStart w:id="3"/>
  <w:customXml ... >
    <w:p/>
  </w:customXml>
  <w:customXmlMoveToRangeEnd w:id="3"/>
  <w:moveFromRangeEnd w:id="2" w:displacedByCustomXml="prev"/>
</w:body>
```

The customXmlMoveToRangeEnd element delimits the end of the region in which all custom XML elements have been moved to this location with revisions enabled. Since this element only affects custom XML, any text in the region is not revision marked moved by this element when present, but the corresponding physical characters for the custom XML element are. *end example*]

Attributes	Description
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[Example: Consider an annotation represented using the following WordprocessingML fragment:</p>

Attributes	Description
	<p data-bbox="451 285 695 315"><... w:id="1" ... ></p> <p data-bbox="451 331 516 382">... </...></p> <p data-bbox="414 424 1453 491">The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p data-bbox="414 529 1469 596">The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Markup](#)) is located in §A.1. *end note*]

17.13.5.11 customXmlMoveToRangeStart (Custom XML Markup Move Destination Location Start)

This element specifies the start of a region within which all custom XML markup was moved to this location in the document and this move was tracked as a revision. The id attribute on this element shall be used to link this element with the corresponding custom XML move destination end marker in the document.

Providing a physical representation of the start and end tags of custom XML markup results in regions which can be inserted and deleted independently, but cannot be encapsulated by a single revision element, since their representation in WordprocessingML is the start or end XML tag for the custom XML markup which it represents. Therefore, the start/end "cross structure" annotation format surrounds the WordprocessingML region to which this move destination applies.

The following restrictions shall be applied to this element:

- If this element occurs without a corresponding customXmlMoveFromRangeEnd element (§17.13.5.8) with a matching id attribute value, then the document is non-conformant.
- If this element and its paired start encapsulate a range with no custom XML markup, then the document is non-conformant.
- If this element and its paired end occur outside of a well-formed move source container (§17.13.5.24; §17.13.5.23) with a matching move destination container (§17.13.5.28; §17.13.5.27), then the document is non-conformant.
- If multiple start elements exist with the same id attribute value, then the document is non-conformant.

[Example: Consider a three-paragraph document with a single block-level custom XML markup element, as follows:

```
<w:body>
  <w:p/>
```

```
<w:customXml ... >
  <w:p/>
</w:customXml>
<w:p/>
</w:body>
```

If the second paragraph is moved to the end of the document with revisions enabled. This revision must therefore be stored using the custom XML markup revision "cross structure" syntax, as follows:

```
<w:body>
  <w:p/>
  <w:moveFromRangeStart w:id="0" w:name="move1" w:displacedByCustomXml="next"
w:author="Example Author"/>
  <w:customXmlMoveFromRangeStart w:id="1"/>
  <w:customXml ... >
    <w:p/>
  </w:customXml>
  <w:customXmlMoveFromRangeEnd w:id="1"/>
  <w:moveFromRangeEnd w:id="0" w:displacedByCustomXml="prev"/>
  <w:p/>
  <w:moveToRangeStart w:id="2" w:name="move1" w:displacedByCustomXml="next"/>
  <w:customXmlMoveToRangeStart w:id="3"/>
  <w:customXml ... >
    <w:p/>
  </w:customXml>
  <w:customXmlMoveToRangeEnd w:id="3"/>
  <w:moveFromRangeEnd w:id="2" w:displacedByCustomXml="prev"/>
</w:body>
```

The customXmlMoveFromRangeStart element delimits the start of the region in which all custom XML elements have been moved from this location with revisions enabled. Since this element only affects custom XML, any text in the region is not revision marked moved by this element when present, but the corresponding physical characters for the custom XML element are. *end example*

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[Example: Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ...</pre>

Attributes	Description
	<p></...></p> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[Example: Consider a comment represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 829 1112 928"><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[Example: Consider an annotation represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 1444 695 1543"><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TrackChange](#)) is located in §A.1. *end note*]

17.13.5.12 del (Deleted Table Row)

This element specifies that the parent table row shall be treated as a deleted row whose deletion has been tracked as a revision. This setting shall not imply any revision state about the table cells in this row or their contents (which shall be revision marked independently), and shall only affect the table row itself.

[*Example:* Consider a two row by two column table in which the second row has been marked as deleted using a revision. This requirement would be specified using the following WordprocessingML:

```
<w:tbl>
...
<w:tr>
  <w:tc>
    <w:p/>
  </w:tc>
  <w:tc>
    <w:p/>
  </w:tc>
</w:tr>
<w:tr>
  <w:trPr>
    <w:del w:id="0" ... />
  </w:trPr>
  <w:tc>
    <w:p/>
  </w:tc>
  <w:tc>
    <w:p/>
  </w:tc>
</w:tr>
</w:tbl>
```

The del element on the table row properties for the second table row specifies that this row was deleted, and this deletion was tracked as a revision. *end example]*

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <p><... w:id="1" w:author="Example Author"></p>

Attributes	Description
	<p>...</p> <p></...></p> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[Example: Consider a comment represented using the following WordprocessingML fragment:</p> <p> <pre><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre> </p> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[Example: Consider an annotation represented using the following WordprocessingML fragment:</p> <p> <pre><... w:id="1" ... > ... </...></pre> </p> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TrackChange](#)) is located in §A.1.
end note]

17.13.5.13 **del (Deleted Math Control Character)**

This element specifies that the Office Open XML Math control character which contains this element was deleted and tracked as a revision. [*Example:* The deletion of a fraction bar. *end example*]

[*Example:* Consider a region of Office Open XML Math in a WordprocessingML document in which the control character for the fraction bar has been deleted, as follows:



This deletion is represented as the following WordprocessingML:

```
<m:f>
  <m:fPr>
    <m:ctrlPr>
      <w:del w:id="0" w:author="Joe Smith" w:date="2006-03-31T12:50:00Z">
        ...
      </w:del>
    </m:ctrlPr>
  </m:fPr>
  ...
</m:f>
```

The del element contains all of the content which must be treated as revision marked as deleted; in this case, the fraction bar was deleted by Joe Smith on March 31, 2006 at 12:50pm. *end example*]

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <div><pre><... w:id="1" w:author="Example Author"> ... </...></pre></div> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 653 1110 751"><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 1266 695 1365"><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model (CT_MathCtrlDel) is located in §A.1. *end note*]

17.13.5.14 del (Deleted Run Content)

This element specifies that the inline-level content contained within it shall be treated as deleted content which has been tracked as a revision.

[*Example:* Consider a paragraph of text in a WordprocessingML document in which one word has been deleted, as follows:

Some ~~text~~

This paragraph has the word `text` marked deleted as a revision, and is represented as the following WordprocessingML:

```
<w:p>
  <w:r>
    <w:t>Some</w:t>
  </w:r>
  <w:del w:id="0" w:author="Joe Smith" w:date="2006-03-31T12:50:00Z">
    <w:r>
      <w:delText>text</w:delText>
    </w:r>
  </w:del>
</w:p>
```

The `del` element contains all of the content which must be treated as revision marked as deleted; in this case, the word `text` was deleted by Joe Smith on March 31, 2006 at 12:50pm. *end example*]

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ... </...></pre> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p>

Attributes	Description
	<p>[<i>Example</i>: Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example</i>: Consider an annotation represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_RunTrackChange](#)) is located in §A.1. *end note*]

17.13.5.15 del (Deleted Paragraph)

This element specifies that the paragraph mark delimiting the end of a paragraph within a WordprocessingML document shall be treated as deleted (i.e. the contents of this paragraph are no longer delimited by this paragraph mark, and are combined with the following paragraph - but those contents shall not automatically be marked as deleted) as part of a tracked revision.

[*Example*: Consider a document consisting of two paragraphs (with each paragraph delimited by a pilcrow ¶), as follows:

This-is-paragraph-one.¶

This-is-paragraph-two.¶

If the physical character delimiting the end of the first paragraph is deleted and this change is tracked as a revision, resulting in the following:

This-is-paragraph-one.This-is-paragraph-two.¶

This revision is represented using the following WordprocessingML:

```
<w:p>
  <w:pPr>
    <w:rPr>
      <w:del w:id="0" ... />
    </w:rPr>
  </w:pPr>
  <w:r>
    <w:t>This is paragraph one.</w:t>
  </w:r>
</w:p>
<w:p>
  <w:r>
    <w:t>This is paragraph two.</w:t>
  </w:r>
</w:p>
```

The del element on the run properties for the first paragraph mark specifies that this paragraph mark was deleted, and this deletion was tracked as a revision. *end example*]

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ... </...></pre>

Attributes	Description
	<p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[<i>Example</i>: Consider a comment represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 758 1110 856"><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example</i>: Consider an annotation represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 1373 695 1472"><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_TrackChange](#)) is located in §A.1. *end note*]

17.13.5.16 **ins (Inserted Math Control Character)**

This element specifies that the Office Open XML Math control character which contains this element was inserted and tracked as a revision. [*Example: The insertion of a fraction bar. end example*]

[*Example: Consider a region of Office Open XML Math in a WordprocessingML document in which the control character for the fraction bar has been inserted, as follows:*

This insertion is represented as the following WordprocessingML:

```
<m:f>
  <m:fPr>
    <m:ctrlPr>
      <w:ins w:id="0" w:author="Joe Smith" w:date="2006-03-31T12:50:00Z">
        ...
      </w:ins>
    </m:ctrlPr>
  </m:fPr>
  ...
</m:f>
```

The ins element contains all of the content which must be treated as revision marked as inserted; in this case, the fraction bar was inserted by Joe Smith on March 31, 2006 at 12:50pm. *end example*]

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example: Consider a comment represented using the following WordprocessingML fragment:</i></p> <div><... w:id="1" w:author="Example Author"> ... </...></div> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation	Specifies the date information for an annotation within a WordprocessingML document.

Attributes	Description
Date)	<p>The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 533 1110 632"><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 1146 695 1245"><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model (CT_MathCtrlIns) is located in §A.1. *end note*]

17.13.5.17 ins (Inserted Table Row)

This element specifies that the parent table row shall be treated as an inserted row whose insertion has been tracked as a revision. This setting shall not imply any revision state about the table cells in this row or their contents (which shall be revision marked independently), and shall only affect the table row itself.

[*Example:* Consider a two row by two column table in which the second row has been marked as inserted using a revision. This requirement would be specified using the following WordprocessingML:

```
<w:tbl>
...
<w:tr>
  <w:tc>
    <w:p/>
  </w:tc>
  <w:tc>
    <w:p/>
  </w:tc>
</w:tr>
<w:tr>
  <w:trPr>
    <w:ins w:id="0" ... />
  </w:trPr>
  <w:tc>
    <w:p/>
  </w:tc>
  <w:tc>
    <w:p/>
  </w:tc>
</w:tr>
</w:tbl>
```

The ins element on the table row properties for the second table row specifies that this row was inserted, and this insertion was tracked as a revision. *end example]*

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ... </...></pre> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example]</i></p>

Attributes	Description
	The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TrackChange](#)) is located in §A.1. *end note*]

17.13.5.18 ins (Inserted Run Content)

This element specifies that the inline-level content contained within it shall be treated as inserted content which has been tracked as a revision.

[*Example:* Consider a paragraph of text in a WordprocessingML document in which one word has been inserted, as follows:

Some text

This paragraph has the word `text` marked inserted as a revision, and is represented as the following WordprocessingML:

```
<w:p>
  <w:r>
    <w:t>Some</w:t>
  </w:r>
  <w:ins w:id="0" w:author="Joe Smith" w:date="2006-03-31T12:50:00Z">
    <w:r>
      <w:t>text</w:t>
    </w:r>
  </w:ins>
</w:p>
```

The `ins` element contains all of the content which must be treated as revision marked as inserted; in this case, the word `text` was inserted by Joe Smith on March 31, 2006 at 12:50pm. *end example*]

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ... </...></pre> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p>

Attributes	Description
	<p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_RunTrackChange](#)) is located in §A.1. *end note*]

17.13.5.19 ins (Inserted Numbering Properties)

This element specifies that the numbering information defined by the parent element shall be treated as numbering information which was recorded as an insertion using revisions.

[*Example:* Consider two paragraphs in a WordprocessingML document, with the words one and two respectively, as follows:

One

Two

If numbering is then applied to these two paragraphs, and this numbering is tracked as a revision, this revision is represented using the following WordprocessingML:

```
<w:p>
  <w:pPr>
    <w:numPr>
      <w:ilvl w:val="0" />
      <w:numId w:val="1" />
      <w:ins w:id="0" w:author="Joe Smith" w:date="2005-01-01T10:00:00Z" />
    </w:numPr>
  </w:pPr>
  <w:r>
    <w:t>one</w:t>
  </w:r>
</w:p>
<w:p>
  <w:pPr>
    <w:numPr>
      <w:ilvl w:val="0" />
      <w:numId w:val="1" />
      <w:ins w:id="0" w:author="Joe Smith" w:date="2005-01-01T10:00:00Z" />
    </w:numPr>
  </w:pPr>
  <w:r>
    <w:t>two</w:t>
  </w:r>
</w:p>
```

The ins element as a child of the numbering properties specifies that the paragraphs in this document have been given numbering properties by Joe Smith and that this change was marked as a revision. *end example*]

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ... </...></pre> <p>The author attribute specifies that the author of the current annotation is Example</p>

Attributes	Description
	<p>Author, which can be used as desired. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[<i>Example</i>: Consider a comment represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 722 1110 827"><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example</i>: Consider an annotation represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 1339 695 1444"><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_TrackChange](#)) is located in §A.1. *end note*]

17.13.5.20 ins (Inserted Paragraph)

This element specifies that the paragraph mark delimiting the end of a paragraph within a WordprocessingML document shall be treated as deleted (i.e. the contents of this paragraph are no longer delimited by this paragraph mark, and are combined with the following paragraph) as part of a tracked revision.

[Example: Consider a document consisting of a single paragraph, as follows:

This-is-paragraph-one.This-is-paragraph-two.¶

If the first sentence is moved into its own new paragraph, and this change is tracked as a revision, resulting in the following:

This-is-paragraph-one.¶

This-is-paragraph-two.¶

This revision is represented using the following WordprocessingML:

```
<w:p>
  <w:pPr>
    <w:rPr>
      <w:ins w:id="0" ... />
    </w:rPr>
  </w:pPr>
  <w:r>
    <w:t>This is paragraph one.</w:t>
  </w:r>
</w:p>
<w:p>
  <w:r>
    <w:t>This is paragraph two.</w:t>
  </w:r>
</w:p>
```

The ins element on the run properties for the first paragraph mark specifies that this paragraph mark was inserted, and this insertion was tracked as a revision. *end example]*

Attributes	Description
author (Annotation Author)	Specifies the author for an annotation within a WordprocessingML document. If this attribute is omitted, then no author shall be associated with the parent annotation type.

Attributes	Description
	<p>[<i>Example</i>: Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ... </...></pre> <p>The author attribute specifies that the author of the current annotation is <code>Example Author</code>, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[<i>Example</i>: Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example</i>: Consider an annotation represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).

[Note: The W3C XML Schema definition of this element’s content model ([CT_TrackChange](#)) is located in §A.1. *end note*]

17.13.5.21 `moveFrom` (Move Source Paragraph)

This element specifies that the parent paragraph has been moved away from this location and tracked as a revision. This does not imply anything about the revision state of the contents of the paragraph, and applies only to the existence of the paragraph as its own unique paragraph.

The following restrictions shall be applied to this content:

- If this element occurs outside of a move source container (§17.13.5.24; §17.13.5.23) for which a matching move destination container (§17.13.5.28; §17.13.5.27) exists in the document, then the document is non-conformant.

[Example: Consider a WordprocessingML document in which a paragraph of text is moved down in the document. This moved paragraph would be represented using the following WordprocessingML markup:

```
<w:moveFromRangeStart w:id="0" w:name="aMove"/>
<w:p>
  <w:pPr>
    <w:rPr>
      <w:moveFrom w:id="1" ... />
    </w:rPr>
  </w:pPr>
  ...
</w:p>
</w:moveFromRangeEnd w:id="0"/>
```

The `moveFrom` element as a child of the run properties of the paragraph mark specify that this paragraph mark was part of the content which was moved in the document. This implies nothing about the contents, since they can have been added later and not tracked as a revision (they must be marked as a move using the `moveFrom` element (§17.13.5.22) around the run content). *end example*]

Attributes	Description
author (Annotation Author)	Specifies the author for an annotation within a WordprocessingML document. If this attribute is omitted, then no author shall be associated with the parent annotation type.

Attributes	Description
	<p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ... </...></pre> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type</p>

ttributes	Description
	(§17.18.10).

[*Note*: The W3C XML Schema definition of this element’s content model (CT_TrackChange) is located in §A.1.
end note]

17.13.5.22 moveFrom (Move Source Run Content)

This element specifies that the inline-level content contained within it shall be treated as content which has been moved away from this location and tracked as a revision.

The following restrictions shall be applied to this content:

- If this element occurs outside of a move source container (§17.13.5.24; §17.13.5.23) for which a matching move destination container (§17.13.5.28; §17.13.5.27) exists in the document, then the document is non-conformant.

[*Example*: Consider a WordprocessingML document in which the first paragraph contains two sentences, and the first sentence is moved before the second sentence, and this move is tracked as a revision, as follows (in this image, green underline indicates the move destination and the green strikethrough indicates the move source location):

Some moved text. Some text. ~~Some moved text.~~

This document has the sentence `Some moved text.` moved to the first sentence in the document. This revision is represented using the following WordprocessingML:

```

<w:p>
  <w:moveToRangeStart w:id="0" ... w:name="move1" />
  <w:moveTo w:id="1" ... >
    <w:r>
      <w:t>Some moved text.</w:t>
    </w:r>
  </w:moveTo>
  <w:moveToRangeEnd w:id="0" />
  <w:r>
    <w:t xml:space="preserve">Some text.</w:t>
  </w:r>
  <w:moveFromRangeStart w:id="2" ... w:name="move1" />
  <w:moveFrom w:id="3" ... >
    <w:r>
      <w:t>Some moved text.</w:t>
    </w:r>
  </w:moveFrom>
  <w:moveFromRangeEnd w:id="2" />
</w:p>

```

The `moveFrom` element specifies that all of the inline-level content contained within must be revision marked as content which was moved from its current location in the document. Because this moved content is contained within a complete move source container (`moveFromRangeStart` and `moveFromRangeEnd`) with a corresponding move destination, this content is tracked as a move. *end example*

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example</i>: Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ... </...></pre> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p>

Attributes	Description
	<p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_RunTrackChange](#)) is located in §A.1. *end note*]

17.13.5.23 [moveFromRangeEnd \(Move Source Location Container - End\)](#)

This element specifies the end of a region whose move source contents are part of a single named move. When a move source is stored as a revision in a WordprocessingML document, two pieces of information shall be stored about that move source:

- A set of pieces of content which were moved - both inline-level content (§17.13.5.22) and paragraphs (§17.13.5.21)

- A move source container (or "bookmark") which specifies that all content within it which marked as a move source is part of a single named move. The name attribute on the move container links a group of move source content with the corresponding group of move destination content.

This element defines the end of the latter piece of the move revision data - the container. The id attribute on this element shall be used to link this element with the corresponding start of a move source container in the document.

The following restrictions are applied to the use of this element:

- If this element occurs without a corresponding moveFromRangeStart element (§17.13.5.24) with a matching id attribute value, then the document is non-conformant.
- If this element and its paired end occur without a matching move destination container (§17.13.5.28; §17.13.5.27), then the document is non-conformant.
- If multiple move source containers surround the same text, the document is non-conformant.

[*Example:* Consider a WordprocessingML document in which the first paragraph contains two sentences, and the first sentence is moved before the second sentence, and this move is tracked as a revision, as follows (in this image, green underline indicates the move destination and the green strikethrough indicates the move source location):

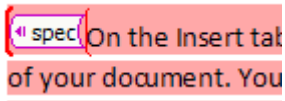
Some moved text. Some text. ~~Some moved text.~~

This document has the sentence Some moved text. moved to the first sentence in the document. This revision is represented using the following WordprocessingML:

```
<w:p>
  <w:moveToRangeStart w:id="0" ... w:name="move1" />
  <w:moveTo w:id="1" ... >
    <w:r>
      <w:t>Some moved text.</w:t>
    </w:r>
  </w:moveTo>
  <w:moveToRangeEnd w:id="0" />
  <w:r>
    <w:t xml:space="preserve">Some text.</w:t>
  </w:r>
  <w:moveFromRangeStart w:id="2" ... w:name="move1" />
  <w:moveFrom w:id="3" ... >
    <w:r>
      <w:t>Some moved text.</w:t>
    </w:r>
  </w:moveFrom>
  <w:moveFromRangeEnd w:id="2" />
</w:p>
```

The `moveFromRangeEnd` element specifies the end of the move source container within which all moved content is part of the move named `move1`. *end example*]

Attributes	Description
<code>displacedByCustomXml</code> (Annotation Marker Relocated For Custom XML Markup)	<p>Specifies that the parent annotation's placement shall be directly linked with the location of the physical presentation of a custom XML element in the document. This element only has an effect when the custom XML element is block-level (i.e. surrounds an entire paragraph), as in this scenario the logical and physical placement of the annotation and custom XML element can differ.</p> <p>Specifically, in this case, the custom XML is presented <i>around</i> the block-level object it encloses (the paragraph, table, table row, or table cell), but is physically represented within that same object (i.e. within the paragraph, table, table row or table cell). This requirement stems from the fact that there is no location for the location of the annotation within the document at its logical location (around a table, for example).</p> <p>If this element is omitted, then the annotation shall be anchored inside of all block-level custom XML elements in the paragraph. If this element is present, but no block-level custom XML tag is located at the position it specifies (before or after), then it shall be ignored.</p> <p>[<i>Example</i>: Consider a paragraph with block level custom XML markup and two comment anchor annotations (one before and one after the custom XML element's physical representation), as follows:</p>

Attributes	Description
	 <p>On the Insert tab of your document. You</p> <p>Since all three of these items are around the entire paragraph, they are stored outside of the paragraph. However, in order to ensure that their relative positions are stored correctly, any annotation which must be displaced by the physical custom XML element specifies this information, resulting in the following WordprocessingML:</p> <pre> ... <w:commentRangeStart w:id="0" /> <w:commentRangeStart w:id="1" w:displaced byCustomXml="next" /> <w:customXml w:element="spec" ... /> <w:p> ... </w:p> ... </pre> <p>The displacedByCustomXml attribute specifies that even though all three of these items are around the paragraph and is moved inside the paragraph to be represented physically, the comment with ID 0 must be inside the custom XML, but the comment with ID 1 must be displaced to stay outside of the relative location of the next custom XML element (the spec element). <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DisplacedByCustomXml simple type (§17.18.13).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre> <... w:id="1" ... > ... </...> </pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_MarkupRange](#)) is located in §A.1.
end note]

17.13.5.24 `moveFromRangeStart` (Move Source Location Container - Start)

This element specifies the start of a region whose move source contents are part of a single named move. When a move source is stored as a revision in a WordprocessingML document, two pieces of information shall be stored about that move source:

- A set of pieces of content which were moved - both inline-level content (§17.13.5.22) and paragraphs (§17.13.5.21)
- A move source container (or "bookmark") which specifies that all content within it which marked as a move source is part of a single named move. The name attribute on the move container links a group of move source content with the corresponding group of move destination content.

This element defines the start of the latter piece of the move revision data - the container. The id attribute on this element shall be used to link this element with the corresponding end of a move source container in the document.

The following restrictions are applied to the use of this element

- If this element occurs without a corresponding `moveFromRangeEnd` element (§17.13.5.23) with a matching id attribute value, then the document is non-conformant.
- If this element and its paired end occur without a matching move destination container (§17.13.5.28; §17.13.5.27), then the document is non-conformant.
- If multiple start elements exist with the same id attribute value, then the document is non-conformant.
- If multiple move source containers surround the same text, the document is non-conformant .

[*Example:* Consider a WordprocessingML document in which the first paragraph contains two sentences, and the first sentence is moved before the second sentence, and this move is tracked as a revision, as follows (in this image, green underline indicates the move destination and the green strikethrough indicates the move source location):

Some moved text. Some text. ~~Some moved text.~~

This document has the sentence `Some moved text.` moved to the first sentence in the document. This revision is represented using the following WordprocessingML:

```

<w:p>
  <w:moveToRangeStart w:id="0" ... w:name="move1" />
  <w:moveTo w:id="1" ... >
    <w:r>
      <w:t>Some moved text.</w:t>
    </w:r>
  </w:moveTo>
  <w:moveToRangeEnd w:id="0" />
  <w:r>
    <w:t xml:space="preserve">Some text.</w:t>
  </w:r>
  <w:moveFromRangeStart w:id="2" ... w:name="move1" />
  <w:moveFrom w:id="3" ... >
    <w:r>
      <w:t>Some moved text.</w:t>
    </w:r>
  </w:moveFrom>
  <w:moveFromRangeEnd w:id="2" />
</w:p>

```

The `moveFromRangeStart` element specifies the start of the move source container within which all moved content is part of the move named `move1`. *end example*

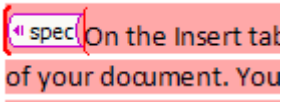
Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ... </...></pre> <p>The author attribute specifies that the author of the current annotation is <code>Example Author</code>, which can be used as desired. <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>
colFirst (First Table Column Covered By Bookmark)	<p>Specifies the zero-based index of the first column in this row which shall be part of this bookmark.</p> <p>When a bookmark is contained within a table, it is possible for that bookmark to only</p>

Attributes	Description									
	<p>cover cells within a certain column and row range within that table, by specifying:</p> <ul style="list-style-type: none">• The first row for which the specified columns are part of the table bookmark. This is accomplished by placing the bookmarkStart element in the first table cell in that row.• The first column included in the bookmark for each of the specified row(s) via this attribute.• The last column included in the bookmark for each of the specified row(s) via the colLast attribute.• The last row for which the specified columns are part of the table bookmark. This is accomplished by placing the bookmarkEnd element at the end of that table row. <p>If this attribute appears, then the colLast attribute shall also appear (regardless of where this bookmark is located) or the document shall be considered non-conformant. If this attribute and its pair occur on a bookmark which is not contained in a table, then their values should be ignored. If this value exceeds the value of colLast or the number of columns in the table, then both values should be ignored.</p> <p>[Example: Consider a three row by three column table where a table bookmark must be applied to the contents of the first two cells in the first two rows in the table (the cells shaded below):</p> <table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table> <p>This bookmark would be specified using the following WordprocessingML for the table's conents:</p> <pre><w:tbl> ... <w:tr> <w:tc> <w:bookMarkStart w:colFirst="0" w:colLast="1" w:id="0" w:name="table"/> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> </w:tr> <w:tr></pre>									

Attributes	Description
	<pre> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:bookmarkEnd w:id="0" /> </w:tr> <w:tr> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> </w:tr> </w:tbl> </pre> <p>The colFirst attribute specifies that all columns starting with the first column must be included in the table bookmark. This applies starting with the first row and ending with the second row (the two rows within the bookmark's start and end). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
colLast (Last Table Column Covered By Bookmark)	<p>Specifies the zero-based index of the last column in this row which shall be part of this bookmark.</p> <p>When a bookmark is contained within a table, it is possible for that bookmark to only cover cells within a certain column and row range within that table, by specifying:</p> <ul style="list-style-type: none"> • The first row for which the specified columns are part of the table bookmark. This is accomplished by placing the bookmarkStart element in the first table cell in that row. • The first column included in the bookmark for each of the specified row(s) via the colFirst attribute. • The last column included in the bookmark for each of the specified row(s) via this attribute. • The last row for which the specified columns are part of the table bookmark. This is accomplished by placing the bookmarkEnd element at the end of that table row.

Attributes	Description									
	<p>If this attribute appears, then the colFirst attribute shall also appear (regardless of where this bookmark is located) or the document shall be considered non-conformant. If this attribute and its pair occur on a bookmark which is not contained in a table, then their values should be ignored. If this value does not equal or exceed the value of colFirst or the number of columns in the table, then both values should be ignored.</p> <p>[Example: Consider a three row by three column table where a table bookmark shall be applied to the contents of the first two cells in the first two rows in the table (the cells shaded below):</p> <table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table> <p>This bookmark would be specified using the following WordprocessingML for the table's conents:</p> <pre><w:tbl> ... <w:tr> <w:tc> <w:bookmarkStart w:colFirst="0" w:colLast="1" w:id="0" w:name="table"/> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> </w:tr> <w:tr> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:bookmarkEnd w:id="0" /> </w:tr> <w:tr> <w:tc></pre>									

Attributes	Description
	<pre> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> </w:tr> </w:tbl> </pre> <p>The collLast attribute specifies that the last column that shall be included in the table bookmark is the second column. This applies starting with the first row and ending with the second row (the two rows within the bookmark's start and end). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre> <... w:id="1" w:date="2006-01-01T10:00:00"> ... </...> </pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
displacedByCustomXml (Annotation Marker Relocated For Custom XML Markup)	<p>Specifies that the parent annotation's placement shall be directly linked with the location of the physical presentation of a custom XML element in the document. This element only has an effect when the custom XML element is block-level (i.e. surrounds an entire paragraph), as in this scenario the logical and physical placement of the annotation and custom XML element can differ.</p> <p>Specifically, in this case, the custom XML is presented <i>around</i> the block-level object it encloses (the paragraph, table, table row, or table cell), but is physically represented within that same object (i.e. within the paragraph, table, table row or table cell). This requirement stems from the fact that there is no location for the location of the annotation within the document at its logical location (around a table, for example).</p>

Attributes	Description
	<p>If this element is omitted, then the annotation shall be anchored inside of all block-level custom XML elements in the paragraph. If this element is present, but no block-level custom XML tag is located at the position it specifies (before or after), then it shall be ignored.</p> <p>[<i>Example:</i> Consider a paragraph with block level custom XML markup and two comment anchor annotations (one before and one after the custom XML element's physical representation), as follows:</p> <div data-bbox="453 619 732 720"></div> <p>Since all three of these items are around the entire paragraph, they are stored outside of the paragraph. However, in order to ensure that their relative positions are stored correctly, any annotation which must be displaced by the physical custom XML element specifies this information, resulting in the following WordprocessingML:</p> <pre data-bbox="453 951 1463 1205"><w:commentRangeStart w:id="0" /> <w:commentRangeStart w:id="1" w:displaced byCustomXml="next" /> <w:customXml w:element="spec" ... /> <w:p> ... </w:p> ...</pre> <p>The displacedByCustomXml attribute specifies that even though all three of these items are around the paragraph and is moved inside the paragraph to be represented physically, the comment with ID 0 must be inside the custom XML, but the comment with ID 1 must be displaced to stay outside of the relative location of the next custom XML element (the spec element). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DisplacedByCustomXml simple type (§17.18.13).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre data-bbox="453 1829 695 1892"><... w:id="1" ... > ...</pre>

Attributes	Description
	<p><code></...></code></p> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
name (Bookmark Name)	<p>Specifies the bookmark name.</p> <p>If multiple bookmarks in a document share the same name, then the first bookmark (defined by the location of the bookmarkStart element in document order) shall be maintained, and all subsequent bookmarks should be ignored.</p> <p>[<i>Example:</i> Consider the following XML for a bookmark around a single word:</p> <pre data-bbox="451 793 1177 1029"> <w:p> <w:bookmarkStart w:id="0" w:name="place" /> <w:r> <w:t>Seattle</w:t> </w:r> <w:bookmarkEnd w:id="0" /> </w:p> </pre> <p>The name attribute specifies that the name for this bookmark is place. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_MoveBookmark](#)) is located in §A.1. *end note*]

17.13.5.25 `moveTo` (Move Destination Run Content)

This element specifies that the inline-level content contained within it shall be treated as content which has been moved to this location and tracked as a revision.

The following restrictions shall be applied to this content:

- If this element occurs outside of a move destination container (§17.13.5.28; §17.13.5.27) for which a matching move source container (§17.13.5.24; §17.13.5.23) exists in the document, then the document is non-conformant.

[*Example:* Consider a WordprocessingML document in which the first paragraph contains two sentences, and the first sentence is moved before the second sentence, and this move is tracked as a revision, as follows (in this

image, green underline indicates the move destination and the green strikethrough indicates the move source location):

Some moved text. Some text. ~~Some moved text.~~

This document has the sentence Some moved text. moved to the first sentence in the document. This revision is represented using the following WordprocessingML:

```
<w:p>
  <w:moveToRangeStart w:id="0" ... w:name="move1" />
  <w:moveTo w:id="1" ... >
    <w:r>
      <w:t>Some moved text.</w:t>
    </w:r>
  </w:moveTo>
  <w:moveToRangeEnd w:id="0" />
  <w:r>
    <w:t xml:space="preserve">Some text.</w:t>
  </w:r>
  <w:moveFromRangeStart w:id="2" ... w:name="move1" />
  <w:moveFrom w:id="3" ... >
    <w:r>
      <w:t>Some moved text.</w:t>
    </w:r>
  </w:moveFrom>
  <w:moveFromRangeEnd w:id="2" />
</w:p>
```

The moveTo element specifies that all of the inline-level content contained within must be revision marked as content which was moved to its current location in the document. Because this moved content is contained within a complete move destination container (moveToRangeStart and moveToRangeEnd) with a corresponding move source, this content is tracked as a move. *end example*]

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[Example: Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ... </pre>

Attributes	Description
	<p data-bbox="456 247 521 279"></...></p> <p data-bbox="415 317 1403 384">The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i></p> <p data-bbox="415 422 1341 489">The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p data-bbox="415 508 1463 575">Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p data-bbox="415 613 1458 680">If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p data-bbox="415 718 1406 785"><i>[Example: Consider a comment represented using the following WordprocessingML fragment:</i></p> <p data-bbox="456 823 1110 926"> <pre data-bbox="456 823 1110 926"><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre> </p> <p data-bbox="415 963 1474 1031">The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i></p> <p data-bbox="415 1068 1386 1136">The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p data-bbox="415 1159 1435 1226">Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p data-bbox="415 1264 1198 1295">If this attribute is omitted, then the document is non-conformant.</p> <p data-bbox="415 1333 1438 1400"><i>[Example: Consider an annotation represented using the following WordprocessingML fragment:</i></p> <p data-bbox="456 1438 695 1541"> <pre data-bbox="456 1438 695 1541"><... w:id="1" ... > ... </...></pre> </p> <p data-bbox="415 1579 1451 1646">The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i></p> <p data-bbox="415 1684 1471 1751">The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_RunTrackChange](#)) is located in §A.1. end note]

17.13.5.26 moveTo (Move Destination Paragraph)

This element specifies that the parent paragraph has been moved to this location and tracked as a revision. This does not imply anything about the revision state of the contents of the paragraph, and applies only to the existence of the paragraph as its own unique paragraph.

The following restrictions shall be applied to this content:

- If this element occurs outside of a move destination container (§17.13.5.28; §17.13.5.27) for which a matching move source container (§17.13.5.24; §17.13.5.23) exists in the document, then the document is non-conformant.

[*Example:* Consider a WordprocessingML document in which a paragraph of text is moved down in the document. This moved paragraph would be represented using the following WordprocessingML markup:

```
<w:moveToRangeStart w:id="0" w:name="aMove"/>
<w:p>
  <w:pPr>
    <w:rPr>
      <w:moveTo w:id="1" ... />
    </w:rPr>
  </w:pPr>
  ...
</w:p>
</w:moveToRangeEnd w:id="0"/>
```

The moveTo element as a child of the run properties of the paragraph mark specify that this paragraph mark was part of the content which was moved in the document. This implies nothing about the contents, since they might have been added later and not tracked as a revision (they must be marked as a move using the moveTo element (§17.13.5.25) around the run content). *end example*]

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ... </...></pre> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i>]</p>

Attributes	Description
	<p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
<p>date (Annotation Date)</p>	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
<p>id (Annotation Identifier)</p>	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TrackChange](#)) is located in §A.1. *end note*]

17.13.5.27 moveToRangeEnd (Move Destination Location Container - End)

This element specifies the end of a region whose move destination contents are part of a single named move. When a move source is stored as a revision in a WordprocessingML document, two pieces of information shall be stored about that move destination:

- A set of pieces of content which were moved - both inline-level content (§17.13.5.25) and paragraphs (§17.13.5.26)
- A move destination container (or "bookmark") which specifies that all content within it which marked as a move destination is part of a single named move. The name attribute on the move container links a group of move destination content with the corresponding group of move source content.

This element defines the end of the latter piece of the move revision data - the container. The id attribute on this element shall be used to link this element with the corresponding start of a move destination container in the document.

The following restrictions are applied to the use of this element:

- If this element occurs without a corresponding moveToRangeStart element (§17.13.5.28) with a matching id attribute value, then the document is non-conformant.
- If this element and its paired end occur without a matching move source container (§17.13.5.24; §17.13.5.23), then the document is non-conformant.
- If multiple move destination containers surround the same text, the document is non-conformant.

[*Example:* Consider a WordprocessingML document in which the first paragraph contains two sentences, and the first sentence is moved before the second sentence, and this move is tracked as a revision, as follows (in this image, green underline indicates the move destination and the green strikethrough indicates the move source location):

Some moved text, Some text, ~~Some moved text~~

This document has the sentence Some moved text. moved to the first sentence in the document. This revision is represented using the following WordprocessingML:

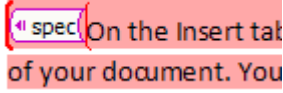
```

<w:p>
  <w:moveToRangeStart w:id="0" ... w:name="move1" />
  <w:moveTo w:id="1" ... >
    <w:r>
      <w:t>Some moved text.</w:t>
    </w:r>
  </w:moveTo>
  <w:moveToRangeEnd w:id="0" />
  <w:r>
    <w:t xml:space="preserve">Some text.</w:t>
  </w:r>
  <w:moveFromRangeStart w:id="2" ... w:name="move1" />
  <w:moveFrom w:id="3" ... >
    <w:r>
      <w:t>Some moved text.</w:t>
    </w:r>
  </w:moveFrom>
  <w:moveFromRangeEnd w:id="2" />
</w:p>

```

The `moveToRangeEnd` element specifies the end of the move destination container within which all moved content is part of the move named `move1`. *end example*]

Attributes	Description
displacedByCustomXml (Annotation Marker Relocated For Custom XML Markup)	<p>Specifies that the parent annotation's placement shall be directly linked with the location of the physical presentation of a custom XML element in the document. This element only has an effect when the custom XML element is block-level (i.e. surrounds an entire paragraph), as in this scenario the logical and physical placement of the annotation and custom XML element can differ.</p> <p>Specifically, in this case, the custom XML is presented <i>around</i> the block-level object it encloses (the paragraph, table, table row, or table cell), but is physically represented within that same object (i.e. within the paragraph, table, table row or table cell). This requirement stems from the fact that there is no location for the location of the annotation within the document at its logical location (around a table, for example).</p> <p>If this element is omitted, then the annotation shall be anchored inside of all block-level custom XML elements in the paragraph. If this element is present, but no block-level custom XML tag is located at the position it specifies (before or after), then it shall be ignored.</p> <p>[<i>Example:</i> Consider a paragraph with block level custom XML markup and two comment anchor annotations (one before and one after the custom XML element's physical representation), as follows:</p>

Attributes	Description
	<p></p> <p>Since all three of these items are around the entire paragraph, they are stored outside of the paragraph. However, in order to ensure that their relative positions are stored correctly, any annotation which must be displaced by the physical custom XML element specifies this information, resulting in the following WordprocessingML:</p> <pre> ... <w:commentRangeStart w:id="0" /> <w:commentRangeStart w:id="1" w:displaced byCustomXml="next" /> <w:customXml w:element="spec" ... /> <w:p> ... </w:p> ... </pre> <p>The <code>displacedByCustomXml</code> attribute specifies that even though all three of these items are around the paragraph and is moved inside the paragraph to be represented physically, the comment with ID 0 must be inside the custom XML, but the comment with ID 1 must be displaced to stay outside of the relative location of the next custom XML element (the <code>spec</code> element). <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_DisplacedByCustomXml</code> simple type (§17.18.13).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the <code>id</code> attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre> <... w:id="1" ... > ... </...> </pre> <p>The <code>id</code> attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_DecimalNumber</code> simple type (§17.18.10).</p>

[*Note: The W3C XML Schema definition of this element's content model ([CT_MarkupRange](#)) is located in §A.1. end note*]

17.13.5.28 `moveToRangeStart` (Move Destination Location Container - Start)

This element specifies the start of the region whose move destination contents are part of a single named move. When a move destination is stored as a revision in a WordprocessingML document, two pieces of information shall be stored about that move destination:

- A set of pieces of content which were moved - both inline-level content (§17.13.5.25) and paragraphs (§17.13.5.26)
- A move destination container (or "bookmark") which specifies that all content within it which marked as a move destination is part of a single named move. The name attribute on the move container links a group of move destination content with the corresponding group of move source content.

This element defines the start of the latter piece of the move revision data - the container. The id attribute on this element shall be used to link this element with the corresponding end of a move destination container in the document.

The following restrictions are applied to the use of this element

- If this element occurs without a corresponding `moveToRangeEnd` element (§17.13.5.27) with a matching id attribute value, then the document is non-conformant.
- If this element and its paired end occur without a matching move source container (§17.13.5.24; §17.13.5.23), then the document is non-conformant.
- If multiple start elements exist with the same id attribute value, then the document is non-conformant.
- If multiple move destination containers surround the same text, the document is non-conformant.

[*Example: Consider a WordprocessingML document in which the first paragraph contains two sentences, and the first sentence is moved before the second sentence, and this move is tracked as a revision, as follows (in this image, green underline indicates the move destination and the green strikethrough indicates the move source location):*

Some moved text. Some text. ~~Some moved text.~~

This document has the sentence `Some moved text.` moved to the first sentence in the document. This revision is represented using the following WordprocessingML:

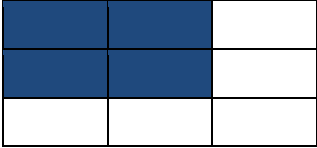
```
<w:p>
  <w:moveToRangeStart w:id="0" ... w:name="move1" />
  <w:moveTo w:id="1" ... >
    <w:r>
      <w:t>Some moved text.</w:t>
    </w:r>
  </w:moveTo>
  <w:moveToRangeEnd w:id="0" />
  <w:r>
    <w:t xml:space="preserve">Some text.</w:t>
  </w:r>
  <w:moveFromRangeStart w:id="2" ... w:name="move1" />
  <w:moveFrom w:id="3" ... >
    <w:r>
      <w:t>Some moved text.</w:t>
    </w:r>
  </w:moveFrom>
  <w:moveFromRangeEnd w:id="2" />
</w:p>
```

The `moveToRangeStart` element specifies the start of the move destination container within which all moved content is part of the move named `move1`. *end example*

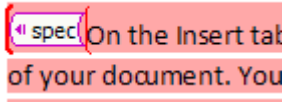
Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[Example: Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ... </...></pre> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
colFirst (First Table Column Covered By Bookmark)	<p>Specifies the zero-based index of the first column in this row which shall be part of this bookmark.</p> <p>When a bookmark is contained within a table, it is possible for that bookmark to only</p>

Attributes	Description									
	<p>cover cells within a certain column and row range within that table, by specifying:</p> <ul style="list-style-type: none">• The first row for which the specified columns are part of the table bookmark. This is accomplished by placing the bookmarkStart element in the first table cell in that row.• The first column included in the bookmark for each of the specified row(s) via this attribute.• The last column included in the bookmark for each of the specified row(s) via the colLast attribute.• The last row for which the specified columns are part of the table bookmark. This is accomplished by placing the bookmarkEnd element at the end of that table row. <p>If this attribute appears, then the colLast attribute shall also appear (regardless of where this bookmark is located) or the document shall be considered non-conformant. If this attribute and its pair occur on a bookmark which is not contained in a table, then their values should be ignored. If this value exceeds the value of colLast or the number of columns in the table, then both values should be ignored.</p> <p>[Example: Consider a three row by three column table where a table bookmark must be applied to the contents of the first two cells in the first two rows in the table (the cells shaded below):</p> <table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table> <p>This bookmark would be specified using the following WordprocessingML for the table's conents:</p> <pre><w:tbl> ... <w:tr> <w:tc> <w:bookmarkStart w:colFirst="0" w:colLast="1" w:id="0" w:name="table"/> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> </w:tr> <w:tr></pre>									

Attributes	Description
	<pre> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:bookmarkEnd w:id="0" /> </w:tr> <w:tr> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> </w:tr> </w:tbl> </pre> <p>The colFirst attribute specifies that all columns starting with the first column must be included in the table bookmark. This applies starting with the first row and ending with the second row (the two rows within the bookmark's start and end). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
colLast (Last Table Column Covered By Bookmark)	<p>Specifies the zero-based index of the last column in this row which shall be part of this bookmark.</p> <p>When a bookmark is contained within a table, it is possible for that bookmark to only cover cells within a certain column and row range within that table, by specifying:</p> <ul style="list-style-type: none"> • The first row for which the specified columns are part of the table bookmark. This is accomplished by placing the bookmarkStart element in the first table cell in that row. • The first column included in the bookmark for each of the specified row(s) via the colFirst attribute. • The last column included in the bookmark for each of the specified row(s) via this attribute. • The last row for which the specified columns are part of the table bookmark. This is accomplished by placing the bookmarkEnd element at the end of that table row.

Attributes	Description
	<p>If this attribute appears, then the colFirst attribute shall also appear (regardless of where this bookmark is located) or the document shall be considered non-conformant. If this attribute and its pair occur on a bookmark which is not contained in a table, then their values should be ignored. If this value does not equal or exceed the value of colFirst or the number of columns in the table, then both values should be ignored.</p> <p>[<i>Example:</i> Consider a three row by three column table where a table bookmark shall be applied to the contents of the first two cells in the first two rows in the table (the cells shaded below):</p>  <p>This bookmark would be specified using the following WordprocessingML for the table's contents:</p> <pre> <w:tbl> ... <w:tr> <w:tc> <w:bookmarkStart w:colFirst="0" w:colLast="1" w:id="0" w:name="table"/> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> </w:tr> <w:tr> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:bookmarkEnd w:id="0" /> </w:tr> <w:tr> <w:tc> </pre>

Attributes	Description
	<pre> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> </w:tr> </w:tbl> </pre> <p>The collLast attribute specifies that the last column that shall be included in the table bookmark is the second column. This applies starting with the first row and ending with the second row (the two rows within the bookmark's start and end). <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre> <... w:id="1" w:date="2006-01-01T10:00:00"> ... </...> </pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
displacedByCustomXml (Annotation Marker Relocated For Custom XML Markup)	<p>Specifies that the parent annotation's placement shall be directly linked with the location of the physical presentation of a custom XML element in the document. This element only has an effect when the custom XML element is block-level (i.e. surrounds an entire paragraph), as in this scenario the logical and physical placement of the annotation and custom XML element can differ.</p> <p>Specifically, in this case, the custom XML is presented <i>around</i> the block-level object it encloses (the paragraph, table, table row, or table cell), but is physically represented within that same object (i.e. within the paragraph, table, table row or table cell). This requirement stems from the fact that there is no location for the location of the annotation within the document at its logical location (around a table, for example).</p>

Attributes	Description
	<p>If this element is omitted, then the annotation shall be anchored inside of all block-level custom XML elements in the paragraph. If this element is present, but no block-level custom XML tag is located at the position it specifies (before or after), then it shall be ignored.</p> <p>[<i>Example:</i> Consider a paragraph with block level custom XML markup and two comment anchor annotations (one before and one after the custom XML element's physical representation), as follows:</p>  <p>Since all three of these items are around the entire paragraph, they are stored outside of the paragraph. However, in order to ensure that their relative positions are stored correctly, any annotation which must be displaced by the physical custom XML element specifies this information, resulting in the following WordprocessingML:</p> <pre> ... <w:commentRangeStart w:id="0" /> <w:commentRangeStart w:id="1" w:displaced byCustomXml="next" /> <w:customXml w:element="spec" ... /> <w:p> ... </w:p> ... </pre> <p>The displacedByCustomXml attribute specifies that even though all three of these items are around the paragraph and is moved inside the paragraph to be represented physically, the comment with ID 0 must be inside the custom XML, but the comment with ID 1 must be displaced to stay outside of the relative location of the next custom XML element (the spec element). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DisplacedByCustomXml simple type (§17.18.13).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre> <... w:id="1" ... > ... </pre>

Attributes	Description
	<p><code></...></code></p> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
name (Bookmark Name)	<p>Specifies the bookmark name.</p> <p>If multiple bookmarks in a document share the same name, then the first bookmark (defined by the location of the bookmarkStart element in document order) shall be maintained, and all subsequent bookmarks should be ignored.</p> <p>[Example: Consider the following XML for a bookmark around a single word:</p> <pre data-bbox="451 793 1172 1033"><w:p> <w:bookmarkStart w:id="0" w:name="place" /> <w:r> <w:t>Seattle</w:t> </w:r> <w:bookmarkEnd w:id="0" /> </w:p></pre> <p>The name attribute specifies that the name for this bookmark is place. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_MoveBookmark](#)) is located in §A.1. *end note*]

17.13.5.29 pPrChange (Revision Information for Paragraph Properties)

This element specifies the details about a single revision to a set of paragraph properties in a WordprocessingML document.

This element stores this revision as follows:

- The child element of this element contains the complete set of paragraph properties which were applied to this paragraph before this revision
- The attributes of this element contain information about when this revision took place (i.e. when these properties became a 'former' set of paragraph properties).

[*Example:* Consider a paragraph in a WordprocessingML document which is centered, and this change in the paragraph properties is tracked as a revision. This revision would be specified using the following WordprocessingML markup:

```
<w:pPr>
  <w:jc w:val="center"/>
  <w:pPrChange w:id="0" w:date="01-01-2006T12:00:00" w:author="John Doe">
    <w:pPr/>
  </w:pPrChange>
</w:pPr>
```

The pPrChange element specifies that there was a revision to the paragraph properties at 01-01-2006 by John Doe, and the previous set of paragraph properties on the paragraph were the null set (i.e. no paragraph properties explicitly present under the pPr element). *end example*]

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ... </...></pre> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre>

Attributes	Description
	<p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 724 695 829"><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_PPrChange](#)) is located in §A.1. *end note*]

17.13.5.30 rPrChange (Revision Information for Run Properties on the Paragraph Mark)

This element specifies the details about a single revision to a set of run properties applied to a paragraph mark within a WordprocessingML document.

This element stores this revision as follows:

- The child element of this element contains the complete set of run properties which were applied to this paragraph mark before this revision
- The attributes of this element contain information about when this revision took place (i.e. when these properties became a 'former' set of run properties).

[*Example:* Consider an italicized paragraph mark in a WordprocessingML document which is also made bold and the latter change in the run properties is tracked as a revision. This revision would be specified using the following WordprocessingML markup:

```

<w:rPr>
  <w:b/>
  <w:i/>
  <w:rPrChange w:id="0" w:date="01-01-2006T12:00:00" w:author="John Doe">
    <w:rPr>
      <w:i/>
    </w:rPr>
  </w:rPrChange>
</w:rPr>

```

The rPrChange element specifies that there was a revision to the paragraph mark's run properties at 01-01-2006 by John Doe, and the previous set of run properties was simply the italicization using the i element (§17.3.2.16). *end example*

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example</i>: Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ... </...></pre> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[<i>Example</i>: Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at</p>

Attributes	Description
	<p>10:00 AM, which can be used as desired. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 688 695 793"><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ParaRPrChange](#)) is located in §A.1. *end note*]

17.13.5.31 rPrChange (Revision Information for Run Properties)

This element specifies the details about a single revision to a set of run properties in a WordprocessingML document.

This element stores this revision as follows:

- The child element of this element contains the complete set of run properties which were applied to this run before this revision
- The attributes of this element contain information about when this revision took place (i.e. when these properties became a 'former' set of run properties).

[*Example:* Consider an italicized run in a WordprocessingML document which is also made bold and the latter change in the run properties is tracked as a revision. This revision would be specified using the following WordprocessingML markup:

```

<w:rPr>
  <w:b/>
  <w:i/>
  <w:rPrChange w:id="0" w:date="01-01-2006T12:00:00" w:author="John Doe">
    <w:rPr>
      <w:i/>
    </w:rPr>
  </w:rPrChange>
</w:rPr>

```

The rPrChange element specifies that there was a revision to the run properties at 01-01-2006 by John Doe, and the previous set of run properties was simply the italicization using the i element (§17.3.2.16). *end example*

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre> <... w:id="1" w:author="Example Author"> ... </...> </pre> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre> <... w:id="1" w:date="2006-01-01T10:00:00"> ... </...> </pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i></p>

Attributes	Description
	The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 653 695 751"><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_RPrChange](#)) is located in §A.1. *end note*]

17.13.5.32 [sectPrChange](#) (Revision Information for Section Properties)

This element specifies the details about a single revision to a set of section properties in a WordprocessingML document.

This element stores this revision as follows:

- The child element of this element contains the complete set of section properties which were applied to the parent section before this revision
- The attributes of this element contain information about when this revision took place (i.e. when these properties became a 'former' set of section properties).

[*Example:* Consider a section in a WordprocessingML document which is set to be divided into three columns, and this change in the section properties is tracked as a revision. This revision would be specified using the following WordprocessingML markup:

```

<w:sectPr>
  <w:cols w:num="3" ... >
    ...
  </w:cols>
  <w:sectPrChange w:id="0" w:date="01-01-2006T12:00:00" w:author="John Doe">
    <w:sectPr/>
  </w:sectPrChange>
</w:sectPr>

```

The sectPrChange element specifies that there was a revision to the section properties at 01-01-2006 by John Doe, and the previous set of properties on the section were the null set (i.e. no section properties explicitly present under the sectPr element). *end example*]

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example</i>: Consider a comment represented using the following WordprocessingML fragment:</p> <pre> <... w:id="1" w:author="Example Author"> ... </...> </pre> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[<i>Example</i>: Consider a comment represented using the following WordprocessingML fragment:</p> <pre> <... w:id="1" w:date="2006-01-01T10:00:00"> ... </...> </pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_SectPrChange](#)) is located in §A.1. *end note*]

17.13.5.33 **tblGridChange (Revision Information for Table Grid Column Definitions)**

This element specifies the details about a single revision to a table's grid column definitions within a WordprocessingML document.

This element stores this revision as follows:

- The child element of this element contains the definition of the table grid which was applied to the parent table before this revision

[*Example:* Consider a two column table in a WordprocessingML document which has the width of its first column significantly reduced, and this change in the table grid is tracked as a revision. This revision would be specified using the following WordprocessingML markup:


```

<w:tblGrid>
  <w:gridCol w:w="1548" />
  <w:gridCol w:w="8028" />
  <w:tblGridChange w:id="1">
    <w:tblGrid>
      <w:gridCol w:w="4788" />
      <w:gridCol w:w="4788" />
    </w:tblGrid>
  </w:tblGridChange>
</w:tblGrid>

```

The `tblGridChange` element specifies that there was a revision to the table grid, and the previous table grid had both columns with a width of 4788 twentieths of a point, vs. their current widths of 1548 and 8028 twentieths of a point respectively. *end example*

Attributes	Description
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the <code>id</code> attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre> <... w:id="1" ... > ... </...> </pre> <p>The <code>id</code> attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_DecimalNumber</code> simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TblGridChange](#)) is located in §A.1. *end note*]

17.13.5.34 `tblPrChange` (Revision Information for Table Properties)

This element specifies the details about a single revision to a set of table properties in a WordprocessingML document.

This element stores this revision as follows:

- The child element of this element contains the complete set of table properties which were applied to the parent table before this revision

- The attributes of this element contain information about when this revision took place (i.e. when these properties became a 'former' set of table properties).

[*Example:* Consider a table in a WordprocessingML document which has the associated table style changed from `LightList` to `LightShading`, and this change in the table properties is tracked as a revision. This revision would be specified using the following WordprocessingML markup:

```
<w:tblPr>
  <w:tblStyle w:val="LightShading"/>
  <w:tblW w:w="0" w:type="auto"/>
  <w:tblLook w:firstRow="true" w:firstColumn="true"
    w:noVBand="true" />
  <w:tblPrChange w:id="0" w:author="Tristan Davis" w:date="2006-06-
01T13:39:00Z">
    <w:tblPr>
      <w:tblStyle w:val="LightList"/>
      <w:tblW w:w="0" w:type="auto"/>
      <w:tblLook w:firstRow="true" w:firstColumn="true"
        w:noVBand="true" />
    </w:tblPr>
  </w:tblPrChange>
</w:tblPr>
```

The `tblPrChange` element specifies that there was a revision to the table properties at 2006-06-01 by Tristan Davis, and the previous set of properties on the table was the set specifies in the child `tblPr` element (including the table style of `LightList`). *end example*

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ... </...></pre> <p>The author attribute specifies that the author of the current annotation is <code>Example Author</code>, which can be used as desired. <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>

Attributes	Description
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 569 1110 667"><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 1182 695 1281"><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TblPrChange](#)) is located in §A.1. *end note*]

17.13.5.35 tblPrExChange (Revision Information for Table-Level Property Exceptions)

This element specifies the details about a single revision to a set of table-level property exceptions in a WordprocessingML document.

This element stores this revision as follows:

- The child element of this element contains the complete set of table-level property exceptions which were applied to the parent table row before this revision
- The attributes of this element contain information about when this revision took place (i.e. when these properties became a 'former' set of table-level exception properties).

[*Example:* Consider a set of table rows which are part of a table in a WordprocessingML document, have table-level property exceptions, and this change in the table-level properties to a fixed table width of ten inches is tracked as a revision. This revision would be specified using the following WordprocessingML markup:

```
<w:tblPrEx>
  <w:tblW w:w="14400" w:type="dxa"/>
  <w:tblPrExChange w:id="0" w:author="Tristan Davis" w:date="2006-06-
01T13:39:00Z">
    <w:tblPrEx>
      <w:tblW w:w="0" w:type="auto"/>
    </w:tblPrEx>
  </w:tblPrExChange>
</w:tblPrEx>
```

The tblPrExChange element specifies that there was a revision to the table-level property exceptions at 2006-06-01 by Tristan Davis, and the previous set of table-level property exceptions set specifies in the child tblPrEx element. *end example*]

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ... </...></pre> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent</p>

Attributes	Description
	<p>annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre> <p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TblPrExChange](#)) is located in §A.1. *end note*]

17.13.5.36 tcPrChange (Revision Information for Table Cell Properties)

This element specifies the details about a single revision to a set of table cell properties in a WordprocessingML document.

This element stores this revision as follows:

- The child element of this element contains the complete set of table cell properties which were applied to the parent table before this revision

- The attributes of this element contain information about when this revision took place (i.e. when these properties became a 'former' set of table cell properties).

[*Example:* Consider a table cell in a WordprocessingML document which has a change in the table cell properties that is tracked as a revision. This revision would be specified using the following WordprocessingML markup:

```
<w:tcPr>
  <w:cnfStyle w:firstColumn="true" />
  <w:tcW w:w="3192" w:type="dxa"/>
  <w:tcPrChange w:id="8" w:author="Tristan Davis" w:date="2006-06-01T13:39:00Z">
    <w:tcPr>
      <w:tcW w:w="3192" w:type="dxa"/>
    </w:tcPr>
  </w:tcPrChange>
</w:tcPr>
```

The tcPrChange element specifies that there was a revision to the table cell properties at 2006-06-01 by Tristan Davis, and the previous set of properties on the table cell was the set specifies in the child tcPr element. *end example]*

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ... </...></pre> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[<i>Example:</i> Consider a comment represented using the following WordprocessingML fragment:</p>

Attributes	Description
	<p data-bbox="451 285 1110 382"> <code><... w:id="1" w:date="2006-01-01T10:00:00"></code> <code>...</code> <code></...></code> </p> <p data-bbox="415 424 1479 491">The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i>]</p> <p data-bbox="415 533 1386 600">The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p data-bbox="415 617 1435 684">Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p data-bbox="415 726 1198 751">If this attribute is omitted, then the document is non-conformant.</p> <p data-bbox="415 793 1442 861">[Example: Consider an annotation represented using the following WordprocessingML fragment:</p> <p data-bbox="451 903 695 999"> <code><... w:id="1" ... ></code> <code>...</code> <code></...></code> </p> <p data-bbox="415 1041 1455 1108">The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p data-bbox="415 1150 1471 1218">The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TcPrChange](#)) is located in §A.1. *end note*]

17.13.5.37 trPrChange (Revision Information for Table Row Properties)

This element specifies the details about a single revision to a set of table row properties in a WordprocessingML document.

This element stores this revision as follows:

- The child element of this element contains the complete set of table row properties which were applied to the parent table row before this revision
- The attributes of this element contain information about when this revision took place (i.e. when these properties became a 'former' set of table row properties).

[*Example*: Consider a table cell in a WordprocessingML document which has a change in the table row properties that is tracked as a revision. This revision would be specified using the following WordprocessingML markup:

```
<w:trPr>
  <w:cantSplit/>
  <w:trPrChange w:id="8" w:author="Tristan Davis" w:date="2006-06-01T13:39:00Z">
    <w:trPr/>
  </w:trPrChange>
</w:trPr>
```

The trPrChange element specifies that there was a revision to the table row properties at 2006-06-01 by Tristan Davis, and the previous set of properties on the table row was the set specified in the child trPr element (in this case, the null set). *end example*]

Attributes	Description
author (Annotation Author)	<p>Specifies the author for an annotation within a WordprocessingML document.</p> <p>If this attribute is omitted, then no author shall be associated with the parent annotation type.</p> <p>[<i>Example</i>: Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:author="Example Author"> ... </...></pre> <p>The author attribute specifies that the author of the current annotation is Example Author, which can be used as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
date (Annotation Date)	<p>Specifies the date information for an annotation within a WordprocessingML document. The use of this information is outside of the scope of ECMA-376.</p> <p>If this attribute is omitted, then no date information shall be associated with the parent annotation type.</p> <p>[<i>Example</i>: Consider a comment represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" w:date="2006-01-01T10:00:00"> ... </...></pre>

Attributes	Description
	<p>The date attribute specifies that the date of the current annotation is January 1st 2006 at 10:00 AM, which can be used as desired. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DateTime simple type (§17.18.9).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 724 695 823"><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TrPrChange](#)) is located in §A.1. *end note*]

17.13.6 Bookmarks

Within a WordprocessingML document, *bookmarks* refer to arbitrary regions of content which are bounded and have a unique name associated with them.

Because bookmarks are a legacy word processing function which predates the concepts of XML and well-formedness, they can start and end at any location within a document's contents and therefore shall use the "cross-structure" annotation format described in §17.13.2.

[*Example:* Consider the following WordprocessingML markup for two paragraphs, each reading Example Text, where a bookmark has been added spanning the second word in paragraph one and the first word in paragraph two:

```

<w:p>
  <w:r>
    <w:t>Example</w:t>
  </w:r>
  <w:bookmarkStart w:id="0" w:name="sampleBookmark" />
  <w:r>
    <w:t xml:space="preserve"> text.</w:t>
  </w:r>
</w:p>
<w:p>
  <w:r>
    <w:t>Example</w:t>
  </w:r>
  <w:bookmarkEnd w:id="0" />
  <w:r>
    <w:t xml:space="preserve"> text.</w:t>
  </w:r>
</w:p>

```

The bookmarkStart and bookmarkEnd elements (§17.13.6.2; §17.13.6.1) specify the location where the bookmark starts and ends, but cannot contain it using a single tag because it spans part of two paragraphs. However, the two tags are part of one group because the id attribute value specifies 0 for both. *end example*]

17.13.6.1 bookmarkEnd (Bookmark End)

This element specifies the end of a bookmark within a WordprocessingML document. This end marker is matched with the appropriately paired start marker by matching the value of the id attribute from the associated bookmarkStart element.

If no bookmarkStart element exists prior to this element in document order with a matching id attribute value, then the document is non-conformant.

[*Example:* Consider a document with a bookmark which spans half of paragraph one, and part of paragraph two. The following WordprocessingML illustrates an example of content which fulfills this constraint:

```

<w:p>
  <w:r>
    <w:t xml:space="preserve">This is sentence one.</w:t>
  </w:r>
  <w:bookmarkStart w:id="0" w:name="testing123"/>
  <w:r>
    <w:t>This is sentence two.</w:t>
  </w:r>
</w:p>

```

```

<w:p>
  <w:r>
    <w:t xml:space="preserve">This </w:t>
  </w:r>
  <w:bookmarkEnd w:id="0"/>
  <w:r>
    <w:t>is sentence three.</w:t>
  </w:r>
</w:p>

```

The bookmarkEnd element specifies the end of the region for the bookmark whose bookmarkStart element has an id attribute value of 0. In this case, this refers to the testing123 bookmark. *end example*]

Attributes	Description
displacedByCustomXml (Annotation Marker Relocated For Custom XML Markup)	<p>Specifies that the parent annotation's placement shall be directly linked with the location of the physical presentation of a custom XML element in the document. This element only has an effect when the custom XML element is block-level (i.e. surrounds an entire paragraph), as in this scenario the logical and physical placement of the annotation and custom XML element can differ.</p> <p>Specifically, in this case, the custom XML is presented <i>*around*</i> the block-level object it encloses (the paragraph, table, table row, or table cell), but is physically represented within that same object (i.e. within the paragraph, table, table row or table cell). This requirement stems from the fact that there is no location for the location of the annotation within the document at its logical location (around a table, for example).</p> <p>If this element is omitted, then the annotation shall be anchored inside of all block-level custom XML elements in the paragraph. If this element is present, but no block-level custom XML tag is located at the position it specifies (before or after), then it shall be ignored.</p> <p>[<i>Example:</i> Consider a paragraph with block level custom XML markup and two comment anchor annotations (one before and one after the custom XML element's physical representation), as follows:</p> <div data-bbox="451 1499 732 1598" data-label="Image"> </div> <p>Since all three of these items are around the entire paragraph, they are stored outside of the paragraph. However, in order to ensure that their relative positions are stored correctly, any annotation which must be displaced by the physical custom XML element specifies this information, resulting in the following WordprocessingML:</p> <pre> ... <w:commentRangeStart w:id="0" /> </pre>

Attributes	Description
	<p> <code><w:commentRangeStart w:id="1" w:displaced byCustomXml="next" /></code> <code><w:customXml w:element="spec" ... /></code> <code><w:p></code> <code>...</code> <code></w:p></code> <code>...</code> </p> <p>The displacedByCustomXml attribute specifies that even though all three of these items are around the paragraph and is moved inside the paragraph to be represented physically, the comment with ID 0 must be inside the custom XML, but the comment with ID 1 must be displaced to stay outside of the relative location of the next custom XML element (the spec element). <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DisplacedByCustomXml simple type (§17.18.13).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <p> <code><... w:id="1" ... ></code> <code>...</code> <code></...></code> </p> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_MarkupRange](#)) is located in §A.1. *end note*]

17.13.6.2 bookmarkStart (Bookmark Start)

This element specifies the start of a bookmark within a WordprocessingML document. This start marker is matched with the appropriately paired end marker by matching the value of the id attribute from the associated bookmarkEnd element.

If no bookmarkEnd element exists subsequent to this element in document order with a matching id attribute value, then the document is non-conformant.

If a bookmark begins and ends within a single table, it is possible for that bookmark to cover discontinuous parts of that table which are logically related (e.g. a single column in a table). This kind of placement for a bookmark is accomplished (and described in detail) on the colFirst and colLast attributes on this element.


[*Example:* Consider a document with a bookmark which spans half of paragraph one, and part of paragraph two. The following WordprocessingML illustrates an example of content which fulfills this constraint:

```
<w:p>
  <w:r>
    <w:t xml:space="preserve">This is sentence one.</w:t>
  </w:r>
  <w:bookmarkStart w:id="0" w:name="testing123"/>
  <w:r>
    <w:t>This is sentence two.</w:t>
  </w:r>
</w:p>
<w:p>
  <w:r>
    <w:t xml:space="preserve">This </w:t>
  </w:r>
  <w:bookmarkEnd w:id="0"/>
  <w:r>
    <w:t>is sentence three.</w:t>
  </w:r>
</w:p>
```

The bookmarkStart element specifies the start of the region for the testing123 bookmark. This element is then linked to the bookmarkEnd element which also has an id attribute value of 0. *end example*]

Attributes	Description
colFirst (First Table Column Covered By Bookmark)	<p>Specifies the zero-based index of the first column in this row which shall be part of this bookmark.</p> <p>When a bookmark is contained within a table, it is possible for that bookmark to only cover cells within a certain column and row range within that table, by specifying:</p> <ul style="list-style-type: none"> • The first row for which the specified columns are part of the table bookmark. This is accomplished by placing the bookmarkStart element in the first table cell in that row. • The first column included in the bookmark for each of the specified row(s) via this attribute. • The last column included in the bookmark for each of the specified row(s) via the colLast attribute. • The last row for which the specified columns are part of the table bookmark. This is accomplished by placing the bookmarkEnd element at the end of that table row.

Attributes	Description									
	<p>If this attribute appears, then the colLast attribute shall also appear (regardless of where this bookmark is located) or the document shall be considered non-conformant. If this attribute and its pair occur on a bookmark which is not contained in a table, then their values should be ignored. If this value exceeds the value of colLast or the number of columns in the table, then both values should be ignored.</p> <p>[Example: Consider a three row by three column table where a table bookmark must be applied to the contents of the first two cells in the first two rows in the table (the cells shaded below):</p> <table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table> <p>This bookmark would be specified using the following WordprocessingML for the table's conents:</p> <pre><w:tbl> ... <w:tr> <w:tc> <w:bookmarkStart w:colFirst="0" w:colLast="1" w:id="0" w:name="table"/> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> </w:tr> <w:tr> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:bookmarkEnd w:id="0" /> </w:tr> <w:tr></pre>									

Attributes	Description
	<pre> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> </w:tr> </w:tbl> </pre> <p>The colFirst attribute specifies that all columns starting with the first column must be included in the table bookmark. This applies starting with the first row and ending with the second row (the two rows within the bookmark's start and end). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
colLast (Last Table Column Covered By Bookmark)	<p>Specifies the zero-based index of the last column in this row which shall be part of this bookmark.</p> <p>When a bookmark is contained within a table, it is possible for that bookmark to only cover cells within a certain column and row range within that table, by specifying:</p> <ul style="list-style-type: none"> • The first row for which the specified columns are part of the table bookmark. This is accomplished by placing the bookmarkStart element in the first table cell in that row. • The first column included in the bookmark for each of the specified row(s) via the colFirst attribute. • The last column included in the bookmark for each of the specified row(s) via this attribute. • The last row for which the specified columns are part of the table bookmark. This is accomplished by placing the bookmarkEnd element at the end of that table row. <p>If this attribute appears, then the colFirst attribute shall also appear (regardless of where this bookmark is located) or the document shall be considered non-conformant. If this attribute and its pair occur on a bookmark which is not contained in a table, then their values should be ignored. If this value does not equal or exceed the value of colFirst or the number of columns in the table, then both values should be ignored.</p> <p>[Example: Consider a three row by three column table where a table bookmark shall be applied to the contents of the first two cells in the first two rows in the table (the cells shaded below):</p> 

Attributes	Description						
	<table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table> <p>This bookmark would be specified using the following WordprocessingML for the table's conents:</p> <pre><w:tbl> ... <w:tr> <w:tc> <w:bookmarkStart w:colFirst="0" w:colLast="1" w:id="0" w:name="table"/> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> </w:tr> <w:tr> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:bookmarkEnd w:id="0" /> </w:tr> <w:tr> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> </w:tr> </w:tbl></pre> <p>The colLast attribute specifies that the last column that shall be included in the table</p>						

Attributes	Description
	<p>bookmark is the second column. This applies starting with the first row and ending with the second row (the two rows within the bookmark's start and end). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
<p>displacedByCustomXml (Annotation Marker Relocated For Custom XML Markup)</p>	<p>Specifies that the parent annotation's placement shall be directly linked with the location of the physical presentation of a custom XML element in the document. This element only has an effect when the custom XML element is block-level (i.e. surrounds an entire paragraph), as in this scenario the logical and physical placement of the annotation and custom XML element can differ.</p> <p>Specifically, in this case, the custom XML is presented <i>around</i> the block-level object it encloses (the paragraph, table, table row, or table cell), but is physically represented within that same object (i.e. within the paragraph, table, table row or table cell). This requirement stems from the fact that there is no location for the location of the annotation within the document at its logical location (around a table, for example).</p> <p>If this element is omitted, then the annotation shall be anchored inside of all block-level custom XML elements in the paragraph. If this element is present, but no block-level custom XML tag is located at the position it specifies (before or after), then it shall be ignored.</p> <p>[<i>Example:</i> Consider a paragraph with block level custom XML markup and two comment anchor annotations (one before and one after the custom XML element's physical representation), as follows:</p> <div data-bbox="451 1203 734 1297" data-label="Image"> </div> <p>Since all three of these items are around the entire paragraph, they are stored outside of the paragraph. However, in order to ensure that their relative positions are stored correctly, any annotation which must be displaced by the physical custom XML element specifies this information, resulting in the following WordprocessingML:</p> <pre> ... <w:commentRangeStart w:id="0" /> <w:commentRangeStart w:id="1" w:displaced byCustomXml="next" /> <w:customXml w:element="spec" ... /> <w:p> ... </w:p> ... </pre> <p>The displacedByCustomXml attribute specifies that even though all three of these items are around the paragraph and is moved inside the paragraph to be represented</p>

Attributes	Description
	<p>physically, the comment with ID 0 must be inside the custom XML, but the comment with ID 1 must be displaced to stay outside of the relative location of the next custom XML element (the spec element). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DisplacedByCustomXml simple type (§17.18.13).</p>
id (Annotation Identifier)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre data-bbox="451 758 695 856"><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
name (Bookmark Name)	<p>Specifies the bookmark name.</p> <p>If multiple bookmarks in a document share the same name, then the first bookmark (defined by the location of the bookmarkStart element in document order) shall be maintained, and all subsequent bookmarks should be ignored.</p> <p>[<i>Example:</i> Consider the following XML for a bookmark around a single word:</p> <pre data-bbox="451 1373 1175 1608"><w:p> <w:bookmarkStart w:id="0" w:name="place" /> <w:r> <w:t>Seattle</w:t> </w:r> <w:bookmarkEnd w:id="0" /> </w:p></pre> <p>The name attribute specifies that the name for this bookmark is place. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Bookmark](#)) is located in §A.1. *end note*]

17.13.7 Range Permissions

Range permissions in a WordprocessingML document refer to a special kind of bookmark used to control which subset(s) of users can edit a particular region of a document. Range permissions specify the user or set of users which are allowed to edit all content between them whenever the document protection specified by the documentProtection element (§17.15.1.29) is enabled and set to readOnly or comments.

Like bookmarks, range permissions are a legacy word processing function which predates the concepts of XML and well-formedness, so they can start and end at any location within a document's contents and therefore shall use the "cross-structure" annotation format described in §17.13.2.

[Example: Consider the following WordprocessingML markup for a single paragraph, where a range permission has been added spanning the words `range permission`:

```
<w:p>
  <w:r>
    <w:t xml:space="preserve">This is a </w:t>
  </w:r>
  <w:permStart w:id="0" w:edGrp="everyone"/>
  <w:r>
    <w:t>range permission</w:t>
  </w:r>
  <w:permEnd w:id="0"/>
  <w:r>
    <w:t>.</w:t>
  </w:r>
</w:p>
```

The permStart and permEnd elements (§17.13.7.1; §17.13.7.2) specify the location where the range permission starts and ends. The two tags are part of one group because the id attribute value specifies 0 for both.

If document protection was enabled, then no content in this document must be editable except for this range permission, which is editable by all users that open the document (specified using an editor group of everyone). *end example*

17.13.7.1 permEnd (Range Permission End)

This element specifies the end of a single range permission within a WordprocessingML document. This end marker is matched with the appropriately paired start marker by matching the value of the id attribute from the associated permStart element.

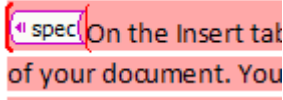
If no permStart element exists prior to this element in document order with a matching id attribute value, then the document is non-conformant.

[*Example:* Consider a document with a range permission which spans half of paragraph one, and part of paragraph two. The following WordprocessingML illustrates an example of content which fufills this constraint:

```
<w:p>
  <w:r>
    <w:t xml:space="preserve">This is sentence one.</w:t>
  </w:r>
  <w:permStart w:id="0" w:edGrp="everyone"/>
  <w:r>
    <w:t>This is sentence two.</w:t>
  </w:r>
</w:p>
<w:p>
  <w:r>
    <w:t xml:space="preserve">This </w:t>
  </w:r>
  <w:permEnd w:id="0"/>
  <w:r>
    <w:t>is sentence three.</w:t>
  </w:r>
</w:p>
```

The permEnd element specifies the end of the region for the range permission whose permStart element has an id attribute value of 0. *end example]*

Attributes	Description
displacedByCustomXml (Annotation Displaced By Custom XML Markup)	<p>Specifies that the parent annotation's placement shall be directly linked with the location of the physical presentation of a custom XML element in the document. This element only has an effect when the custom XML element is block-level (i.e. surrounds an entire paragraph), as in this scenario the logical and physical placement of the annotation and custom XML element can differ.</p> <p>Specifically, in this case, the custom XML is presented <i>*around*</i> the block-level object it encloses (the paragraph, table, table row, or table cell), but is physically represented within that same object (i.e. within the paragraph, table, table row or table cell). This requirement stems from the fact that there is no location for the location of the annotation within the document at its logical location (around a table, for example).</p> <p>If this element is omitted, then the annotation shall be anchored inside of all block-level custom XML elements in the paragraph. If this element is present, but no block-level custom XML tag is located at the position it specifies (before or after), then it shall be ignored.</p> <p>[<i>Example:</i> Consider a paragraph with block level custom XML markup and two comment anchor annotations (one before and one after the custom XML element's physical</p>

Attributes	Description
	<p>representation), as follows:</p>  <p>Since all three of these items are around the entire paragraph, they are stored outside of the paragraph. However, in order to ensure that their relative positions are stored correctly, any annotation which must be displaced by the physical custom XML element specifies this information, resulting in the following WordprocessingML:</p> <pre> ... <w:commentRangeStart w:id="0" /> <w:commentRangeStart w:id="1" w:displaced byCustomXml="next" /> <w:customXml w:element="spec" ... /> <w:p> ... </w:p> ... </pre> <p>The displacedByCustomXml attribute specifies that even though all three of these items are around the paragraph and is moved inside the paragraph to be represented physically, the comment with ID 0 must be inside the custom XML, but the comment with ID 1 must be displaced to stay outside of the relative location of the next custom XML element (the spec element). <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DisplacedByCustomXml simple type (§17.18.13).</p>
id (Annotation ID)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre> <... w:id="1" ... > ... </...> </pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Perm](#)) is located in §A.1. *end note*]

17.13.7.2 permStart (Range Permission Start)

This element specifies the start of a range permission within a WordprocessingML document. This start marker is matched with the appropriately paired end marker by matching the value of the id attribute from the associated permEnd element.

If no permEnd element exists subsequent to this element in document order with a matching id attribute value, then the document is non-conformant.

If a range permission begins and ends within a single table, it is possible for that permission to cover discontinuous parts of that table which are logically related (e.g. a single column in a table). This type of placement for a range permission is accomplished (and described in detail) on the colFirst and colLast attributes on this element.

[Example: Consider a document with a range permission which spans half of paragraph one, and part of paragraph two. The following WordprocessingML illustrates an example of content which fulfills this constraint:

```
<w:p>
  <w:r>
    <w:t xml:space="preserve">This is sentence one.</w:t>
  </w:r>
  <w:permStart w:id="0" w:edGrp="everyone"/>
  <w:r>
    <w:t>This is sentence two.</w:t>
  </w:r>
</w:p>
<w:p>
  <w:r>
    <w:t xml:space="preserve">This </w:t>
  </w:r>
  <w:permEnd w:id="0"/>
  <w:r>
    <w:t>is sentence three.</w:t>
  </w:r>
</w:p>
```

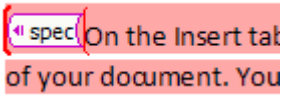
The permStart element specifies the start of the region for the range permission. This element is then linked to the permEnd element which also has an id attribute value of 0. *end example*]

Attributes	Description
colFirst (First Table Column Covered By Range Permission)	Specifies the zero-based index of the first column in this row which shall be part of this range permission.

Attributes	Description									
	<p>When a range permission is contained within a table, it is possible for that range permission to only cover cells within a certain column and row range within that table, by specifying:</p> <ul style="list-style-type: none">• The first row for which the specified columns are part of the table range permission. This is accomplished by placing the permStart element in the first table cell in that row.• The first column included in the range permission for each of the specified row(s) via this attribute.• The last column included in the range permission for each of the specified row(s) via the colLast attribute.• The last row for which the specified columns are part of the table range permission. This is accomplished by placing the permEnd element at the end of that table row. <p>If this attribute appears, then the colLast attribute shall also appear (regardless of where this bookmark is located) or the document shall be considered non-conformant. If this attribute and its pair occur on a range permission which is not contained in a table, then their values should be ignored. If this value exceeds the value of colLast or the number of columns in the table, then both values should be ignored.</p> <p>[Example: Consider a three row by three column table where a table range permission shall be applied to the contents of the first two cells in the first two rows in the table (the cells shaded below):</p> <table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table> <p>This bookmark would be specified using the following WordprocessingML for the table's conents:</p> <pre><w:tbl> ... <w:tr> <w:tc> <w:permStart w:colFirst="0" w:colLast="1" w:id="0" w:edGrp="everyone"/> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc></pre>									

Attributes	Description
	<pre> </w:tr> <w:tr> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:permEnd w:id="0" /> </w:tr> <w:tr> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> </w:tr> </w:tbl> </pre> <p>The colFirst attribute specifies that all columns starting with the first column must be included in the table range permission. This applies starting with the first row and ending with the second row (the two rows within the range permission's start and end). <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
colLast (Last Table Column Covered By Range Permission)	<p>Specifies the zero-based index of the last column in this row which shall be part of this range permission.</p> <p>When a range permission is contained within a table, it is possible for that range permission to only cover cells within a certain column and row range within that table, by specifying:</p> <ul style="list-style-type: none"> • The first row for which the specified columns are part of the table range permission. This is accomplished by placing the permStart element in the first table cell in that row. • The first column included in the range permission for each of the specified row(s) via the colFirst attribute. • The last column included in the range permission for each of the specified row(s) via this attribute.

Attributes	Description									
	<ul style="list-style-type: none">The last row for which the specified columns are part of the table range permission. This is accomplished by placing the permEnd element at the end of that table row. <p>If this attribute appears, then the colFirst attribute shall also appear (regardless of where this bookmark is located) or the document shall be considered non-conformant. If this attribute and its pair occur on a bookmark which is not contained in a table, then their values should be ignored. If this value does not equal or exceed the value of colFirst or the number of columns in the table, then both values should be ignored.</p> <p>[Example: Consider a three row by three column table where a table range permission must be applied to the contents of the first two cells in the first two rows in the table (the cells shaded below):</p> <table><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table> <p>This bookmark would be specified using the following WordprocessingML for the table's conents:</p> <pre><w:tbl> ... <w:tr> <w:tc> <w:permStart w:colFirst="0" w:colLast="1" w:id="0" w:edGrp="everyone"/> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> </w:tr> <w:tr> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> </w:tr></pre>									

Attributes	Description
	<pre><w:permEnd w:id="0" /> </w:tr> <w:tr> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> <w:tc> <w:p/> </w:tc> </w:tr> </w:tbl></pre> <p>The collLast attribute specifies that the last column that must be included in the table range permission is the second column. This applies starting with the first row and ending with the second row (the two rows within the range permission's start and end). <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>
displacedByCustomXml (Annotation Displaced By Custom XML Markup)	<p>Specifies that the parent annotation's placement shall be directly linked with the location of the physical presentation of a custom XML element in the document. This element only has an effect when the custom XML element is block-level (i.e. surrounds an entire paragraph), as in this scenario the logical and physical placement of the annotation and custom XML element can differ.</p> <p>Specifically, in this case, the custom XML is presented <i>*around*</i> the block-level object it encloses (the paragraph, table, table row, or table cell), but is physically represented within that same object (i.e. within the paragraph, table, table row or table cell). This requirement stems from the fact that there is no location for the location of the annotation within the document at its logical location (around a table, for example).</p> <p>If this element is omitted, then the annotation shall be anchored inside of all block-level custom XML elements in the paragraph. If this element is present, but no block-level custom XML tag is located at the position it specifies (before or after), then it shall be ignored.</p> <p>[Example: Consider a paragraph with block level custom XML markup and two comment anchor annotations (one before and one after the custom XML element's physical representation), as follows:</p> <div></div>

Attributes	Description
	<p>Since all three of these items are around the entire paragraph, they are stored outside of the paragraph. However, in order to ensure that their relative positions are stored correctly, any annotation which must be displaced by the physical custom XML element specifies this information, resulting in the following WordprocessingML:</p> <pre> ... <w:commentRangeStart w:id="0" /> <w:commentRangeStart w:id="1" w:displaced byCustomXml="next" /> <w:customXml w:element="spec" ... /> <w:p> ... </w:p> ... </pre> <p>The displacedByCustomXml attribute specifies that even though all three of these items are around the paragraph and is moved inside the paragraph to be represented physically, the comment with ID 0 must be inside the custom XML, but the comment with ID 1 must be displaced to stay outside of the relative location of the next custom XML element (the spec element). <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DisplacedByCustomXml simple type (§17.18.13).</p>
ed (Single User For Range Permission)	<p>Specifies a single user for which this range permission shall be enabled (i.e. a user which shall be able to edit this range when document protection is enabled).</p> <p>This editor can be stored in one of the following forms:</p> <ul style="list-style-type: none"> • DOMAIN\username - for users whose access shall be authenticated using the current user's domain credentials • user@domain.com - for users whose access shall be authenticated using the user's e-mail address as credentials • user - for users whose access shall be authenticated using the current user's machine credentials <p>[<i>Example</i>: Consider a range permission defined as follows:</p> <pre> <w:permStart w:id="0" w:ed="example@example.com" ... /> ... <w:permEnd w:id="0" /> </pre> <p>The ed attribute value of example@example.com specifies that only user(s) who can authenticate with an application as associated with that e-mail address must be allowed to edit the contents between the start and end markers when document protection is being enforced. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type</p>

Attributes	Description
	(§22.9.2.13).
edGrp (Editor Group For Range Permission)	<p>Specifies an alias (or editing group) which shall be used to determine if the current user shall be allowed to edit this range of the document. This mechanism simply provides a set of predefined editing groups which can be associated with user accounts by applications in any desired manner.</p> <p>[<i>Example:</i> Consider a range permission defined as follows:</p> <pre><w:permStart w:id="0" w:edGrp="editors" ... /> ... <w:permEnd w:id="0" /></pre> <p>The edGrp attribute value of editors specifies that only user(s) who the current application associates with the editors group shall be allowed to edit the contents between the start and end markers when document protection is being enforced. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_EdGrp simple type (§17.18.21).</p>
id (Annotation ID)	<p>Specifies a unique identifier for an annotation within a WordprocessingML document. The restrictions on the id attribute, if any, are defined by the parent XML element.</p> <p>If this attribute is omitted, then the document is non-conformant.</p> <p>[<i>Example:</i> Consider an annotation represented using the following WordprocessingML fragment:</p> <pre><... w:id="1" ... > ... </...></pre> <p>The id attribute specifies that the ID of the current annotation is 1. This value is used to uniquely identify this annotation within the document content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_PermStart](#)) is located in §A.1. *end note*]

17.13.8 Spelling and Grammar

The remaining kind of annotation stored in a WordprocessingML document, *spelling and grammar errors* are annotations used to specify the locations of existing spelling and grammatical errors within the contents of a document.

[*Rationale*: When a WordprocessingML document is saved, applications can choose to save currently flagged spelling and grammar errors, for two reasons:

- In order to increase the performance subsequent loads of the document (as those load operations can rely on the persisted proofing state of the document)
- In order to store words which must not be marked as proofing errors regardless of how they would normally be flagged by the proofing tools engine (i.e. to store spelling and grammar exceptions).

end rationale]

[*Example*: Consider the following paragraph consisting of two misspelled words, where the second word has been explicitly flagged as not being a spelling error. This paragraph would consist of the following WordprocessingML markup:

```
<w:p>
  <w:proofErr w:type="spellStart"/>
  <w:r>
    <w:t>erqwt</w:t>
  </w:r>
  <w:proofErr w:type="spellEnd"/>
  <w:r>
    <w:t xml:space="preserve"> werewr</w:t>
  </w:r>
</w:p>
```

The proofErr elements, with a val attribute value of spellStart and spellEnd respectively, delimit the start and end the content in this paragraph which is stored as a spelling error. Since the second word is not included in that range, it is not stored as a spelling error. *end example*]

17.13.8.1 proofErr (Proofing Error Anchor)

This element specifies the presence of a start or end anchor for a single proofing error within a WordprocessingML document.

When proofing errors are stored in a document, their semantics shall be interpreted as follows:

- Each proofing error with a type attribute value of spellStart shall be linked with the next error with a type attribute of spellEnd. If one does not exist, then this error should be ignored.
- Each proofing error with a type attribute value of spellEnd which was not preceded by an error with a type attribute value of spellStart (that was not previously matched to an end) should be ignored.
- Each proofing error with a type attribute value of gramStart shall be linked with the next error with a type attribute of gramEnd. If one does not exist, then this error should be ignored.
- Each proofing error with a type attribute value of gramEnd which was not preceded by an error with a type attribute value of gramStart (that was not previously matched to an end) should be ignored.

[*Example:* Consider the following sentence with a grammatical error in its subject/verb agreement. If an application recognized this error and wished to persist it to the document, this paragraph would consist of the following WordprocessingML markup:

```
<w:p>
  <w:proofErr w:type="gramStart"/>
  <w:r>
    <w:t>This are</w:t>
  </w:r>
  <w:proofErr w:type="gramEnd"/>
  <w:r>
    <w:t xml:space="preserve"> an error.</w:t>
  </w:r>
</w:p>
```

The proofErr elements, with a val attribute value of gramStart and gramEnd respectively, delimit the start and end the content in this paragraph which is stored as a grammatical error. *end example]*

Attributes	Description
type (Proofing Error Anchor Type)	<p>Specifies the type of proofing error anchor at this location in the document. This proofing error type implies the necessary semantics for this element as defined by the parent element.</p> <p>[<i>Example:</i> Consider the following sentence with a proofing error, consisting of the following WordprocessingML markup:</p> <pre><w:r> <w:t>are</w:t> </w:r> <w:proofErr w:val="gramEnd"/> <w:r> <w:t xml:space="preserve"> an error.</w:t> </w:r></pre> <p>The val attribute value of gramEnd specifies that the proofing error is the location of the end of content which is stored as a grammatical error. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_ProofErr simple type (§17.18.70).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_ProofErr](#)) is located in §A.1. *end note]*

17.14 Mail Merge

Mail merge refers to an operation by which WordprocessingML documents can work in conjunction with data from an external data source, importing this data into a document according to a set of codes contained in WordprocessingML known as fields.

A WordprocessingML document that contains the mailMerge element (§17.14.20) and is therefore connected to an external data source, is known as a *source document*. In addition to being connected to an external data source and containing fields, a source document can contain any regular WordprocessingML constructs such as:

- Text runs
- Paragraphs
- Images
- Tables
- Numbering
- Etc.

There are two key parts of the mail merge data stored in a WordprocessingML document

9. Information connecting a document to an external data source
10. Information populating fields within that document with external data.

Once the fields in a merged document have been populated with external data, mail merge has been completed and the resulting files are known as *mail merged documents* or simply *merged documents*.

The mail merge settings for a WordprocessingML document are stored in two locations:

- The standard mail merge settings are stored as the child elements of the mailMerge element (§17.14.20)
- A set of additional mail merge settings stored in the odso element (§17.14.25), and collectively referred to as the Office Data Source Object settings. The *Office Data Source Object* is an extension to the standard settings stored with a mail merge which performs two functions: First, it provides additional information about the mail merge data source, specifically: information about how to map the columns in the data source to MERGEFIELD fields and information about records which shall be included and excluded when creating merged documents. Second, it provides an alternate set of connection information which should be used when the dataType element (§17.14.10) specifies a value of native. This alternate connection string provides additional connection information for applications which choose to support the ODSO connection string syntax.

[*Example:* Consider a WordprocessingML document containing static WordprocessingML constructs such as text runs and paragraphs in addition to two WordprocessingML MERGEFIELD fields (§17.16.5.35) calling for Courtesy Title and Last Name data. The field codes for each field are displayed, delimited by {} characters:

Dear {MERGEFIELD "Courtesy Title" \m}
 {MERGEFIELD "Last Name" \m},

Sample text. Sample text. Sample text.
 Sample text. Sample text. Sample text. Sample
 text. Sample text. Sample text. Sample text.
 Sample text. Sample text. Sample text. Sample
 text. Sample text. Sample text. Sample text.
 Sample text. Sample text. Sample text. Sample
 text. Sample text. Sample text. Sample text.
 Sample text.

Sincerely,

If the following WordprocessingML was added to this document, this document would become a *source document* rather than just a standard WordprocessingML document, as the mailMerge (§17.14.20) element specifies the elements and attributes necessary to enabled the document to connect to an external spreadsheet data source.

```
<w:mailMerge>
...
<w:dataType w:val="spreadsheet" />
<w:query w:val="SELECT * FROM `Sheet1$`" />
<w:dataSource r:id="rId1" />
...
</w:mailMerge>
```

Here, the dataType (§17.14.10) and dataSource (§17.14.9) elements specify that the given document must be connected to the external data source target by the relationship whose relationship value is rId1 as specified in the dataSource element (§17.14.9). While connected to the external data source, the *source document* together with the hosting application and/or data source access application extracts data from the external data source to perform the merge as specified by the connectionString (§17.14.8) and query (§17.14.26) elements. *end example*]

17.14.1 active (Record Is Included in Mail Merge)

This element specifies whether a specific record from the specified external data source shall be imported into a merged WordprocessingML document when the mail merge defined for a source document is performed. If this

element's `val` attribute is `false`, then the record specified by the parent element shall not be used to create a merged document.

If this element is omitted for a given record, the data record associated with it shall be imported into a merged WordprocessingML document when the mail merge is performed.

[*Example:* Consider the following fragment from a source WordprocessingML document that is connected to an external data source containing two records, one of which is not imported into a merged WordprocessingML document when the conforming hosting application performs the data import.

```
<w:recipients>
  <w:recipientData>
    <w:active w:val="false" />
    ...
    <w:uniqueTag>1126664175</w:uniqueTag>
  </w:recipientData>
  <w:recipientData>
    ...
    <w:uniqueTag>1530576378</w:uniqueTag>
  </w:recipientData>
</w:recipients>
```

In this XML fragment, the external data record who is identified by the `uniqueTag` element (§17.14.35) with a `val` attribute equal to 1126664175 is not imported into a merged document as the active element associated with it has a `val` attribute equal to `false`. Conversely, the external data record associated with the `uniqueTag` element with a `val` attribute equal to 1530576378 is imported into a merged document, as its active element has been omitted (implying the default value of `true`). *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.14.2 activeRecord (Record Currently Displayed In Merged Document)

This element specifies that the hosting application shall display the given record from the specified external data source in place of the `MERGEFIELD` fields (§17.16.5.35) its data is mapped to via the `fieldMapData` element (§17.14.15) in a merged document. When this element is present, the `val` attribute shall specify the one-based index of the record from that data source which shall be used to populate this document.

If the `activeRecord` element is omitted with the `viewMergedData` element's `val` attribute equal to `true`, the hosting application shall behave as if the `activeRecord` element's `val` attribute was equal to 1. If the `viewMergedData` element (§17.14.36) is omitted or present with a `val` attribute equal to 0 or `false`, then this element shall be ignored. If the `activeRecord` record is given a `val` attribute that is less than one or greater than the number of records in the specified external data source, the hosting application shall treat this `val` attribute as if it were equal to 1.

[*Example:* Consider a merged WordprocessingML document containing two WordprocessingML fields calling for Courtesy Title and Last Name data and a sample text paragraph. Also, note that the external data source this merged document is connected to contains two records, both containing name and address information, with the first record pertaining to Mr. Doe, and the second pertaining to Ms. Smith.

This table below illustrates the necessary WordprocessingML to display applicable data from the specified external data source within the merged document where fields have been inserted:

<code><w:viewMergedData val="0"/></code>	<code><w:viewMergedData val="1" /></code> <code><w:activeRecord w:val="1" /></code>	<code><w:viewMergedData val="1" /></code> <code><w:activeRecord w:val="2" /></code>
Dear {MERGEFIELD "Courtesy Title" \m} {MERGEFIELD "Last Name" \m}, Sample letter text. Sample letter text. Sample letter text. Sample letter text. Sample letter text. Sample letter text. Sincerely,	Dear Mr. Doe: Sample letter text. Sample letter text. Sample letter text. Sample letter text. Sample letter text. Sample letter text. Sincerely,	Dear Ms. Smith: Sample letter text. Sample letter text. Sample letter text. Sample letter text. Sample letter text. Sample letter text. Sincerely,

end example]

[*Example:* Consider the following WordprocessingML from a merged WordprocessingML document:

```
<w:viewMergedData />  
<w:activeRecord w:val="2" />
```

The activeRecord element is present and has a val attribute equal to 2, therefore this WordprocessingML specifies that a conforming hosting application must display data from the second record of the specified external data source in place of fields its data is mapped to within the merged document. *end example]*

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <p><code><... w:val="1512645511" /></code></p>

Attributes	Description
	<p>The value of the <code>val</code> attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_DecimalNumber</code> simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model (`CT_DecimalNumber`) is located in §A.1. *end note*]

17.14.3 addressFieldName (Column Containing E-mail Address)

This element specifies the column within a given external data source that contains e-mail addresses. This element is specified independently of the field mappings specified for a given merged document via the `fieldMapData` element (§17.14.15).

If this element is omitted, or no column exists in the data source with this column name, then the source document specifies that no e-mail address data shall be associated with this mail merge.

[*Note:* This element is generally used to allow the e-mailing of merged documents resulting from populating the fields within a merged document with external data.

This element is independent of the field mapping specified for a given merged document via the `fieldMapData` element (§17.14.15). This separation enables applications to email the documents resulting from the population of WordprocessingML fields with external data regardless of the presence or absence of a field mapped to external data specifying email addresses. *end note*]

[*Example:* Consider a merged WordprocessingML document that is connected to an external data source containing a column of data titled `Alternate Email Addresses`. The following WordprocessingML would be included in the source and merged documents to specify which column in the external data source contains email addresses.

```
<w:addressFieldName w:val="Alternate Email Address" />
```

The `addressFieldName` element specifies that the `Alternate Email Address` column contains e-mail addresses for each record. *end example*]

Attributes	Description
<code>val</code> (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p>

Attributes	Description
	<pre data-bbox="451 254 954 348"><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p data-bbox="414 388 1409 420">The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p data-bbox="414 459 925 491">However, consider the following fragment:</p> <pre data-bbox="451 531 1079 663"><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p data-bbox="414 703 1477 804">In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p data-bbox="414 844 1339 909">The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_String](#)) is located in §A.1. *end note*]

17.14.4 checkErrors (Mail Merge Error Reporting Setting)

This element specifies the type of error reporting which shall be conducted by an application when performing a mail merge against the specified source data.

The type of error reporting implied by this element shall be defined as follows:

- Simulate the population of fields with mapped external data and report errors in a new document if the val attribute is equal to 1.
- While populating fields with mapped external data, pausing to report each error as it occurs if the val attribute is equal to 2.
- Populate fields with mapped external data and report errors in a new document if the val attribute is equal to 3.
- Application-defined behaviors can be used if the val attribute is equal to any other value.

If this element is omitted, or its value is set to a value outside of those specified below that is not understood by the hosting application, then its value shall be assumed to be 2.

[Example: Consider a mail merge whose WordprocessingML definition includes the following:

```
<w:checkErrors w:val="3" />
```

The presence of a `checkErrors` element with a `val` attribute of 3 indicates that the hosting application must conduct the type of error reporting specified above, performing the mail merge, populating fields with mapped external data and reporting errors in a new document . *end example*]

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following numeric WordprocessingML property of simple type <code>ST_DecimalNumber</code>:</p> <pre><... w:val="1512645511" /></pre> <p>The value of the <code>val</code> attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_DecimalNumber</code> simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model (`CT_DecimalNumber`) is located in §A.1. *end note*]

17.14.5 colDelim (Column Delimiter for Data Source)

This element specifies the character which shall be interpreted as the column delimiter used to separate columns within external data sources. The character representing the specific delimiter used for the external data source referenced by a source or merged WordprocessingML document is specified via a decimal number representing the decimal number for the Unicode character representation within this element's `val` attribute.

If this element is omitted, then no column delimiter shall be specified for the data source in this mail merge.

[*Example:* Consider the following WordprocessingML fragment:

```
<w:colDelim w:val="44" />
```

Here, the `colDelim` element's `val` attribute specifies that the given external data source is using the comma character (,) to delimit column data, as 44 is the decimal value for the Unicode character representation of a comma. *end Example*]

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent</p>

Attributes	Description
	<p>XML element.</p> <p>[<i>Example</i>: Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <p style="padding-left: 40px;"><code><... w:val="1512645511" /></code></p> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_DecimalNumber](#)) is located in §A.1. *end note*]

17.14.6 column (Index of Column Being Mapped)

This element specifies the zero-based index of the column within a given external data source which shall be mapped to the local name of a specific MERGEFIELD field (§17.16.5.35) specified by the parent field mapping data. The val attribute specifies this index value, which is used to look up the appropriate column in the data source.

If this element is omitted, or its value exceeds the number of columns in the associated data source, then the index of the referenced column shall be assumed to be 0.

[*Example*: Consider a source document that is connected to an external data source with three columns. Within this external data source, these are three columns are ordered and titled as follows: first, middle, and last, respectively. The following WordprocessingML specifies that when this document was connected to the data source, these columns were ordered in this manner:

```

<w:fieldMapData>
  ...
  <w:name w:val="first" />
  <w:column w:val="0" />
</w:fieldMapData>
<w:fieldMapData>
  ...
  <w:name w:val="middle" />
  <w:column w:val="1" />
</w:fieldMapData>
<w:fieldMapData>
  ...
  <w:name w:val="last" />
  <w:column w:val="2" />
</w:fieldMapData>

```

The WordprocessingML above demonstrates that the column titled `first` must be associated with the first column in the external database by specifying a column element with its `val` attribute equal to 0. In addition, the column titled `middle` must be associated with the second column in the external database by specifying a column element with its `val` attribute equal to 1. Finally, the column titled `last` must be associated with the third column in the external database by specifying a column element with its `val` attribute equal to 2. *end example*]

It is important to realize that the name element's values are a cache of the last time the document was connected to the database, and the indices specified must be used to connect the field mappings with the columns in the data source. *end example*]

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example</i>: Consider the following numeric WordprocessingML property of simple type <code>ST_DecimalNumber</code>:</p> <pre><... w:val="1512645511" /></pre> <p>The value of the <code>val</code> attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_DecimalNumber</code> simple type (§17.18.10).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_DecimalNumber](#)) is located in §A.1. *end note*]

17.14.7 column (Index of Column Containing Unique Values for Record)

This element specifies the column within the specified external data source that contains unique data for the current record within that data source. This element shall be used in conjunction with the uniqueTag element (§17.14.35) to maintain a relationship between a specific record within an external data source and a given source or merged document. The val attribute on this element shall be interpreted as a zero-based index into the columns specified by the data source, specifying the resulting column as the column in which the uniqueTag element shall be looked up.

If this element specifies a column number which exceeds the number of columns in the specified external data source, then its value shall be ignored.

[*Note*: This information is necessary as part of a mail merge as records can be added or deleted from external data sources, and a means must be provided to maintain record-specific inclusion or exclusion data using the active element (§17.14.1) and the affected external data record when the WordprocessingML document is reconnected to the external data source irrespective of the ordering of the records within the external data source. *end note*]

[*Example*: Consider the following WordprocessingML fragment for the information about a single record in a source document for a mail merge:

```
<w:recipientData>
  <w:active w:val="0" />
  <w:column w:val="12" />
  <w:uniqueTag>258865469</w:uniqueTag>
</w:recipientData>
```

The external data record associated with this information is specified via the column in the external data source corresponding to the column element with a val attribute equal to 12, which contains a row whose value in this column has a value corresponding to the uniqueTag element (§17.14.35) with a val attribute equal to 258865469. This record is not imported into the merged WordprocessingML document as the active (§17.14.1) element associated with the given external data record has a val attribute equal to 0.

In other words, when the specified external data source is connected to, the record within the thirteenth column of the external data source that has the contents 258865469, and not populate mapped fields in a merged document with data from that record. *end example*]

Attributes	Description
val (Decimal Number Value)	Specifies that the contents of this attribute contains a decimal number. The contents of this decimal number are interpreted based on the context of the parent XML element.

Attributes	Description
	<p>[<i>Example:</i> Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <pre data-bbox="451 394 841 426"><... w:val="1512645511" /></pre> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DecimalNumber](#)) is located in §A.1. *end note*]

17.14.8 connectString (Data Source Connection String)

This element specifies the connection string used to reconnect to an external data source. The string within this element's val attribute shall contain the connection string that the hosting application shall pass to a external data source access application to enable the WordprocessingML document to be reconnected to the specified external data source.

[*Note:* This string is generally comprised of a series of name/value pairs, delimited by semicolons, determined by the data source access application and the external data source that is accessed. *end note*]

If this string is omitted, then no legacy connection string shall be associated with this mail merge.

This connection string should be ignored under the following conditions:

- The udl element (§17.14.34) is present within the mail merge data
- The dataType element (§17.14.10) is set to native
- The current application is able to use the information contained in the odso element (§17.14.25) to access the data source

[*Guidance:* In this case, using the connection string in the udl element provides an equal or greater amount of connection information for the mail merge data source for clients which support it. *end guidance*]

[*Example:* Consider a merged WordprocessingML document that has been connected to an external data source for the purposes of a mail merge. The following WordprocessingML fragment represents the legacy connection string used to connect to the external data source when the merged WordprocessingML document is reopened:

```
<w:connectString w:val="Provider=Example;Password=Test;User ID=readonly;..." />
```

The `connectString` element specifies that the string `Provider=Example;Password=Test;User ID=readonly;...` must be used to enable the given WordprocessingML document to be reconnected to the specified external data source. *end example*

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[Example: Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the <code>val</code> attribute is the ID of the associated paragraph style's <code>styleId</code>.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the <code>val</code> attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element’s content model (`CT_String`) is located in §A.1. *end note*]

17.14.9 dataSource (Data Source File Path)

This element specifies the relationship whose target is the location of the external data source to be connected to a given WordprocessingML document to perform the mail merge (for a source document) or to find the associated field data (for a merged document).

If this element is omitted, then no file location is specified for the data source for the current mail merge. If no relationship exists with the given relationship ID, or this relationship is not of type `http://purl.oclc.org/ooxml/officeDocument/relationships/mailMergeSource` then this document shall be considered non-conformant.

The data source location can also be ignored under the following conditions:

- The src element (§17.14.30) is present within the mail merge data
- The dataType element (§17.14.10) is set to native
- The current application is able to use the information contained in the odso element (§17.14.25) to access the data source

[*Guidance*: In this case, using the data source file path in the src element provides an equal or greater amount of information for the mail merge data source for clients which can consume it. *end guidance*]

[*Example*: Consider a WordprocessingML source document containing the following mail merge data:

```
<w:mailMerge>
...
  <w:dataSource r:id="rId1" />
...
</w:mailMerge>
```

This mail merge's dataSource element specifies via its r:id attribute value of rId1 that the external data source to be connected to the given WordprocessingML document is the data source targeted by the relationship whose Id attribute is equal to rId1. If we examine the corresponding relationship part item for the setting part, as follows:

```
<Relationships>
  <Relationship Id="rId1"
Type="http://purl.oclc.org/ooxml/officeDocument/relationships/mailMergeSource"
Target="file:///c:/example_file.mdb" TargetMode="External" />
</Relationships>
```

Since the relationship whose Id attribute value is rId1 specifies the source file path for the data source, that data source effectively specifies a file path of c:\example_file.mdb. *end example*]

Attributes	Description
id (Relationship to Part) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the relationship ID to a specified part. The specified relationship shall match the relationship type required by the parent element: <ul style="list-style-type: none"> • http://purl.oclc.org/ooxml/officeDocument/relationships/customXml for the contentPart element • http://purl.oclc.org/ooxml/officeDocument/relationships/footer for the footerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/header for the headerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/font for the embedBold, embedBoldItalic, embedItalic, or embedRegular elements • http://purl.oclc.org/ooxml/officeDocument/relationships/printerSettings for the printerSettings element

Attributes	Description
	<ul style="list-style-type: none"> • http://purl.oclc.org/ooxml/officeDocument/relationships/hyperlink for the longDesc or hyperlink element <p>[<i>Example:</i> Consider an XML element which has the following id attribute:</p> <pre><... r:id="rId10" /></pre> <p>The markup specifies the associated relationship part with relationship ID rId1 contains the corresponding relationship information for the parent XML element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Rel](#)) is located in §A.1. *end note*]

17.14.10 dataType (Data Source Type)

This element specifies the type of external data source to be connected to via the Dynamic Data Exchange (DDE) system (such as a spreadsheet or database), or the alternative method of data access if the Dynamic Data Exchange system is not used. This setting is purely a suggestion of the data source access mechanism which shall be used, and can be ignored in favor of an alternative mechanism if one is present.

[*Example:* Consider the following WordprocessingML fragment for a mail merge source or merged document:

```
<w:dataType w:val="odbc" />
```

The dataType element's val attribute is equal to odbc, specifying that the given merged WordprocessingML document has been connected to an external data source via the Open Database Connectivity interface. *end example*]

Attributes	Description
val (Value)	<p>Specifies the exact type of external data source to which a given merged WordprocessingML document is to be connected.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment for a mail merge document.</p> <pre><w:dataType w:val="database" /></pre> <p>The val attribute is equal to database, specifying that the given WordprocessingML document has been connected to a database via the Dynamic Data Exchange (DDE) system. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_MailMergeDataType simple type (§17.18.52).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_MailMergeDataType](#)) is located in §A.1. *end note*]

17.14.11 destination (Merged Document Destination)

This element specifies what the result which shall be generated when a mail merge is carried out on a given WordprocessingML source document. In other words, this element is used to specify what is to be done with the merged documents that result from populating the fields within a given merged WordprocessingML document with data from the specified external data source.

If this element is omitted, then the default destination of merged documents shall be assumed to be of type `newDocument`.

[Note: The aspects of the mail merge outside of connecting to an external data source and populating the fields within a given merged document with external data from the specified external data source are not specified by ECMA-376.

For example, if a given merged WordprocessingML document contains a destination element with its `val` attribute equal to `email`, the hosting application can surface a user interface specific to creating emails with the data resulting from populating fields within a given merged WordprocessingML document with external data from the specified external data source. WordprocessingML only provides a flag (via the destination element) to tell the hosting application to surface this user interface. *end note*]

[Example: Consider a WordprocessingML source document containing the following WordprocessingML:

```
<w:mailMerge>
  <w:destination w:val="newDocument" />
  ...
</w:mailMerge>
```

The destination element's `val` attribute is set to `newDocument`, specifying that when the mail merge is carried out, the source document must be used to generate a specified number of new documents, which can be handled as appropriate. *end example*]

Attributes	Description
<code>val</code> (Mail Merge Merged Document Type)	<p>Specifies the type of merged documents which shall be the result of carrying out a mail merge on a given source WordprocessingML document.</p> <p>[Example: Consider the WordprocessingML mail merge data specified as follows:</p> <pre><w:destination w:val="email" /></pre> <p>This specifies that a given merged WordprocessingML document is used by the hosting application to generate e-mails containing the static contents of the merged document as</p>

Attributes	Description
	well as external data populated into mapped fields. <i>end example</i> The possible values for this attribute are defined by the ST_MailMergeDest simple type (§17.18.53).

[Note: The W3C XML Schema definition of this element’s content model ([CT_MailMergeDest](#)) is located in §A.1. *end note*]

17.14.12 doNotSuppressBlankLines (Remove Blank Lines from Merged Documents)

This element specifies how an application performing the mail merge shall handle blank lines in the merged documents resulting from the mail merge. Typically, when a mail merge is performed, any blank lines which result from lines whose sole contents are merge fields with no content are removed from the merged document in order to prevent extraneous blank lines from appearing in the merged documents. When this element is present, the merged documents which are generated from the mail merge shall not have any blank lines removed before they are sent to their destination format.

If this element is omitted, the merged documents generated from this mail merge shall have all blank lines suppressed if they consist of only merge fields with values consisting of empty strings.

[Example: Consider a WordprocessingML document containing a single WordprocessingML field calling for Test data as seen in the first column of the table below. If the current record in the mail merge data source contains an empty string for the Test column, the resulting merged document would be displayed as follows depending on the setting for the doNotSuppressBlankLines element:

Source Document	<w:doNotSuppressBlankLines val="true" />	<w:doNotSuppressBlankLines val="false" />
One Two {MERGEFIELD "Test" } Three	One Two Three	One Two Three

With this element set to a value of true, the blank lines in the resulting document must not be suppressed when the resulting merged documents are created. *end example*]

This element’s content model is defined by the common boolean property definition in §17.17.4.

17.14.13 dynamicAddress (Use Country-Based Address Field Ordering)

This element specifies that the contents of the AddressBlock MERGEFIELD field shall be dynamically ordered based on the country associated with the current record or if the country-invariant version of the address field shall be used in its place. [Rationale: When a source document is combined with the contents of a data source in

order to produce multiple merged documents, it is often necessary to use an address form specific to the destination country for each particular record in the data source, rather than one static address form for all records. *end rationale*] If this element is set to `true`, then the mail merge shall use an address form suited to the country associated with the current record in the external data source.

If this element is omitted, then the form of the address shall be dynamically determined based on the country specified in the current record.

[*Example*: Consider a merged WordprocessingML document that is specified to **not** dynamically create the address field order based on the country associated with the current record. This requirement might be specified using the following WordprocessingML:

```
<w:fieldMapData>
...
  <w:dynamicAddress w:val="off" />
</w:fieldMapData>
```

The `dynamicAddress` element is set to a value of `off`, specifying that the dynamic address format must not be used when performing a mail merge with the specified data source. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.14.14 fHdr (First Row of Data Source Contains Column Names)

This element specifies that a hosting application shall treat the first row of data in the specified external data source as a header row containing the names of each column in the data source, rather than data to populate mapped fields in a merged document. When present, this information shall not change the indices specified in the `recipientData` elements (§17.14.27), but shall indicate that the first row is not part of the mail merge when it is performed.

If this element is omitted, then the first row of the data source shall not be considered a header row when a mail merge is performed.

[*Example*: Consider a WordprocessingML source document that has been connected to an external data source whose first row of data is not data the hosting application is to populate mapped fields with, but rather contains column names for each column in the data source. This setting on the data source is specified using the following fragment of WordprocessingML:

```
<w:fHdr w:val="on" />
```

The `fHdr` element specifies that the data source's first row is a header row, rather than regular data to be used in the mail merge. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.14.15 fieldMapData (External Data Source to Merge Field Mapping)

This element specifies how a column specified in the external data source that has been connected to a WordprocessingML document shall be mapped to the pre-defined MERGEFIELD fields (§17.16.5.35) within the given merged document's contents. Each instance of a fieldMapData element contains the information needed to map one column in the external data source to a single type of pre-defined MERGEFIELD field for the purposes of the mail merge in the current document.

[*Example:* Consider a single merged document. The WordprocessingML below demonstrates the mapping of the Country column from the external data source to the predefined WordprocessingML Country or Region merge field when the merged document is populated with external data as part of a mail merge:

```
<w:odso>
...
<w:fieldMapData>
  <w:type w:val="dbColumn" />
  <w:name w:val="Country" />
  <w:mappedName w:val="Country or Region" />
  <w:column w:val="9" />
...
</w:fieldMapData>
</w:odso>
```

The fieldMapData element specifies the mapping between the external data source and a single merge field as follows: the child elements specify that the tenth column in the data source, last titled Country in the specified external data source when the connection was last made is to be mapped to the predefined WordprocessingML merge field calling for Country or Region data.

With the fieldMapData element configured as such, an application can be used in conjunction with this WordprocessingML document to populate the document with data mapped from the specified external data source to fields within the merged document. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_OdsoFieldMapData](#)) is located in §A.1. *end note*]

17.14.16 headerSource (Header Definition File Path)

This element specifies the location of a file that contains the column header information which shall be used when connecting to an external data source that does not have column header data specified. Specifically, this element specifies a file that corresponds with the aforementioned external data source. [*Note:* Column headers are needed to enable a hosting application to associate external data source's columns to fields via the fieldMapData element (§17.14.15).

If this element is omitted, then the column header definition data is not specified in an external file and shall be retrieved from the primary data source associated with the mail merge.

[Example: Consider a WordprocessingML merged document containing the following WordprocessingML:

```
<w:settings>
...
<w:headerSource r:id="rId2" />
...
</w:settings>
```

This mail merge's headerSource element specifies via its r:id attribute value of rId2 that the external data source to be used for the column header information for the given WordprocessingML document is the data source targeted by the relationship whose Id attribute is equal to rId2. If we examine the corresponding relationship part item for the setting part, as follows:

```
<Relationships>
  <Relationship Id="rId2"
    Type="http://purl.oclc.org/ooxml/officeDocument/relationships/mailMergeSource"
    Target="file:///c:/headerData.txt" TargetMode="External" />
</Relationships>
```

Since the relationship whose Id attribute value is rId2 specifies the column header data file path for the data source effectively specifies a file path of c:\headerData.txt. *end example*]

Attributes	Description
id (Relationship to Part) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the relationship ID to a specified part. The specified relationship shall match the relationship type required by the parent element: <ul style="list-style-type: none"> • http://purl.oclc.org/ooxml/officeDocument/relationships/customXml for the contentPart element • http://purl.oclc.org/ooxml/officeDocument/relationships/footer for the footerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/header for the headerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/font for the embedBold, embedBoldItalic, embedItalic, or embedRegular elements • http://purl.oclc.org/ooxml/officeDocument/relationships/prINTERSettings for the prINTERSettings element • http://purl.oclc.org/ooxml/officeDocument/relationships/hyperlink for the longDesc or hyperlink element <p>[Example: Consider an XML element which has the following id attribute:</p> <pre><... r:id="rId10" /></pre> <p>The markup specifies the associated relationship part with relationship ID rId1 contains the corresponding relationship information for the parent XML element. <i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

[Note: The W3C XML Schema definition of this element’s content model ([CT_Rel](#)) is located in §A.1. *end note*]

17.14.17 lid (Merge Field Name Language ID)

This element specifies the language ID for the language which was used to generate the merge field name which was associated with a given column in the data source, as specified by the fieldMapData element (§17.14.15). This element specifies that when this field mapping is processed by an application, it shall interpret the merge field name as the name for the specified language.

If this element is omitted, then the mapped field names specified in the current document can be interpreted using any method desired by the consuming application (i.e. no language data is included with the field mapping information).

[Example: Consider the following WordprocessingML fragment for a field mapping for a document to be merged to an external data source. If the merge field name stored in the file corresponds with the U.S. English version of the merge field names, that information would be stored as follows:

```
<w:fieldMapData>
  <w:name w:val="Title" />
  <w:mappedName w:val="Courtesy Title" />
  <w:column w:val="3" />
  <w:lid w:val="en-US" />
  ...
</w:fieldMapData>
```

The lid element specifies that the mapping of the data contained in the fourth column of external data source named Title to the WordprocessingML of 'Courtesy Title', must be associated with the U.S. English language as specified by the val attribute equal to en-US. *end example*]

Attributes	Description
val (Language Code)	<p>Specifies an identifier for a specific language.</p> <p>This code is interpreted in the context of the parent XML element.</p> <p>[Example: Consider an object which must specify the English(Canada) language. That object would use an identifier of en-CA to specify this language. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Lang simple type (§22.9.2.6).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Lang](#)) is located in §A.1. *end note*]

17.14.18 linkToQuery (Query Contains Link to External Query File)

This element specifies that the current WordprocessingML document's query string, stored in the query element (§17.14.26) and used to specify the data to be imported from the external data source, actually contains a reference to an external query file which contains the actual query data to be used against the specified external data source for the mail merge. This query shall mimic a SQL query and be of the following form: `SELECT * FROM <query file path>`.

If this element is omitted, then the query specified for the data source attached to the current document shall be assumed to not be a query containing a link to an external file.

[*Example:* Consider a mail merge source document that uses the linkToQuery element to specify that the query used is stored in the specified external data source as follows:

```
<w:mailMerge>
...
<w:linkToQuery />
<w:query w:val="SELECT * FROM C:\queryExample.txt" />
...
</w:mailMerge>
```

The linkToQuery element specifies that the query string stored in the query element (§17.14.26) is actually just a reference to an externally stored query file, in this case, an external query file stored at `c:\queryExample.txt`. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.14.19 mailAsAttachment (Merged Document To E-Mail Attachment)

This element specifies that, after importing external data into fields to generate a series of destination WordprocessingML documents as e-mails, the resulting documents should be emailed as an attachment rather than the body of the actual e-mail.

If this element is omitted, then its value shall be assumed to be `false` (i.e. the destination source is not an e-mail attachment). If the destination element (§17.14.11) specifies that the merged document destination is not email, then this element shall be ignored.

[*Example:* Consider a merged WordprocessingML document that has been connected to an external data source containing three records and that contains the following WordprocessingML in its mail merge properties as follows:

```

<w:mailMerge>
...
<w:destination w:val="email" />
<w:mailAsAttachment />
...
</w:mailMerge>

```

After the external data has been imported into the merged document's respective merge fields, three emails is generated (as specified by the destination element (§17.14.11) with a val attribute of `email`, each an attachment consisting of one of the three documents resulting from the mail merge result (rather than just including the merged document as the body of the email). *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.14.20 mailMerge (Mail Merge Settings)

This element specifies all of the mail merge information for a document that has been connected to an external data source as part of a mail merge operation.

The document which contains this mail merge data can be of one of two types:

- A *source document*, the document which contains all of the information for the mail merge, and is used in conjunction with an application to connect to an external data source and create one document for each record in that data source.
- A *merged document*, a document which contains all of the information for the mail merge as well as a reference to a single specific record which shall be used to populate the values of all of the merge fields in that document.

The information in this element shall contain all data needed to connect to a data source and populate any merge fields in the document with data from that data source.

[*Example*: Consider the following WordprocessingML fragment for a document which is part of a mail merge:

```

<w:mailMerge>
...
<w:dataType w:val="spreadsheet" />
<w:query w:val="SELECT * FROM `Sheet1$`" />
<w:dataSource r:id="rId1" />
...
</w:mailMerge>

```

Here, the `dataType` (§17.14.10) and `dataSource` (§17.14.9) elements specify that the given document must be connected to the external data source referenced by the relationship whose id value is equal to `rId1`. While connected to the external data source, the document together with a hosting application can extract data from the external data source as specified by the query (§17.14.26) element. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_MailMerge](#)) is located in §A.1. *end note*]

17.14.21 mailSubject (Merged E-mail or Fax Subject Line)

This element specifies the text which shall appear in the subject line of the e-mails or faxes that result after the actions of a mail merge have imported external data into fields within a merged WordprocessingML document whose destination, as specified in the destination element (§17.14.21), is email or fax.

If this element is omitted, then no subject line text shall be associated with each merged document produced via a mail merge using the specified mail merge data. If the destination element (§17.14.11) specifies that the merged document destination is not email or fax, this element shall be ignored.

[*Example:* Consider a merged WordprocessingML document containing fields and the following WordprocessingML as part of its mail merge data:

```
<w:mailMerge>
...
<w:destination w:val="email" />
<w:mailSubject w:val="Example Subject Line" />
...
</w:mailMerge>
```

The mailSubject element specifies that after the specified external data has been imported into the specified fields in the merged document, each record merged must result in a single e-mail message, each with their subject line reading Example Subject Line. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre>

Attributes	Description
	<p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_String](#)) is located in §A.1. *end note*]

17.14.22 mainDocumentType (Source Document Type)

This element specifies the document type of a given WordprocessingML source document.

If this element is omitted, then its value shall be assumed to be formLetters.

[Note: This element is generally used in conjunction with the behavior of an application to customize aspects of the mail merge user interface and experience independent of the WordprocessingML file format. For example, if a given WordprocessingML merged document contains a mainDocumentType element with its val attribute equal to envelopes, the hosting application can surface a piece of user interface specific to creating envelopes when the given document is opened.

In addition, what a hosting application does with the documents that result from importing external data into specified fields can be determined based on the mainDocumentType element, but other than this, is independent of a given merged document's WordprocessingML. For example, if a given merged WordprocessingML document contains a mainDocumentType element with its val attribute equal to email, the hosting application can call a email service after importing external data into specified fields, in order to generate emails containing the resulting documents.

WordprocessingML simply provides the mainDocumentType that can serve as a trigger for an application to surface user interface specific to a document type of mail merge. *end note*]

[Example: Consider the WordprocessingML below:

```
<w:mailMerge>
  <w:mainDocumentType w:val="formLetters" />
  ...
</w:mailMerge>
```

In this example, the source document is of the formLetters type, as specified by the mainDocumentType element's val attribute being equal to formLetters. *end example*]

Attributes	Description
val (Mail Merge)	Specifies the type of source document which is specified by the given WordprocessingML

Attributes	Description
Source Document Type)	<p>document.</p> <p>[<i>Example:</i> Consider the WordprocessingML below:</p> <pre><w:mainDocumentType w:val="formLetters" /></pre> <p>This WordprocessingML specifies that a given source document is a formLetters document. This setting implies nothing about the file, but can be interpreted by an application as desired. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_MailMergeDocType simple type (§17.18.54).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_MailMergeDocType](#)) is located in §A.1. *end note*]

17.14.23 mappedName (Predefined Merge Field Name)

This element specifies the predefined WordprocessingML MERGEFIELD field name which shall be mapped to the column number specified by the column element (§17.14.6) within this field mapping. [*Guidance:* This element allows the current column from the specified data source to be mapped to a predefined field name, allowing applications to have one standard set of field names to use regardless of the data source column names, for example, to create the address formats to place into an ADDRESSBLOCK field. *end guidance*]

If this element is omitted, then the current data source column mapping shall not have a predefined merge field name mapped to its contents, and shall only be referenced via the data source column name specified by the name element (§17.14.24) when referenced by one or more MERGEFIELD fields. If the application does not have a predefined merge field whose name matches the name specified using the val attribute, then this element can be ignored.

[*Example:* Consider the following WordprocessingML fragment, representing two columns from an external data source which have been mapped to the built-in fields First Name and Last Name, respectively:

```
<w:fieldMapData>
  <w:name w:val="Column Name A" />
  <w:mappedName w:val="First Name" />
  <w:column w:val="0" />
  ...
</w:fieldMapData>
<w:fieldMapData>
  <w:name w:val="Column Name B" />
  <w:mappedName w:val="Last Name" />
  <w:column w:val="1" />
```

...
</w:fieldMapData>

The first and second columns, specified by the column element values of 0 and 1 respectively, specify that the predefined WordprocessingML field names First Name and Last Name are mapped to the columns of the external data source, and the data source names for those columns are Column Name A and Column Name B, respectively.

Therefore, if MERGEFIELD fields calling for First Name and Last Name are inserted in a WordprocessingML document connected to the external data source with the field mappings specified above, when the mail merge takes place, the data from the first and second column populates the fields calling for First Name and Last Name data within the merged WordprocessingML document. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_String](#)) is located in §A.1. *end note*]

17.14.24 name (Data Source Name for Column)

This element specifies the column name within a given external data source for the column whose index is specified via the column element (§17.14.6). This data source name provides a column name which shall be used to map a specific MERGEFIELD field in the document, as specified by the parent field mapping data. The val attribute specifies the name of this column in the data source when the connection is initially established, which is then used permanently to link columns in the database to MERGEFIELD fields in the document.

If this element is omitted, no data source name is provided for the current column.

[*Example:* Consider a source document that is connected to an external data source with three columns. Within this external data source, these are three columns are ordered and titled as follows: first, middle, and last, respectively. The following WordprocessingML specifies that when this document was connected to the data source, these columns were ordered in this manner:

```
<w:fieldMapData>
  ...
  <w:name w:val="first" />
  <w:column w:val="0" />
</w:fieldMapData>
<w:fieldMapData>
  ...
  <w:name w:val="middle" />
  <w:column w:val="1" />
</w:fieldMapData>
<w:fieldMapData>
  ...
  <w:name w:val="last" />
  <w:column w:val="2" />
</w:fieldMapData>
```

The WordprocessingML above demonstrates that the column name first must be associated with the first column in the external database by specifying a column element with its val attribute equal to 0. In addition, the column name middle must be associated with the second column in the external database by specifying a column element with its val attribute equal to 1. Finally, the column name last must be associated with the third column in the external database by specifying a column element with its val attribute equal to 2. *end example]*

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p>

Attributes	Description
	<pre data-bbox="451 283 954 384"><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p data-bbox="414 422 1409 453">The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p data-bbox="414 493 922 525">However, consider the following fragment:</p> <pre data-bbox="451 564 1079 695"><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p data-bbox="414 735 1474 840">In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p data-bbox="414 879 1339 945">The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element’s content model (CT_String) is located in §A.1. *end note*]

17.14.25 odso (Office Data Source Object Settings)

This element specifies a group of additional settings for the mail merge information which comprise an extension to the standard settings stored with a mail merge which performs two functions:

- First, it provides additional information about the mail merge data source, specifically: information about how to map the columns in the data source to MERGEFIELD fields and information about records which shall be included and excluded when creating merged documents, and column delimiters used in text data sources. This information can be used regardless of the value of the dataType element (§17.14.10) when it is present.
- Second, it provides an alternate set of connection information which should be used when the dataType element (§17.14.10) specifies a value of native. This alternate connection string provides additional connection information for applications which choose to support the ODSO connection string syntax. If the dataType element (§17.14.10) specifies that the data type of the current mail merge is not native, then the second group of settings specified within this element shall be ignored in favor of their non-ODSO equivalents.

[Example: Consider the WordprocessingML for a source document whose mail merge includes mail merge information including ODSO settings as follows:

```

<w:odso>
  <w:udl w:val="..." />
  <w:table w:val="Sheet1$" />
  <w:src r:id="rId1" />
  <w:colDelim w:val="9" />
  <w:fHdr w:val="1" />
  <w:fieldMapData>
    <w:type w:val="dbColumn" />
    <w:name w:val="Title" />
    <w:mappedName w:val="Courtesy Title" />
    <w:lid w:val="en-US" />
  </w:fieldMapData>
  <w:recipientData r:id="rId2" />
  ...
</w:odso>

```

The odso element and its child elements provide all of the information specified above that is needed to carry out a mail merge with the current document. This includes alternate connection information using the udl, table, and src elements, and additional mail merge information in the other child elements. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_Odso](#)) is located in §A.1. *end note*]

17.14.26 query (Query For Data Source Records To Merge)

This element contains the Structured Query Language string (as defined by the normative reference in §3) that shall be run against the specified external data source to return the set of records from the external data which shall be imported into merged WordprocessingML documents when the mail merge operation is performed.

If this element is omitted, then no query shall be associated with the current data source.

[Example: Consider a WordprocessingML document that has been connected to an external database. In addition, consider that the data specifies that the table within the database titled Documentation shall be the specific table whose data is imported. This shall be specified in WordprocessingML as follows:

```
<w:query w:val="SELECT * FROM Documentation" />
```

The query element specifies the syntax for the data source query via its val attribute. *end example*

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[Example: Consider the following WordprocessingML fragment:</p>

Attributes	Description
	<pre data-bbox="451 247 954 346"><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p data-bbox="414 384 1409 415">The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p data-bbox="414 457 925 489">However, consider the following fragment:</p> <pre data-bbox="451 527 1079 661"><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p data-bbox="414 699 1477 804">In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p data-bbox="414 842 1339 909">The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_String](#)) is located in §A.1. *end note*]

17.14.27 recipientData (Data About Single Data Source Record)

This element specifies information about a single record within an external data source. If a record shall be merged into a merged document, then no information is needed about that record within this part. However, if a given record shall not be merged into a merged document, then the value of the unique key for that record shall be stored within the uniqueTag element as a child of this element (along with the active element) to indicate this exclusion.

[Note: This mapping is necessary in place of simply using the element order to correspond to the record indices in the external data source, as records can be added or deleted from external data sources, and a means must be provided to maintain WordprocessingML external record specific data like that specified in the active element (§17.14.1) and the corresponding external data record when the WordprocessingML document is reconnected to the external data source; irrespective of the ordering of the records within the external data source. In other words, this element, and its child elements enable merged WordprocessingML documents to maintain the relationship between the records within an external data and record specific WordprocessingML parameters. *end note*]

[Example: Consider a merged WordprocessingML document that:

1. Has been connected to a specified external data source containing three records; and
2. Has been configured by the hosting application to not populate a merged document with the record pertaining to John Smith in the external data source.

Consider also that the first time the given WordprocessingML document was connected to the external data source, John Smith's record was in the second record in the data source.

When this merged document is connected to the external data source the recipientData element can be used to store the number and value of the column containing the unique key for each data record within the external data source including John Smith's. This setting is represented using the following WordprocessingML to use the hash codes within the recipientData element to uniquely identify the three records within the external data source.

```
<w:recipientData>
  <w:column w:val="1" />
  <w:uniqueTag>1408613399</w:uniqueTag>
</w:recipientData>
<w:recipientData>
  <w:active w:val="0" />
  <w:column w:val="1" />
  <w:uniqueTag>870254691</w:uniqueTag>
</w:recipientData>
<w:recipientData>
  <w:column w:val="1" />
  <w:uniqueTag>1107777181</w:uniqueTag>
</w:recipientData>
```

Here, the first, second (John Smith record), and third records within the specified data source whose unique key values are 1408613399, 870254691, and 1107777181 have been associated with with recipient data via the active element to specify that the record associated with the given record (John Smith's record) must not be used to populate a merged WordprocessingML document.

With these association in place, if a fourth record is added to the given external data source above John Smith's record, when the given merged WordprocessingML document is reconnected to the external data source, the hosting application still knows that John Smith's record must not be used to populate a merged WordprocessingML document as it is associated via its unique key value and is not dependent on the given record's ordinal position within the external data source. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_RecipientData](#)) is located in §A.1. *end note*]

17.14.28 recipientData (Reference to Inclusion/Exclusion Data for Data Source)

This element shall specify a reference to the part which contains data about whether the set of records in the associated data source have been explicitly included or excluded from the specified mail merge. Only those records which must not be used to generate merged WordprocessingML documents shall be stored within the referenced part, as all records shall be merged by default as part of the mail merge operation. [*Guidance:* Applications can choose to store only those records which are excluded for efficiency, or a list of all records in order to determine which set of records were added/removed between mail merge operations. *end guidance*]

[*Rationale*: When defining a mail merge, it is possible that a user wishes to connect to a specified data source, but specify only a subset of the records returned by the query specified by the query element (§17.14.26) which must be merged as part of the mail merge operation. This element allows applications to utilize a separate part to store this information, either the shared part defined by ECMA-376, or an application-defined part as needed. *end rationale*]

If the relationship type of the relationship specified by this element is not

<http://purl.oclc.org/ooxml/officeDocument/relationships/mailMergeRecipientData>, is not present, or does not have a TargetMode attribute value of Internal, then the document shall be considered non-conformant. If an application cannot process external content of the content type specified by the targeted part, then it can be ignored.

ECMA-376 defines one shared mechanism for storing this data: using the Mail Merge Recipient Data part. This mechanism shall be used if the associated data source has a column which can be used as the unique key. However, when using data sources which do not have a unique key, applications can store their own part (of an application-defined content type) using this relationship.

[*Example*: Consider a WordprocessingML document which is a mail merge source document, containing inclusion/exclusion data for the data source. The document settings part would contain the mail merge data:

```
<w:settings>
...
<w:mailMerge>
...
<w:odso>
...
  <w:recipientData r:id="recipient1" />
</w:odso>
</w:mailMerge>
</w:settings>
```

The recipientData element specifies that the external content targeted by the relationship with an ID of recipient1 contains the recipient inclusion/exclusion data for the mail merge operation. Examining the contents of the corresponding relationship part item, we can see the targets for that relationship:

```
<Relationships ... >
...
  <Relationship Id="recipient1" TargetMode="Internal"
Type="http://purl.oclc.org/ooxml/officeDocument/relationships/mailMergeRecipientData,"
Target="recipientData.xml" />
...
</Relationships>
```

The corresponding relationship part item shows that the file containing this data is located next to the main document and is named recipientData.xml. *end example*]

Attributes	Description
<p>id (Relationship to Part)</p> <p>Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships</p>	<p>Specifies the relationship ID to a specified part.</p> <p>The specified relationship shall match the relationship type required by the parent element:</p> <ul style="list-style-type: none"> • http://purl.oclc.org/ooxml/officeDocument/relationships/customXml for the contentPart element • http://purl.oclc.org/ooxml/officeDocument/relationships/footer for the footerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/header for the headerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/font for the embedBold, embedBoldItalic, embedItalic, or embedRegular elements • http://purl.oclc.org/ooxml/officeDocument/relationships/printerSettings for the printerSettings element • http://purl.oclc.org/ooxml/officeDocument/relationships/hyperlink for the longDesc or hyperlink element <p>[Example: Consider an XML element which has the following id attribute:</p> <pre><... r:id="rId10" /></pre> <p>The markup specifies the associated relationship part with relationship ID rId1 contains the corresponding relationship information for the parent XML element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Rel](#)) is located in §A.1. *end note*]

17.14.29 recipients (Inclusion/Exclusion Data for Data Source)

This element specifies all of the inclusion/exclusion data for the contents of the specified mail merge data source. It is the root element for the Mail Merge Recipient Data part.

[Example: Consider a document which is the source document for a mail merge operation. If two records of the three specified by the data source were excluded from the mail merge, the resulting recipient data part would appear as follows:

```
<w:recipients>
  <w:recipientData>
    <w:active w:val="false"/>
    ...
  </w:recipientData>
```

```

    <w:recipientData>
      <w:active w:val="false"/>
      ...
    </w:recipientData>
    <w:recipientData>
      ...
    </w:recipientData>
  </w:recipients>

```

The recipients element contains all of the recipient inclusion/exclusion data for this mail merge document. *end example]*

[Note: The W3C XML Schema definition of this element's content model ([CT_Recipients](#)) is located in §A.1. *end note]*

17.14.30 src (ODSO Data Source File Path)

This element specifies the relationship whose target is the location of the external data source to be connected to a given WordprocessingML document to perform the mail merge (for a source document) or to find the associated field data (for a merged document) when the merge type, specified using the dataType element (§17.14.10), is set to native.

If this element is omitted, then no file location is specified for the data source for the current mail merge. If no relationship exists with the given relationship ID, or this relationship is not of the Mail Merge Data Source relationship type, then this document shall be considered non-conformant.

The data source location is only used under the following conditions:

- The dataType element (§17.14.10) is set to native
- The current application is able to use the information contained in the odso element (§17.14.25) to access the data source

[Guidance: In this case, using the data source file path in the src element provides an equal or greater amount of information for the mail merge data source for clients which can consume it. *end guidance]*

[Example: Consider a WordprocessingML source document containing the following mail merge data:

```

<w:odso>
  ...
  <w:src r:id="rId1" />
  ...
</w:odso>

```

This mail merge's src element specifies via its r:id attribute value of rId1 that the external data source to be connected to the given WordprocessingML document is the data source targeted by the relationship whose Id

attribute is equal to rId1. If we examine the corresponding relationship part item for the setting part, as follows:

```
<Relationships>
  <Relationship Id="rId1"
    Type="http://purl.oclc.org/ooxml/officeDocument/relationships/mailMergeSource"
    Target="file:///c:/example_file.mdb" TargetMode="External" />
</Relationships>
```

Since the relationship whose Id attribute value is rId1 specifies the source file path for the data source, that data source effectively specifies a file path of c:\example_file.mdb. *end example*

Attributes	Description
id (Relationship to Part) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	<p>Specifies the relationship ID to a specified part.</p> <p>The specified relationship shall match the relationship type required by the parent element:</p> <ul style="list-style-type: none"> • http://purl.oclc.org/ooxml/officeDocument/relationships/customXml for the contentPart element • http://purl.oclc.org/ooxml/officeDocument/relationships/footer for the footerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/header for the headerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/font for the embedBold, embedBoldItalic, embedItalic, or embedRegular elements • http://purl.oclc.org/ooxml/officeDocument/relationships/printerSettings for the printerSettings element • http://purl.oclc.org/ooxml/officeDocument/relationships/hyperlink for the longDesc or hyperlink element <p>[Example: Consider an XML element which has the following id attribute:</p> <pre><... r:id="rId10" /></pre> <p>The markup specifies the associated relationship part with relationship ID rId1 contains the corresponding relationship information for the parent XML element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Rel](#)) is located in §A.1. *end note*]

17.14.31 table (Data Source Table Name)

This element specifies the particular set of data that a source or merged WordprocessingML document shall be connected to within an external data source containing multiple data sets. In other words, when connecting to a

WordprocessingML document to an external data source that can have more than one repository of data within it, such as a database with multiple tables or a spreadsheet with multiple worksheets, this element is used to distinguish the specific table or spreadsheet from which data is imported from within the external data source.

[*Example:* Consider a WordprocessingML document that has been connected to database containing two tables named Table One and Table Two, respectively. To specify that the mail merge must import data from Table One into the WordprocessingML document, this requirement would be specified using the following WordprocessingML:

```
<w:odso>
...
<w:table w:val="Table One" />
...
</w:odso>
```

The table element with a value of Table One specifies that the external data must be retrieved from this table in the data source. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_String](#)) is located in §A.1. *end note*]

17.14.32 type (ODSO Data Source Type)

This element specifies the type of external data source to be connected to via as part of the ODSO connection information for this mail merge. This setting is purely a suggestion of the data source type which is being used for this mail merge, and can be ignored in favor of an alternative mechanism if one is present.

[Example: Consider the following WordprocessingML fragment for a mail merge source or merged document:

```
<w:type w:val="database" />
```

The type element's val attribute is equal to database, specifying that the given merged WordprocessingML document has been connected to an external data source via the ODSO settings, and that the resulting data source was a database. *end example*]

Attributes	Description
val (Data Source Type Value)	<p>Specifies the type of an external data source used for a mail merge operation.</p> <p>[Example: Consider the following WordprocessingML fragment for a mail merge source or merged document:</p> <pre><w:type w:val="text" /></pre> <p>The val attribute is equal to text, specifying that the given merged WordprocessingML document has been connected to an external data source via the ODSO settings, and that the resulting data source was a text file. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_MailMergeSourceType simple type (§17.18.56).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_MailMergeSourceType](#)) is located in §A.1. *end note*]

17.14.33 type (Merge Field Mapping)

This element specifies if a given mail merge field has been mapped to a column in the given external data source or not.

If this element is omitted, then the field mapping shall be considered to be of type null (i.e. not mapped).

[Example: Consider the WordprocessingML for a single field mapping within a mail merge source document:

```
<w:odso>
...
<w:fieldMapData>
  <w:type w:val="dbColumn" />
  <w:name w:val="Country" />
  <w:mappedName w:val="Country or Region" />
  <w:column w:val="9" />
...
</w:fieldMapData>
</w:odso>
```

In this example, the country column within the given external data source must be mapped to the mail merge field Country or Region, as specified by the type element's val attribute being equal to dbColumn. *end example]*

Attributes	Description
val (Merge Field Mapping Type)	<p>Specifies if the given mail merge field has been mapped to a column in the given external data source (i.e. if the merge field mapping is active or not).</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment for a mail merge source or merged document:</p> <pre><w:type w:val="null" /></pre> <p>In this example, the given mail merge field must not be mapped to a column in the given external data source, as specified by the type element's val attribute being equal to null. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_MailMergeOdsoFMDFieldType simple type (§17.18.55).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_MailMergeOdsoFMDFieldType](#)) is located in §A.1. *end note]*

17.14.34 udl (UDL Connection String)

This element specifies the Universal Data Link (UDL) connection string used to reconnect to an external data source. The string within this element's val attribute shall contain the connection string that the hosting application shall pass to a external data source access application to enable the WordprocessingML document to be reconnected to the specified external data source.

If this string is omitted, then no UDL connection string shall be associated with the ODSO data for this mail merge.

This connection string is only used under the following conditions:

- The dataType element (§17.14.10) is set to native
- The current application is able to use the information contained in the odso element (§17.14.25) to access the data source

[*Guidance*: In this case, using the connection string in the udl element provides an equal or greater amount of information for the mail merge data source for clients which can consume it. *end guidance*]

[*Example*: Consider a merged WordprocessingML document that has been connected to an external data source for the purposes of a mail merge. The following WordprocessingML fragment represents the legacy connection string used to connect to the external data source when the merged WordprocessingML document is reopened:

```
<w:udl w:val="Provider=Example;Password=Test;User ID=readonly;..." />
```

The udl element specifies that the string Provider=Example;Password=Test;User ID=readonly;... must be used to enable the given WordprocessingML document to be reconnected to the specified external data source. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example</i>: Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_String](#)) is located in §A.1. *end note*]

17.14.35 uniqueTag (Unique Value for Record)

This element specifies the contents of a given record within the specified external data source, in the column containing unique data for every record within the external data source. This element is used in conjunction with the column (§17.14.6) element to maintain a relationship between the records within an external data source and a given merged WordprocessingML document.

The contents of this attribute shall be the base64-encoded value of the unique tag value as specified by the data source.

[*Note:* This information is necessary as part of a mail merge as records can be added or deleted from external data sources, and a means must be provided to maintain record-specific inclusion or exclusion data using the active element (§17.14.1) and the affected external data record when the WordprocessingML document is reconnected to the external data source irrespective of the ordering of the records within the external data source. *end note*]

[*Example:* Consider the following WordprocessingML fragment for the information about a single record in a source document for a mail merge:

```
<w:recipientData>
  <w:active w:val="0" />
  <w:column w:val="12" />
  <w:uniqueTag>258865469</w:uniqueTag>
</w:recipientData>
```

The external data record associated with this information is specified via the column in the external data source corresponding to the column element with a val attribute equal to 12, which contains a row whose value in this column has a value corresponding to the uniqueTag element with a val attribute equal to 258865469. This record is not imported into the merged WordprocessingML document as the active (§17.14.1) element associated with the given external data record has a val attribute equal to 0.

In other words, when the specified external data source is connected to, the record within the thirteenth column of the external data source that has the contents 258865469, and not populate mapped fields in a merged document with data from that record. *end example*]

The possible values for this element are defined by the W3C XML Schema CT_Base64Binary datatype.

17.14.36 viewMergedData (View Merged Data Within Document)

This element specifies that a specific merged document shall display the data from the specified external data source where merge fields have been inserted. The activeRecord element (§17.14.2) is used to specify which record within the external data source is to have its applicable data displayed where applicable within the WordprocessingML merged document.

If the activeRecord element is not present in the WordprocessingML for the document with the viewMergedData's val attribute equal to true, the hosting application can behave as if the activeRecord

element's `val` attribute was equal to 1. This element is ignored if the `viewMergedData` (§17.14.36) element is not present or present with a `val` attribute equal to `Off`, `0`, or `false`.

[*Example:* Consider a merged WordprocessingML document containing two WordprocessingML fields calling for `Courtesy Title` and `Last Name` data and a sample text paragraph. Also, note that the external data source this merged document is connected to contains two records, both containing name and address information, with the first record pertaining to Mr. Doe, and the second pertaining to Ms. Smith.

This table below illustrates the necessary WordprocessingML to display applicable data from the specified external data source within the merged document where fields have been inserted:

<code><w:viewMergedData val="0"/></code>	<code><w:viewMergedData val="1" /> <w:activeRecord w:val="1" /></code>	<code><w:viewMergedData val="0" /> <w:activeRecord w:val="1" /></code>
Dear {MERGEFIELD "Courtesy Title"} \m} {MERGEFIELD "Last Name" \m}, Sample letter text. Sample letter text. Sample letter text. Sample letter text. Sample letter text. Sample letter text. Sincerely,	Dear Mr. Doe: Sample letter text. Sample letter text. Sample letter text. Sample letter text. Sample letter text. Sample letter text. Sincerely,	Dear {MERGEFIELD "Courtesy Title"} \m} {MERGEFIELD "Last Name" \m}, Sample letter text. Sample letter text. Sample letter text. Sample letter text. Sample letter text. Sample letter text. Sincerely,

The `viewMergedData` element specifies that the specified record in the external data source must be displayed in place of merge fields in the current document. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15 Settings

Within a WordprocessingML document, *settings* specify stored preferences which shall be used when processing the contents of the document. These settings are typically divided into three categories:

- *Document Settings* - settings which influence the appearance and behavior of the current document, as well as store document-level state.
- *Compatibility Settings* - settings which tell applications to perform behaviors which are designed to maintain visual output of previous word processing applications. These settings are for backward compatibility and are all ignorable.
- *Web Settings* - settings which affect how this document shall be handled when it is saved as HTML. These settings exist primarily for backward compatibility reasons and are all ignorable.

The first two groups are stored in the Document Settings part, and the last group is stored in the Web Settings part.

17.15.1 Document Settings

The first group of settings stored in WordprocessingML is document settings. These settings specify all document-level properties which affect the handling of the current document.

[*Example:* Consider the following WordprocessingML fragment for the document settings in a WordprocessingML document:

```
<w:settings>
  <w:defaultTabStop w:val="720" />
  <w:characterSpacingControl w:val="doNotCompress" />
</w:settings>
```

The settings element contains all of the document settings for this document. In this case, the two settings applied are automatic tab stop increments of 0.5" using the defaultTabStop element (§17.15.1.25), and no character level whitespace compression using the characterSpacingControl element (§17.15.1.18). *end example*

17.15.1.1 activeWritingStyle (Grammar Checking Settings)

This element specifies information about the parameters of the grammar checking which was performed on the contents of the current WordprocessingML document. [*Note:* This information can be used as desired by applications; for example, to determine if the current grammar checking state, specified by the proofState element (§17.15.1.65) is sufficient. *end note*]

[*Example:* Consider the following WordprocessingML fragment from the document settings:

```
<w:activeWritingStyle w:lang="en-CA" w:vendorID="64" w:dllVersion="131078"
w:nlCheck="1" w:checkStyle="0" w:appName="testApp" />
```

The activeWritingStyle element's lang attribute specifies that the English (Canada) language setting for grammatical and stylistic checks must be applied; the vendorID attribute specifies information about the vendor associated with the DLL used to perform the grammatical and stylistic checks; the dllVersion attribute specifies the version of this DLL; the nlCheck attribute specifies if natural language checks were performed or not; the checkStyle attribute specifies that the hosting application should allow its grammar engine to check both the grammar and style of the given WordprocessingML document, if that functionality is available; and the appName attribute indicates that an application called testApp specified the grammar checking rules of the given WordprocessingML. *end example*

Attributes	Description
appName (Application Name)	Specifies the name of the application which specified the grammatical settings contained on the attributes for this element.

Attributes	Description
	<p>If an application reads these settings and does not understand the value of this attribute, then its settings can be ignored and the application's default settings used instead.</p> <p>[<i>Example:</i> Consider the WordprocessingML below:</p> <pre><w:activeWritingStyle ... w:appName="testApp"/></pre> <p>The appName attribute has a value of testApp, specifying that the application called testApp specified the grammar checking rules of the given WordprocessingML document. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
checkStyle (Check Stylistic Rules With Grammar)	<p>Specifies if the grammar content checking performed on this document included stylistic rules for the document content. If specified, applications which support this functionality shall check stylistic rules as well as grammatical ones when checking the grammatical content of this document.</p> <p>[<i>Example:</i> Consider the WordprocessingML below:</p> <pre><w:activeWritingStyle ... w:checkStyle="false"/></pre> <p>The checkStyle attribute has a value of false, specifying that hosting applications must only check grammatical rules of the given WordprocessingML document. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
dllVersion (Grammatical Check Engine Version)	<p>Specifies the version of the engine that was used to check the grammatical content of the WordprocessingML document.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:activeWritingStyle ... w:dllVersion="131078" /></pre> <p>The dllVersion attribute specifies that the writing style DLL version used to check the writing style of is the writing style DLL version associated with the string 131078. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
lang (Writing Style Language)	<p>Specifies the language of the engine used to perform the grammatical content checking.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:activeWritingStyle w:lang="en-CA" .../></pre>

Attributes	Description
	<p>The lang attribute has a value of en-CA, therefore the grammatical check language is specified as English (en) and Canada (CA), resulting in use of the English (Canada) grammar checker. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_Lang simple type (§22.9.2.6).</p>
nlCheck (Natural Language Grammar Check)	<p>Specifies whether the engine that was used to check the grammatical content of the WordprocessingML document performed natural language-based analysis.</p> <p>[<i>Example:</i> Consider the WordprocessingML below:</p> <pre data-bbox="483 617 1127 646"><w:activeWritingStyle ... w:nlCheck="1" /></pre> <p>The nlCheck attribute has a value of 1, specifying that the writing style DLL supported natural language analysis. <i>end example</i>].</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
vendorID (Grammatical Engine ID)	<p>Specifies a value indicating a unique ID for the writing style engine that was used to check the grammatical content of the WordprocessingML document.</p> <p>[<i>Example:</i> Consider the WordprocessingML below:</p> <pre data-bbox="483 1016 1143 1045"><w:activeWritingStyle ... w:vendorID="64"/></pre> <p>The vendorId attribute has a value of 64, specifying that the grammatical checker used is identified by the string 64. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_WritingStyle](#)) is located in §A.1. *end note*]

17.15.1.2 alignBordersAndEdges (Align Paragraph and Table Borders with Page Border)

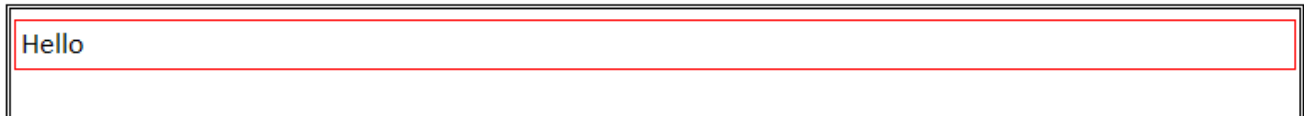
This element specifies that paragraph borders specified using the pBdr element (§17.3.1.24) and table borders using the tblBorders element (§17.4.39) shall be adjusted to align with extents of the page border defined using the pgBorders element (§17.6.10) if the spacing between these borders is less than or equal to 10.5 points (one character width) or less from the page border. The presence of this setting shall ensure there are no gaps of one character width or less between adjoining page and paragraph/table borders, as borders which are perfectly aligning shall not be displayed in favor of the intervening page border.

If this element is omitted, then borders shall not be automatically adjusted to prevent gaps of less than one character width. If the page border is not measured from the text extents using a value of text in the offsetFrom attribute on the pgBorders element, then it can be ignored.

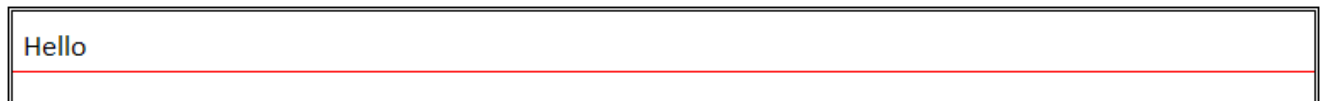
[*Example:* Consider the following WordprocessingML fragment from the document settings:

```
<w:alignBordersAndEdges w:val="true"/>
```

The alignBordersAndEdges element has a value of true specifying that borders must be adjusted to prevent gaps of less than one character width. If a document has a page border specified to appear 4 points from the text extents, and within that page a paragraph border specified to appear one point from the text extents, that would normally appear like this:



If this element is present, then those gaps (which are all of three points in width) must be adjusted to ensure that the borders align exactly and the paragraph border is suppressed:



end example]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.3 alwaysMergeEmptyNamespace (Do Not Mark Custom XML Elements With No Namespace As Invalid)

This element specifies whether custom XML markup specified via the customXml element which has no associated namespace shall be treated as an error and moved into a special error namespace (for the purposes of XML schema validation) when the document is opened. If this element is turned on, when an application determines that the current XML markup is in the empty namespace, those elements shall not automatically be moved into an error namespace.

If this element is not present in a WordprocessingML document than custom XML markup which has no associated namespace shall be treated as an error and moved into a special error namespace when the document is opened.

[*Example:* Consider a WordprocessingML document which should not automatically flag empty namespace XML as invalid. This requirement would be specified using the following WordprocessingML:

```
<w:alwaysMergeEmptyNamespace w:val="true"/>
```

The alwaysMergeEmptyNamespace element's val attribute has a value of true specifying that custom XML markup in the empty namespace must never be treated as an error. *end example]*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.4 `alwaysShowPlaceholderText` (Use Custom XML Element Names as Default Placeholder Text)

This element specifies that each custom XML element specified using the `customXml` element within this document shall always show some form of in-document placeholder text presentation when it contains no run content. If the placeholder element (§17.5.2.25) is present in the custom XML element's properties, then this is the placeholder text displayed and this effect has no effect. If the placeholder element is omitted, then the application shall use the name of the element to generate default placeholder text in its place.

If this element is omitted, then custom XML markup which does not contain a placeholder element within its properties shall not display any placeholder text.

[Example: Consider the following WordprocessingML fragment from the document settings:

```
<w:alwaysShowPlaceholderText w:val="true" />
```

The `alwaysShowPlaceholderText` element has a value of `true`, which specifies that placeholder text must be generated using the element's name if no placeholder text is present. If two custom XML elements are defined as follows:

```
<w:customXml w:name="spec" ... >
  <w:customXmlPr>
    <w:placeholder w:val="Type the name of the specification." />
  </w:customXmlPr>
</w:customXml>
...
<w:customXml w:name="spec" ... >
</w:customXml>
```

The first custom XML element has placeholder text, and the second doesn't, so if this element is omitted, these two elements might be displayed as follows:

Type the name of the specification.

Notice that the second custom XML element has no placeholder text, and therefore is not displayed. However, when this element is present, then the application should generate default placeholder text in its place:

Type the name of the specification.

[spec]

The application generated default placeholder text from the element name, resulting in a value of [spec] in the document. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.5 attachedSchema (Attached Custom XML Schema)

This element specifies that the custom XML schema whose target namespace matches the value specified in the `val` attribute should be associated with this document when it is loaded, if such a schema is available to the hosting application. Applications can also load and utilize any additional schemas as well as those explicitly mentioned here. [Note: These custom XML schemas can then be used to validate the structure of the custom XML markup in the document, etc. *end note*]

If no elements of this type are present, then no custom XML schemas have been explicitly associated with the contents of this document.

[Example: Consider the following WordprocessingML fragment from the document settings:

```
<w:attachedSchema w:val="http://www.example.com/schema1" />
<w:attachedSchema w:val="http://www.example.com/schema2" />
```

The `attachedSchema` elements specify that two custom XML schemas with namespaces of `http://www.example.com/schema1` and `http://www.example.com/schema2` should be associated with the custom XML markup in the current document. *end example*

Attributes	Description
<code>val</code> (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[Example: Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the <code>val</code> attribute is the ID of the associated paragraph style's <code>styleId</code>.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the <code>val</code> attribute is the caption of the nearest</p>

Attributes	Description
	<p>ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model (CT_String) is located in §A.1. *end note*]

17.15.1.6 attachedTemplate (Attached Document Template)

This element specifies the location of a document template which shall be attached to the current WordprocessingML document if it is accessible and of a format supported by an application. Specifically, this element's `val` attribute shall contain the file path of the associated document template.

If this element is omitted, then the document shall not have an attached document template, and applications should use their default template in its place.

[*Example:* Consider a WordprocessingML document which is attached to a WordprocessingML template located on the local C drive within a file whose name is `c:\template.dotx`. This association is specified using the following WordprocessingML:

```
<w:attachedTemplate r:id="rId1" />
```

The attachedTemplate element contains the ID of the relationship which references the associated template. *end example*]

Attributes	Description
<p><code>id</code> (Relationship to Part)</p> <p>Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships</p>	<p>Specifies the relationship ID to a specified part.</p> <p>The specified relationship shall match the relationship type required by the parent element:</p> <ul style="list-style-type: none"> • http://purl.oclc.org/ooxml/officeDocument/relationships/customXml for the <code>contentPart</code> element • http://purl.oclc.org/ooxml/officeDocument/relationships/footer for the <code>footerReference</code> element • http://purl.oclc.org/ooxml/officeDocument/relationships/header for the <code>headerReference</code> element • http://purl.oclc.org/ooxml/officeDocument/relationships/font for the <code>embedBold</code>, <code>embedBoldItalic</code>, <code>embedItalic</code>, or <code>embedRegular</code> elements • http://purl.oclc.org/ooxml/officeDocument/relationships/printerSettings for the <code>printerSettings</code> element • http://purl.oclc.org/ooxml/officeDocument/relationships/hyperlink for the <code>longDesc</code> or <code>hyperlink</code> element

Attributes	Description
	<p>[<i>Example:</i> Consider an XML element which has the following id attribute:</p> <pre><... r:id="rId10" /></pre> <p>The markup specifies the associated relationship part with relationship ID rId1 contains the corresponding relationship information for the parent XML element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>

[*Note:* The W3C XML Schema definition of this element's content model (CT_Rel) is located in §A.1. *end note*]

17.15.1.7 autoCaption (Single Automatic Captioning Setting)

This element specifies what type(s) of objects shall automatically labelled with captions (§17.15.1.17), and with which captions the specified objects shall be labelled as defined in the caption element (§17.15.1.16).

[*Example:* Consider the diagram below illustrating a two page WordprocessingML document that has leveraged WordprocessingML to automatically label WordprocessingML tables with a specified caption when tables are inserted into the given document.

<p>Chapter 1 - FY02</p> <table border="1"> <thead> <tr> <th>Quarter</th><th>Sales</th></tr> </thead> <tbody> <tr> <td>First</td><td>1M</td></tr> <tr> <td>Second</td><td>2M</td></tr> <tr> <td>Third</td><td>3M</td></tr> <tr> <td>Fourth</td><td>4M</td></tr> </tbody> </table> <p>Table 1-A</p> <table border="1"> <thead> <tr> <th>Quarter</th><th>Mkt. Share</th></tr> </thead> <tbody> <tr> <td>First</td><td>2%</td></tr> <tr> <td>Second</td><td>3%</td></tr> <tr> <td>Third</td><td>3%</td></tr> <tr> <td>Fourth</td><td>4%</td></tr> </tbody> </table> <p>Table 1-B</p>	Quarter	Sales	First	1M	Second	2M	Third	3M	Fourth	4M	Quarter	Mkt. Share	First	2%	Second	3%	Third	3%	Fourth	4%	<p>Chapter 2 - FY03</p> <table border="1"> <thead> <tr> <th>Quarter</th><th>Sales</th></tr> </thead> <tbody> <tr> <td>First</td><td>1.5M</td></tr> <tr> <td>Second</td><td>2.5M</td></tr> <tr> <td>Third</td><td>3.5M</td></tr> <tr> <td>Fourth</td><td>4.5M</td></tr> </tbody> </table> <p>Table 2-A</p> <table border="1"> <thead> <tr> <th>Quarter</th><th>Mkt. Share</th></tr> </thead> <tbody> <tr> <td>First</td><td>3%</td></tr> <tr> <td>Second</td><td>3%</td></tr> <tr> <td>Third</td><td>4%</td></tr> <tr> <td>Fourth</td><td>5%</td></tr> </tbody> </table> <p>Table 2-B</p>	Quarter	Sales	First	1.5M	Second	2.5M	Third	3.5M	Fourth	4.5M	Quarter	Mkt. Share	First	3%	Second	3%	Third	4%	Fourth	5%
Quarter	Sales																																								
First	1M																																								
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Second	3%																																								
Third	4%																																								
Fourth	5%																																								

This type of automatic captioning is specified using the following WordprocessingML fragment:

```

<w:captions>
  <w:caption w:name="Table" w:pos="below" w:chapNum="1" w:heading="2"
w:numFmt="upperLetter" w:sep="hyphen" />
  <w:autoCaptions>
    <w:autoCaption w:name="wfwTable" w:caption="Table" />
  </w:autoCaptions>
</w:captions>

```

Here, the autoCaption element specifies through the name attribute being set equal to wfwTable that tables are automatically be labeled with the caption specified in the caption element whose name attribute is equal to Table, as the caption element's caption attribute has a value of Table. *end example*]

Attributes	Description
caption (Caption Used for Automatic Captioning)	<p>Specifies the caption defined in using the caption element (§17.15.1.16) which shall be used to automatically label a given type of object inserted in a WordprocessingML document. The caption settings are linked by matching the value of this attribute with the name attribute of the corresponding caption element.</p> <p>[<i>Example:</i> Consider the WordprocessingML below</p> <pre> <w:captions> <w:caption w:name="table" w:pos="below" w:chapNum="1" w:heading="0" w:noLabel="1" w:numFmt="upperRoman" /> <w:autoCaptions> <w:autoCaption w:name="Paint.Picture" w:caption="table" /> </w:autoCaptions> </w:captions> </pre> <p>The autoCaption element specifies through the name attribute being set equal to wfwTable that tables are automatically be labeled with the caption whose name attribute is equal to Table (specified by the caption element's attribute name having a value of Table). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
name (Identifier of Object to be Automatically Captioned)	<p>Specifies a unique identifier which can be used to associate objects inserted into the document which are to be automatically labeled with a caption when inserted into the WordprocessingML document.</p> <p>[<i>Example:</i> Consider the WordprocessingML below specifying that WordprocessingML tables should be labeled with the custom caption:</p> <pre> <w:autoCaption w:name="wfwTables" w:caption="custom" /> </pre> <p>The name attribute value of wfwTables specifies that WordprocessingML tables must be</p>

Attributes	Description
	labeled with the custom caption. <i>end example</i>
	The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([CT_AutoCaption](#)) is located in §A.1. *end note*]

17.15.1.8 autoCaptions (Automatic Captioning Settings)

This element specifies that one or more types of objects, when inserted into a WordprocessingML document, are automatically be labeled with a specific caption defined using the caption element (§17.15.1.16).

[Example: Consider the following example illustrating a two page WordprocessingML document that has leveraged WordprocessingML to automatically label WordprocessingML tables with a specified caption.

<p>Chapter 1 - FY02</p> <table border="1"> <thead> <tr> <th>Quarter</th><th>Sales</th></tr> </thead> <tbody> <tr> <td>First</td><td>1M</td></tr> <tr> <td>Second</td><td>2M</td></tr> <tr> <td>Third</td><td>3M</td></tr> <tr> <td>Fourth</td><td>4M</td></tr> </tbody> </table> <p>Table 1-A</p> <table border="1"> <thead> <tr> <th>Quarter</th><th>Mkt. Share</th></tr> </thead> <tbody> <tr> <td>First</td><td>2%</td></tr> <tr> <td>Second</td><td>3%</td></tr> <tr> <td>Third</td><td>3%</td></tr> <tr> <td>Fourth</td><td>4%</td></tr> </tbody> </table> <p>Table 1-B</p>	Quarter	Sales	First	1M	Second	2M	Third	3M	Fourth	4M	Quarter	Mkt. Share	First	2%	Second	3%	Third	3%	Fourth	4%	<p>Chapter 2 - FY03</p> <table border="1"> <thead> <tr> <th>Quarter</th><th>Sales</th></tr> </thead> <tbody> <tr> <td>First</td><td>1.5M</td></tr> <tr> <td>Second</td><td>2.5M</td></tr> <tr> <td>Third</td><td>3.5M</td></tr> <tr> <td>Fourth</td><td>4.5M</td></tr> </tbody> </table> <p>Table 2-A</p> <table border="1"> <thead> <tr> <th>Quarter</th><th>Mkt. Share</th></tr> </thead> <tbody> <tr> <td>First</td><td>3%</td></tr> <tr> <td>Second</td><td>3%</td></tr> <tr> <td>Third</td><td>4%</td></tr> <tr> <td>Fourth</td><td>5%</td></tr> </tbody> </table> <p>Table 2-B</p>	Quarter	Sales	First	1.5M	Second	2.5M	Third	3.5M	Fourth	4.5M	Quarter	Mkt. Share	First	3%	Second	3%	Third	4%	Fourth	5%
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Third	4%																																								
Fourth	5%																																								

This type of automatic captioning is specified using the following WordprocessingML fragment:

```
<w:captions>
  <w:caption w:name="Table" w:pos="below" w:chapNum="1" w:heading="2"
w:numFmt="upperLetter" w:sep="hyphen" />
  <w:autoCaptions>
    <w:autoCaption w:name="wfwTable" w:caption="Table" />
  </w:autoCaptions>
</w:captions>
```

The autoCaptions element specifies set of objects that when inserted into a WordprocessingML document are automatically be labeled with a given caption. *end example*

[*Note*: The W3C XML Schema definition of this element's content model ([CT_AutoCaptions](#)) is located in §A.1. *end note*]

17.15.1.9 autoFormatOverride (Allow Automatic Formatting to Override Formatting Protection Settings)

This element specifies whether formatting automatically applied by an application (i.e. not explicitly applied by a user or an application) shall be allowed to override formatting protection enabled via the formatting attribute on the documentProtection element (§17.15.1.9) when those formatting operations would add formatting which has been explicitly disabled. [*Example*: Automatically adding superscript to the st in the string 1st. *end example*]

If this element is omitted, then no automatic formatting rule(s) shall be allowed to override the formatting restrictions enabled for the document.

[*Example* Consider a WordprocessingML document which has been protected such that a user must not be able to directly format text within the document. Consider also that the hosting application has been constructed such that if a user enters an ampersand, then one or more alphabetical characters, then another ampersand, that the alphabetical characters are to take on italicized formatting.

If the autoFormatOverride element is omitted or set to false and document protection is enabled, the aforementioned series of events does not cause the English alphabetical characters to be italicized as the document protection preventing formatting of the document in question supersedes the formatting to take place after these events. If this operation should not be prevented when active formatting restrictions are used, this would be specified using the following WordprocessingML:

```
<w:autoFormatOverride w:val="true"/>
```

The autoFormatOverride element's val attribute is equal to true specifying that the automatic formatting behavior shall be applied regardless of the formatting restrictions in place. *End Example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.10 autoHyphenation (Automatically Hyphenate Document Contents When Displayed)

This element specifies whether the content of a given WordprocessingML document should automatically be hyphenated by the hosting application before it is displayed, if the application supports this functionality.

If this element is omitted, then hyphenation shall not automatically be performed by application displaying this document.

[*Example*: Consider the images below illustrating a paragraph of text in a WordprocessingML document:

This is sample text. This is sample text. This is sample text. This is sample text. This is sample text. This is sample text. This is sample text. This is sample text. This is sample text. This is sample text. This is sample text.

If the content in this document must automatically be hyphenated when it is displayed, that requirement would be specified using the following WordprocessingML in the document settings:

```
<w:autoHyphenation w:val="true" />
```

The resulting output might look like the following (depending on the application's hyphenation algorithm and the hyphenation zone setting (§17.15.1.53):

This is sample text. This is sample text. This is sample text. This is sample text. This is sample text. This is sample text. This is sample text. This is sample text. This is sample text. This is sample text. This is sample text. This is sample text.

The autoHyphenation element has its val attribute equal to true, the document is automatically hyphenated and the word *sample*, beginning at the end of the second line, is hyphenated automatically and thus carried over onto the third line. Conversely, when the autoHyphenation element has its val attribute equal to off, the entire word *sample* is carried over to the third line as it was not hyphenated automatically and could not fit onto the second line. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.11 bookFoldPrinting (Book Fold Printing)

This element specifies if the contents of a given WordprocessingML document should be printed as signatures. *Signatures* are printed *sheets*, which depict several pages of a document that are folded and bound with other signatures to form a booklet, a set of which can be bound together to form a book like publication. Specifically, this element specifies that each page in a given WordprocessingML document should be oriented in a landscape fashion, divided in half vertically with two left margins emanating from the bisector of the page, and two right margins instantiated at the left and right side of each page.

This element is used in conjunction with the bookFoldPrintingSheets element (§17.15.1.12) to enable a WordprocessingML document to be printed such that the series of signatures printed can be folded and bound to create a booklet.

This element has no impact on the settings of printer leveraged by the hosting application. In other words, if the printer leveraged by the hosting application has been configured to print on one side of a page, including the WordprocessingML for this element has no effect.

If this element is omitted, then pages shall not be printed as signatures. If the bookFoldRevPrinting element (§17.15.1.13) is also specified, then this element shall be ignored.

[*Example*: Consider a four page WordprocessingML document with a 2,160 twentieths of a point (one and a half inch) left margin, and 1,440 twentieths of a point (one inch) bottom, right, and top margins using the pgMar

element (§17.6.11) surrounding the text extents of the page (represented by the gray shaded area in diagrams below). These page margins are specified using the following WordprocessingML:

```
<w:pgMar w:header="0" w:top="1440" w:right="1440" w:bottom="1440" w:left="2160"
w:footer="720" w:gutter="0" />
```

The necessary WordprocessingML and consequential effect of setting the bookFoldPrinting element's val attribute to true versus false and the bookFoldPrintingSheets element's val attribute to 4, is depicted graphically below—diagrams not drawn to scale:

<code><w: bookFoldPrinting w:val="false"/></code>	<code><w: bookFoldPrinting w:val="true" /></code>
First Printed Sheet	First Printed Signature
Second Printed Sheet	Second Printed Signature

Assuming the page was already oriented in a landscape fashion, setting the `bookFoldPrinting` element's `val` attribute to `true` divided the page in half vertically, with two left margins emanating from the bisector of the page, and right margins instantiated at the left and right side of each page, enabling two signatures to be printed.

In addition, this element is used in conjunction with the `bookFoldPrintingSheets` element to enable the given WordprocessingML document to be printed such that the series of signatures printed can be folded and bound to create a booklet. Specifically, the signatures can be placed back to back, with top the bottom of each sheet aligned, and folded such that a booklet is created. *end example*

[*Note*: This element could also be leveraged by the hosting application to notify the application to display two pages per sheets within its user interface to allow for a WYSIWYG user experience. *end note*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.12 `bookFoldPrintingSheets` (Number of Pages Per Booklet)

This element shall be used in conjunction with the `bookFoldPrinting` (§17.15.1.11) and `bookFoldRevPrinting` (§17.15.1.13) elements to specify the number of pages to be included in each booklet when printing a series of signatures. Signatures are printed *sheets*, which depict several pages of a document that are to be folded and bound with other signatures to form a booklet. Booklets can be bound together to form a book like publication.

If this element is omitted, then its default behavior shall be to print the contents of the content on a single sheet. A *sheet* is a single piece of paper which is folded and cut to produce a book.

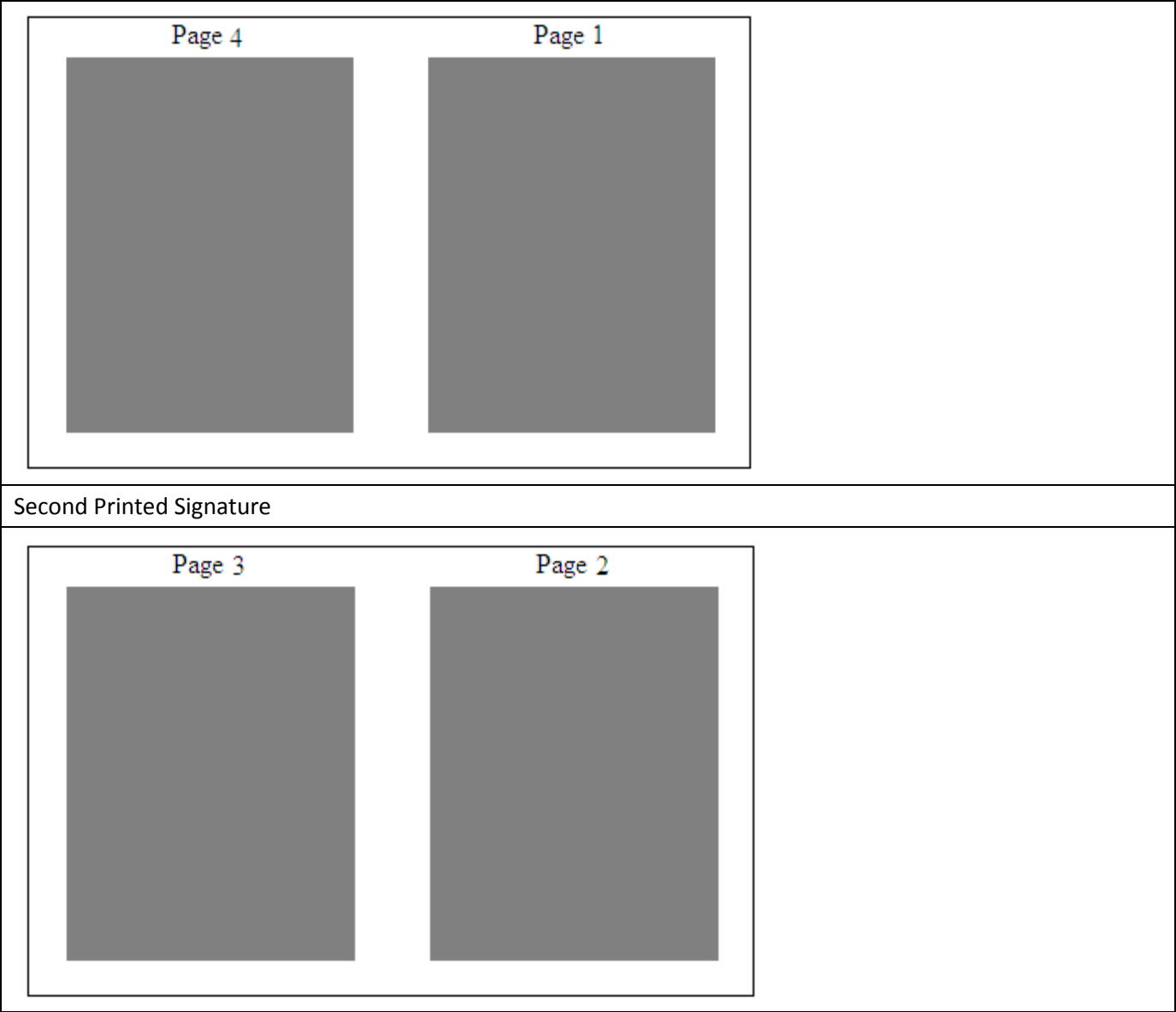
[*Example*: Consider a four page WordprocessingML document is printed as a set of two signatures to be compiled into a single booklet. This setting would be specified using the following WordprocessingML fragment in the document settings part:

```
<w:bookFoldPrinting w:val="true" />
<w:bookFoldPrintingSheets w:val="4" />
```

The `bookFoldPrintingSheets` element's `val` attribute specifies that 4 pages must be included in each booklet. Since each signature contains two pages and are printed such that the signatures can be placed back to back, with top the bottom of each sheet aligned, and folded such that the booklet is created, a booklet containing four pages distributed over two signatures can be created.

This setting is depicted visually using the illustration below (gray shading represents a page):

First Printed Signature



end example]

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <p><... w:val="1512645511" /></p> <p>The value of the val attribute is a decimal number whose value must be interpreted in</p>

Attributes	Description
	<p>the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DecimalNumber](#)) is located in §A.1. *end note*]

17.15.1.13 bookFoldRevPrinting (Reverse Book Fold Printing)

This element specifies if pages of a given WordprocessingML document are to be printed as signatures in reverse order. *Signatures* are printed *sheets*, which depict several pages of a document that are folded and bound with other signatures to form a booklet, a set of which can be bound together to form a book like publication. Specifically, this element specifies that each page in a given WordprocessingML document should be oriented in a landscape fashion and divided in half vertically, with two left margins emanating from the bisector of the page, and right margins instantiated at the left and right side of each page.

In addition, this element is used in conjunction with the bookFoldPrintingSheets element (§17.15.1.12) to enable given WordprocessingML document to be printed such that the series of signatures printed can be folded and bound to create a booklet.

This element has no impact on the settings of printer leveraged by the hosting application. In other words, if the printer leveraged by the hosting application has been configured to print on one side of a page, including the WordprocessingML for this element has no effect.

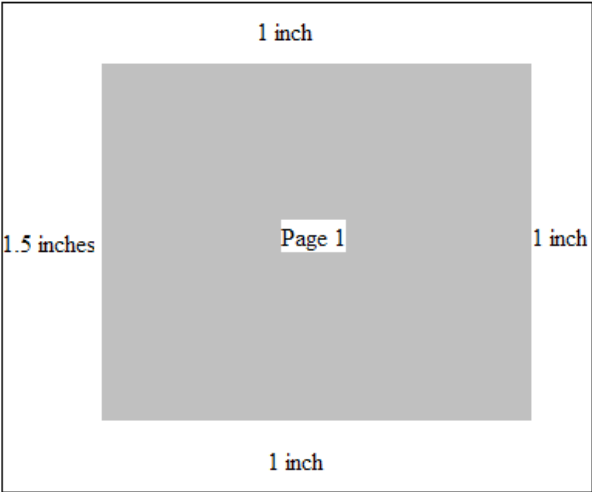
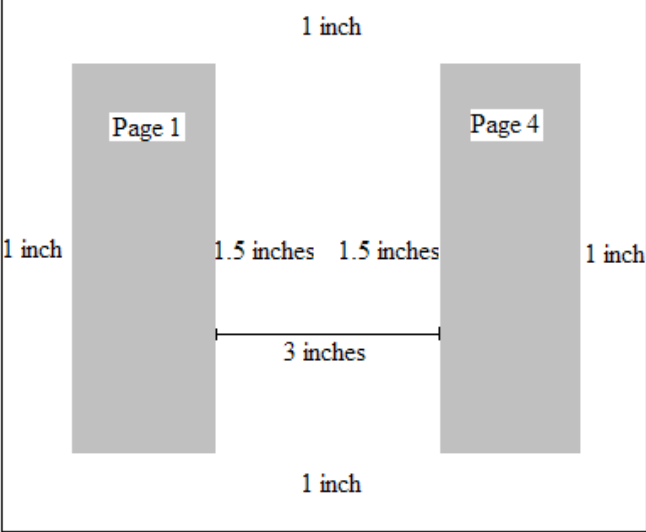
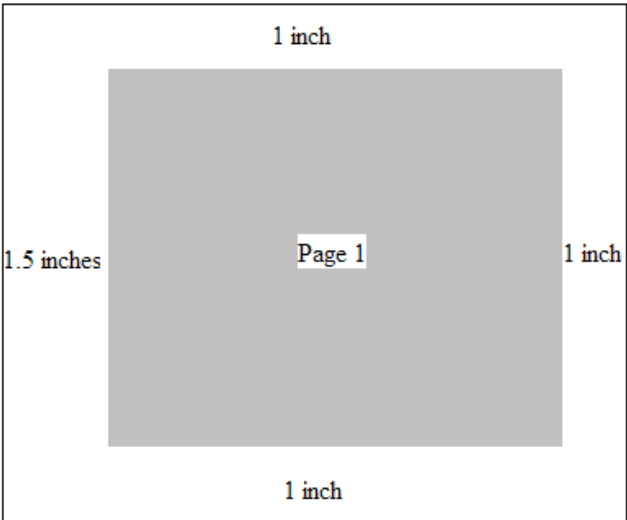
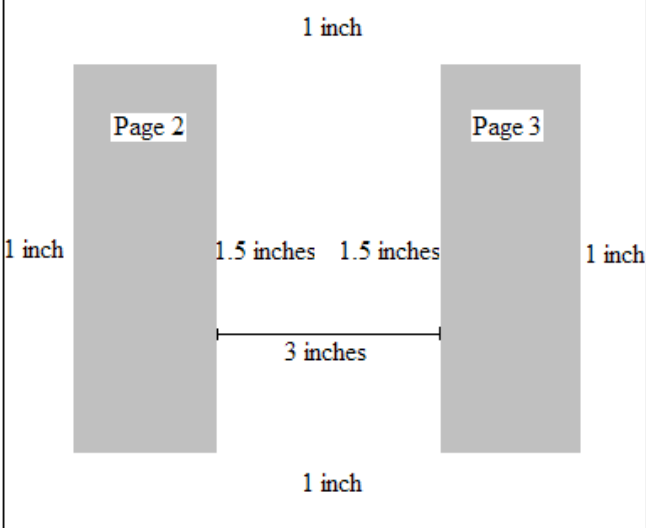
If this element is omitted, then pages shall not be printed as reverse book fold signatures. If the bookFoldPrinting element (§17.15.1.11) is also specified, then that element shall be ignored, and this element shall be used instead.

[*Example:* Consider a four page WordprocessingML document with a 2,160 twentieths of a point (one and a half inch) left margin, and 1,440 twentieths of a point (one inch) bottom, right, and top margins using the pgMar element (§17.6.11) surrounding the text extents of the page (represented by the gray shaded area in diagrams below). These page margins are specified using the following WordprocessingML:

```
<w:pgMar w:header="0" w:top="1440" w:right="1440" w:bottom="1440" w:left="2160"
w:footer="720" w:gutter="0" />
```

The necessary WordprocessingML and consequential effect of setting the bookFoldRevPrinting element's val attribute to true versus false and the bookFoldPrintingSheets element's val attribute to 4, is depicted graphically below—diagrams not drawn to scale:

<code><w: bookFoldRevPrinting w:val="false"/></code>	<code><w: bookFoldRevPrinting w:val="true"/></code> <code><w: bookFoldPrintingSheets w:val="4"/></code>
--	--

<div>First Printed Sheet</div> <div></div>	<div>First Printed Signature</div> <div></div>
<div>Second Printed Sheet</div> <div></div>	<div>Second Printed Signature</div> <div></div>

Assuming the page was already oriented in a landscape fashion, setting the bookFoldRevPrinting element’s val attribute to true divided the page in half vertically, with two left margins emanating from the bisector of the page, and right margins instantiated at the left and right side of each page, enabling two signatures to be printed.

In addition, this element is used in conjunction with the bookFoldPrintingSheets element to enable the given WordprocessingML document to be printed such that the series of signatures printed can be folded and bound to create a booklet. Specifically, the signatures can be placed back to back, with top the bottom of each sheet aligned, and folded such that a booklet is created. *end example*]

[*Note:* This element could also be leveraged by the hosting application to notify the application to display two pages per sheets within its user interface to allow for a WYSIWYG user experience. *end note*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.14 bordersDoNotSurroundFooter (Page Border Excludes Footer)

This element specifies that a given WordprocessingML document's page border specified using the pgBorders element (§17.6.10) should not surround contents of the footer.

If this element is omitted, then the page border shall not exclude the footer on the page. As well, this element shall be ignored if the pgBorders element has an offsetFrom attribute which is not equal to text.

[*Note:* If the pgBorders element has a offsetFrom attribute equal to page, the bordersDoNotSurroundFooter element is ignored as specifying the pgBorders element with a offsetFrom attribute equal to page is to specify that the positioning of borders within the document shall be calculated relative to the edge of the page and therefore irrespective of document content in the footer. *end note*]

[*Example:* Consider the following page in a WordprocessingML document:



If this WordprocessingML document is modified to leverage the behavior enabled by this element, this setting would be specified using the following WordprocessingML fragment in the document settings:

```
<w:bordersDoNotSurroundFooter w:val="true"/>
```

The bordersDoNotSurroundFooter element's val attribute is equal to true specifying that the page border shall not surround the text extents of the footer, as follows:



end example]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.15 bordersDoNotSurroundHeader (Page Border Excludes Header)

This element specifies that a given WordprocessingML document's page border specified using the pgBorders element (§17.6.10) should not surround contents of the header.

If this element is omitted, then the page border shall not exclude the header on the page. As well, this element shall be ignored if the pgBorders element has a offsetFrom attribute which is not equal to text.

[*Note:* If the pgBorders element has a offsetFrom attribute equal to page, the bordersDoNotSurroundHeader element is ignored as specifying the pgBorders element with a offsetFrom attribute equal to page is to specify that the positioning of borders within the document shall be calculated relative to the edge of the page and therefore irrespective of document content in the header. *end note*]

[*Example:* Consider the following page in a WordprocessingML document:



If this WordprocessingML document is modified to leverage the behavior enabled by this element, this setting would be specified using the following WordprocessingML fragment in the document settings:

```
<w:bordersDoNotSurroundHeader w:val="true"/>
```

The bordersDoNotSurroundHeader element's val attribute is equal to true specifying that the page border shall not surround the text extents of the header, as follows:



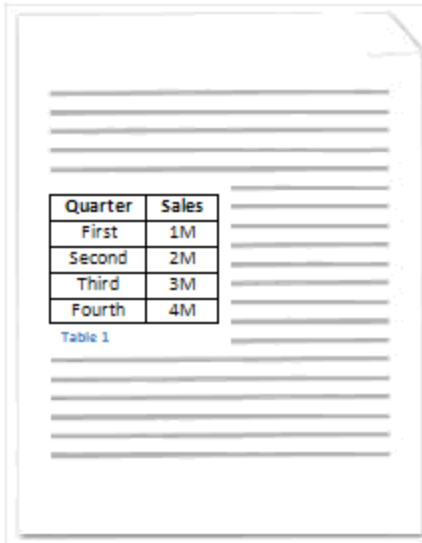
end example]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.16 caption (Single Caption Type Definition)

This element specifies the contents and positioning for captions which can be used to automatically label objects in a WordprocessingML document. A *caption* is a string that labels an object included in a WordprocessingML document, and typically consists of a string plus a field which numbers this item within a collection of similar objects.

[*Example:* Consider the diagram below illustrating a WordprocessingML document containing a table that has been labeled with a caption:



Quarter	Sales
First	1M
Second	2M
Third	3M
Fourth	4M

Table 1

In this diagram, the table contained in the WordprocessingML document has been labeled by inserting a caption below the table consisting of the string `Table` followed by a field whose result is a decimal number. The settings which automatically produced this form of caption are specified using the following WordprocessingML fragment:

```
<w:captions>
  <w:caption w:name="Table" w:pos="below" w:numFmt="decimal" />
</w:captions>
```

The caption element specifies the parameters for the resulting caption to be used to automatically label content within the WordprocessingML document. Specifically, the `name` and `numFmt` attributes specify that captions of this caption type inserted in the given WordprocessingML document shall consist of the string `Table` followed by an incrementing decimal number field. In addition, the `pos` attribute specifies that these captions shall be placed below the object they are used to label.

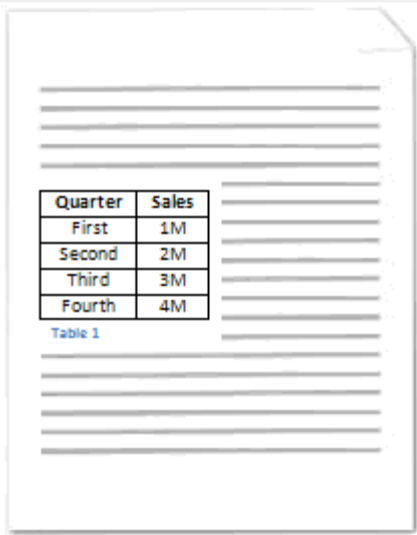
WordprocessingML is designed such that the caption element can be used in conjunction with applications to provide a dynamic captioning experience. In other words, an application can use the WordprocessingML in the example above to automatically insert a caption consisting of the string `Table` followed by an incrementing decimal number field below tables when tables are inserted into a WordprocessingML document as defined by the `autoCaption` element (§17.15.1.7). *end example*

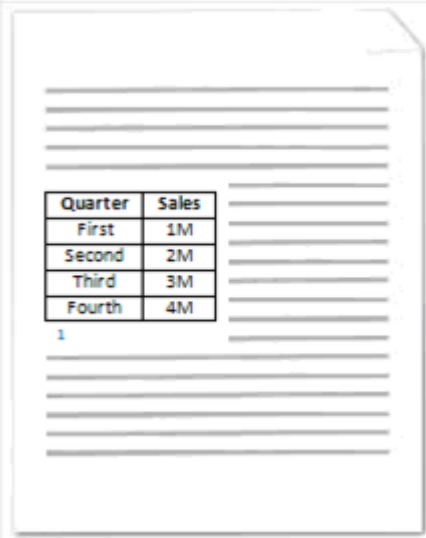
Attributes	Description
chapNum (Include Chapter Number in Field for Caption)	Specifies whether or not to display numbering associated with the most recent chapter heading in the WordprocessingML document within the caption field. A <i>chapter heading</i> is a paragraph of text within a WordprocessingML document that is formatted with a style that has been specified by the heading attribute to demarcate chapters in documents. Only a style with its styleID attribute equal to <code>Heading1</code> , <code>Heading2</code> , <code>Heading3</code> ,

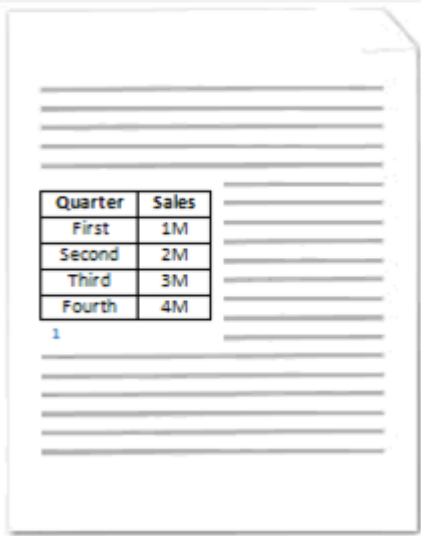
Attributes	Description																																								
	<p>Heading4, Heading5, Heading6, Heading7, Heading8, or Heading9 can be specified as the style used to demarcate chapters in a document. The choice of which of these heading levels shall be used to determine the current chapter number is defined by the value of the corresponding heading attribute. [Example: Heading1 is used as the chapter heading when chapNum is true and heading is 1. end example]</p> <p>If this attribute is omitted, then chapter numbers shall not be included in the resulting caption.</p> <p>[Example: Consider the diagram below:</p> <div><div><p>Chapter 1 - FY02</p><table><tr><th>Quarter</th><th>Sales</th></tr><tr><td>First</td><td>1M</td></tr><tr><td>Second</td><td>2M</td></tr><tr><td>Third</td><td>3M</td></tr><tr><td>Fourth</td><td>4M</td></tr></table><p>Table 1-A</p><table><tr><th>Quarter</th><th>Mkt. Share</th></tr><tr><td>First</td><td>2%</td></tr><tr><td>Second</td><td>3%</td></tr><tr><td>Third</td><td>3%</td></tr><tr><td>Fourth</td><td>4%</td></tr></table><p>Table 1-B</p></div><div><p>Chapter 2 - FY03</p><table><tr><th>Quarter</th><th>Sales</th></tr><tr><td>First</td><td>1.5M</td></tr><tr><td>Second</td><td>2.5M</td></tr><tr><td>Third</td><td>3.5M</td></tr><tr><td>Fourth</td><td>4.5M</td></tr></table><p>Table 2-A</p><table><tr><th>Quarter</th><th>Mkt. Share</th></tr><tr><td>First</td><td>3%</td></tr><tr><td>Second</td><td>3%</td></tr><tr><td>Third</td><td>4%</td></tr><tr><td>Fourth</td><td>5%</td></tr></table><p>Table 2-B</p></div></div> <p>This diagram depicts a WordprocessingML document containing two chapters, each containing two tables labeled with captions. The Heading 2 style has been associated with chapter headings and applied to the strings: Chapter 1 - FY02 and Chapter 2 - FY03 in this document.</p> <p>Specifically, the style used to demarcate chapters, is the style with a styleID attribute equal to Heading2 as specified by the heading attribute value of 2 in the WordprocessingML for this caption, defined as follows:</p> <pre><w:caption w:name="Table" w:pos="below" w:chapNum="true" w:heading="2" w:numFmt="upperLetter" w:sep="hyphen" /></pre> <p>The chapNum attribute has a value of true, specifying that the captions used to label the tables within this document contains a symbol corresponding to the one-based index of the chapter in which it is contained.</p> <p>This can be seen in that the captions in Chapter 1 contain a 1, while the captions in Chapter 2 contain a 2, each corresponding with their respective chapter number. end</p>	Quarter	Sales	First	1M	Second	2M	Third	3M	Fourth	4M	Quarter	Mkt. Share	First	2%	Second	3%	Third	3%	Fourth	4%	Quarter	Sales	First	1.5M	Second	2.5M	Third	3.5M	Fourth	4.5M	Quarter	Mkt. Share	First	3%	Second	3%	Third	4%	Fourth	5%
Quarter	Sales																																								
First	1M																																								
Second	2M																																								
Third	3M																																								
Fourth	4M																																								
Quarter	Mkt. Share																																								
First	2%																																								
Second	3%																																								
Third	3%																																								
Fourth	4%																																								
Quarter	Sales																																								
First	1.5M																																								
Second	2.5M																																								
Third	3.5M																																								
Fourth	4.5M																																								
Quarter	Mkt. Share																																								
First	3%																																								
Second	3%																																								
Third	4%																																								
Fourth	5%																																								

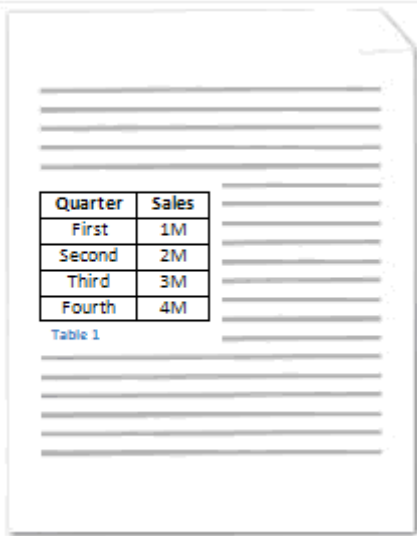
Attributes	Description																						
	<p><i>example]</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>																						
heading (Style for Chapter Headings)	<p>Specifies the given style that is used to demarcate chapter headings in a document.</p> <p>This value is used to link the chapter headings with paragraphs with a styleID attribute as follows:</p> <table data-bbox="415 508 1336 1075"> <tr> <th>Value</th><th>Description</th></tr> <tr> <td>1</td><td>Style with styleID of Heading1</td></tr> <tr> <td>2</td><td>Style with styleID of Heading2</td></tr> <tr> <td>3</td><td>Style with styleID of Heading3</td></tr> <tr> <td>4</td><td>Style with styleID of Heading4</td></tr> <tr> <td>5</td><td>Style with styleID of Heading5</td></tr> <tr> <td>6</td><td>Style with styleID of Heading6</td></tr> <tr> <td>7</td><td>Style with styleID of Heading7</td></tr> <tr> <td>8</td><td>Style with styleID of Heading8</td></tr> <tr> <td>9</td><td>Style with styleID of Heading9</td></tr> <tr> <td>Any other value</td><td>Application-defined. Can be ignored.</td></tr> </table> <p>If this attribute is omitted, then its value shall be assumed to be 1.</p> <p>[Example: Consider the diagram below:</p> <div data-bbox="415 1255 1336 1829"> <p>The diagram illustrates two chapters within a WordprocessingML document. Chapter 1, titled 'Chapter 1 - FY02', contains two tables: Table 1-A, which lists quarterly sales (First: 1M, Second: 2M, Third: 3M, Fourth: 4M), and Table 1-B, which lists quarterly market share (First: 2%, Second: 3%, Third: 3%, Fourth: 4%). Chapter 2, titled 'Chapter 2 - FY03', also contains two tables: Table 2-A, which lists quarterly sales (First: 1.5M, Second: 2.5M, Third: 3.5M, Fourth: 4.5M), and Table 2-B, which lists quarterly market share (First: 3%, Second: 3%, Third: 4%, Fourth: 5%).</p> </div> <p>This diagram depicts a WordprocessingML document containing two chapters, each</p>	Value	Description	1	Style with styleID of Heading1	2	Style with styleID of Heading2	3	Style with styleID of Heading3	4	Style with styleID of Heading4	5	Style with styleID of Heading5	6	Style with styleID of Heading6	7	Style with styleID of Heading7	8	Style with styleID of Heading8	9	Style with styleID of Heading9	Any other value	Application-defined. Can be ignored.
Value	Description																						
1	Style with styleID of Heading1																						
2	Style with styleID of Heading2																						
3	Style with styleID of Heading3																						
4	Style with styleID of Heading4																						
5	Style with styleID of Heading5																						
6	Style with styleID of Heading6																						
7	Style with styleID of Heading7																						
8	Style with styleID of Heading8																						
9	Style with styleID of Heading9																						
Any other value	Application-defined. Can be ignored.																						

Attributes	Description
	<p>containing two tables labeled with captions. The Heading 2 style has been associated with chapter headings and applied to the strings: Chapter 1 - FY02 and Chapter 2 - FY03 in this document.</p> <p>Specifically, the style used to demarcate chapter headings is the style with its styleID attribute equal to <code>Heading</code> as specified by the heading attribute value of 2 in the WordprocessingML below.</p> <pre><w:caption w:name="Table" w:pos="below" w:chapNum="1" w:heading="2" w:numFmt="upperLetter" w:sep="hyphen" /></pre> <p>In other words, the WordprocessingML above can be used to label tables inserted in a given WordprocessingML document generated by an application with a caption consisting of: the string <code>Table</code> followed by a decimal number corresponding with the chapter number in which the table is present, a hyphen as defined in the <code>sep</code> attribute, and a capital English letter defined by the <code>numFmt</code> attribute corresponding with the given table's ordering within the current chapter. <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_DecimalNumber</code> simple type (§17.18.10).</p>
name (Caption Type Name)	<p>Specifies the literal string component of this caption.</p> <p>This value is used as follows:</p> <ul style="list-style-type: none"> • It is added to the field containing the chapter number and item number of this object when a caption is automatically added to the document. • It is used to uniquely label this caption type, allowing it to be linked with classes of objects via the <code>autoCaption</code> element (§17.15.1.7) • It can be used to label this caption type in a user interface. <p>[<i>Example:</i> Consider the diagram below illustrating a WordprocessingML document containing a table that has been labeled with a caption:</p>

Attributes	Description
	 <p>In this diagram, the table contained in the WordprocessingML document has been labeled by inserting a caption below the table consisting of the string <code>Table</code> followed by a decimal number. This caption format is specified with the following WordprocessingML:</p> <pre><w:caption w:name="Table" w:pos="below" w:numFmt="decimal" /></pre> <p>Specifically, the name attribute specifies that the first part of the string that comprises the give caption shall consist of the string <code>Table</code>. <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>
noLabel (Do Not Include Name In Caption)	<p>Specifies if the string specified in the name attribute shall be included in the resulting caption when it is automatically added to the document. If set to true, then the label text in the name attribute is omitted when adding the caption.</p> <p>If this attribute is omitted, then the name shall be added to the caption.</p> <p>[<i>Example:</i> Consider the diagram below illustrating a WordprocessingML document containing a table that has been labeled with a caption:</p>

Attributes	Description
	<div></div> <p>In this diagram, the table contained in the WordprocessingML document has been labeled by inserting a caption below the table consisting of only a decimal number.</p> <p>This caption format is specified using the following WordprocessingML:</p> <pre><w:caption w:name="Custom" w:pos="below" w:noLabel="true" w:numFmt="decimal" /></pre> <p>Here, the noLabel attribute is equal to true specifying that when this caption format is automatically added, it must not include the label. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
numFmt (Caption Numbering Format)	<p>Specifies the format of the numbering which shall be included in an automatically generated caption to specify the index of this item in that collection (within the current chapter if chapNum is specified, or within the current document story).</p> <p>If this attribute is omitted, then its default value shall be assumed to be decimal.</p> <p>[<i>Example:</i> Consider the diagram below illustrating a WordprocessingML document containing a table that has been labeled with a caption:</p>

Attributes	Description
	 <p>In this example, the table contained in the WordprocessingML document has been labeled by inserting a caption below the table consisting of only a decimal number.</p> <p>This caption format is specified using the following WordprocessingML:</p> <pre><w:caption w:name="Custom" w:pos="below" w:noLabel="true" w:numFmt="decimal" /></pre> <p>Here, the numFmt attribute is equal to decimal, specifying that a decimal number shall be included in the table caption when it is automatically inserted. <i>End Example</i></p> <p>The possible values for this attribute are defined by the ST_NumberFormat simple type (§17.18.59).</p>
pos (Automatic Caption Placement)	<p>Specifies how an automatically inserted caption shall be positioned relative to the object that it is captioning.</p> <p>If this attribute is omitted, then the default value shall be below.</p> <p>[<i>Example</i>: Consider the diagram below illustrating a WordprocessingML document containing a table that has been labeled with a <i>caption</i>.</p>

Attributes	Description
	<div></div> <p>In this diagram, the table contained in the WordprocessingML document has been labeled by inserting a caption below the table consisting of the string Table followed by a decimal number.</p> <p>This caption format is specified using the following WordprocessingML:</p> <pre><w:caption w:name="Table" w:pos="below" w:numFmt="decimal" /></pre> <p>The pos attribute specifies that the given caption shall be placed below the object it is labelling. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_CaptionPos simple type (§17.18.5).</p>
sep (Chapter Number/Item Index Separator)	<p>Specifies the character which shall be used to separate the chapter number used in this caption from the caption item numbering. A caption format consists of three components:</p> <ul style="list-style-type: none">• The (optional) literal string• The (optional) chapter number• The index of this caption within the chapter/document <p>When the latter two items are both present, they are delimited using the chapter separator specified by this attribute.</p> <p>If this attribute is omitted, then its default value shall be hyphen. If the chapter number is not part of the caption format, then this parameter shall be ignored.</p> <p>[<i>Example</i>: Consider the diagram below:</p>

Attributes	Description																																								
	<div data-bbox="418 247 1334 821"> <p>The diagram illustrates a WordprocessingML document structure with two chapters. Chapter 1 - FY02 contains two tables: Table 1-A (Sales) and Table 1-B (Mkt. Share). Chapter 2 - FY03 contains two tables: Table 2-A (Sales) and Table 2-B (Mkt. Share). The tables are styled with blue headings and captions.</p> <table border="1" data-bbox="483 380 678 527"> <thead> <tr> <th>Quarter</th><th>Sales</th></tr> </thead> <tbody> <tr> <td>First</td><td>1M</td></tr> <tr> <td>Second</td><td>2M</td></tr> <tr> <td>Third</td><td>3M</td></tr> <tr> <td>Fourth</td><td>4M</td></tr> </tbody> </table> <p>Table 1-A</p> <table border="1" data-bbox="618 541 813 716"> <thead> <tr> <th>Quarter</th><th>Mkt. Share</th></tr> </thead> <tbody> <tr> <td>First</td><td>2%</td></tr> <tr> <td>Second</td><td>3%</td></tr> <tr> <td>Third</td><td>3%</td></tr> <tr> <td>Fourth</td><td>4%</td></tr> </tbody> </table> <p>Table 1-B</p> <table border="1" data-bbox="938 390 1133 537"> <thead> <tr> <th>Quarter</th><th>Sales</th></tr> </thead> <tbody> <tr> <td>First</td><td>1.5M</td></tr> <tr> <td>Second</td><td>2.5M</td></tr> <tr> <td>Third</td><td>3.5M</td></tr> <tr> <td>Fourth</td><td>4.5M</td></tr> </tbody> </table> <p>Table 2-A</p> <table border="1" data-bbox="1068 552 1263 726"> <thead> <tr> <th>Quarter</th><th>Mkt. Share</th></tr> </thead> <tbody> <tr> <td>First</td><td>3%</td></tr> <tr> <td>Second</td><td>3%</td></tr> <tr> <td>Third</td><td>4%</td></tr> <tr> <td>Fourth</td><td>5%</td></tr> </tbody> </table> <p>Table 2-B</p> </div> <p>This diagram depicts a WordprocessingML document containing two chapters, each containing two tables labeled with captions. The Heading 2 style has been associated with chapter headings and applied to the strings: Chapter 1 - FY02 and Chapter 2 - FY03 in this document.</p> <p>Specifically, the style used to demarcate chapter headings is the style with a styleID attribute equal to Heading2 as specified by the heading attribute value of 2 in the WordprocessingML below.</p> <pre><w:caption w:name="Table" w:pos="below" w:chapNum="1" w:heading="2" w:numFmt="upperLetter" w:sep="hyphen" /></pre> <p>The sep attribute value of hyphen specifies that the chapter number and caption index must be separated by a hyphen character when displayed in the document. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ChapterSep simple type (§17.18.6).</p>	Quarter	Sales	First	1M	Second	2M	Third	3M	Fourth	4M	Quarter	Mkt. Share	First	2%	Second	3%	Third	3%	Fourth	4%	Quarter	Sales	First	1.5M	Second	2.5M	Third	3.5M	Fourth	4.5M	Quarter	Mkt. Share	First	3%	Second	3%	Third	4%	Fourth	5%
Quarter	Sales																																								
First	1M																																								
Second	2M																																								
Third	3M																																								
Fourth	4M																																								
Quarter	Mkt. Share																																								
First	2%																																								
Second	3%																																								
Third	3%																																								
Fourth	4%																																								
Quarter	Sales																																								
First	1.5M																																								
Second	2.5M																																								
Third	3.5M																																								
Fourth	4.5M																																								
Quarter	Mkt. Share																																								
First	3%																																								
Second	3%																																								
Third	4%																																								
Fourth	5%																																								

[Note: The W3C XML Schema definition of this element's content model ([CT_Caption](#)) is located in §A.1. *end note*]

17.15.1.17 captions (Caption Settings)

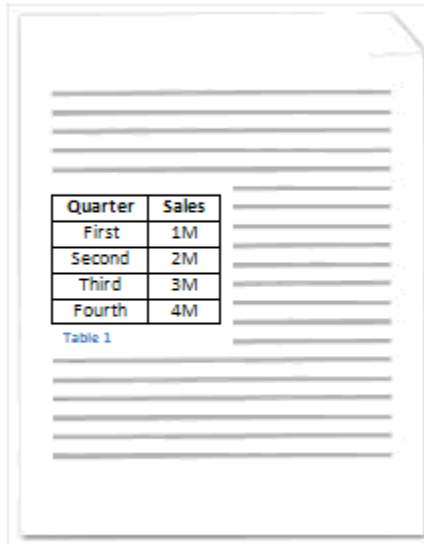
This element specifies the presence of information about captions in a given WordprocessingML document. This information is divided into two components:

- The child element caption defines the format for a single type of caption to be automatically added to the document.

- The child element `autoCaptions` defines the types of objects to which a caption format shall automatically be applied.

This information should be used to determine the captions which are automatically added to objects when they are inserted into a WordprocessingML document. [*Note: This setting is typically ignored unless it is specified in an application's default template. end note*]

[*Example: Consider the diagram below illustrating a WordprocessingML document containing a table that has been labeled with a caption:*



The diagram shows a document page with a table and a caption. The table has two columns: 'Quarter' and 'Sales'. The rows are: 'First' with '1M', 'Second' with '2M', 'Third' with '3M', and 'Fourth' with '4M'. Below the table is the caption 'Table 1'.

Quarter	Sales
First	1M
Second	2M
Third	3M
Fourth	4M

Table 1

In this diagram, the table contained in the WordprocessingML document has been labeled by inserting a caption below the table consisting of the string `Table` followed by a decimal number. This automatically inserted caption format is specified using the following WordprocessingML:

```
<w:captions>
  <w:caption w:name="Table" w:pos="below" w:numFmt="decimal" />
</w:captions>
```

Here, the captions element specifies the presence of one or more caption formats in a given WordprocessingML document with its child element `caption`. Specifically, the child element `caption` specifies a single type of caption to be used within the WordprocessingML document. *end example*

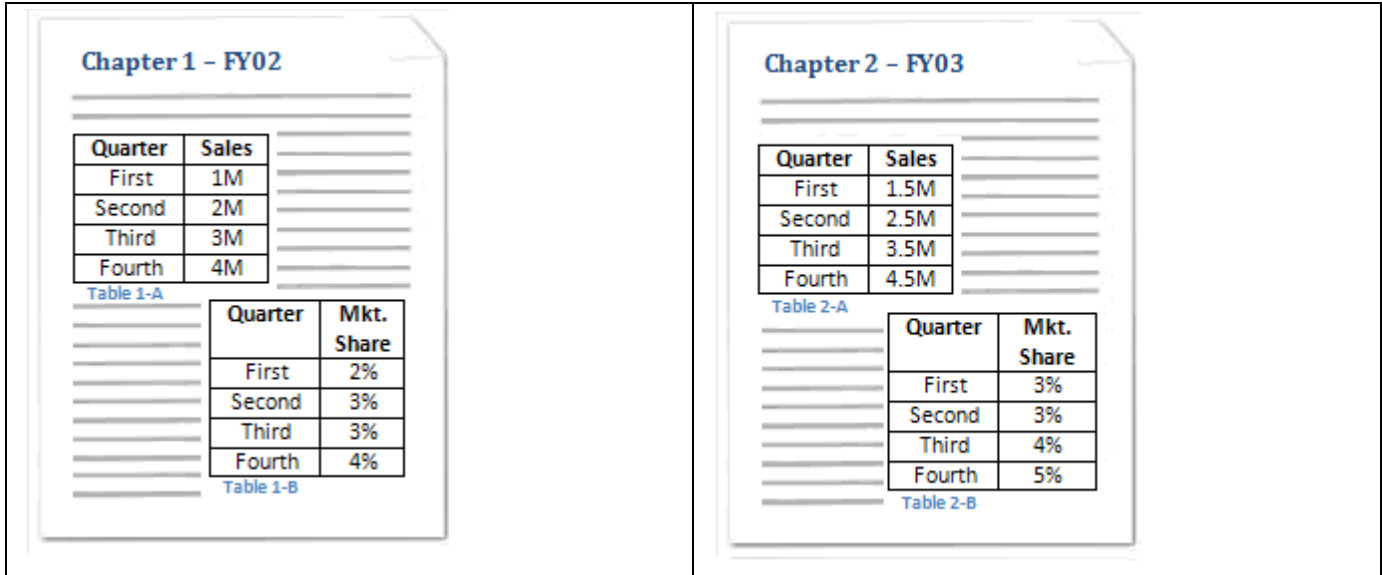
Captioning leverages fields (§17.16.5) to label objects with reference to either:

- Other captioned objects within a given document
- Other captioned objects within the same chapter in a given document (when chapter numbers are added by specifying the `chapNum` attribute on the caption type).

A *chapter* is a section of text within a WordprocessingML document that is preceded by content with a style that has been specified by to demarcate chapters in documents. Only one style can be specified as

the style used for a single caption type to demarcate chapters in a document. A chapter ends immediately above the next instance of content with the style used to demarcate chapters.

[Example: Consider the diagram below:



This diagram depicts a WordprocessingML document containing two chapters, each containing two tables labeled with captions. The style associated with chapter demarcation has been applied to the strings: Chapter 1 - FY02 and Chapter 2 - FY03 in this document. Specifically, the style used to demarcate chapters is the style with its styleID attribute equal to Heading2 as specified by the heading attribute value of 2 in the WordprocessingML for the caption format:

```
<w:caption w:name="Table" w:pos="below" w:chapNum="1" w:heading="2"
w:numFmt="upperLetter" w:sep="hyphen" />
```

In other words, the WordprocessingML above can be used to label objects (in this case, tables) inserted in a given WordprocessingML document generated by an application with a caption consisting of: the string Table followed by a decimal number corresponding with the chapter number in which the table is present, a hyphen, and a capital English letter corresponding with the given table's index within the given chapter. *end example]*

[Note: WordprocessingML is designed such that the caption element can be used in conjunction with applications to provide a dynamic captioning experience. In other words, an application can use the WordprocessingML in the example above to automatically insert a caption consisting of the string Table followed by an incrementing decimal number field below tables when tables are inserted into a WordprocessingML document as defined by the autoCaption element (§17.15.1.7). *end note]*

[Note: The W3C XML Schema definition of this element's content model ([CT_Captions](#)) is located in §A.1. *end note]*

17.15.1.18 characterSpacingControl (Character-Level Whitespace Compression)

This element specifies how full-width characters in the current WordprocessingML document should be compressed to remove additional whitespace when the contents of this document are displayed, specifically by specifying the set(s) of characters which can be compressed to remove additional whitespace. [Note: The behavior of this element is functionally identical to the CSS text-justify-trim property. end note]

If this element is omitted, then the default value shall be dontCompress.

[Example: Consider the WordprocessingML below:

```
<w:characterSpacingControl w:val="doNotCompress" />
```

The characterSpacingControl element has a val attribute value of doNotCompress, which specifies that no character compression shall be applied to any character when the document is displayed. end example]

Attributes	Description
val (Value)	<p>Specifies the set(s) of characters which should be compressed when the contents of this document are displayed.</p> <p>[Example: Consider a WordprocessingML document for which only full-width punctuation characters must have their whitespace compression applied. This requirement would be specified using the following WordprocessingML:</p> <pre><w:characterSpacingControl w:val="compressPunctuation"/></pre> <p>The val attribute value of compressPunctuation specifies that character compression must be applied to full-width punctuation characters only when the document is displayed. end example]</p> <p>The possible values for this attribute are defined by the ST_CharacterSpacing simple type (§17.18.7).</p>

[Note: The W3C XML Schema definition of this element’s content model (CT_CharacterSpacing) is located in §A.1. end note]

17.15.1.19 clickAndTypeStyle (Paragraph Style Applied to Automatically Generated Paragraphs)

This element specifies the paragraph style, specified using the style element, which shall be applied to paragraphs which are automatically created when text is inserted into a WordprocessingML document in an area of the document that has no other style associated with it. This style is referenced via the val attribute, which stores the style ID of the style (stored in the styleId attribute on the style definition).

[Guidance: Consider a WordprocessingML document opened in an application that allows users to place their cursor anywhere within the document editing canvas and enter text. The clickAndTypeStyle element should be

used to specify the paragraph style to be associated with the paragraph of text entered after a user places their cursor somewhere in the blank document that results in the generation of new paragraphs. *end guidance*]

If this element is omitted, then the default paragraph style (the paragraph style whose default attribute is set to true), shall be used for automatically generated paragraphs. If the style whose styleId is specified using the val attribute is not a paragraph style or does not exist in the document, then the default paragraph style shall be used instead.

[*Example:* Consider a WordprocessingML document that has specified that paragraphs which are automatically created when text is inserted in a given area of the document which has no other style associated with it must be associated with the paragraph style that has a styleId equal to BalloonText.

This is accomplished by specifying a clickAndTypeStyle element with a val attribute equal to the value of the ID of the desired style. This constraint would be specified using the following WordprocessingML:

```
<w:clickAndTypeStyle w:val="BalloonText" />
```

The corresponding style in the styles part would be defined as follows:

```
<w:style w:type="paragraph" w:styleId="BalloonText">
...
</w:style>
```

The clickAndTypeStyle element specifies the use of the paragraph style with the style ID of BalloonText. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre>

Attributes	Description
	<p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_String](#)) is located in §A.1. *end note*]

17.15.1.20 clrSchemeMapping (Theme Color Mappings)

This element specifies the theme color, stored in the document's Theme part to which the value of this theme color shall be mapped. This mapping enables multiple theme colors to be chained together.

[Example: Consider a WordprocessingML document that must have the theme color value background1 mapped to the theme color light1 as defined in the document's theme part. This requirement would be specified using the following WordprocessingML in the document settings:

```
<w:clrSchemeMapping w:bg1="light1" />
```

The clrSchemeMapping element's attribute background1 has a value of light1, specifying that theme color value background1 must be mapped to the theme color light1. *end example*

Attributes	Description
accent1 (Accent 1 Theme Color Mapping)	<p>Specifies the theme color in the document's theme part which shall be used in place of this color when it is referenced by document content.</p> <p>If this attribute is omitted, then the accent1 theme color shall be used.</p> <p>[Example: Consider a WordprocessingML document that must have references to the theme color accent1 mapped to the theme color lt1 as defined in the document's theme part. This requirement would be specified using the following WordprocessingML in the document settings:</p> <pre><w:clrSchemeMapping w:accent1="light1" /></pre> <p>The accent1 attribute has a value of light1, specifying that uses of the theme color value accent1 must be mapped to the theme color lt1. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_WmlColorSchemeIndex simple type (§17.18.103).</p>
accent2 (Accent 2 Theme Color Mapping)	<p>Specifies the theme color in the document's theme part which shall be used in place of this color when it is referenced by document content.</p> <p>If this attribute is omitted, then the accent2 theme color shall be used.</p>

Attributes	Description
	<p>[<i>Example:</i> Consider a WordprocessingML document that must have the references to the theme color <code>accent2</code> mapped to the theme color <code>hlink</code> as defined in the document's theme part. This requirement would be specified using the following WordprocessingML in the document settings:</p> <pre><w:clrSchemeMapping w:accent2="hyperlink" /></pre> <p>The <code>accent2</code> attribute has a value of <code>hyperlink</code>, specifying that uses of the theme color value <code>accent2</code> must be mapped to the theme color <code>hlink</code>. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_WmlColorSchemeIndex</code> simple type (§17.18.103).</p>
<p><code>accent3</code> (Accent3 Theme Color Mapping)</p>	<p>Specifies the theme color in the document's theme part which shall be used in place of this color when it is referenced by document content.</p> <p>If this attribute is omitted, then the <code>accent3</code> theme color shall be used.</p> <p>[<i>Example:</i> Consider a WordprocessingML document that must have references to the theme color <code>accent3</code> mapped to the theme color <code>dk1</code> as defined in the document's theme part. This requirement would be specified using the following WordprocessingML in the document settings:</p> <pre><w:clrSchemeMapping w:accent3="dark1" /></pre> <p>The <code>accent3</code> attribute has a value of <code>dark1</code>, specifying that uses of the theme color value <code>accent3</code> must be mapped to the theme color <code>dk1</code>. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_WmlColorSchemeIndex</code> simple type (§17.18.103).</p>
<p><code>accent4</code> (Accent4 Theme Color Mapping)</p>	<p>Specifies the theme color in the document's theme part which shall be used in place of this color when it is referenced by document content.</p> <p>If this attribute is omitted, then the <code>accent4</code> theme color shall be used.</p> <p>[<i>Example:</i> Consider a WordprocessingML document that must have references to the theme color <code>accent4</code> mapped to the theme color <code>dk2</code> as defined in the document's theme part. This requirement would be specified using the following WordprocessingML in the document settings:</p> <pre><w:clrSchemeMapping w:accent4="dark2" /></pre> <p>The <code>accent4</code> attribute has a value of <code>dark2</code>, specifying that uses of the theme color value <code>accent3</code> must be mapped to the theme color <code>dk2</code>. <i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_WmlColorSchemeIndex simple type (§17.18.103).
accent5 (Accent5 Theme Color Mapping)	<p>Specifies the theme color in the document's theme part which shall be used in place of this color when it is referenced by document content.</p> <p>If this attribute is omitted, then the accent5 theme color shall be used.</p> <p>[<i>Example:</i> Consider a WordprocessingML document that must have references to the theme color accent5 mapped to the theme color accent1 as defined in the document's theme part. This requirement would be specified using the following WordprocessingML in the document settings:</p> <pre data-bbox="451 688 1128 720"><w:clrSchemeMapping w:accent5="accent1" /></pre> <p>The accent5 attribute has a value of accent1, specifying that uses of the theme color value accent5 must be mapped to the theme color accent1. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_WmlColorSchemeIndex simple type (§17.18.103).</p>
accent6 (Accent6 Theme Color Mapping)	<p>Specifies the theme color in the document's theme part which shall be used in place of this color when it is referenced by document content.</p> <p>If this attribute is omitted, then the accent6 theme color shall be used.</p> <p>[<i>Example:</i> Consider a WordprocessingML document that must have references to the theme color accent6 mapped to the theme color accent1 as defined in the document's theme part. This requirement would be specified using the following WordprocessingML in the document settings:</p> <pre data-bbox="451 1308 1128 1339"><w:clrSchemeMapping w:accent6="accent1" /></pre> <p>The accent6 attribute has a value of accent1, specifying that uses of the theme color value accent6 must be mapped to the theme color accent1. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_WmlColorSchemeIndex simple type (§17.18.103).</p>
bg1 (Background 1 Theme Color Mapping)	<p>Specifies the theme color in the document's theme part which shall be used in place of this color when it is referenced by document content.</p> <p>If this attribute is omitted, then the light1 theme color shall be used.</p> <p>[<i>Example:</i> Consider a WordprocessingML document that must have references to the theme color bg1 mapped to the theme color lt2 as defined in the document's theme part. This requirement would be specified using the following WordprocessingML in the document settings:</p>

Attributes	Description
	<p data-bbox="456 285 1049 317"><w:clrSchemeMapping w:bg1="light2" /></p> <p data-bbox="415 354 1435 422">The bg1 attribute has a value of light2, specifying that uses of the theme color value bg1 must be mapped to the theme color lt2. <i>end example</i>]</p> <p data-bbox="415 464 1419 531">The possible values for this attribute are defined by the ST_WmlColorSchemeIndex simple type (§17.18.103).</p>
bg2 (Background 2 Theme Color Mapping)	<p data-bbox="415 548 1446 615">Specifies the theme color in the document's theme part which shall be used in place of this color when it is referenced by document content.</p> <p data-bbox="415 653 1247 684">If this attribute is omitted, then the light2 theme color shall be used.</p> <p data-bbox="415 726 1458 863">[Example: Consider a WordprocessingML document that must have references to the theme color bg2 mapped to the theme color dk1 as defined in the document's theme part. This requirement would be specified using the following WordprocessingML in the document settings:</p> <p data-bbox="456 905 1032 936"><w:clrSchemeMapping w:bg2="dark1" /></p> <p data-bbox="415 974 1471 1041">The bg2 attribute has a value of dark1, specifying that uses of the theme color value bg2 must be mapped to the theme color dk1. <i>end example</i>]</p> <p data-bbox="415 1083 1419 1150">The possible values for this attribute are defined by the ST_WmlColorSchemeIndex simple type (§17.18.103).</p>
followedHyperlink (Followed Hyperlink Theme Color Mapping)	<p data-bbox="415 1165 1446 1232">Specifies the theme color in the document's theme part which shall be used in place of this color when it is referenced by document content.</p> <p data-bbox="415 1270 1409 1302">If this attribute is omitted, then the followedHyperlink theme color shall be used.</p> <p data-bbox="415 1344 1484 1480">[Example: Consider a WordprocessingML document that must have references to the theme color followedHyperlink mapped to the theme color hyperlink as defined in the document's theme part. This requirement would be specified using the following WordprocessingML in the document settings:</p> <p data-bbox="456 1522 1321 1554"><w:clrSchemeMapping w:followedHyperlink="hyperlink" /></p> <p data-bbox="415 1591 1458 1690">The followedHyperlink attribute has a value of hyperlink, specifying that uses of the theme color value followedHyperlink must be mapped to the theme color hyperlink. <i>end example</i>]</p> <p data-bbox="415 1732 1419 1799">The possible values for this attribute are defined by the ST_WmlColorSchemeIndex simple type (§17.18.103).</p>
hyperlink (Hyperlink Theme)	<p data-bbox="415 1816 1446 1883">Specifies the theme color in the document's theme part which shall be used in place of this color when it is referenced by document content.</p>

Attributes	Description
Color Mapping)	<p>If this attribute is omitted, then the hyperlink theme color shall be used.</p> <p>[<i>Example:</i> Consider a WordprocessingML document that must have references to the theme color hyperlink mapped to the theme color accent1 as defined in the document's theme part. This requirement would be specified using the following WordprocessingML in the document settings:</p> <pre data-bbox="456 533 1159 564"><w:clrSchemeMapping w:hyperlink="accent1" /></pre> <p>The hyperlink attribute has a value of accent1, specifying that uses of the theme color value hyperlink must be mapped to the theme color accent1. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_WmlColorSchemeIndex simple type (§17.18.103).</p>
t1 (Text 1 Theme Color Mapping)	<p>Specifies the theme color in the document's theme part which shall be used in place of this color when it is referenced by document content.</p> <p>If this attribute is omitted, then the t1 theme color shall be used.</p> <p>[<i>Example:</i> Consider a WordprocessingML document that must have references to the theme color t1 mapped to the theme color lt1 as defined in the document's theme part. This requirement would be specified using the following WordprocessingML in the document settings:</p> <pre data-bbox="456 1150 1029 1182"><w:clrSchemeMapping w:t1="light1" /></pre> <p>The t1 attribute has a value of light1, specifying that uses of the theme color value t1 must be mapped to the theme color lt1. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_WmlColorSchemeIndex simple type (§17.18.103).</p>
t2 (Text 2 Theme Color Mapping)	<p>Specifies the theme color in the document's theme part which shall be used in place of this color when it is referenced by document content.</p> <p>If this attribute is omitted, then the t2 theme color shall be used.</p> <p>[<i>Example:</i> Consider a WordprocessingML document that must have references to the theme color t2 mapped to the theme color dk1 as defined in the document's theme part. This requirement would be specified using the following WordprocessingML in the document settings:</p> <pre data-bbox="456 1768 1013 1799"><w:clrSchemeMapping w:t2="dark1" /></pre> <p>The t2 attribute has a value of dark1, specifying that uses of the theme color value t2</p>

Attributes	Description
	<p>must be mapped to the theme color dk1. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_WmlColorSchemeIndex simple type (§17.18.103).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_ColorSchemeMapping](#)) is located in §A.1. *end note*]

17.15.1.21 compat (Compatibility Settings)

This element specifies a set of optional compatibility options for the current document.

[*Example:* Consider a WordprocessingML document with a series of compatibility settings:

```
<w:settings>
  <w:compat>
    ...
  </w:compat>
</w:settings>
```

The `compat` element specifies the set of compatibility settings for a document. *end example*]

[Note: The W3C XML Schema definition of this element's content model ([CT_Compat](#)) is located in §A.1. *end note*]

17.15.1.22 consecutiveHyphenLimit (Maximum Number of Consecutively Hyphenated Lines)

This element specifies the maximum number of consecutive lines of text that can end with a hyphen when the contents of this document are displayed. Once this limit has been reached, the following line shall not be hyphenated regardless of whether or not it meets the criteria needed for hyphenation.

If this element is omitted or has its val attribute equal to 0, the given WordprocessingML document shall have no limit on the number of consecutive lines of text that can end with a hyphen.

[*Example:* Consider a WordprocessingML document which should automatically be hyphenated. If the contents of this document result in hyphens appearing on every line in the document, as follows:

[illegible]

This output might be undesirable. If the document shall have a maximum of two consecutive hyphens, this requirement is specified using the following WordprocessingML in the document settings:

If this element is omitted, the application shall use the default radix point of its current locale setting to evaluate field instructions. If this element's attribute value is more than a single character, then the document is non-conformant.

[*Example:* Consider a WordprocessingML document which should use the comma character as the radix point for all field instructions. This requirement is specified using the following WordprocessingML in the document settings:

```
<w:decimalSymbol w:val="," />
```

The decimalSymbol element's val attribute has a value of , specifying that the comma character must be interpreted as the radix point.

For instance, the string 12.345,00 would be interpreted as a numeric value of twelve thousand three hundred and forty five. If the decimalSymbol was a period, the same string would be twelve and three hundred and forty five thousandths. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_String](#)) is located in §A.1. *end note*]

17.15.1.24 defaultTableStyle (Default Table Style for Newly Inserted Tables)

This element specifies the table style which shall automatically be applied to the table properties of tables added to this document by an application. Note that it does not change the table style applied to tables which do not reference a style, instead, it automatically applies the style to that table via the tblStyle element (§17.4.62). This link is made by referencing the styleId attribute value of the table style which shall be used to format newly inserted tables.

If this element is omitted, then no table style shall automatically be applied to inserted tables (therefore inheriting the default table style). If the referenced style is not present or not a table style, then no table style shall automatically be applied to inserted tables.

[Example: Consider a WordprocessingML document which should use the LightShading-Accent3 style. This requirement is specified using the following WordprocessingML in the document settings:

```
<w:defaultTableStyle w:val="LightShading-Accent3" />
```

The corresponding table style must therefore exist in the styles part:

```
<w:style w:type="table" w:styleId="LightShading-Accent3">
...
</w:style>
```

The defaultTableStyle element's val attribute has a value of LightShading-Accent3 specifying that that style is applied automatically to newly inserted tables. end example]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[Example: Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre>

Attributes	Description
	<p>In this case, the decimal number in the <code>val</code> attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model (`CT_String`) is located in §A.1. *end note*]

17.15.1.25 `defaultTabStop` (Distance Between Automatic Tab Stops)

This element specifies the value which shall be used as the multiplier to generate automatic tab stops in this document. *Automatic tab stops* refer to the tab stop locations which occur after all custom tab stops in the current paragraph have been surpassed.

If this element is omitted, then automatic tab stops should be generated at 720 twentieths of a point (0.5") intervals across the displayed page.

[*Example:* Consider a WordprocessingML document which should have automatic tab stops every 360 twentieths of a point (0.25 inches). This requirement is specified using the following WordprocessingML in the document settings:

```
<w:defaultTabStop w:val="360" />
```

The `defaultTabStop` element's `val` attribute has a value of 360 specifying that automatic tab stops shall occur every 1/4th of an inch across the page.

If a custom tab stop was located at 2.28", then the next three automatic tab stops would be at 2.5", 2.75" and 3.0" (the next three multiples of the default tab stop value). *end example*]

Attributes	Description
<code>val</code> (Measurement in Twentieths of a Point)	<p>Specifies a positive measurement value, specified in twentieths of a point. This value is interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML element with a <code>val</code> attribute containing a positive measurement in twentieths of a point:</p> <pre><... w:val="720" /></pre> <p>The <code>val</code> attribute has a value of 720, specifying that this measurement value is 720 twentieths of a point (0.5"). This value is interpreted by the parent element as needed. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_TwipsMeasure</code> simple type (§22.9.2.14).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_TwipsMeasure](#)) is located in §A.1.
end note]

17.15.1.26 `displayBackgroundShape` (Display Background Objects When Displaying Document)

This element specifies whether the images and colors defined in the document's background using the background element (§17.2.1) shall be displayed when the document is displayed in print layout view as specified in the view element (§17.15.1.92).

If this element is omitted, then background shapes shall not be displayed when the document is displayed in print layout view.

[*Example*: Consider a WordprocessingML document that has a turquoise background specified for all pages and is being displayed in page layout view, as follows:



If the document's background should not be displayed, that requirement would be specified using the following WordprocessingML in the document settings:

```
<w:displayBackgroundShape w:val="true" />
```

The resulting document would display the background in page layout view:



end example]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.27 `displayHorizontalDrawingGridEvery` (Distance between Horizontal Gridlines)

This element specifies the number of horizontal grid units defined using the `drawingGridHorizontalSpacing` element (§17.15.1.45) which shall be allowed between subsequent visible horizontal drawing grid lines in this document, if gridlines are being shown. [Note: The display of gridlines is an application-level setting not specified in ECMA-376. *end note*] The *drawing grid* is a grid which can be used by applications to help position floating objects in the document.

If this element is omitted, then gridlines shall be displayed for each horizontal grid unit.

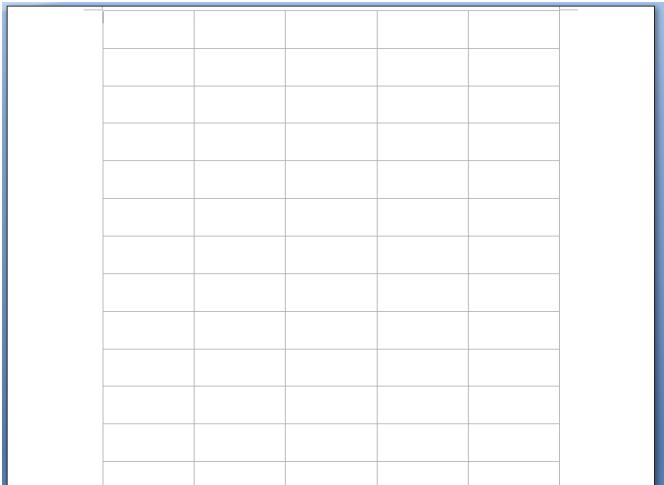
[Example: Consider the image below illustrating a WordprocessingML document in which all horizontal grid units are visible (the default setting):



If the gridlines in this document shall only be displayed for every 4th horizontal drawing gridline, that requirement would be specified using the following WordprocessingML in the document settings:

```
<w:displayHorizontalDrawingGridEvery w:val="4" />
```

The resulting grid would look like the following:



The displayHorizontalDrawingGridEvery element has its val attribute equal to 4, therefore every fourth gridline is displayed in the document when the drawing grid is turned on. *end example*

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <pre><... w:val="1512645511" /></pre> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element’s content model (CT_DecimalNumber) is located in §A.1. *end note*]

17.15.1.28 displayVerticalDrawingGridEvery (Distance between Vertical Gridlines)

This element specifies the number of vertical grid units defined using the drawingGridVerticalSpacing element (§17.15.1.47) which shall be allowed between subsequent vertical gridlines in this document, if gridlines are

being shown. [Note: The display of gridlines is an application-level setting not specified in ECMA-376. *end note*] The *drawing grid* is a grid which can be used by applications to help position floating objects in the document.

If this element is omitted, then vertical gridlines shall not be displayed.

[Example: Consider the image below illustrating a WordprocessingML document in which all vertical grid units are visible (the default setting):



If the vertical drawing gridlines in this document must only be displayed for every 4th gridline, that requirement would be specified using the following WordprocessingML in the document settings:

```
<w:displayVerticalDrawingGridEvery w:val="4" />
```

The resulting grid would look like the following:



The displayVerticalDrawingGridEvery element has its val attribute equal to 4, therefore every fourth vertical gridline is displayed in the document when the drawing grid is turned on. *end example*]

Attributes	Description
val (Decimal)	Specifies that the contents of this attribute contains a decimal number.

Attributes	Description
Number Value)	<p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <div><... w:val="1512645511" /></div> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_DecimalNumber](#)) is located in §A.1. *end note*]

17.15.1.29 documentProtection (Document Editing Restrictions)

This element specifies the set of document protection restrictions which have been applied to the contents of a WordprocessingML document. These restrictions should be enforced by applications editing this document when the enforcement attribute is turned on, and ignored (but persisted) otherwise. *Document protection* is a set of restrictions used to prevent unintentional changes to all or part of a WordprocessingML document. [*Note:* This protection does not encrypt the document, and malicious applications might circumvent its use. This protection is not intended as a security feature. *end note*]

If this element is omitted, then no protection shall be applied to this document. When a password is to be hashed and stored in this element, it shall be hashed as defined below, starting from a UTF-16LE encoded string value. If there is a leading BOM character (U+FEFF) in the encoded password it is removed before hash calculation.

Attributes	Description				
algorithmName (Cryptographic Algorithm Name)	<p>Specifies the specific cryptographic hashing algorithm which shall be used along with the salt attribute and input password in order to compute the hash value.</p> <p>The following values are reserved:</p> <table><tr><th>Value</th><th>Algorithm</th></tr><tr><td>MD2</td><td>Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used.</td></tr></table>	Value	Algorithm	MD2	Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used.
Value	Algorithm				
MD2	Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used.				

Attributes	Description	
		[<i>Note</i> : It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]
	MD4	Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used. [<i>Note</i> : It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]
	MD5	Specifies that the MD5 algorithm, as defined by RFC 1321, shall be used. [<i>Note</i> : It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]
	RIPEMD-128	Specifies that the RIPEMD-128 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used. [<i>Note</i> : It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]
	RIPEMD-160	Specifies that the RIPEMD-160 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	SHA-1	Specifies that the SHA-1 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	SHA-256	Specifies that the SHA-256 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	SHA-384	Specifies that the SHA-384 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	SHA-512	Specifies that the SHA-512 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	WHIRLPOOL	Specifies that the WHIRLPOOL algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	<p>[<i>Example</i>: Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre>< ... algorithmName="SHA-1" hashValue="9oN7nWkCayEZib1RomSJTjmPpCY=" /></pre> <p>The algorithmName attribute value of “SHA-1” specifies that the SHA-1 hashing algorithm must be used to generate a hash from the user-defined password. <i>end</i></p>	

Attributes	Description
	<p><i>example]</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
edit (Document Editing Restrictions)	<p>Specifies the set of editing restrictions which shall be enforced on a given WordprocessingML document, as defined by the simple type referenced below</p> <p>If this attribute is omitted, the consumer shall behave as though there are no editing restrictions applied to this document; equivalent to an attribute value of none.</p> <p>[<i>Example:</i> Consider a WordprocessingML document that contains the following WordprocessingML specifying that hosting applications must enforce read-only protection for a given document:</p> <pre data-bbox="456 758 1414 789"><w:documentProtection w:edit="readOnly" w:enforcement="1" /></pre> <p>The edit attribute has a value of readOnly and a enforcement attribute with a value of 1, specifying that read-only document protection must be enforced on the given document. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_DocProtect simple type (§17.18.18).</p>
enforcement (Enforce Document Protection Settings)	<p>Specifies if the document protection settings shall be enforced for a given WordprocessingML document. If the value of this element is off, 0, or false, all the WordprocessingML pertaining to document protection is still preserved in the document, but is not enforced. If the value of this element is on, 1, or true, the document protection is enforced.</p> <p>If this attribute is omitted, then document protection settings shall not be enforced by applications.</p> <p>[<i>Example:</i> Consider a WordprocessingML document that contains the following WordprocessingML specifying that hosting applications must apply read-only protection for a given document:</p> <pre data-bbox="456 1518 1414 1549"><w:documentProtection w:edit="readOnly" w:enforcement="1" /></pre> <p>The enforcement attribute has a value of 1, specifying that the document protection specified must be enforced on the given document. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
formatting (Only Allow Formatting With Unlocked Styles)	<p>Specifies if formatting restrictions are in effect for a given WordprocessingML document. This enables the document to restrict the types of styles that can exist in a given WordprocessingML document. Specifically, by setting this attribute's value equal to true, every style whose locked element (§17.7.4.7) has a value of true (or latent styles</p>

Attributes	Description
	<p>(§17.7.4.5) whose locked attribute is true) shall not be available for use in the application, nor should any direct formatting. Only styles with a locked value of false can be used.</p> <p>If this attribute is omitted, then no formatting restrictions shall be applied, even when document protection is enforced.</p> <p>[<i>Example:</i> Consider a WordprocessingML document that must apply formatting protection. This requirement would be specified using the following WordprocessingML in the document settings:</p> <pre><w:documentProtection w:formatting="true" w:enforcement="true" /></pre> <p>If the following definition for a style was also present in the document:</p> <pre><w:style w:type="paragraph" w:styleId="Heading1"> <w:name w:val="Heading 1" /> <w:locked w:val="1" /> ... </w:style></pre> <p>The formatting attribute has a value of true specifying that the applications must not allow the style above to be added to the WordprocessingML document. This does not preclude previous uses of that style (which must not be removed), but does prevent new uses of this style from being added. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
hashValue (Password Hash Value)	<p>Specifies the hash value for the password stored with this document. This value shall be compared with the resulting hash value after hashing the user-supplied password using the algorithm specified by the preceding attributes and parent XML element, and if the two values match, the protection shall no longer be enforced.</p> <p>If this value is omitted, then the reservationPassword attribute shall contain the password hash for the workbook.</p> <p>[<i>Example:</i> Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre><... AlgorithmName="SHA-1" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The hashValue attribute value of 9oN7nWkCAyEZib1RomSJTjmPpCY= specifies that the user-supplied password must be hashed using the pre-processing defined by the parent element (if any) followed by the SHA-1 algorithm (specified via the algorithmName attribute value of SHA-1) and that the resulting has value must be</p>

Attributes	Description
	<p>9oN7nWkCAyEZib1RomSJTjmPpCY= for the protection to be disabled. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema base64Binary datatype.</p>
saltValue (Salt Value for Password Verifier)	<p>Specifies the salt which was prepended to the user-supplied password before it was hashed using the hashing algorithm defined by the preceding attribute values to generate the hashValue attribute, and which shall also be prepended to the user-supplied password before attempting to generate a hash value for comparison. A <i>salt</i> is a random string which is added to a user-supplied password before it is hashed in order to prevent a malicious party from pre-calculating all possible password/hash combinations and simply using those pre-calculated values (often referred to as a "dictionary attack").</p> <p>If this attribute is omitted, then no salt shall be prepended to the user-supplied password before it is hashed for comparison with the stored hash value.</p> <p>[<i>Example</i>: Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre><... saltValue="ZUdHa+D8F/OAKP3I7ssUnQ==" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The saltValue attribute value of ZUdHa+D8F/OAKP3I7ssUnQ== specifies that the user-supplied password must have this value prepended before it is run through the specified hashing algorithm to generate a resulting hash value for comparison. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema base64Binary datatype.</p>
spinCount (Iterations to Run Hashing Algorithm)	<p>Specifies the number of times the hashing function shall be iteratively run (runs using each iteration's result plus a 4 byte value (0-based, little endian) containing the number of the iteration as the input for the next iteration) when attempting to compare a user-supplied password with the value stored in the hashValue attribute.</p> <p>[<i>Rationale</i>: Running the algorithm many times increases the cost of exhaustive search attacks correspondingly. Storing this value allows for the number of iterations to be increased over time to accommodate faster hardware (and hence the ability to run more iterations in less time). <i>end rationale</i>]</p> <p>[<i>Example</i>: Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre><... spinCount="100000" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The spinCount attribute value of 100000 specifies that the hashing function must be run one hundred thousand times to generate a hash value for comparison with the</p>

Attributes	Description
	<p>hashValue attribute. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DocProtect](#)) is located in §A.1. *end note*]

17.15.1.30 documentType (Document Classification)

This element specifies the classification of a given WordprocessingML document.

[*Note:* This element can be used by hosting applications to facilitate customized user interface and/or automatic formatting behaviors based on the 'type' of a given WordprocessingML document. *end note*]

If this element is omitted, then the document shall be classified as a general document.

[*Example:* Consider a set of WordprocessingML documents which should be classified as 'letters'. This classification would be specified using the following WordprocessingML in the document settings of these documents:

```
<w:documentType w:val="letter" />
```

The documentType element's val attribute is equal to letter, specifying that the hosting application must apply the behaviors it has specified for letters to the given WordprocessingML document. *end example*]

Attributes	Description
val (Document Classification Value)	<p>Specifies the classification of the document based on the types defined in the referenced simple type definition.</p> <p>[<i>Example:</i> Consider a WordprocessingML document which should be classified as an e-mail message. This classification would be specified using the following WordprocessingML in the document settings:</p> <pre><w:documentType w:val="eMail" /></pre> <p>The val attribute is equal to eMail, specifying that the hosting application can apply e-mail behaviors (if any) to this document. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DocType simple type (§17.18.19).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DocType](#)) is located in §A.1. *end note*]

17.15.1.31 docVar (Single Document Variable)

This element specifies the parameters of a single document variable. A *document variable* is a storage location for arbitrary customer data in name/value pairs that is persisted in a given WordprocessingML document. Specifically, this element specifies through its name and val attributes the name and value pair for a given document variable.

[*Note:* This mechanism is maintained for legacy compatibility only, and should be avoided in favor of the custom XML data support defined in ECMA-376. *end note*]

[*Example:* Consider the following WordprocessingML fragment specifying a document variable named example and containing the value example value:

```
<w:docVars>
  <w:docVar w:name="example" w:val="example value" />
</w:docVars>
```

The docVar element defines a single document variable, named example using the name attribute, and assigned the value example value through the val attribute. *end example*]

Attributes	Description
name (Document Variable Name)	<p>Specifies the name of the parent document variable.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment specifying a document variable:</p> <pre><w:docVars> <w:docVar w:name="example name" w:val="example value" /> </w:docVars></pre> <p>The name attribute specifies that the name of the document variable is example name. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
val (Document Variable Value)	<p>Specifies the value of the parent document variable.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment specifying a document variable:</p> <pre><w:docVars> <w:docVar w:name="example name" w:val="Tristan Davis" /> </w:docVars></pre> <p>The val attribute specifies that the value of the document variable is Tristan Davis. <i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DocVar](#)) is located in §A.1. *end note*]

17.15.1.32 docVars (Document Variables)

This element specifies the presence of document variables in a WordprocessingML. A *document variable* is a storage location for arbitrary customer data in name/value pairs that is persisted in a given WordprocessingML document.

[*Note:* This mechanism is maintained for legacy compatibility only, and should be avoided in favor of the custom XML data support defined in ECMA-376. *end note*]

[*Example:* Consider the following WordprocessingML specifying three document variables:

```
<w:docVars>
  <w:docVar ... />
  <w:docVar ... />
  <w:docVar ... />
</w:docVars>
```

The docVars element contains three child elements each defining a single document variable in this document. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DocVars](#)) is located in §A.1. *end note*]

17.15.1.33 doNotAutoCompressPictures (Do Not Automatically Compress Images)

This element specifies that pictures in this document shall not automatically be compressed when saving the document in order to reduce the overall size of the resulting WordprocessingML document.

If this element is omitted, applications can perform basic compression on images before saving the contents of the document.

[*Example:* Consider a WordprocessingML document which should never have its images compressed before they are saved. This requirement would be specified using the following WordprocessingML:

```
<w:doNotAutoCompressPictures w:val="true"/>
```

The doNotAutoCompressPictures element's val attribute has a value of true specifying that images must not be automatically compressed when the document is saved. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.34 doNotDemarcateInvalidXml (Do Not Show Visual Indicator For Invalid Custom XML Markup)

This element specifies whether a visual cue should be displayed around content contained in a WordprocessingML document which is contained with custom XML markup specified via the customXml element when an application determines that the current XML markup (or its contents) violate the constraints of the attached XML schema(s).

If this element is not present in a WordprocessingML document visual cues shall be displayed on content contained in custom XML markup in a WordprocessingML document which is considered to be invalid based on the associated XML schema(s).

[*Example:* Consider a WordprocessingML document which should show no visual indication of invalid custom XML markup. This requirement would be specified using the following WordprocessingML:

```
<w:doNotDemarcateInvalidXml w:val="true"/>
```

The doNotDemarcateInvalidXml element's val attribute has a value of true specifying the display of any visual indication of invalid custom XML markup must be suppressed for this document. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.35 doNotDisplayPageBoundaries (Do Not Display Visual Boundary For Header/Footer or Between Pages)

This element specifies whether applications displaying this document should display the contents of the header and footer when displaying the document in print layout view (§17.15.1.92) or should collapse those areas as well as the whitespace on all displayed pages so that the text extents are directly following one another.

[*Rationale:* Collapsing the ends of pages makes it easier to read the contents of the document, since the text flows between pages without whitespace, while maintaining the WYSIWYG functionality of print layout view for the document's main content. *end rationale*]

If this element is omitted, then all pages should be shown at their full size (including whitespace and headers/footers) when they are displayed in print layout view.

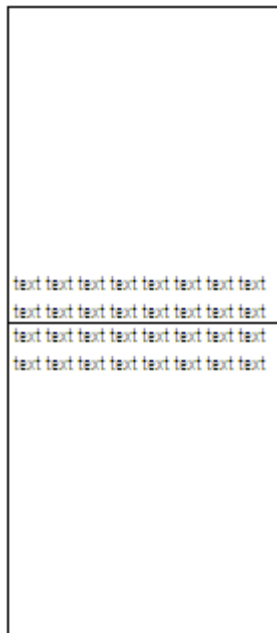
[*Example:* Consider the images below illustrating two pages in a WordprocessingML document:



If document must automatically have whitespace between pages removed when it is displayed, that requirement would be specified using the following WordprocessingML in the document settings:

```
<w:doNotDisplayPageBoundaries w:val="true" />
```

The resulting output might look like the following:



The `doNotDisplayPageBoundaries` element has its `val` attribute equal to `true`, therefore the document is automatically displayed with whitespace between text extents on following pages compressed, allowing the pages to be viewed more easily. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.36 `doNotEmbedSmartTags` (Remove Smart Tags When Saving)

This element specifies if any smart tags specified using the `smartTag` element shall be removed from the contents of this document before it is resaved. This setting shall also prevent the addition of new smart tags to the content of the document.

If this element is omitted, then smart tags shall not be removed from the file when it is saved.

[*Example:* Consider a WordprocessingML document which should never be saved with `smartTag` elements in its contents. This requirement is specified using the following WordprocessingML fragment in the document settings:

```
<w:doNotEmbedSmartTags w:val="true"/>
```

The `doNotEmbedSmartTags` element's `val` attribute has a value of `true` specifying that smart tags must never be saved in the contents of this document. For example, if a run formerly looked like this:

```
<w:p>
  <w:r>
    <w:t xml:space="preserve">Hello</w:t>
  </w:r>
  <w:smartTag ... >
    <w:r>
      <w:t>world</w:t>
    </w:r>
  </w:smartTag>
</w:p>
```

The presence of this element specifies that the `SmartTag` element must be removed, and applications might then choose to combine duplicated runs as desired. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.37 `doNotHyphenateCaps` (Do Not Hyphenate Words in ALL CAPITAL LETTERS)

This element specifies whether or not words comprised of all capital letters shall be hyphenated within a given document when automatic hyphenation is specified via the `autoHyphenation` element (§17.15.1.10).

If this element is omitted, then words in ALL CAPITAL LETTERS shall be hyphenated when the document is hyphenated.

[*Example:* Consider a document which is automatically hyphenated containing the following paragraph of content:

THIS IS A HYPHENATION EXAMPLE. THIS IS A SHORT HYPHENATION EXAMPLE. THIS IS A SHORT HYPHENATION EXAMPLE.

If words in ALL CAPITAL LETTERS must not be hyphenated, this requirement would be specified by adding the following WordprocessingML to the document settings part:

```
<w:doNotHyphenateCaps w:val="true"/>
```

The resulting content would not be hyphenated:

THIS IS A HYPHENATION EXAMPLE. THIS IS A SHORT HYPHENATION EXAMPLE. THIS IS A SHORT HYPHENATION EXAMPLE.

The doNotHyphenateCaps element val set to true, specifying that the first line of text to end with the word SHORT as the word HYPHENATION had to be moved to the second line since it could not fit in its entirety on the first line.

Conversely, setting the doNotHyphenateCaps element val set to off (the default) caused the first line of text to contain a hyphenated portion of the word HYPHENATION as hyphenation of words comprised of all capital letters is permitted. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.38 doNotIncludeSubdocsInStats (Do Not Include Content in Text Boxes, Footnotes, and Endnotes in Document Statistics)

This element specifies if document content contained in text boxes, footnotes, and endnotes shall be excluded when an application calculates a given document's statistics when these values are calculated and/or displayed by an application.

[*Note:* Some examples of document statistics that an application might chose to calculate are: number of words, number of characters, number of paragraphs, number of pages, number of lines, and so on. *end note*]

[*Example:* Consider a WordprocessingML that specifies that it must not include these document stories when its contents are used to calculate document statistics. This requirement would be specified using the following WordprocessingML in the document settings part:

```
<w:doNotIncludeSubdocsInStats w:val="true"/>
```

The doNotIncludeSubdocsInStats element's val attribute has a value of true specifying that only the contents of the main document story should be used when calculating document statistics. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.39 doNotShadeFormData (Do Not Show Visual Indicator For Form Fields)

This element specifies whether a visual cue should be displayed around form fields contained in a WordprocessingML document specified via the FORMTEXT, FORMCHECKBOX, or FORMDROPDOWN fields.

If this element is not present in a WordprocessingML document visual cues should be displayed on form fields contained in the document.

[*Example:* Consider a WordprocessingML document which should no visual indication of form fields. This requirement would be specified using the following WordprocessingML:

```
<w:doNotShadeFormData w:val="true"/>
```

The doNotShadeFormData element's val attribute has a value of true specifying the display of any visual indication of form fields must be suppressed for this document. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.40 doNotTrackFormatting (Do Not Track Formatting Revisions When Tracking Revisions)

This element specifies that applications shall not track revisions made to the formatting of this WordprocessingML document when the trackRevisions element (§17.15.1.89) is turned on.

If this element is omitted, then revisions to formatting shall be generated by changes to the contents of this document when the trackRevisions element is turned on.

[*Example:* Consider a WordprocessingML document containing the text run Example that must have revisions tracked. Example WordprocessingML from Document 1 is given below:

```
<w:document>
  <w:body>
    <w:p>
      <w:r>
        <w:t>Example</w:t>
      </w:r>
    </w:p>
  </w:body>
</w:document>
```

If the word text was added to the end of this document and bolded, the resulting WordprocessingML would be output as follows:

```

<w:document>
  <w:body>
    <w:p>
      <w:r>
        <w:t>Example</w:t>
      </w:r>
      <w:ins ... >
        <w:r>
          <w:rPr>
            <w:b/>
            <w:rPrChange ... >
              <w:rPr/>
            </w:rPrChange>
          </w:rPr>
          <w:t>text</w:t>
        </w:r>
      </w:ins>
    </w:p>
  </w:body>
</w:document>

```

If changes to formatting were turned off using the following WordprocessingML syntax in the document settings:

```

<w:settings>
  <w:trackRevisions w:val="true" />
  <w:doNotTrackFormatting w:val="true" />
  ...
</w:settings>

```

The same revision (the word text was added to the end of this document and bolded) would result in the following markup:

```

<w:document>
  <w:body>
    <w:p>
      <w:r>
        <w:t>Example</w:t>
      </w:r>
      <w:ins ... >
        <w:r>
          <w:rPr>
            <w:b/>
          </w:rPr>
          <w:t>text</w:t>
        </w:r>
      </w:ins>
    </w:p>
  </w:body>
</w:document>

```

The doNotTrackFormatting element's val attribute was set to true, therefore the changes to the formatting of the document were not tracked as revisions in the document's WordprocessingML. Specifically, applying bold formatting to the text was not tracked as a revision with the rPrChange (§17.13.5.31) element. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.41 doNotTrackMoves (Do Not Use Move Syntax When Tracking Revisions)

This element specifies that applications shall not track revisions made to this WordprocessingML document as moves when the trackRevisions element (§17.15.1.89) is turned on, even when that syntax is appropriate. Instead, applications should use a standard insertion and deletion annotation syntax. Existing moves shall not be modified. [*Rationale*: This element is provided to enable interoperability with earlier word processing applications which do not understand moves. *end rationale*]

If this element is omitted, then move annotations can be generated by changes to the contents of this document when the trackRevisions element is turned on as appropriate.

[*Example*: Consider a WordprocessingML that specifies that it must not have additional moves added to its contents. This requirement would be specified using the following WordprocessingML in the document settings part:

```
<w:doNotTrackMoves w:val="true"/>
```

The doNotTrackMoves element's val attribute has a value of true specifying that insertion/deletion annotations must be used rather than moves when revisions are tracked in this document. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.42 `doNotUseMarginsForDrawingGridOrigin` (Do Not Use Margins for Drawing Grid Origin)

This element specifies that the top-left corner of the page shall not be used as the origin for the drawing grid. The *drawing grid* is a virtual grid which can be used by applications to specify where drawing objects shall be positioned on a page when inserted (i.e. to ensure objects are aligned, etc.). If this element is present the grid shall start at the top-left edge of the page and not the text extents.

If this element is omitted, then the gridlines shall start at the topmost edge of the text extents.

[*Example:* Consider a WordprocessingML document whose drawing grid must begin at the top left edge of the page. This requirement would be specified using the following WordprocessingML markup in the document settings:

```
<w:doNotUseMarginsForDrawingGridOrigin w:val="true" />
```

The `doNotUseMarginsForDrawingGridOrigin` element's `val` attribute is equal to `true` specifying that the document's drawing grid must begin from the top left corner of the page, rather than the top left corner of the text extents. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.43 `doNotValidateAgainstSchema` (Do Not Validate Custom XML Markup Against Schemas)

This element specifies that applications shall not validate the custom XML markup in this document against the applicable custom XML schema(s), even when those schemas are available. The application should silently behave as if it was unable to provide this functionality.

If this element is omitted, then applications which support this functionality should attempt to validate the custom XML contents against any available related custom XML schema(s).

[*Example:* Consider a WordprocessingML document which should not have its custom XML content validated even by applications which support this operation. This requirement is specified using the following WordprocessingML in the document settings:

```
<w:doNotValidateAgainstSchema w:val="true" />
```

The `doNotValidateAgainstSchema` element's `val` attribute has a value of `true` specifying that the custom XML markup in this document must not be validated. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.44 `drawingGridHorizontalOrigin` (Drawing Grid Horizontal Origin Point)

This element specifies the distance from of the left edge of the page which shall be used as the origin for the horizontal gridlines used by the drawing grid. The *drawing grid* is a virtual grid which might be used by applications to specify where drawing objects shall be positioned on a page when inserted (i.e. to ensure objects

are aligned, etc.). Since the grid always covers the entire page when the `doNotUseMarginsForDrawingGridOrigin` element (§17.15.1.42) is specified, this element shall only affect the starting edge of the first horizontal gridline displayed (i.e. it only adjusts the grid by the modulus of the value against the width of one grid unit).

If this element is omitted, then the gridlines shall start at the leftmost edge of the page. If the `doNotUseMarginsForDrawingGridOrigin` element is not specified, then this element is ignored.

[*Example:* Consider a `WordprocessingML` document whose drawing grid must begin three inches (4320 twentieths of a point) before the left edge of the page. This requirement would be specified using the following `WordprocessingML` markup in the document settings:

```
<w:settings>
...
<w:doNotUseMarginsForDrawingGridOrigin w:val="true" />
<w:drawingGridHorizontalOrigin w:val="4320" />
...
</w:settings>
```

The `drawingGridHorizontalOrigin` element's `val` attribute is equal to 4320 specifying that the horizontal edge of the document's drawing grid must begin three inches (4320 twentieths of a point) from the left edge of the page, since the `doNotUseMarginsForDrawingGridOrigin` element's `val` attribute is equal to `true`. *end example]*

Attributes	Description
<code>val</code> (Measurement in Twentieths of a Point)	<p>Specifies a positive measurement value, specified in twentieths of a point. This value is interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following <code>WordprocessingML</code> element with a <code>val</code> attribute containing a positive measurement in twentieths of a point:</p> <pre><... w:val="720" /></pre> <p>The <code>val</code> attribute has a value of 720, specifying that this measurement value is 720 twentieths of a point (0.5"). This value is interpreted by the parent element as needed. <i>end example]</i></p> <p>The possible values for this attribute are defined by the <code>ST_TwipsMeasure</code> simple type (§22.9.2.14).</p>

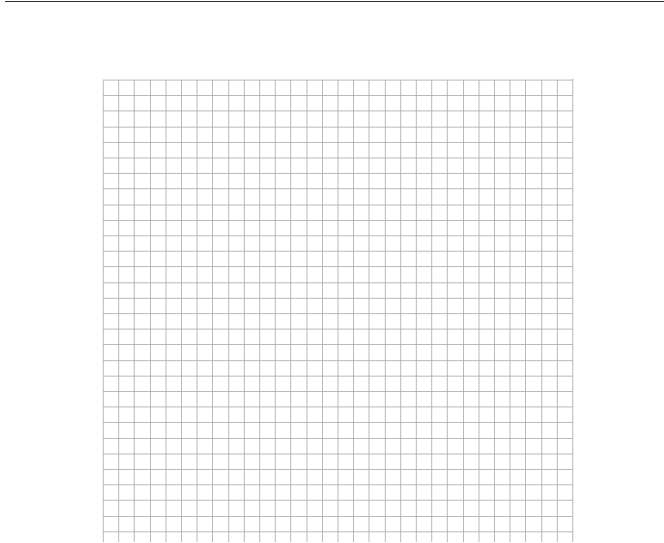
[*Note:* The W3C XML Schema definition of this element's content model (`CT_TwipsMeasure`) is located in §A.1. *end note]*

17.15.1.45 `drawingGridHorizontalSpacing` (Drawing Grid Horizontal Grid Unit Size)

This element specifies the width of horizontal grid units in this document. The *drawing grid* is a grid which can be used by applications to help position floating objects in the document.

If this element is omitted, then each horizontal grid unit shall be 180 twentieths of a point (0.125") in width.

[*Example:* Consider the image below illustrating a WordprocessingML document in which all horizontal grid units are each 144 twentieths of a point wide (and all are showing):



If the gridlines in this document must only be displayed for every half an inch, that requirement would be specified using the following WordprocessingML in the document settings:

```
<w:drawingGridHorizontalSpacing w:val="720" />
```

The resulting grid would look like the following:



The `drawingGridHorizontalSpacing` element has its `val` attribute equal to 720, therefore every horizontal gridline has a width of one half of an inch (720 twentieths of a point). *end example*]

Attributes	Description
<code>val</code> (Measurement in Twentieths of a Point)	<p>Specifies a positive measurement value, specified in twentieths of a point. This value is interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following <code>WordprocessingML</code> element with a <code>val</code> attribute containing a positive measurement in twentieths of a point:</p> <pre><... w:val="720" /></pre> <p>The <code>val</code> attribute has a value of 720, specifying that this measurement value is 720 twentieths of a point (0.5"). This value is interpreted by the parent element as needed. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_TwipsMeasure</code> simple type (§22.9.2.14).</p>

[*Note:* The W3C XML Schema definition of this element’s content model (`CT_TwipsMeasure`) is located in §A.1. *end note*]

17.15.1.46 `drawingGridVerticalOrigin` (Drawing Grid Vertical Origin Point)

This element specifies the distance from of the top edge of the page which shall be used as the origin for the vertical gridlines used by the drawing grid. The *drawing grid* is a virtual grid which can be used by applications to specify where drawing objects shall be positioned on a page when inserted (i.e. to ensure objects are aligned, etc.). Since the grid always covers the entire page when the `doNotUseMarginsForDrawingGridOrigin` element (§17.15.1.42) is specified, this element shall only affect the starting edge of the first vertical gridline displayed (i.e. it only adjusts the grid by the modulus of the value against the width of one grid unit).

If this element is omitted, then the gridlines shall start at the topmost edge of the page. If the `doNotUseMarginsForDrawingGridOrigin` element is not specified, then this element is ignored.

[*Example:* Consider a `WordprocessingML` document whose drawing grid must begin one inch (1440 twentieths of a point) before the top edge of the page. This requirement would be specified using the following `WordprocessingML` markup in the document settings:

```
<w:settings>
...
<w:doNotUseMarginsForDrawingGridOrigin w:val="true" />
<w:drawingGridVerticalOrigin w:val="1440" />
...
</w:settings>
```


The `drawingGridVerticalOrigin` element's `val` attribute is equal to 1440 specifying that the vertical edge of the document's drawing grid must begin one inch (1440 twentieths of a point) from the top edge of the page, since the `doNotUseMarginsForDrawingGridOrigin` element's `val` attribute is equal to `true`. *end example*

Attributes	Description
<code>val</code> (Measurement in Twentieths of a Point)	<p>Specifies a positive measurement value, specified in twentieths of a point. This value is interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML element with a <code>val</code> attribute containing a positive measurement in twentieths of a point:</p> <pre><... w:val="720" /></pre> <p>The <code>val</code> attribute has a value of 720, specifying that this measurement value is 720 twentieths of a point (0.5"). This value is interpreted by the parent element as needed. <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_TwipsMeasure</code> simple type (§22.9.2.14).</p>

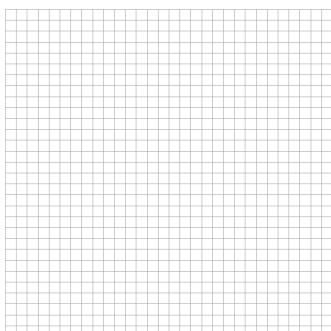
[*Note:* The W3C XML Schema definition of this element's content model (`CT_TwipsMeasure`) is located in §A.1. *end note*]

17.15.1.47 `drawingGridVerticalSpacing` (Drawing Grid Vertical Grid Unit Size)

This element specifies the width of vertical grid units in this document. The *drawing grid* is a grid which can be used by applications to help position floating objects in the document.

If this element is omitted, then each vertical grid unit shall be 180 twentieths of a point (0.125") in width.

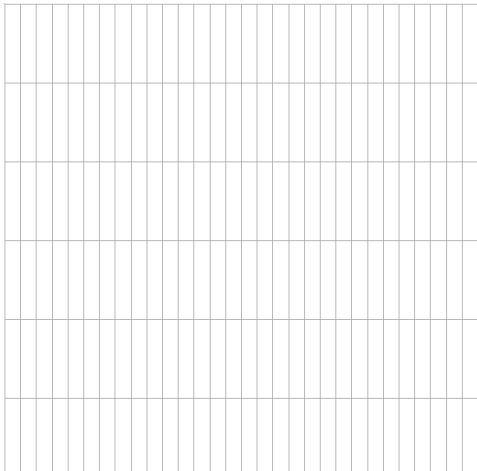
[*Example:* Consider the image below illustrating a WordprocessingML document in which all vertical grid units are each 144 twentieths of a point high (and all are showing):



If the vertical gridlines in this document must only be displayed for every half an inch, that requirement would be specified using the following WordprocessingML in the document settings:

<w:drawingGridVerticalSpacing w:val="720" />

The resulting grid would look like the following:



The drawingGridVerticalSpacing element has its val attribute equal to 720, therefore every vertical gridline has a height of one half of an inch (720 twentieths of a point). *end example*

Attributes	Description
val (Measurement in Twentieths of a Point)	<p>Specifies a positive measurement value, specified in twentieths of a point. This value is interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML element with a val attribute containing a positive measurement in twentieths of a point:</p> <p style="text-align: center;"><... w:val="720" /></p> <p>The val attribute has a value of 720, specifying that this measurement value is 720 twentieths of a point (0.5"). This value is interpreted by the parent element as needed. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_TwipsMeasure](#)) is located in §A.1. *end note*

17.15.1.48 `forceUpgrade` (Upgrade Document on Open)

This element specifies that the contents of this document can be upgraded and that the resulting document shall not have its functionality limited to only those functions compatible with earlier word processing applications. The only actions required as part of upgrading the document are:

- The removal of this element. If an application does not know how to upgrade a document, this element should be ignored and persisted.
- The removal of all compatibility options (§17.15.1.21) on the document which maintain compatibility with previous word processing applications. The compatibility settings which simply affect a given behavior shall not be turned off.

[*Note:* The remaining operations which must be performed as part of upgrading the document are application-defined and outside the scope of ECMA-376. *end note*]

[*Example:* Consider a WordprocessingML document that specifies that it must automatically be upgraded when it is opened by an application. This requirement would be specified using the following WordprocessingML in the document settings part:

```
<w:forceUpgrade/>
```

The `forceUpgrade` element's presence specifies that this document must be upgraded by any application which supports this operation. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.1. *end note*]

17.15.1.49 `formsDesign` (Structured Document Tag Placeholder Text Should be Resaved)

This element specifies that the document was last saved while the placeholder text of all structured document tags in this document were being edited. This means that the placeholder text currently displayed in all structured document tags which are displaying the `showingPlcHdr` element (§17.5.2.39) shall be committed to the corresponding glossary document entry as specified using the `docPart` element (§17.12.5) when this document is opened, in order to ensure that the most recent placeholder text is stored in the glossary document entry. If the current placeholder text cannot be saved as a glossary document entry, then it should be modified as needed before saving.

If this element is omitted, then the placeholder text in this document should not automatically be resaved when the document is opened.

[*Example:* Consider a WordprocessingML document that specifies that its placeholder text should be resaved to the glossary document when the file is opened. This requirement would be specified using the following WordprocessingML in the document settings part:

```
<w:formsDesign w:val="true"/>
```

The `formsDesign` element's `val` attribute has a value of `true` specifying that this document should be resaved to its glossary document by any application which supports this operation. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.50 gutterAtTop (Position Gutter At Top of Page)

This element specifies that a given WordprocessingML document's gutter shall be positioned at the top of the document's pages when the document is displayed. A *gutter* is the white space formed by the inner margins of two pages facing one another; such as the white space between the text on pages of a book when the book is opened.

If this element is omitted, then the gutter shall not be positioned at the top of the page. If the mirrorMargins (§17.15.1.57), bookFoldPrinting (§17.15.1.11), bookFoldRevPrinting (§17.15.1.13), or printTwoOnOne (§17.15.1.64) elements are used within a given document, the gutterAtTop element shall not be used. Rather, the gutter shall be positioned automatically as necessary to enable the printing and page layout capabilities of these settings.

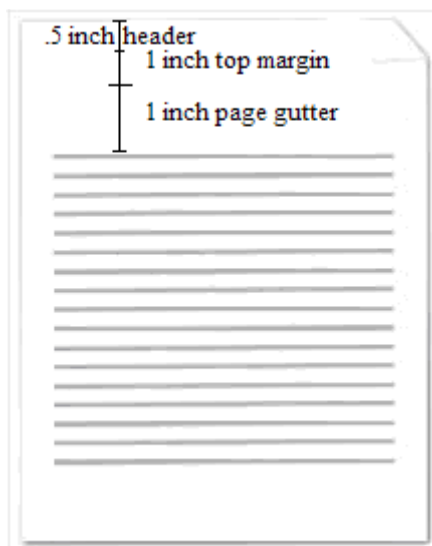
[*Example:* Consider a one page WordprocessingML document with a 1,440 twentieths of a point (one inch) top margin and gutter, and a 720 twentieths of a point (one half of an inch) header. Consider also, that the gutter must exist at the top of the document's pages. This requirement is specified using the following WordprocessingML in the section properties:

```
<w:pgMar w:top="1440" ... w:header="720" ... w:gutter="1440" />
```

And the following WordprocessingML in the document settings:

```
<w:gutterAtTop w:val="true" />
```

The resulting document's pages would have the gutter positioned as follows:



The gutterAtTop element's val attribute is equal to true, specifying that the gutter must appear at the top of each page. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.51 `hideGrammaticalErrors` (Do Not Display Visual Indication of Grammatical Errors)

This element specifies whether a visual cue should be displayed around run content contained in a WordprocessingML document which has been flagged as a possible grammatical error using the `proofErr` element (§17.13.8.1) or via the application's own grammar engine.

If this element is not present in a WordprocessingML document, visual cues shall be displayed on content contained in a WordprocessingML document which is considered to contain grammatical errors.

[*Example*: Consider a WordprocessingML document which should show no visual indication of grammatical errors. This requirement would be specified using the following WordprocessingML:

```
<w:hideGrammaticalErrors w:val="true"/>
```

The `hideGrammaticalErrors` element's `val` attribute has a value of `true` specifying the display of any visual indication of grammatical errors must be suppressed for this document. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.52 `hideSpellingErrors` (Do Not Display Visual Indication of Spelling Errors)

This element specifies whether a visual cue should be displayed around run content contained in a WordprocessingML document which has been flagged as a possible spelling error using the `proofErr` element (§17.13.8.1) or via the application's own spelling engine.

If this element is not present in a WordprocessingML document, visual cues shall be displayed on content contained in a WordprocessingML document which is considered to contain spelling errors.

[*Example*: Consider a WordprocessingML document which should show no visual indication of spelling errors. This requirement would be specified using the following WordprocessingML:

```
<w:hideSpellingErrors w:val="true"/>
```

The `hideSpellingErrors` element's `val` attribute has a value of `true` specifying the display of any visual indication of spelling errors must be suppressed for this document. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.53 `hyphenationZone` (Hyphenation Zone)

This element specifies the hyphenation zone which shall be used when automatically or manually hyphenating the contents of this document. The *hyphenation zone* is the amount of whitespace which can be left at the end of a line (or added to justified lines) before hyphenation should be attempted on the next word in the document (in order to reduce the amount of whitespace on the line). A smaller hyphenation zone should reduce the raggedness of the right edge of a given document's body text, as more words is hyphenated. Conversely, a larger hyphenation zone should increase the raggedness of the right edge of a given document's text, as fewer words is hyphenated.

If this element is omitted, then a default hyphenation zone of 360 twentieths of a point (0.25") shall be applied when performing hyphenation on this document.

[*Example:* Consider the images below illustrating a paragraph of text in a WordprocessingML document which was automatically hyphenated with the default hyphenation zone:

[illegible]

If document must instead be hyphenated using a hyphenation zone of one-half of an inch, that requirement would be specified using the following WordprocessingML in the document settings:

<w:hyphenationZone w:val="720" />

The resulting output would only hyphenate words when the remaining line whitespace was less than half an inch, and would look like the following:

This is sample text. This is sample text. This is sample text. This is sample text. This is sample text. This is
sample text. This is sample text. This is sample text. This is sample text. This is sample text. This is
sample text. This is sample text. This is sample text. This is sample text. This is sample text. This is
sample text. This is sample text. This is sample text. This is sample text. This is sample text. This is

The hyphenationZone element has its val attribute equal to 720, therefore lines in the document are hyphenated when the remaining line spacing is less than 720 twentieths of a point (0.5"), resulting in fewer hyphens. *end example*]

Attributes	Description
val (Measurement in Twentieths of a Point)	<p>Specifies a positive measurement value, specified in twentieths of a point. This value is interpreted based on the context of the parent XML element.</p> <p>[<i>Example</i>: Consider the following WordprocessingML element with a val attribute containing a positive measurement in twentieths of a point:</p> <pre><... w:val="720" /></pre> <p>The val attribute has a value of 720, specifying that this measurement value is 720 twentieths of a point (0.5"). This value is interpreted by the parent element as needed. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TwipsMeasure](#)) is located in §A.1. end note]

17.15.1.54 ignoreMixedContent (Ignore Mixed Content When Validating Custom XML Markup)

This element specifies that applications should ignore all text content which is not contained within a leaf custom XML markup element when validating the contents of the custom XML markup in this document against one or more attached custom XML schema(s). A *leaf element* is a custom XML element which has no child custom XML elements (it is a leaf in the custom XML tree).

If this element is omitted, then text content in leaf elements shall not be ignored when validating the custom XML markup against one or more custom XML schema(s).

[Example: Consider a WordprocessingML document that contains the following markup:

```
<w:customXml w:element="invoice" w:uri="http://www.example.com/invoice">
  <w:p>
    <w:r>
      <w:t>Invoice #:</w:t>
    </w:r>
    <w:customXml w:element="id" w:uri="http://www.example.com/invoice">
      <w:r>
        <w:t>012345</w:t>
      </w:r>
    </w:customXml>
  </w:p>
  <w:p>
    <w:r>
      <w:t>Invoice Date:</w:t>
    </w:r>
    <w:customXml w:element="date" w:uri="http://www.example.com/invoice">
      <w:r>
        <w:t>01/29/2009</w:t>
      </w:r>
    </w:customXml>
  </w:p>
</w:customXml>
```

If all the custom markup is extracted from the document, that markup would include all content in the document, i.e.:

```

<invoice xmlns="http://www.example.com/invoice">
  Invoice #:
  <id>012345</id>
  Invoice Date
  <date>01/29/2009</date>
</invoice>

```

The content shown above is formatted for readability. In fact, there is no such space in the XML.

However, if the ignoreMixedContent element is present with a val attribute value of true (or equivalent) then an application should ignore all text nodes in elements with mixed content, i.e.:

```

<invoice xmlns="http://www.example.com/invoice">
  <id>012345</id>
  <date>01/29/2009</date>
</invoice>

```

end example]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.55 linkStyles (Automatically Update Styles From Document Template)

This element specifies that styles in the given document shall be updated to match the styles in the attached template specified using the attachedTemplate element (§17.15.1.6) when the document is opened by a hosting application. This setting enables the styles contained in documents with attached templates to stay synchronized with the styles used in the attached template.

If this element is omitted, then styles shall not be updated based on the document template regardless of its availability. If the attached template cannot be located or is not a valid file, then this setting should be silently ignored.

[*Example:* Consider a WordprocessingML document which should always update its styles with those defined in the document's attached template. This requirement would be specified using the following WordprocessingML in the document settings:

```

<w:settings>
  <w:linkStyles w:val="true" />
  <w:attachedTemplate r:id="rId10" />
  ...
</w:settings>

```

The linkStyles element has a val attribute value of true, specifying that applications should attempt to locate the document template referenced by the relationship specified in the attachedTemplate element and update the document's styles with the styles from that template. *end example]*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.56 listSeparator (List Separator for Field Code Evaluation)

This element specifies the character that shall be interpreted as a list item separator when evaluating the contents of all fields in the current document.

[*Rationale:* When evaluating field instructions based on the contents of the current document, it is necessary to know the character which must be treated as the list separator in order to prevent changes to the calculation of the same field instructions based on the current user's locale. This element stores the list separator which must be used to evaluate fields in the contents of this document, irrespective of the locale of the application loading the file. *end rationale*]

If this element is omitted, the application shall use the default list separator of its current locale setting to evaluate field instructions. If this element's attribute value is more than a single character, then the document is non-conformant.

[*Example:* Consider a WordprocessingML document which should use the semicolon character as the list separator for all field instructions. This requirement is specified using the following WordprocessingML in the document settings:

```
<w:listSeparator w:val=";" />
```

The listSeparator element's val attribute has a value of ; specifying that the semicolon character shall be interpreted as a list item separator.

For instance, the string 10;20,5 would be interpreted as having two values - 10 and 20,5. If the listSeparator was a comma, the same string would be interpreted as 10;20 and 5. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre>

Attributes	Description
	<p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_String](#)) is located in §A.1. *end note*]

17.15.1.57 **mirrorMargins** (Mirror Page Margins)

This element specifies that the left and right margins defined in the section properties shall be swapped on every second page. [*Note*: Page numbering can be set arbitrarily, so the flip might not always be on the pages with even-numbered labels. *end note*]

[*Guidance*: This setting is generally used when printing on both sides of pages and binding them like a book. *end guidance*]

[*Example*: Consider a graphical representation (below) of a three page WordprocessingML document with a left margin of 1" and a right margin of 2".

If the mirrorMargins element is present in the document settings with its val attribute equal to true, as follows:

```
<w:mirrorMargins w:val="true" />
```

The resulting pages has mirrored margins as follows (un this representation, the gray rectangles representing the text extents on each page):



end example]

This element’s content model is defined by the common boolean property definition in §17.17.4.

17.15.1.58 noLineBreaksAfter (Custom Set of Characters Which Cannot End a Line)

This element specifies the set of characters which shall be restricted from ending a line for runs of text which shall be subject to custom line breaking logic using the kinsoku element (§17.3.1.16) when the contents of the document are displayed. This constraint shall only apply to text which has been flagged in the language of this rule via the lang element (§17.3.2.20) or automatic detection methods outside the scope of ECMA-376.

If this element is omitted, then no custom set of characters shall be used to restrict the characters which can end a line when using the kinsoku element.

[*Example:* Consider a paragraph of WordprocessingML text displayed as follows, with the dollar symbol \$ was flagged as Japanese content using the following WordprocessingML in the run properties:

```
<w:r>
  <w:rPr>
    <w:lang w:eastAsia="ja-JP" />
  </w:rPr>
  <w:t>$</w:t>
</w:r>
```

This is a sample line of text. This is a sample line of text. This is a sample line of text. This is a \$ sample line of text.

This text is displayed and the resulting first line ends with the dollar sign symbol. If this character must not be used to end a line, that requirement would be specified as follows in the document settings:

```
<w:noLineBreaksAfter w:lang="ja-JP" w:val="$" />
```

The noLineBreaksAfter element's val attribute has a value of ja-JP, specifying that all dollar signs in this document which are marked as Japanese text must not be allowed to end a line. This means that the dollar sign character must therefore be moved to the next line as it can no longer be the last character on a line:

This is a sample line of text. This is a sample line of text. This is a sample line of text. This is a \$ sample line of text.

end example]

Attributes	Description
lang (Language For Which Custom Line Breaking Rule Applies)	<p>Specifies the language of text for which the parent custom line breaking rule shall be applied. Applications supporting this functionality shall support custom line breaking for the following four languages:</p> <ul style="list-style-type: none"> Chinese (Traditional) Chinese (Simplified) Japanese Korean

Attributes	Description
	<p>Applications can also support custom line breaking rules for other languages, but this is not required.</p> <p>[<i>Example:</i> Consider a WordprocessingML document which must have a custom line breaking rule for Japanese. That requirement would be specified as follows in the document settings:</p> <pre data-bbox="456 499 935 531"><... w:lang="ja-JP" w:val="\$" /></pre> <p>The lang attribute has a value of ja-JP, specifying that the rules must be applied to Japanese text. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Lang simple type (§22.9.2.6).</p>
val (Characters For Custom Line Breaking Rule)	<p>Specifies the set of characters which shall be included in the custom line breaking rule.</p> <p>[<i>Example:</i> Consider a WordprocessingML document which must have a custom line breaking rule for Japanese. That requirement would be specified as follows in the document settings:</p> <pre data-bbox="456 940 935 972"><... w:lang="ja-JP" w:val="\$" /></pre> <p>The val attribute has a value of \$, specifying that the dollar sign character is the only restricted character for Japanese text. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Kinsoku](#)) is located in §A.1. *end note*]

17.15.1.59 noLineBreaksBefore (Custom Set Of Characters Which Cannot Begin A Line)

This element specifies the set of characters which shall be restricted from beginning a new line for runs of text which shall be subject to custom line breaking logic using the kinsoku element (§17.3.1.16) when the contents of the document are displayed. This constraint shall only apply to text which has been flagged in the language of this rule via the lang element (§17.3.2.20) or automatic detection methods outside the scope of ECMA-376.

If this element is omitted, then no custom set of characters shall be used to restrict the characters which can end a line when using the kinsoku element.

[*Example:* Consider a paragraph of WordprocessingML text displayed as follows, with the dollar symbol \$ was flagged as Korean content using the following WordprocessingML in the run properties:

```

<w:r>
  <w:rPr>
    <w:lang w:eastAsia="ko-KR" />
  </w:rPr>
  <w:t>$</w:t>
</w:r>

```

This is a sample line of text. This is a sample line of text. This is a sample line of text. This is a \$ sample line of text.

This text is displayed and the resulting second line begins with the dollar sign symbol. If this character must not be used to begin a line, that requirement would be specified as follows in the document settings:

```
<w:noLineBreaksBefore w:lang="ko-KR" w:val="$" />
```

The noLineBreaksBefore element's val attribute has a value of ko-KR, specifying that all dollar signs in this document which are marked as Korean text must not be allowed to begin a line. This means that the previous word character must therefore be moved to the next line as the dollar sign can no longer be the first character on a line:

This is a sample line of text. This is a sample line of text. This is a sample line of text. This is a \$ sample line of text.

end example]

Attributes	Description
lang (Language For Which Custom Line Breaking Rule Applies)	<p>Specifies the language of text for which the parent custom line breaking rule shall be applied. Applications supporting this functionality shall support custom line breaking for the following four languages:</p> <ul style="list-style-type: none"> Chinese (Traditional) Chinese (Simplified) Japanese Korean <p>Applications can also support custom line breaking rules for other languages, but this is not required.</p> <p>[<i>Example:</i> Consider a WordprocessingML document which must have a custom line breaking rule for Japanese. That requirement would be specified as follows in the document settings:</p> <pre><... w:lang="ja-JP" w:val="\$" /></pre> <p>The lang attribute has a value of ja-JP, specifying that the rules must be applied to Japanese text. <i>end example]</i></p>

Attributes	Description
	The possible values for this attribute are defined by the ST_Lang simple type (§22.9.2.6).
val (Characters For Custom Line Breaking Rule)	<p>Specifies the set of characters which shall be included in the custom line breaking rule.</p> <p>[<i>Example:</i> Consider a WordprocessingML document which must have a custom line breaking rule for Japanese. That requirement would be specified as follows in the document settings:</p> <pre data-bbox="451 510 935 541"><... w:lang="ja-JP" w:val="\$" /></pre> <p>The val attribute has a value of \$, specifying that the dollar sign character is the only restricted character for Japanese text. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model (CT_Kinsoku) is located in §A.1. *end note*]

17.15.1.60 noPunctuationKerning (Never Kern Punctuation Characters)

This element specifies that punctuation characters shall not be kerned in the current document when kerning is enabled on a run using the kern element (§17.3.2.19). *Kerning* refers to a process by which a hosting application shall reduce the spacing of adjacent characters and/or punctuation to improve the visual appearance of text. Well kerned text has a similar amount of blank space between each pair of characters and/or each set of a character and punctuation symbol. When kerning is enabled, Latin text shall always be kerned, and this option shall control whether punctuation characters are also kerned.

If this element is omitted, then punctuation characters shall be kerned when kerning is enabled on a given run.

[*Example:* Consider a WordprocessingML document that must not kern punctuation even when kerning is enabled on a given run. This requirement is specified using the following WordprocessingML in the document settings:

```
<w:noPunctuationKerning w:val="true" />
```

The noPunctuationKerning element's val attribute has a value of true, specifying that punctuation characters must not be kerned in this document. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.61 printFormsData (Only Print Form Field Content)

This element specifies that printing the contents of this document shall only print the contents of WordprocessingML form fields defined using the FORMTEXT, FORMCHECKBOX, and FORMDROPDOWN field codes in their current locations on the page - all other document contents shall be suppressed.

[*Rationale:* This setting is typically used to allow duplication of paper forms in electronic WordprocessingML document form, allowing the resulting online document to be printed into the correct locations on the existing paper form. *end rationale*]

If this element is omitted, then the contents of the entire document (not just form fields) should be printed according to the normal print settings.

[*Example:* Consider a WordprocessingML document which has form fields in the top right and bottom left corners of the first page, as follows (with the text box form fields shaded in grey):

one Sample text.
Sample text. Sample
text. Sample text.
Sample text. Sample
text. Sample text.
Sample text. Sample
text. Sample text. two

If the only content which must be printed on the page are the form fields' contents, this requirement is specified using the following WordprocessingML in the document settings:

```
<w:printFormsData w:val="true" />
```

The `printFormsData` element's `val` attribute as a value of `true`, specifying that only form field data shall be printed, resulting in output as follows when printed:

one

two

end example]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.62 `printFractionalCharacterWidth` (Print Fractional Character Widths)

This element specifies the contents of this document shall be printed with fractional character widths. *Fractional character widths* exist when the spacing between characters is not constant (i.e. a proportional font face is used).

[*Note*: Fractional character widths are generally used in conjunction with large font sizes to prevent characters from running together or having too much space between one another. *end note*]

[*Example*: Consider a WordprocessingML document which should be printed using fractional character widths as needed. This requirement is specified using the following WordprocessingML markup in the document settings:

```
<w:printFractionalCharacterWidth w:val="true"/>
```

The `printFractionalCharacterWidth` element's `val` attribute is equal to `true`, specifying that fractional character widths can be used as necessary. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.63 `printPostScriptOverText` (Print PostScript Codes With Document Text)

This element specifies that the PostScript codes specified in WordprocessingML documents containing PRINT fields shall be included in foreground (on the same Z-order as text) with the data printed in the contents of a given WordprocessingML document.

[*Note*: This setting is maintained to ensure compatibility of legacy word processing documents. The PRINT field should not be used in lieu of newer technologies in ECMA-376. *end note*]

If this element is omitted, then the contents of PRINT fields shall be printed behind text (i.e. in the background).

[*Example*: Consider a WordprocessingML document containing PRINT fields whose PostScript code must be printed in the foreground of the WordprocessingML document. This requirement is specified using the following WordprocessingML in the document settings:

```
<w:printPostScriptOverText w:val="true"/>
```

The `printPostScriptOverText` element's `val` attribute is equal to `true` specifying that the PostScript codes must be treated as results for the main text level of the document (i.e. not behind that text). *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.64 `printTwoOnOne` (Print Two Pages Per Sheet)

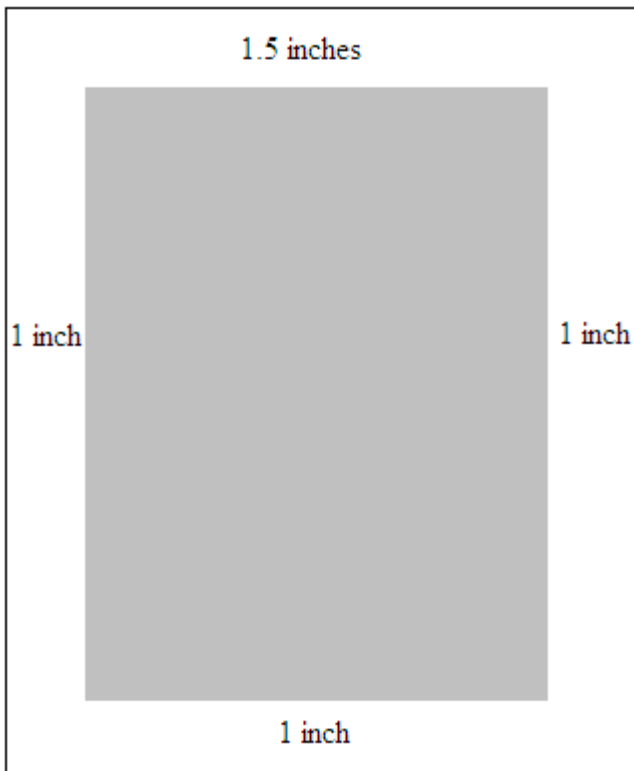
This element specifies whether two pages should be printed on one sheet of paper when this document is printed. Specifically, this element specifies that each page displayed for the contents in a given WordprocessingML document should be the page size specified in the section settings divided in half with two top margins originating from the bisector of the page, and bottom margins instantiated at the top and bottom of each page.

If this element is omitted, then pages should be displayed and printed as one per sheet.

[*Example:* Consider a one section document with a 2,160 twentieths of a point (one and a half inch) top margin, and 1,440 twentieths of a point (one inch) bottom, right, and left margins surrounding the document editing canvas (represented by the gray shaded area in diagrams below). This page setup is represented in WordprocessingML using the following fragment:

```
<w:pgMar w:header="0" w:top="2160" w:right="1440" w:bottom="1440" w:left="1440"
w:footer="720" w:gutter="0" />
```

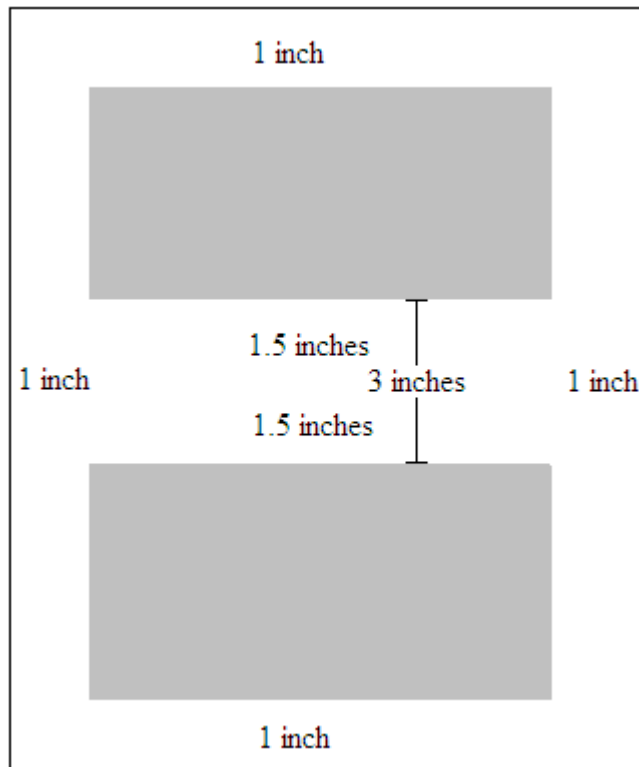
The resulting printed pages would appear as follows:



If a document should be displayed and printed as though two pages were printed on a single sheeting, this requirement would be specified using the following WordprocessingML:

```
<w:printTwoOnOne w:val="true" />
```

The printTwoOnOne element's val attribute is equal to true specifying that pages should be printed two to a sheet, resulting in the following printout given these page margins:



end example]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.65 proofState (Spelling and Grammatical Checking State)

This element specifies if the grammar and spell checking engines of the last application to process this document completed checking the grammar and spelling of a the document before the document was last saved. Applications which modify the document contents without checking spelling or grammar should reset these states as needed.

[*Note:* If this element specifies that an application's grammar and spell checking engines completed checking the grammar and spelling of the document when the document was last saved, then subsequent applications might elect to not run their grammar and spell checking engines when the given WordprocessingML document is loaded.

This might increase the speed with which the hosting application loads the file, and does not compromise the state of the grammar or spell checking of the document, as all errors have already been found and flagged with the proofErr element (§17.13.8.1) as the document has not been edited, only loaded, since it was last saved.

end note]

[*Example:* Consider a WordprocessingML document that is saved by a hosting application whose spelling and grammar checking engines have completed checking grammar and spelling in the given WordprocessingML document. This state is specified using the following WordprocessingML in the document settings:

```
<w:proofState w:spelling="clean" w:grammar="clean" />
```

The proofState element's attributes spelling and grammar attribute both have the value clean specifying that the hosting application's grammar and spell checking engines completed checking both the grammar and spelling of the given document when it was last saved. *end example*]

Attributes	Description
grammar (Grammatical Checking State)	<p>Specifies if an application's grammar checking engine completed checking the grammatical content of the document when it was last saved.</p> <p>If this attribute is omitted, then its value is assumed to be dirty (not complete).</p> <p>[<i>Example:</i> Consider a WordprocessingML document saved by a hosting application whose spelling and grammar checking engines have completed checking grammar and spelling in the given WordprocessingML document. This state is specified using the following WordprocessingML in the document settings:</p> <pre><w:proofState w:spelling="clean" w:grammar="clean" /></pre> <p>The grammar attribute has the value clean specifying that the hosting application's grammar checking engine completed checking the grammar of the given document when it was last saved. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Proof simple type (§17.18.69).</p>
spelling (Spell Checking State)	<p>Specifies if an application's spell checking engine completed checking the spelling of the document when it was last saved.</p> <p>If this attribute is omitted, then its value is assumed to be dirty (not complete).</p> <p>[<i>Example:</i> Consider a WordprocessingML document saved by a hosting application whose spelling and grammar checking engines have completed checking grammar and spelling in the given WordprocessingML document. This state is specified using the following WordprocessingML in the document settings:</p> <pre><w:proofState w:spelling="clean" w:grammar="clean" /></pre> <p>The spelling attribute has the value clean specifying that the hosting application's spell checking engine completed checking the spelling of the given document when it was last saved. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Proof simple type (§17.18.69).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Proof](#)) is located in §A.1. *end note*]

17.15.1.66 readModeInkLockDown (Freeze Document Layout)

This element specifies the exact set of page and text sizing parameters which shall be used to display the contents of a WordprocessingML document. [*Rationale*: This setting is typically used for documents that have been annotated using ink. This setting freezes the document's presentation such that the ink annotations must exist at the same position of the WordprocessingML document irrespective of the monitor on which the WordprocessingML document is rendered. *end rationale*]

This element shall only affect the display of WordprocessingML documents as follows:

- When the actualPage attribute is specified with a value of `true`, the given WordprocessingML document's pages shall be rendered as they would normally be displayed. The resulting pages can have their magnification setting changed as desired. All other attributes shall be ignored.
- When the actualPage attribute is specified with a value of `false`, the given WordprocessingML document's pages shall be rendered as *virtual pages* when loaded by a conforming hosting application irrespective of the given WordprocessingML document's view (§17.15.1.92). *Virtual pages* are pages with no correlation with the printed layout of a given WordprocessingML document that have been scaled by a conforming hosting application to improve the readability of a given WordprocessingML document when it is displayed. Specifically, the `w` and `h` attributes specify the width and height of the virtual pages, and the `fontSz` attribute specifies the scaling to be applied to text within the given WordprocessingML document.

[*Example*: Consider a WordprocessingML document that must be displayed using virtual pages when its contents are displayed. This state is specified using the following WordprocessingML in the document settings:

```
<w:readModeInkLockDown w:w="692" w:h="986" w:fontSz="95" w:actualPg="0"/>
```

The `readModeInkLockDown` element has `w` and `h` attribute values which specify the width and height of the virtual pages to be used to render the given WordprocessingML document. Finally, the `fontSz` attribute specifies the scaling to be applied to text within the given WordprocessingML document. *end example*]

Attributes	Description
actualPg (Use Actual Pages, Not Virtual Pages)	<p>Specifies if applications shall render this WordprocessingML document with actual pages, not virtual pages. <i>Actual pages</i> are pages rendered as they is printed.</p> <p>A value of <code>true</code> specifies that the given WordprocessingML document's pages is rendered as they are printed, and the <code>w</code>, <code>h</code>, and <code>fontSz</code> attributes shall be ignored. A value of <code>false</code> specifies that the given WordprocessingML document's pages shall be rendered as virtual pages using the other attributes on this element.</p> <p>[<i>Example</i>: Consider a WordprocessingML document that must be displayed using virtual pages. This state is specified using the following WordprocessingML in the document settings:</p> <pre><w:readModeInkLockDown w:w="692" w:h="986" w:fontSz="95" w:actualPg="0" /></pre>

Attributes	Description
	<p>The actualPage attribute is equal to 0 specifying that the given WordprocessingML document must be rendered by conforming hosting applications using virtual pages. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
fontSz (Font Size Scaling)	<p>Specifies the percentage that text in a given WordprocessingML document shall be scaled by before it is displayed on a virtual page, including a trailing percent sign (U+0025).</p> <p>This attribute shall only be used if the actualPage attribute equals off, 0, or false.</p> <p>[<i>Example:</i> Consider a WordprocessingML document that must be displayed using virtual pages. This state is specified using the following WordprocessingML in the document settings:</p> <pre data-bbox="451 793 1365 863"><w:readModeInkLockDown w:w="692" w:h="986" w:fontSz="95%" w:actualPg="0" /></pre> <p>The fontSz attribute is equal to 95% specifying that the text in the WordprocessingML document must be displayed at 95% of its normal size when it is displayed on a virtual page. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumberOrPercent simple type (§17.18.11).</p>
h (Virtual Page Height)	<p>Specifies the height of the virtual pages which shall be used in this document. This value is specified in pixels.</p> <p>This attribute shall only be used if the actualPage attribute equals off, 0, or false.</p> <p>[<i>Example:</i> Consider a WordprocessingML document that must be displayed using virtual pages. This state is specified using the following WordprocessingML in the document settings:</p> <pre data-bbox="451 1444 1349 1514"><w:readModeInkLockDown w:w="692" w:h="986" w:fontSz="95%" w:actualPg="0" /></pre> <p>The h attribute is equal to 986 specifying that virtual pages in this document must be 986 pixels high. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_PixelsMeasure simple type (§17.18.67).</p>
w (Virtual Page Width)	<p>Specifies the width of the virtual pages which shall be used in this document. This value is specified in pixels.</p> <p>This attribute shall only be used if the actualPage attribute equals off, 0, or false.</p>

Attributes	Description
	<p>[<i>Example</i>: Consider a WordprocessingML document that must be displayed using virtual pages. This state is specified using the following WordprocessingML in the document settings:</p> <pre><w:readModeInkLockDown w:w="692" w:h="986" w:fontSz="95" w:actualPg="0" /></pre> <p>The w attribute is equal to 692 specifying that virtual pages in this document must be 692 pixels wide. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PixelsMeasure simple type (§17.18.67).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_ReadModeInkLockDown](#)) is located in §A.1. *end note*]

17.15.1.67 removeDateAndTime (Remove Date and Time from Annotations)

This element specifies that the date and time information shall be removed from all annotations which are present in the current document when it is saved. Annotations store this information in the date attribute on the annotation's XML element.

If this element is omitted, then date information shall not be removed when the document is saved. If the removePersonalInformation element is not turned on, then this setting shall be ignored.

[*Example*: Consider a WordprocessingML document that must not save date and time information on annotations in the document content. This state is specified using the following WordprocessingML in the document settings:

```
<w:settings>
...
<w:removePersonalInformation w:val="true" />
<w:removeDateAndTime w:val="true" />
...
</w:settings>
```

The removeDateAndTime element's val attribute has a value of true specifying that all annotations in the document must have and date and time information removed before they are saved by omitting their date attributes. *end example*]

This element’s content model is defined by the common boolean property definition in §17.17.4.

17.15.1.68 `removePersonalInformation` (Remove Personal Information from Document Properties)

This element specifies that hosting applications shall remove all personal information of document authors upon saving a given WordprocessingML document. The definition and extent of personal information is not defined by ECMA-376.

If this element is omitted, then personal information shall not be removed when the document is saved.

[*Example:* Consider a WordprocessingML document that must not save personal information in the document. This state is specified using the following WordprocessingML in the document settings:

```
<w:removePersonalInformation w:val="true" />
```

The `removePersonalInformation` element's `val` attribute has a value of `true` specifying that applications must remove any personal information when saving this file. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.69 `revisionView` (Visibility of Annotation Types)

This element specifies which forms of annotations shall be visible for a WordprocessingML document when it is displayed. This setting shall not affect whether annotations are added or persisted, it shall only affect the display of the annotations which exist in the document's contents (persisted or in memory).

If this element is omitted, then all forms of annotations shall be visible.

[*Example:* Consider the WordprocessingML below specifying that only formatting and ink annotations within a given WordprocessingML document must be displayed when the document is opened:

```
<w:revisionView w:markup="false" w:comments="false" w:insDel="false" />
```

The `revisionView` element specifies that the visibility of the markup region, comments and content additions/deletions must be suppressed by setting a value of `false`. Since the `formatting` and `inkAnnotation` attributes are omitted, they inherit the default of `true` and must be displayed. *end example*]

Attributes	Description
comments (Display Comments)	<p>Specifies if comments should be included when the contents of this document are displayed.</p> <p>If this attribute is omitted, then comments shall be displayed when annotations are visible based on application-level settings.</p> <p>[<i>Example:</i> Consider the WordprocessingML below specifying that comments must be displayed:</p> <pre><w:revisionView w:comments="true" /></pre>

Attributes	Description
	<p>The comments attribute has a value of true, specifying that comments must be rendered when the document's annotations are displayed. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
formatting (Display Formatting Revisions)	<p>Specifies if revisions to properties (i.e. formatting revisions) should be included when the contents of this document are displayed.</p> <p>If this attribute is omitted, then formatting revisions shall be displayed when annotations are visible based on application-level settings.</p> <p>[<i>Example</i>: Consider the WordprocessingML below specifying that formatting revisions must be displayed:</p> <pre data-bbox="456 724 1062 756"><w:revisionView w:formatting="true" /></pre> <p>The formatting attribute has a value of true, specifying that formatting revisions must be rendered when the document's annotations are displayed. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
inkAnnotations (Display Ink Annotations)	<p>Specifies if ink annotations should be included when the contents of this document are displayed.</p> <p>If this attribute is omitted, then ink annotations shall be displayed when annotations are visible based on application-level settings.</p> <p>[<i>Example</i>: Consider the WordprocessingML below specifying that ink annotations must be displayed:</p> <pre data-bbox="456 1270 1127 1302"><w:revisionView w:inkAnnotations="true" /></pre> <p>The inkAnnotations attribute has a value of true, specifying that ink annotations must be rendered when the document's annotations are displayed. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
insDel (Display Content Revisions)	<p>Specifies if revisions to content (i.e. insertions, deletions, and moves) should be included when the contents of this document are displayed.</p> <p>If this attribute is omitted, then insertions, deletions, and moves shall be displayed when annotations are visible based on application-level settings.</p> <p>[<i>Example</i>: Consider the WordprocessingML below specifying that insertions, deletions, and moves must be displayed:</p> <pre data-bbox="456 1816 997 1848"><w:revisionView w:insDel="true" /></pre>

Attributes	Description
	<p>The insDel attribute has a value of true, specifying that insertions, deletions, and moves must be rendered when the document's annotations are displayed. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
markup (Display Visual Indicator Of Markup Area)	<p>Specifies if the application shall visually indicate any additional non-printing area used to display annotations when the annotations in this document are displayed.</p> <p>If this attribute is omitted, then any additional non-printing area shall be indicated when they are visible based on application-level settings.</p> <p>[<i>Example</i>: Consider the WordprocessingML below specifying that no visual indicator must be displayed for non-printing regions holding annotations:</p> <pre data-bbox="451 722 1015 756"><w:revisionView w:markup="false" /></pre> <p>The markup attribute has a value of false, specifying that nothing must be rendered indicating when a non-printing region is added when the document's annotations are displayed. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_TrackChangesView](#)) is located in §A.1. *end note*]

17.15.1.70 rsid (Single Session Revision Save ID)

This element specifies the revision save ID that was associated with a single editing session for a document. An editing session is a span of time that begins and ends with any event that produces an editable file, such as a save or an e-mail send, and contains no such event. When revision save IDs are added to a document, they shall follow these rules:

- Every editing session shall be assigned a revision save ID that is larger than all earlier ones in the same file
- Revision save IDs should be randomly generated based on the current time (to minimize the chance that two disparate editing sessions starting with the same immediate predecessor are assigned the same revision save ID)
- Changes to document content in an editing session shall be stamped with the current revision save ID using the appropriate rsid* attributes
- An identical rsid value between two documents with the same rsidRoot (§17.15.1.71) shall indicate the same editing sessions

[*Note*: A revision save ID should be treated as unique within the context of all documents with the same rsidRoot value. Although in practice it is possible for two independent sessions to result in the same value, this

outcome is extremely rare as the values are based on the current time. However, the meaning of two revision save IDs is not defined for documents with a different rsidRoot. Applications can use this information as desired. *end note*]

[*Example:* Consider the following fragments from two WordprocessingML documents' document settings:

Document 1	Document 2
<pre><w:rsids> <w:rsidRoot w:val="00464813"/> <w:rsid w:val="00455AAB" /> <w:rsid w:val="00464813" /> <w:rsid w:val="00996E03" /> </w:rsids></pre>	<pre><w:rsids> <w:rsidRoot w:val="00464813"/> <w:rsid w:val="00455AAB" /> <w:rsid w:val="00464813" /> <w:rsid w:val="00473403" /> <w:rsid w:val="0048414E" /> </w:rsids></pre>

The rsid elements are identical for the first three editing sessions for both documents, indicating that these documents, although they are now separate, originated from the same document. The documents were then separated and the first was saved once afterwards; and the second, twice. *end example*]

Attributes	Description
val (Long Hexadecimal Number Value)	<p>Specifies a number value specified as a four digit hexadecimal number), whose contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following value for an attribute of simple type ST_LongHexNumber: 00BE2C6C.</p> <p>This value is permitted, as it contains four hexadecimal digits, each an encoding of an octet of the actual decimal number value. It can therefore be interpreted as desired in the context of the parent XML element, <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>

[*Note:* The W3C XML Schema definition of this element's content model (CT_LongHexNumber) is located in §A.1. *end note*]

17.15.1.71 rsidRoot (Original Document Revision Save ID)

This element specifies the revision save ID which was associated with the first editing session for this document.

[*Note:* This information must be identical between any number of copies of the same document, as they all originate from the same original editing session. Applications can use this information as desired. *end note*]

If this element is omitted, then the original document revision save ID is unknown.

[*Example:* Consider the following fragments from two WordprocessingML documents' document settings:

Document 1	Document 2
<pre> <w:rsids> <w:rsidRoot w:val="00464813"/> <w:rsid w:val="00455AAB" /> <w:rsid w:val="00464813" /> <w:rsid w:val="00996E03" /> </w:rsids> </pre>	<pre> <w:rsids> <w:rsidRoot w:val="00464813"/> <w:rsid w:val="00455AAB" /> <w:rsid w:val="00464813" /> <w:rsid w:val="00473403" /> <w:rsid w:val="0048414E" /> </w:rsids> </pre>

The rsidRoot element's val attribute has a value of 00464813 for both documents, indicating that these documents, although they are now separate, originated from the same document. This information can be used as desired. *end example*]

Attributes	Description
val (Long Hexadecimal Number Value)	<p>Specifies a number value specified as a four digit hexadecimal number), whose contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example</i>: Consider the following value for an attribute of simple type ST_LongHexNumber: 00BE2C6C.</p> <p>This value is permitted, as it contains four hexadecimal digits, each an encoding of an octet of the actual decimal number value. It can therefore be interpreted as desired in the context of the parent XML element, <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_LongHexNumber simple type (§17.18.50).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_LongHexNumber](#)) is located in §A.1. *end note*]

17.15.1.72 rsids (Listing of All Revision Save ID Values)

This element specifies the set of revision save ID values for the current document. *Revision save ID values* refer to four digit hexadecimal values which uniquely identify an editing session in the life of the current document. An *editing session* is the period of time between two subsequent save operations by an application.

[*Guidance*: The set of revision save IDs stored with a document only supplies information about the editing session in which document components were last saved, which can be used by applications in any manner desired. *end guidance*]

If this element is omitted, then no information is available about the set of revision save ID values for this document.

[*Example*: Consider a WordprocessingML document with the following information present in its document settings:

```
<w:rsids>
  <w:rsidRoot w:val="00464813" />
  <w:rsid w:val="00455AAB" />
  <w:rsid w:val="00464813" />
  <w:rsid w:val="00473403" />
</w:rsids>
```

The rsids element contains four child elements, specifying that the document was edited over four distinct editing sessions (i.e. it was saved three times). *end example*]

[*Note*: The W3C XML Schema definition of this element's content model ([CT_DocRsids](#)) is located in §A.1. *end note*]

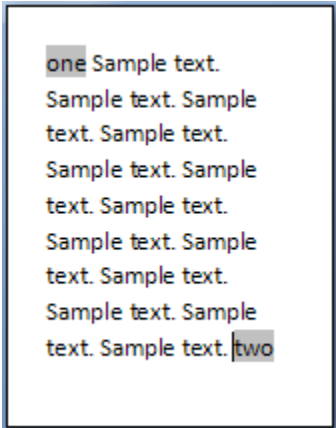
17.15.1.73 saveFormsData (Only Save Form Field Content)

This element specifies that saving the contents of this document shall only save the contents of WordprocessingML form fields defined using the FORMTEXT, FORMCHECKBOX, and FORMDROPDOWN field codes in a comma-delimited text format which does not conform to ECMA-376 (i.e. it is a one-way export from a WordprocessingML document).

[*Rationale*: This setting is typically used to allow duplication of paper forms in electronic WordprocessingML document form, allowing the resulting content to be extracted as a comma-delimited text file. *end rationale*]

If this element is omitted, then the contents of the entire document (not just form fields) should be saved according to the definition of WordprocessingML in ECMA-376.

[*Example*: Consider a WordprocessingML document which has form fields in the top right and bottom left corners of the first page, as follows (with the text box form fields shaded in grey):



If the only content which must be saved are the form fields' contents, this requirement is specified using the following WordprocessingML in the document settings:

```
<w:saveFormsData w:val="true" />
```

The saveFormsData element's val attribute as a value of true, specifying that only form field data must be saved, resulting in output as follows in a text file:

```
one,two
```

end example]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.74 [saveInvalidXml \(Allow Saving Document As XML File When Custom XML Markup Is Invalid\)](#)

This element specifies that this document should be capable of being saved into a format consisting of a single XML file (not defined by ECMA-376) even when its contents are invalid based XML schema validation of the custom XML markup contained in the document. This setting has no effect on documents that do not contain custom XML markup, or that do contain custom XML markup but do not have a schema attached. *[Guidance: Because this setting specifies behavior when saving to an alternative file format not defined by ECMA-376, this behavior is optional. end guidance]*

If this element is omitted, then applications should not allow this document to be saved into a single XML file when its contents are invalid based on the custom XML markup contained in the document. If the doNotValidateAgainstSchema element (§17.15.1.43) is set, then the XML is never "invalid" and this property is ignored.

[Example: Consider a WordprocessingML document which should be saved into a single XML file even when its custom XML content is marked invalid by applications which support this operation. This requirement is specified using the following WordprocessingML in the document settings:

```
<w:saveInvalidXml w:val="true" />
```

The saveInvalidXml element's val attribute has a value of true specifying that the content in this document can be saved regardless of its validation status. *end example]*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.75 [savePreviewPicture \(Generate Thumbnail For Document On Save\)](#)

This element specifies if a document's Thumbnail part should be generated for the contents of the first page of this document when saved by application which support document thumbnail generation.

If this element is omitted, then applications can choose to save a thumbnail, however, that behavior is not required. If this element is specified, a thumbnail shall be produced if that functionality is supported.

[Example: Consider a WordprocessingML document that specifies that a document thumbnail must always be created when it is saved. This requirement would be specified using the following WordprocessingML in the document settings part:

<w:savePreviewPicture w:val="true"/>

The savePreviewPicture element's val attribute has a value of true specifying that a document thumbnail should be generated each time this document is saved. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.76 saveThroughXslt (Custom XSL Transform To Use When Saving As XML File)

This element specifies the location of a custom XSL transform which shall be used when this document is saved as a single XML file (in a format not defined by ECMA-376). [*Guidance*: Because this setting specifies behavior when saving to an alternative file format not defined by ECMA-376, this behavior is optional. *end guidance*]

If this element is omitted, then no custom XSL transform shall be used when saving this file as a single XML file. If the useXSLTWhenSaving element (§17.15.1.91) is omitted or set to false, then this transform shall not be applied when the document is saved as a single XML file.

[*Example*: Consider a XML document that must have the XSL transform applied when the document is saved as a single XML file. This requirement would be specified using the following WordprocessingML in the document settings:

<w:useXSLTWhenSaving w:val="on"/>
<w:saveThroughXslt r:id="rId5" />

The useXSLTWhenSaving element's val is set to true indicating that applications must apply the XSLT specified by the relationship targeted by the id attribute of the saveThroughXslt element, located at rId5, when saving as a single XML file. *end example*]

Attributes	Description
id (XSL Transformation Location) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	<p>Specifies an explicit relationship to the location of the XSL Transformation which shall be applied.</p> <p>The relationship targeted by this element shall be of type http://purl.oclc.org/ooxml/officeDocument/relationships/transform, or this document shall be declared non-conformant.</p> <p>[<i>Example</i>: Consider a XML document that must have the XSL transform located at c:\Example Transform.xslt applied when the document is saved as a single XML file. This requirement would be specified using the following WordprocessingML in the document settings:</p> <p><w:saveThroughXslt r:id="rId5" /></p> <p>The saveThroughXslt element specifies that the relationship located at rId5 must be used when saving as a single XML file in this case, that relationship must target c:\Example Transform.xslt. <i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).
solutionID (Local Identifier for XSL Transform)	<p>Specifies a string identifier which can be used to locate the XSL transform to be applied. The semantics of this attribute are not defined by ECMA-376 - applications can use this information in any application-defined manner to resolve the location of the XSL transform to apply.</p> <p>If this attribute is omitted, then no local identifier is specified for the XSL transform. If both this and the xslt attributes are present, then this data shall be used first, and the latter shall only be used if this information cannot be used successfully.</p> <p>[<i>Example:</i> Consider a XML document that must have the XSL transform identified by mySolution applied to when the document is saved as a single XML file. This requirement would be specified using the following WordprocessingML in the document settings:</p> <pre data-bbox="451 829 1209 861"><w:saveThroughXslt w:solutionID="mySolution" /></pre> <p>The solutionID attribute has a value of mySolution indicating that applications must apply the XSLT identified by this value (if known) when saving as a single XML file. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SaveThroughXslt](#)) is located in §A.1. *end note*]

17.15.1.77 saveXmlDataOnly (Only Save Custom XML Markup)

This element specifies that the contents of this document shall be saved as an XML file containing only the custom XML markup in this document in its regular form. The resulting document does not conform to ECMA-376 (i.e. this is an export-only save option for a WordprocessingML document).

[*Rationale:* This setting is typically used to extract custom XML markup from a WordprocessingML document for further processing by XML-enabled applications. *end rationale*]

If this element is omitted, then the contents of the entire document (not just custom XML markup) should be saved according to the definition of WordprocessingML in ECMA-376.

[*Example:* Consider a WordprocessingML document which should be saved as an XML file containing only its custom XML markup. This requirement is specified using the following WordprocessingML fragment in the document settings:

```
<w:saveXmlDataOnly w:val="true"/>
```

The `saveXmlDataOnly` element's `val` attribute has a value of `true` specifying that only custom XML must be saved into a regular XML file when saving this document. For example, the document body formerly looked like this:

```
<w:body>
  <w:p>
    <w:customXml w:element="root" w:uri="urn:example">
      <w:r>
        <w:t>Hello, world</w:t>
      </w:r>
    </w:customXml>
  </w:p>
</w:body>
```

The presence of this element specifies that the resulting document only contains the custom Xml markup, resulting in the following:

```
<ns0:root xmlns:ns0="urn:example">Hello, world</ns0:root>
```

end example]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.78 settings (Document Settings)

This element specifies the settings that are applied to a WordprocessingML document. This element is the root element of the Document Settings part in a WordprocessingML document.

[*Example:* Consider the following WordprocessingML fragment for the settings part of a document:

```
<w:settings>
  <w:defaultTabStop w:val="720" />
  <w:characterSpacingControl w:val="doNotCompress" />
</w:settings>
```

The settings element contains all of the settings for this document. In this case, the two settings applied are automatic tab stop increments of 0.5" using the `defaultTabStop` element, and no character level whitespace compression using the `characterSpacingControl` element. *end example]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT Settings](#)) is located in §A.1. *end note]*

17.15.1.79 showEnvelope (Show E-Mail Message Header)

This element specifies that an e-mail message header shall be displayed when this document is opened, if an e-mail header is supported by the application opening the file.

If this element is omitted, then applications shall not display the e-mail message header automatically when this file is opened, even if one is available in the application opening the file.

[*Example:* Consider a WordprocessingML document which should show an e-mail message header when opened. This requirement is specified using the following WordprocessingML in the document settings:

```
<w:showEnvelope w:val="true" />
```

The showEnvelope element's val attribute has a value of true specifying that an e-mail message header must be displayed when the document is viewed, whenever such functionality is available. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.80 showXMLTags (Show Visual Indicators for Custom XML Markup Start/End Locations)

This element specifies that some visual indicator shall be provided for the start and end locations of custom XML markup present in this document, if any.

If this element is omitted, then applications should not provide any visual indicator of the locations of custom XML markup start/end tags.

[*Example:* Consider a WordprocessingML document which should show a visual indicator to the location of custom XML markup elements. This requirement is specified using the following WordprocessingML in the document settings:

```
<w:showXMLTags w:val="true" />
```

The showXMLTags element's val attribute has a value of true specifying that custom XML markup should have a visual indicator in the document when displayed. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.81 smartTagType (Supplementary Smart Tag Information)

This element specifies optional supplementary information about one or more smart tags (§17.5.1.9) used in the current WordprocessingML document. This supplementary data is linked to the smart tag to which it applies via its name and namespaceuri attributes.

[*Example:* Consider a smart tag which has supplementary information defined as using the following WordprocessingML:

```
<w:smartTagType w:name="companyName" w:namespaceuri="urn:smartTagExample"
w:url="http://www.example.com/smartTag"/>
```

The name and namespaceuri attributes specify that the smart tag to which this data must be companyName in the urn:smartTagExample namespace. The supplementary data is an associated URL of http://www.example.com/smartTag. *end example*]

Attributes	Description
name (Smart Tag Name)	<p>Specifies the name of the smart tag within the document for which supplementary data is provided.</p> <p>[<i>Example:</i> Consider a smart tag which has a name of <code>companyName</code>. This name would be referenced using the following WordprocessingML:</p> <pre><w:smartTagType w:name="companyName" ... /></pre> <p>The name attribute specifies that the name for this smart tag must be <code>companyName</code>. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
namespaceuri (Smart Tag Namespace)	<p>Specifies the namespace URI of the smart tag for which supplementary data is provided.</p> <p>If this attribute is omitted, the URI shall be assumed to be null (no associated URI).</p> <p>[<i>Example:</i> Consider a smart tag which must have a namespace URI of <code>urn:smartTagExample</code>. This namespace would be referenced using the following WordprocessingML:</p> <pre><w:smartTagType w:namespaceuri="urn:smartTagExample" /></pre> <p>The namespaceuri attribute specifies that the namespace for the smart tag to which this data applies must be <code>urn:smartTagExample</code>. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
url (Smart Tag Supplementary URL)	<p>Specifies a URL provided for a particular smart tag type in this document. [<i>Note:</i> This URL is typically used to provide access to a URL for additional updates to this smart tag type as requested by the smart tag provider. <i>end note</i>]</p> <p>If this attribute is omitted, then no supplementary URL is provided for this type.</p> <p>[<i>Example:</i> Consider a smart tag which must have a supplementary URL of <code>http://www.example.com/smartTag</code>. This URL would be specified using the following WordprocessingML:</p> <pre><w:smartTagType ... w:url="http://www.example.com/smartTag" /></pre> <p>The url attribute specifies that the supplementary data for the smart tag to which this data applies must be <code>http://www.example.com/smartTag</code>. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SmartTagType](#)) is located in §A.1. *end note*]

17.15.1.82 `strictFirstAndLastChars` (Use Strict Kinsoku Rules for Japanese Text)

This element specifies that the strict set of Kinsoku rules shall be applied to Japanese text in this document when the kinsoku element (§17.3.1.16) is applied to that text. The resulting line breaking rules are provided on the kinsoku element.

If this element is omitted, then standard rules shall apply to Japanese text when the kinsoku element is applied to that text.

[*Example:* Consider a WordprocessingML document that specifies that strict Kinsoku rules must be applied to Japanese text. This requirement would be specified using the following WordprocessingML in the document settings part:

```
<w:strictFirstAndLastChars w:val="true"/>
```

The strictFirstAndLastChars element's val attribute has a value of true specifying that a document must apply the strict set of disallowed characters for the start and end of a line. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.83 `styleLockQFSet` (Prevent Replacement of Styles Part)

This element specifies whether applications shall prevent the replacement of the complete set of styles stored in the Styles part when editing this document. This setting should not preclude the editing or removal of individual styles, instead, it should only prevent the removal and replacement of the entire styles part in a single operation (either through a user interface or a programmatic operation).

If this element is omitted, then applications can allow the replacement of the entire styles part in this document.

[*Example:* Consider a WordprocessingML document that specifies that applications must prevent the replacement of the entire styles part. This requirement would be specified using the following WordprocessingML in the document settings part:

```
<w:styleLockQFSet w:val="true"/>
```

The styleLockQFSet element's val attribute has a value of true specifying that individual style changes should be allowed, but the styles data must not be replaced as a whole via a single operation. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.84 `styleLockTheme` (Prevent Modification of Themes Part)

This element specifies whether applications shall prevent the modification of the document's theme information stored in the Theme part when editing this document. This setting should not preclude the use of the theme

information, instead, it should only prevent the modification of the theme part in a single operation (either through a user interface or a programmatic operation).

If this element is omitted, then applications can allow the replacement or modification of the theme part in this document.

[*Example:* Consider a WordprocessingML document that specifies that applications must prevent the modification of the theme part. This requirement would be specified using the following WordprocessingML in the document settings part:

```
<w:styleLockTheme w:val="true"/>
```

The styleLockTheme element's val attribute has a value of true specifying that theme data must not be modified when modifying the contents of this document. *end example]*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.85 stylePaneFormatFilter (Suggested Filtering for List of Document Styles)

This element specifies a set of suggested filters which should be applied to the list of document styles in this application if the styles are displayed in a user interface.

If this element is omitted, then all settings defined by this element are turned off.

[*Example:* Consider a document with the following value in its document settings:

```
<w:stylePaneFormatFilter w:customStyles="true" w:top3HeadingStyles="true" />
```

The stylePaneFormatFilter element's settings specify two suggested filter options for the list of document styles:

- Only custom styles should be shown
- Heading styles with a styleId of Heading1 to Heading3 should always be displayed in the list

end example]

Attributes	Description
allStyles (Display All Styles)	Specifies that all styles present in the Styles part should be displayed in the list of document styles. The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).
alternateStyleNames (Use the Alternate Style Name)	Specifies that primary names for styles should not be shown if an alternate name using the name element (§17.7.4.9) exists. The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).
clearFormatting (Display Styles to)	Specifies that a style should be present which removes all formatting and styles from text.

Attributes	Description
Remove Formatting)	The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).
customStyles (Display Only Custom Styles)	<p>Specifies that only styles with the customStyle attribute should be displayed in the list of document styles.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
directFormattingOnNumbering (Display Direct Formatting on Numbering Data)	<p>Specifies that all unique forms of direct formatting of numbering data should be displayed in the list of document styles as though they were each a unique style.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
directFormattingOnParagraphs (Display Paragraph Level Direct Formatting)	<p>Specifies that all unique forms of paragraph-level direct formatting should be displayed in the list of document styles as though they were each a unique style.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
directFormattingOnRuns (Display Run Level Direct Formatting)	<p>Specifies that all unique forms of run-level direct formatting should be displayed in the list of document styles as though they were each a unique style.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
directFormattingOnTables (Display Direct Formatting on Tables)	<p>Specifies that all unique forms of direct formatting of tables should be displayed in the list of document styles as though they were each a unique style.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
headingStyles (Display Heading Styles)	<p>Specifies that heading styles (styles with a styleId of Heading1 to Heading9) should be displayed in the list of document styles when the previous style is used in the document and/or is present in the Styles part.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
latentStyles (Display Latent Styles)	<p>Specifies that all latent styles should be displayed in the list of document styles.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
numberingStyles (Display Numbering Styles)	<p>Specifies that numbering styles should be displayed in the list of document styles.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
stylesInUse (Display Styles in Use)	<p>Specifies that only styles used in the document should be displayed in the list of document styles.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
tableStyles (Display Table Styles)	<p>Specifies that table styles should be displayed in the list of document styles.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

Attributes	Description
top3HeadingStyles (Display Heading 1 through 3)	Specifies that heading styles with a styleId of Heading1 to Heading3 should always be displayed in the list of document styles. The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).
visibleStyles (Only Show Visible Styles)	Specifies that styles should only be shown if the semiHidden element (§17.7.4.16) is false and the hidden element (§17.7.4.4) is false. The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).

[Note: The W3C XML Schema definition of this element's content model ([CT_StylePaneFilter](#)) is located in §A.1. *end note*]

17.15.1.86 stylePaneSortMethod (Suggested Sorting for List of Document Styles)

This element specifies a sorting which should be applied to the list of styles in this document if the styles are displayed in a user interface.

If this element is omitted, then styles which are visible should be sorted by the default sorting of the host application.

[Example: Consider a document with the following value in its document settings:

```
<w:stylePaneSortMethod w:val="type" />
```

The stylePaneFormatFilter element's val attribute specifies that styles which are visible should be sorted by their style types (i.e. character, linked, paragraph) via a value of type. *end example*]

Attributes	Description
val (Style Sorting)	Specifies a sort order which should be applied to the list of document styles when they are displayed in a user interface. The possible values for this attribute are defined by the ST_StyleSort simple type (§17.18.82).

[Note: The W3C XML Schema definition of this element's content model ([CT_StyleSort](#)) is located in §A.1. *end note*]

17.15.1.87 summaryLength (Percentage of Document to Use When Generating Summary)

This element specifies the size for automatic document summaries performed on the content of a WordprocessingML document. An *automatic document summary* is a subset of text contained in a document deemed by the hosting application to summarize the content of the WordprocessingML document. The val attribute of this element specifies the size of an automatic document summary to be performed on a given

WordprocessingML document as a percentage of the total size of the given WordprocessingML document. Performing an automatic document summary is a runtime operation outside the scope of ECMA-376.

If this element is omitted, then applications can summarize this document to any desired size.

[*Example:* Consider a WordprocessingML document whose automatic document summary is to be ten percent of the size of the given WordprocessingML document. This requirement would be specified using the following WordprocessingML in the document settings part:

```
<w:summaryLength w:val="10%" />
```

The summaryLength element's val attribute is equal to 10% specifying that any automatic document summary is to be ten percent of the size of the document. *end example*]

Attributes	Description
val (Value in Percent)	<p>Specifies a measurement in whole percentage points, with a trailing percent sign (U+0025).</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><... w:val="50.125%" /></pre> <p>This value specifies a value of fifty and one-eighth percent. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumberOrPercent simple type (§17.18.11).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DecimalNumberOrPrecent](#)) is located in §A.1. *end note*]

17.15.1.88 themeFontLang (Theme Font Languages)

This element specifies the language which shall be used to determine the appropriate theme fonts in the document's Theme part which map to the major/minor theme fonts. Specifically, the bidi attribute is used to determine the theme font applied to complex script text, the eastAsia attribute is used to determine the theme font applied to East Asian text, and the val attribute is used to determine the theme font applied to all other text.

These mappings are performed as follows:

- For majorAscii/majorHAnsi, locate the font element (§20.1.4.1.16) in the majorFont element (§20.1.4.1.24) in the theme part for the language specified by the val attribute
- For majorBidi, locate the font element in the majorFont element in the theme part for the language specified by the bidi attribute

- For `majorEastAsia`, locate the font element in the `majorFont` element in the theme part for the language specified by the `eastAsia` attribute
- For `minorAscii/minorHAnsi`, locate the font element in the `minorFont` element (§20.1.4.1.25) in the theme part for the language specified by the `val` attribute
- For `minorBidi`, locate the font element in the `minorFont` element in the theme part for the language specified by the `bidi` attribute
- For `minorEastAsia`, locate the font element in the `minorFont` element in the theme part for the language specified by the `eastAsia` attribute

If this element is omitted, then the default fonts for each region as specified by the `latin`, `ea`, and `cs` elements (§21.1.2.3.7; §21.1.2.3.3; §21.1.2.3.1) should be used.

[*Example*: Consider a document with the following WordprocessingML in its document settings:

```
<w:themeFontLang w:val="ja-JP" />
```

The `themeFontLang` element's `val` attribute has a value of `ja-JP`, specifying that the theme fonts used for Latin text must be the theme fonts for Japanese. If the following content was present in the theme part:

```
...
<a:majorFont>
...
  <a:font script="Jpan" typeface="MS Mincho"/>
...
</a:majorFont>
...
```

Then this setting would specify that uses of the `majorAscii` and `majorHAnsi` theme font enumerations must be mapped to the MS Mincho font. *end example*]

Attributes	Description
<code>bidi</code> (Complex Script Language)	<p>Specifies the language which shall be used when processing the contents of this run which use complex script characters, as determined by the Unicode character values of the run content.</p> <p>If this attribute is omitted, then the languages for the contents of this run using complex script characters shall be automatically determined based on their contents using any appropriate method.</p> <p>[<i>Example</i>: Consider a run which contains complex script characters in its contents. If those contents should be interpreted as Hebrew, that requirement would be specified as follows in the resulting WordprocessingML:</p> <pre><w:r> <w:rPr> <w:lang w:bidi="he-IL" /></pre>

Attributes	Description
	<pre></w:rPr> </w:r></pre> <p>The resulting run specifies that any complex script contents must be spell and grammar checked using a Hebrew dictionary and grammar engine, if one is available. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Lang simple type (§22.9.2.6).</p>
eastAsia (East Asian Language)	<p>Specifies the language which shall be used when processing the contents of this run which use East Asian characters, as determined by the Unicode character values of the run content.</p> <p>If this attribute is omitted, then the languages for the contents of this run using East Asian characters shall be automatically determined based on their contents using any appropriate method.</p> <p>[<i>Example:</i> Consider a run which contains East Asian characters in its contents. If those contents should be interpreted as Korean, that requirement would be specified as follows in the resulting WordprocessingML:</p> <pre><w:r> <w:rPr> <w:lang w:eastAsia="ko-KR" /> </w:rPr> </w:r></pre> <p>The resulting run specifies that any complex script contents must be spell and grammar checked using a Korean dictionary and grammar engine, if one is available. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Lang simple type (§22.9.2.6).</p>
val (Latin Language)	<p>Specifies the language which shall be used to check spelling and grammar (if requested) when processing the contents of this run which use Latin characters, as determined by the Unicode character values of the run content.</p> <p>If this attribute is omitted, then the languages for the contents of this run using Latin characters shall be automatically determined based on their contents using any appropriate method.</p> <p>[<i>Example:</i> Consider a run which contains Latin characters in its contents. If those contents should be interpreted as English (Canada), that requirement would be specified as follows in the resulting WordprocessingML:</p> <pre><w:r> <w:rPr> <w:lang w:val="en-CA" /> </w:rPr> </w:r></pre>

Attributes	Description
	<p>The resulting run specifies that any complex script contents must be spell and grammar checked using a English (Canada) dictionary and grammar engine, if one is available. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_Lang simple type (§22.9.2.6).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_Language](#)) is located in §A.1. *end note*]

17.15.1.89 trackRevisions (Track Revisions to Document)

This element specifies that applications shall track revisions made to the WordprocessingML document. *Revisions* are changes to a WordprocessingML document which are recorded such that they can be viewed independently, accepted or removed, and reverted if needed. When revisions are tracked, the resulting WordprocessingML markup in the Revisions subclause of this document describes the necessary syntax.

If this element is omitted, then revisions shall not be generated by changes to the contents of this document.

[Example: Consider a WordprocessingML document containing the text run Example that must not have revisions tracked. Example WordprocessingML from Document 1 is given below:

```
<w:document>
  <w:body>
    <w:p>
      <w:r>
        <w:t>Example</w:t>
      </w:r>
    </w:p>
  </w:body>
</w:document>
```

And the corresponding document settings:

```
<w:settings>
  <w:trackRevisions w:val="false"/>
  ...
</w:settings>
```

If the word text was added to the end of this document and bolded without revisions tracked, the resulting WordprocessingML would be output as follows:

```

<w:document>
  <w:body>
    <w:p>
      <w:r>
        <w:t>Example</w:t>
      </w:r>
      <w:r>
        <w:rPr>
          <w:b/>
        </w:rPr>
        <w:t>text</w:t>
      </w:r>
    </w:p>
  </w:body>
</w:document>

```

And the corresponding document settings:

```

<w:settings>
  <w:trackRevisions w:val="false"/>
  ...
</w:settings>

```

Finally, assume the same insertion and formatting took place when the trackRevisions element's val attribute was set to true, the resulting WordprocessingML would be output as follows:

```

<w:document>
  <w:body>
    <w:p>
      <w:r>
        <w:t>Example</w:t>
      </w:r>
    </w:p>
  </w:body>
</w:document>

```

```

    <w:ins ... >
      <w:r>
        <w:rPr>
          <w:b/>
          <w:rPrChange ... >
            <w:rPr/>
          </w:rPrChange>
        </w:rPr>
        <w:t>text</w:t>
      </w:r>
    </w:ins>
  </w:p>
</w:body>
</w:document>

```

And the corresponding document settings:

```

<w:settings>
  <w:trackRevisions w:val="true"/>
  ...
</w:settings>

```

The trackRevisions element's val attribute was set to true, therefore the changes to the content of the document were inserted using the appropriate annotation elements in the document's WordprocessingML. Specifically, inserting the text Text to the right of the existing text was tracked as a revision with the ins element. In addition, applying bold formatting to the text was tracked as a revision with the rPrChange element. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.90 updateFields (Automatically Recalculate Fields on Open)

This element specifies whether the fields contained in this document should automatically have their field result recalculated from the field codes when this document is opened by an application which supports field calculations. [Note: Some fields are always recalculated (e.g. the page numbering), therefore this element only affects fields which are typically not automatically recalculated on opening the document. Also note that this setting must not supersede any document protection (§17.15.1.29) or write protection (§17.15.1.93) settings. *end note*]

If this element is omitted, then fields should not automatically be recalculated on opening this document.

[Example: Consider a WordprocessingML document that specifies that applications should attempt to automatically recalculate fields from their field codes upon opening this document. This requirement would be specified using the following WordprocessingML in the document settings part:

```

<w:updateFields w:val="true"/>

```

The `updateFields` element's `val` attribute has a value of `true` specifying that all fields should automatically be recalculated when opening this document. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.91 `useXSLTWhenSaving` (Save Document as XML File through Custom XSL Transform)

This element specifies that this document should be saved through the custom XSLT transform defined by the `saveThroughXslt` element (§17.15.1.76) in this document when it is saved as a single XML file (not defined by ECMA-376). [*Guidance*: Because this setting specifies behavior when saving to an alternative file format not defined by ECMA-376, this behavior is optional. *end guidance*]

If the `saveXmlDataOnly` element (§17.15.1.77) is specified, then the single XML file to be transformed is the custom XML markup of the document, otherwise, it a format outside the scope of ECMA-376. If the XSL transform specified by the `saveThroughXslt` element is not present, then this setting should be ignored.

If this element is omitted, then this document should not be saved through a custom XSL transform when it is saved as a single XML file.

[*Example*: Consider a WordprocessingML document which should be saved through a custom XSL transform when it is saved as a single XML file. This requirement is specified using the following WordprocessingML in the document settings:

```
<w:useXSLTWhenSaving w:val="true" />
```

The `useXSLTWhenSaving` element's `val` attribute has a value of `true` specifying that the content in this document should be saved as a single XML file through the custom XSLT specified by the `saveThroughXslt` element. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.1.92 `view` (Document View Setting)

This element specifies the manner in which the contents of this document should be displayed when opened by an application.

If this element is omitted, then an application can view the document in any desired default state.

[*Example*: Consider a WordprocessingML document that must be displayed on the screen in the same form as it is printed. This requirement would be specified using the following WordprocessingML in the document settings:

```
<w:view w:val="print" />
```

The `view` element's `val` attribute is equal to `print` specifying that the given WordprocessingML document must be rendered as it is printed. *end example*]

Attributes	Description
val (Document View Setting Value)	<p>Specifies the view which shall be used to render the contents of a WordprocessingML document.</p> <p>Applications can omit support for one or more of the views defined by the ST_View simple type (referenced below). If a WordprocessingML document containing an unsupported view is loaded by an application, it shall fall back to its default view (equivalent to use of the enumeration value none).</p> <p>[<i>Example:</i> Consider a WordprocessingML document that must be rendered in a view meant to mimic how the document would look in a web browser (i.e. without a fixed page width). This requirement would be specified using the following WordprocessingML in the document settings:</p> <pre><w:view w:val="web" /></pre> <p>The val attribute is equal to web specifying that the given WordprocessingML document must be rendered in a view mimicking web page display. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_View simple type (§17.18.102).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_View](#)) is located in §A.1. *end note*]

17.15.1.93 writeProtection (Write Protection)

This element specifies the write protection settings which have been applied to a WordprocessingML document. *Write protection* refers to a mode in which the document's contents cannot be edited, and the document cannot be resaved using the same file name. This setting is independent of the documentProtection (§17.15.1.29) element, but like document protection, this setting is not intended as a security feature and can be ignored.

When present, the write protection shall result in one of two write protection behaviors:

- If the password attribute is present, or both attributes are omitted, then the application shall prompt for a password to exit write protection. If the supplied password does not match the hash value in this attribute, then write protection shall be enabled.
- If only the recommended attribute is present, the application should provide user interface recommending that the user open this document in write protected state. If the user chooses to do so, the document shall be write protected, otherwise, it shall be opened fully editable.

If this element is omitted, then no write protection shall be applied to the current document.

[*Example:* Consider a WordprocessingML document that can be opened but only in a write protected state unless a password is provided, in which case the file would be opened in an editable state. This requirement would be specified using the following WordprocessingML in the document settings:

```
<w:writeProtection w:hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" />
```

If the attributes specified in the password attribute group AG_Password are present, then the application shall require a password to exit write protection. If the hash value derived from supplied password does not match the hash value in the attribute hashValue, then write protection shall be enabled. *end example*

Attributes	Description																		
algorithmName (Cryptographic Algorithm Name)	<p>Specifies the specific cryptographic hashing algorithm which shall be used along with the salt attribute and input password in order to compute the hash value.</p> <p>The following values are reserved:</p> <table> <tr> <th>Value</th><th>Algorithm</th></tr> <tr> <td>MD2</td><td> <p>Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p> </td></tr> <tr> <td>MD4</td><td> <p>Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p> </td></tr> <tr> <td>MD5</td><td> <p>Specifies that the MD5 algorithm, as defined by RFC 1321, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p> </td></tr> <tr> <td>RIPEMD-128</td><td> <p>Specifies that the RIPEMD-128 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p> </td></tr> <tr> <td>RIPEMD-160</td><td> <p>Specifies that the RIPEMD-160 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> </td></tr> <tr> <td>SHA-1</td><td> <p>Specifies that the SHA-1 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> </td></tr> <tr> <td>SHA-256</td><td> <p>Specifies that the SHA-256 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> </td></tr> <tr> <td>SHA-384</td><td> <p>Specifies that the SHA-384 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> </td></tr> </table>	Value	Algorithm	MD2	<p>Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>	MD4	<p>Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>	MD5	<p>Specifies that the MD5 algorithm, as defined by RFC 1321, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>	RIPEMD-128	<p>Specifies that the RIPEMD-128 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>	RIPEMD-160	<p>Specifies that the RIPEMD-160 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>	SHA-1	<p>Specifies that the SHA-1 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>	SHA-256	<p>Specifies that the SHA-256 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>	SHA-384	<p>Specifies that the SHA-384 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>
Value	Algorithm																		
MD2	<p>Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>																		
MD4	<p>Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>																		
MD5	<p>Specifies that the MD5 algorithm, as defined by RFC 1321, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>																		
RIPEMD-128	<p>Specifies that the RIPEMD-128 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>																		
RIPEMD-160	<p>Specifies that the RIPEMD-160 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>																		
SHA-1	<p>Specifies that the SHA-1 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>																		
SHA-256	<p>Specifies that the SHA-256 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>																		
SHA-384	<p>Specifies that the SHA-384 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>																		

Attributes	Description	
	SHA-512	Specifies that the SHA-512 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	WHIRLPOOL	Specifies that the WHIRLPOOL algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	<p>[<i>Example:</i> Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre>< ... algorithmName="SHA-1" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The algorithmName attribute value of “SHA-1” specifies that the SHA-1 hashing algorithm must be used to generate a hash from the user-defined password. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>	
	<p>hashValue (Password Hash Value)</p> <p>Specifies the hash value for the password stored with this document. This value shall be compared with the resulting hash value after hashing the user-supplied password using the algorithm specified by the preceding attributes and parent XML element, and if the two values match, the protection shall no longer be enforced.</p> <p>If this value is omitted, then the reservationPassword attribute shall contain the password hash for the workbook.</p> <p>[<i>Example:</i> Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre><... AlgorithmName="SHA-1" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The hashValue attribute value of 9oN7nWkCAyEZib1RomSJTjmPpCY= specifies that the user-supplied password must be hashed using the pre-processing defined by the parent element (if any) followed by the SHA-1 algorithm (specified via the algorithmName attribute value of SHA-1) and that the resulting has value must be 9oN7nWkCAyEZib1RomSJTjmPpCY= for the protection to be disabled. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema base64Binary datatype.</p>	
	<p>recommended (Recommend Write Protection in User Interface)</p> <p>Specifies that applications should provide user interface recommending that the user open this document in write protected state. If the user chooses to do so, the document shall be write protected, otherwise, it shall be opened fully editable.</p> <p>If this attribute is omitted, then user interface recommending that the user open this document in write protected state should not be provided. If the password attribute is</p>	

Attributes	Description
	<p>also specified, then this setting shall be ignored.</p> <p>[<i>Example:</i> Consider a WordprocessingML document which specifies that applications must recommend write protection to this document. This requirement would be specified using the following WordprocessingML in the document settings:</p> <pre><w:writeProtection w:recommended="true" /></pre> <p>The recommended attribute has a value of <code>true</code> specifying that the applications must hash any password provided, and if it matches this hash value, can only then halt enforcement of write protection. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_OnOff</code> simple type (§22.9.2.7).</p>
saltValue (Salt Value for Password Verifier)	<p>Specifies the salt which was prepended to the user-supplied password before it was hashed using the hashing algorithm defined by the preceding attribute values to generate the <code>hashValue</code> attribute, and which shall also be prepended to the user-supplied password before attempting to generate a hash value for comparison. A <i>salt</i> is a random string which is added to a user-supplied password before it is hashed in order to prevent a malicious party from pre-calculating all possible password/hash combinations and simply using those pre-calculated values (often referred to as a "dictionary attack").</p> <p>If this attribute is omitted, then no salt shall be prepended to the user-supplied password before it is hashed for comparison with the stored hash value.</p> <p>[<i>Example:</i> Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre><... saltValue="ZUdHa+D8F/OAKP3I7ssUnQ==" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The <code>saltValue</code> attribute value of <code>ZUdHa+D8F/OAKP3I7ssUnQ==</code> specifies that the user-supplied password must have this value prepended before it is run through the specified hashing algorithm to generate a resulting hash value for comparison. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema <code>base64Binary</code> datatype.</p>
spinCount (Iterations to Run Hashing Algorithm)	<p>Specifies the number of times the hashing function shall be iteratively run (runs using each iteration's result plus a 4 byte value (0-based, little endian) containing the number of the iteration as the input for the next iteration) when attempting to compare a user-supplied password with the value stored in the <code>hashValue</code> attribute.</p> <p>[<i>Rationale:</i> Running the algorithm many times increases the cost of exhaustive search attacks correspondingly. Storing this value allows for the number of iterations to be increased over time to accommodate faster hardware (and hence the ability to run more iterations in less time). <i>end rationale</i>]</p>

Attributes	Description
	<p>[<i>Example:</i> Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre><... spinCount="100000" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The spinCount attribute value of 100000 specifies that the hashing function must be run one hundred thousand times to generate a hash value for comparison with the hashValue attribute. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_WriteProtection](#)) is located in §A.1. *end note*]

17.15.1.94 zoom (Magnification Setting)

This element specifies the magnification level which should be applied to a document when it is displayed by an application. The zoom level is specified with the use of two attributes stored on this element:

- val, which stores the type of zoom applied to the document
- percent, which stores the zoom percentage to be used when rendering the document

If both attributes are present, then the percent attribute shall be treated as a 'cached' value and only used when the value none is specified for the val attribute.

If this element is omitted, then applications can display the document in any desired magnification setting.

[*Example:* Consider a WordprocessingML document that is to have its zoom level at seventy one percent when it is displayed. This requirement would be specified using the following WordprocessingML fragment in the document settings:

```
<w:zoom w:percent="71%" />
```

The zoom element's percent attribute has a value of 71%, specifying that the given document must have its zoom level set to seventy one percent when it is displayed. *end example*]

Attributes	Description
percent (Zoom Percentage)	<p>Specifies the zoom percentage that should be applied when a given WordprocessingML document is rendered by conforming hosting applications. This value is the zoom percentage specified as an integer with a trailing percent sign (U+0025).</p> <p>If this attribute is omitted, then applications can use any desired default percentage for</p>

Attributes	Description
	<p>the magnification.</p> <p>If the <code>val</code> attribute is instantiated in addition to the <code>percent</code> attribute, then the <code>percent</code> attribute shall be treated as a cached value and only used when the value <code>none</code> is specified for the <code>val</code> attribute. If the value specified exceeds the maximum zoom level available in a conforming hosting application, the conforming hosting application shall display the document using its maximum zoom level. Correspondingly, if the value specified is less than the minimum zoom level available in the conforming hosting application, the conforming hosting application shall display the document using its minimum zoom level.</p> <p>[<i>Example:</i> Consider a WordprocessingML document that is to have its zoom level at fifty percent when rendered by conforming hosting applications. This requirement would be specified using the following WordprocessingML:</p> <pre><w:zoom w:percent="50%" /></pre> <p>The <code>percent</code> attribute has a value of 50%, specifying that the given WordprocessingML document must to have its zoom level set to fifty percent when it is displayed. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_DecimalNumberOrPercent</code> simple type (§17.18.11).</p>
val (Zoom Type)	<p>Specifies the type of zoom which shall be applied to a given document on open.</p> <p>If this attribute is not present, then the document shall be displayed as though the value had been set to <code>none</code>, and should rely on the value of the <code>percent</code> attribute for the actual zoom percentage.</p> <p>[<i>Example:</i> Consider a WordprocessingML document that should be visible without any horizontal scrolling when it is displayed. This requirement would be specified using the following WordprocessingML:</p> <pre><w:zoom w:val="bestFit" w:percent="90%" /></pre> <p>The <code>val</code> attribute is equal to the value <code>bestFit</code> specifying that an application must dynamically calculate the magnification needed such that the given document must be visible on the horizontal plane of the document with no horizontal scrolling required to see any part of the WordprocessingML document's pages.</p> <p>Since both attributes are present, the <code>percent</code> attribute must be treated as a 'cached' value and ignored. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_Zoom</code> simple type (§17.18.105).</p>

[*Note: The W3C XML Schema definition of this element's content model ([CT_Zoom](#)) is located in §A.1. end note*]

17.15.2 Web Page Settings

The next group of settings stored in WordprocessingML is web page settings. These settings specify two categories of settings:

- Settings which are related to HTML documents (i.e. frameset definitions) that can be used in WordprocessingML documents as well
- All settings which affect how this document shall be handled when it is saved as HTML. Actually saving a document as HTML is outside of the scope of ECMA-376, but in order to ensure the maximum interoperability between a WordprocessingML document and an HTML document, settings not explicitly stored elsewhere are stored in these settings.

[*Example: Consider the following WordprocessingML fragment for the web page settings in a WordprocessingML document:*

```
<w:webSettings>
  <w:frameset>
    ...
  </w:frameset>
  <w:doNotUseLongFileNames w:val="true" />
</w:webSettings>
```

The webSettings element contains all of the web page settings for this document. In this case, the web page settings specified for this document are: a frameset defined using the frameset element (§17.15.2.19); and a setting specifying that when this file is saved as a web page, all resulting files must not exceed 8 octets with 3 octet extension using the doNotUseLongFileNames element (§17.15.2.13). *end example*]

17.15.2.1 allowPNG (Allow PNG as Graphic Format)

This element specifies that applications shall allow use of the PNG file format when the contents of this WordprocessingML document are saved as a web page. This includes all supporting images used as part of this HTML web page.

If this element is omitted from the document, then the PNG file format shall not be allowed when this document is saved as a web page, and that another suitable file format (such as the JPEG file format) should be utilized in its place.

[*Note: This setting is intended for applications to save web pages which can be supported by legacy web browsers which do not support the reading of PNG images. However, although PNG utilizes a lossless compression algorithm, JPEG uses 'lossy' compression and can in some cases result in lower fidelity images. end note*]

[*Example: Consider a WordprocessingML document which contains the following content within the web settings part:*

```
<w:webSettings>
  <w:allowPNG w:val="true" />
</w:webSettings>
```

The allowPNG element has a val attribute value of true, which specifies that applications can use the PNG graphic format as needed when saving this WordprocessingML document as a web page. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.2.2 blockQuote (Data for HTML blockquote Element)

This element specifies that the current div element does not represent an HTML div element, but rather represents an HTML blockquote element. This element shall specify that this container shall be written out using the blockquote element if this document is subsequently saved as HTML.

If this element is omitted, then the current div element does not represent an HTML blockquote element. If both this element and the bodyDiv element (§17.15.2.3) are specified, then this element shall take precedence in all cases.

[*Example:* Consider a simple HTML document defined as follows:

```
<html>
  <body style="margin-left:200px;margin-top:50px">
    <p>Paragraph one.</p>
    <blockquote style="border: 5px solid #00FFFF">
      <p>Paragraph in a blockquote.</p>
    </blockquote>
    <p>Paragraph two.</p>
  </body>
</html>
```

When this document is saved in the WordprocessingML format, the information stored on the div, blockquote, and body elements is stored in the web setting part as follows:

```
<w:divs>
  <w:div w:id="1626542603">
    ...
    <w:divsChild>
      <w:div w:id="313534916">
        <w:blockQuote w:val="true" />
        ...
      </w:div>
    </w:divsChild>
  </w:div>
</w:divs>
```

The `blockquote` element has a `val` attribute value of `true`, which specifies that the nested `div` element actually represents a nested HTML `blockquote` when this document is resaved as HTML. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.2.3 `bodyDiv` (Data for HTML body Element)

This element specifies that the current `div` element does not represent an HTML `div` element, but rather represents formatting properties on the HTML body element. This element shall specify that the properties specified by this container shall be written out onto the body element if this document is subsequently saved as HTML.

If this element is omitted, then the current `div` element does not represent an HTML body element. If both this element and the `blockquote` element (§17.15.2.2) are specified, then this element shall be ignored. If this element is specified on any `div` which is not the main `div` element for the document, then this element shall be ignored.

[*Example:* Consider a simple HTML document defined as follows:

```
<html>
  <body style="margin-left:200px;margin-top:50px">
    <p>Paragraph one.</p>
    <blockquote style="border: 5px solid #00FFFF">
      <p>Paragraph in a blockquote.</p>
    </blockquote>
    <p>Paragraph two.</p>
  </body>
</html>
```

When this document is saved in the WordprocessingML format, the information stored on the `div`, `blockquote`, and `body` elements is stored in the web setting part as follows:

```
<w:divs>
  <w:div w:id="1626542603">
    <w:bodyDiv w:val="true" />
    ...
  <w:divsChild>
    ...
  </w:divsChild>
</w:div>
</w:divs>
```

The `bodyDiv` element has a `val` attribute value of `true`, which specifies that the `div` element actually represents properties on the HTML body when this document is resaved as HTML. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.2.4 bottom (Bottom Border for HTML div)

This element specifies the border which shall be displayed at the bottom of the boundaries of the current HTML div object.

If this element is omitted, then this HTML div object shall not have a bottom border.

[Example: Consider a simple HTML document defined as follows:

```
<html>
  <body>
    <div style=" border-left-style:solid; border-right-style:groove; border-
right-width:1px; border-top-style:dashed; border-top-width:3px; border-bottom-
style:outset; border-bottom-width:3px">
      <p>paragraph of text</p>
    </div>
  </body>
</html>
```

This HTML would therefore normally appear as follows (image scaled appropriately):



Now, when this document is saved in the WordprocessingML format, the information stored on the div elements is stored in the web setting part as follows:

```
<w:divs>
  <w:div w:id="1785730240">
    ...
    <w:divBdr>
      <w:top w:val="dashed" w:sz="18" w:space="7" w:color="auto" />
      <w:left w:val="single" w:sz="24" w:space="4" w:color="auto" />
      <w:bottom w:val="outset" w:sz="18" w:color="auto" />
      <w:right w:val="threeDEngrave" w:sz="6" w:color="auto" />
    </w:divBdr>
  </w:div>
</w:divs>
```

The bottom element specifies border information about the bottom border for the single HTML div structure in the document; in this case, a 2.25 point bottom border of type outset. The initial 3 pixel border was converted to 2.25 points using the following logic:

$$3\text{px} * \frac{1 \text{ inch}}{96 \text{ px}} * \frac{576 \text{ eighth points}}{1 \text{ inch}} = 18 \text{ eighth points (2.25 points)}$$

end example]

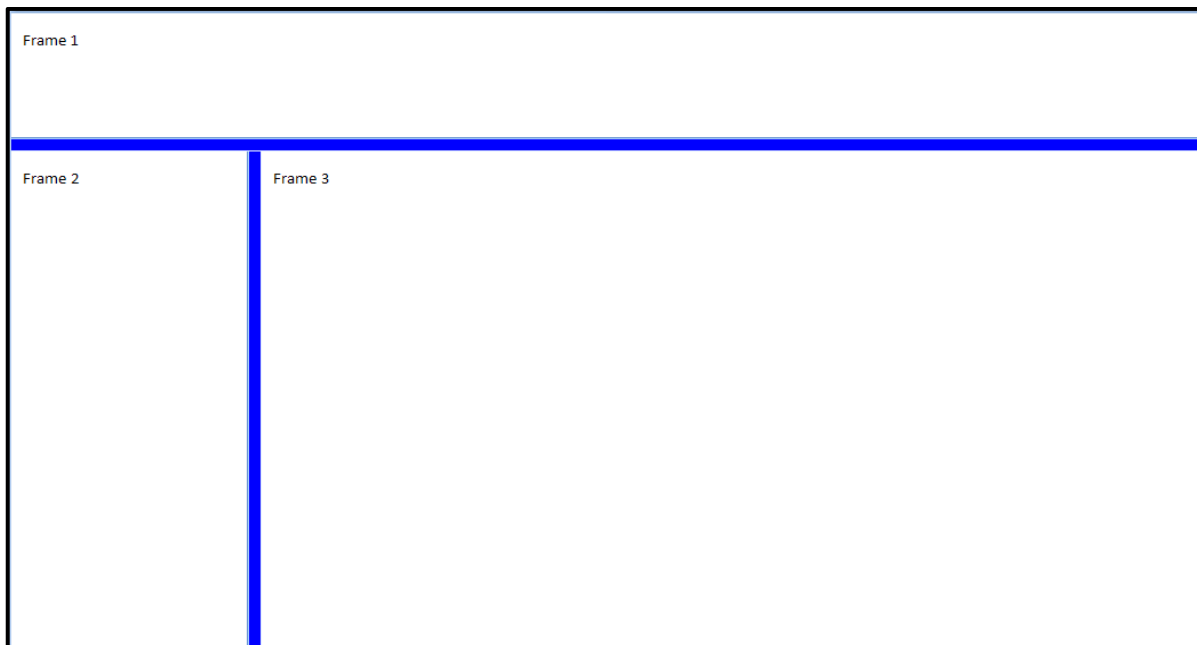
This element's content model is defined by the common border properties definition in §17.3.4.

17.15.2.5 color (Frameset Splitter Color)

This element specifies the color of the splitters within the frameset in this WordprocessingML document. This element shall only be honored on the root frameset for this document, and can be ignored for all nested framesets in this document.

If this element is omitted, then the default color of the splitter can be automatically determined by the application displaying this WordprocessingML document (equivalent to a val attribute value of auto).

[*Example:* Consider a frameset consisting of the following three frames:



The following properties define the presentation of the splitter bars within this frameset:

```
<w:frameset>
  <w:framesetSplitbar>
    <w:w w:val="200" />
    <w:color w:val="0000FF" />
  </w:framesetSplitbar>
  ...
</w:frameset>
```


The color element's val attribute specifies that the splitters must be displayed in the RGB color 0000FF (blue) when the contents of this document are displayed. *end example*]

Attributes	Description
themeColor (Run Content Theme Color)	<p>Specifies a theme color which should be applied to the current run.</p> <p>The specified theme color is a reference to one of the predefined theme colors, located in the document's Theme part, which allows for color information to be set centrally in the document.</p> <p>If the themeColor attribute is specified, then the val attribute is ignored for this run.</p> <p>[<i>Example</i>: Consider a run of text which should be displayed using the accent3 theme color from the document's Theme part. This requirement would be specified as follows in the resulting WordprocessingML:</p> <pre><w:rPr> <w:color w:themeColor="accent3" /> </w:rPr></pre> <p>The color attribute specifies that the run must use the accent3 theme color. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ThemeColor simple type (§17.18.97).</p>
themeShade (Run Content Theme Color Shade)	<p>Specifies the shade value applied to the supplied theme color (if any) for this run's contents.</p> <p>If the themeShade is supplied, then it is applied to the RGB value of the theme color to determine the final color applied to this run.</p> <p>The themeShade value is stored as a hex encoding of the shade value (from 0 to 255) applied to the current border.</p> <p>[<i>Example</i>: Consider a shade of 40% applied to a run in a document. This shade is calculated as follows:</p> $ \begin{aligned} S_{xml} &= 0.4 * 255 \\ &= 102 \\ &= 66(hex) \end{aligned} $ <p>The resulting themeShade value in the file format would be 66. <i>end example</i>]</p> <p>Given a input red, green, or blue color value C (from 0-255), an output color value of C' (from 0-255), and a shade value S (from 0-100), the shade is applied as follows:</p>

Attributes	Description
	$C' = \left(1 - \frac{S}{100}\right)C$ <p>[<i>Example</i>: Consider a document with a run using the <code>accent6</code> theme color, whose RGB value (in RRGGBB hex format) is <code>F79646</code>.</p> <p>The hex value for the green component is <code>96</code> - 150 in decimal. Applying the shade formula with shade of 50%, the output decimal value of the green component is 75, or a hex value of <code>4B</code>. This transformed value can be seen in the resulting run color WordprocessingML's <code>val</code> attribute:</p> <pre><w:color w:val="7B4B23" w:themeColor="accent6" w:themeShade="80" /></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_UcharHexNumber</code> simple type (§17.18.98).</p>
themeTint (Run Content Theme Color Tint)	<p>Specifies the tint value applied to the supplied theme color (if any) for this run's contents.</p> <p>If the <code>themeTint</code> is supplied, then it is applied to the RGB value of the theme color to determine the final color applied to this run.</p> <p>The <code>themeTint</code> value is stored as a hex encoding of the tint value (from 0 to 255) applied to the current border.</p> <p>[<i>Example</i>: Consider a tint of 60% applied to a run in a document. This tint is calculated as follows:</p> $\begin{aligned} T_{xml} &= 0.6 * 255 \\ &= 153 \\ &= 99(hex) \end{aligned}$ <p>The resulting <code>themeTint</code> value in the file format would be <code>99</code>. <i>end example</i>]</p> <p>Given a input red, green, or blue color value C (from 0-255), an output color value of C' (from 0-255), and a tint value T (from 0-100), the tint is applied as follows:</p> $C' = \left(1 - \frac{T}{100}\right)(255 - C) + C$ <p>[<i>Example</i>: Consider a document with a run using the <code>accent1</code> theme color, whose RGB value (in RRGGBB hex format) is <code>C0504D</code>.</p> <p>The hex value for the green component is <code>50</code> - 80 in decimal. Applying the tint formula with tint of 60%, the output decimal value of the green component is 150, or a hex value</p>

Attributes	Description
	<p>of 96. This transformed value can be seen in the resulting run color's WordprocessingML val attribute:</p> <pre><w:color w:val="D99694" w:themeColor="accent1" w:themeTint="99" /></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_UcharHexNumber simple type (§17.18.98).</p>
val (Run Content Color)	<p>Specifies the color for this run.</p> <p>This color can either be presented as a hex value (in RRGGBB format), or auto to allow a consumer to automatically determine the run color as appropriate.</p> <p>If the run specifies the use of a theme color via the themeColor attribute, then this value is superseded by the theme color value.</p> <p>[<i>Example:</i> Consider a run color with value auto, as follows:</p> <pre><w:rPr> <w:color ... w:val="auto" /> </w:rPr></pre> <p>This color therefore can be automatically be modified by a consumer as appropriate, for example, in order to ensure that the run contents can be distinguished against the page's background color. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_HexColor simple type (§17.18.38).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Color](#)) is located in §A.1. *end note]*

17.15.2.6 div (Information About Single HTML div Element)

This element specifies information about a single HTML `div`, `body`, or `blockquote` element which was included in this document, so that that information (which is stored on a logical structure with no direct analog in WordprocessingML) can be maintained when an HTML document is stored in the WordprocessingML format.

The `div` element stores the following information about these structures:

- The child HTML `div`, and `blockquote` elements
- The borders for the element
- The margins for the element

When the resulting WordprocessingML document is displayed by an application, the settings specified by this information shall be reflected in the formatting of the resulting paragraphs (i.e. this information shall not only be used when the document is resaved in the HTML format).

[*Example:* Consider a simple HTML document defined as follows:

```
<html>
  <body>
    <div style="border-left-style: solid; border-left-width: 1px; border-right-
style: solid; border-right-width: 1px; padding-left: 4px; padding-right: 4px;
padding-top: 1px; padding-bottom: 1px; margin-left: 50px">
      <p>Paragraph one.</p>
      <p>Paragraph two.</p>
    </div>
  </body>
</html>
```

This HTML would therefore normally appear as follows (image scaled appropriately):



Now, when this document is saved in the WordprocessingML format, the information stored on the `div`, `blockquote`, and `body` elements is stored in the web setting part as follows:

```
<w:divs>
  <w:div w:id="1785730240">
    <w:marLeft w:val="750" />
    ...
    <w:divBdr>
      <w:left w:val="single" w:sz="6" w:color="auto" />
      <w:right w:val="single" w:sz="6" w:color="auto" />
    </w:divBdr>
  </w:div>
</w:divs>
```

The `div` element specifies all margin and border information about the single HTML `div` structures in the document; in this case, the left indentation and the left and right borders. *end example*]

Attributes	Description
id (div Data ID)	<p>Specifies a unique decimal number which shall be used to associate one or more structures in the WordprocessingML content with this HTML div information.</p> <p>When a WordprocessingML structure (a paragraph or a table row) is associated with div information, it shall be associated with the set of information which most immediately contains the current object.</p> <p>[Example: If a paragraph is wrapped within two HTML div elements, like this:</p> <pre data-bbox="451 569 776 737"><div> <div> <p>Paragraph</p> </div> </div></pre> <p>The resulting WordprocessingML paragraph must reference the div Data ID associated with the inner HTML div element - the fact that it is also contained within the outer HTML div must be implied by the nesting of the corresponding WordprocessingML div elements in the web settings part. <i>end example</i>]</p> <p>The ID specified by this attribute is then referenced by the divId element for all structures which are immediately contained within the specified HTML div.</p> <p>[Example: Consider a simple HTML document defined as follows:</p> <pre data-bbox="451 1136 1003 1398"><html> <body style=" margin-top:50px"> <p>Paragraph one.</p> <div style="margin-left:50px"> <p>Paragraph two.</p> </div> </body> </html></pre> <p>If the outer and inner body and div elements were assigned id attributes as follows:</p> <pre data-bbox="451 1514 938 1883"><w:div> <w:div w:id="1626542603"> <w:bodyDiv w:val="1" /> ... <w:divsChild> <w:div w:id="313534916"> ... </w:div> </w:divsChild> </w:div> </w:div></pre>

Attributes	Description
	<p>Then the first paragraph would reference the div ID of the outer div (since it is contained by the HTML body element) and the second paragraph would reference the div ID of the inner div (since it is contained within the child HTML div element), as follows:</p> <pre> <w:p> <w:pPr> <w:divId w:val="1626542603" /> </w:pPr> <w:r> <w:t>Paragraph one.</w:t> </w:r> </w:p> <w:p> <w:pPr> <w:divId w:val="313534916" /> </w:pPr> <w:r> <w:t>Paragraph one.</w:t> </w:r> </w:p> </pre> <p>The id attributes on the div elements link each paragraph with the corresponding container div element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_Div](#)) is located in §A.1. *end note*]

17.15.2.7 [divBdr](#) (Set of Borders for HTML div)

This element specifies the set of borders for the boundaries of the current HTML div, body, or blockquote element, using the four border types defined by its child elements.

If this element is omitted, then there shall be no borders associated with the current HTML v, body, or blockquote element.

[Example: Consider a simple HTML document defined as follows:

```

<html>
  <body>
    <div style=" border-left-style:solid; border-right-style:groove; border-
right-width:3px; border-top-style:dashed; border-top-width:3px; border-bottom-
style:outset; border-bottom-width:3px">
      <p>paragraph of text</p>

```

```

    </div>
  </body>
</html>

```

This HTML would therefore normally appear as follows (image scaled appropriately):



Now, when this document is saved in the WordprocessingML format, the information stored on the `div` elements is stored in the web setting part as follows:

```

<w:divs>
  <w:div w:id="1785730240">
    ...
    <w:divBdr>
      <w:top w:val="dashed" w:sz="18" w:space="7" w:color="auto" />
      <w:left w:val="single" w:sz="24" w:space="4" w:color="auto" />
      <w:bottom w:val="outset" w:sz="18" w:color="auto" />
      <w:right w:val="threeDEngrave" w:sz="6" w:color="auto" />
    </w:divBdr>
  </w:div>
</w:divs>

```

The `divBdr` element specifies border information about the single HTML `div` structure in the document. *end example]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DivBdr](#)) is located in §A.1. *end note]*

17.15.2.8 `divs` (Information about HTML `div` Elements)

This element specifies all information about the set of HTML `div` elements (as well as the `body` and `blockquote` elements) which were included in this document, so that that information (which is stored on a logical structure with no direct analog in WordprocessingML) can be maintained when an HTML document is stored in the WordprocessingML format.

The `divs` element stores the following information about these structures:

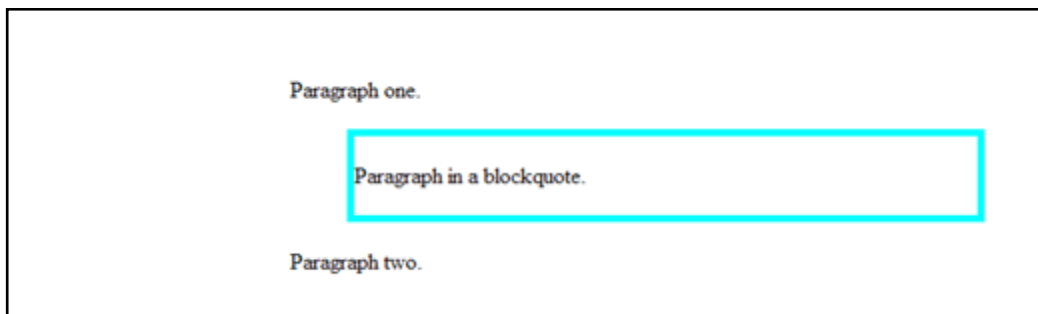
- The parent/child structure of HTML `div`, `blockquote`, and `body` elements
- The borders for each of these elements
- The margins for each of these elements

When the resulting WordprocessingML document is displayed by an application, the settings specified by this information shall be reflected in the formatting of the resulting paragraphs (i.e. this information shall not only be used when the document is resaved in the HTML format).

[Example: Consider a simple HTML document defined as follows:

```
<html>
  <body style="margin-left:200px;margin-top:50px">
    <p>Paragraph one.</p>
    <blockquote style="border: 5px solid #00FFFF">
      <p>Paragraph in a blockquote.</p>
    </blockquote>
    <p>Paragraph two.</p>
  </body>
</html>
```

This HTML would therefore normally appear as follows (image scaled appropriately):



Now, when this document is saved in the WordprocessingML format, the information stored on the `div`, `blockquote`, and `body` elements is stored in the web setting part as follows:

```
<w:divs>
  <w:div w:id="1626542603">
    <w:bodyDiv w:val="1" />
    <w:marLeft w:val="3000" />
    <w:marTop w:val="750" />
```



```

...   <w:divsChild>
      <w:div w:id="313534916">
        <w:blockQuote w:val="1" />
        <w:marLeft w:val="720" />
        <w:marRight w:val="720" />
        <w:marTop w:val="100" />
        <w:marBottom w:val="100" />
        <w:divBdr>
          <w:top w:val="single" w:sz="36" w:color="00FFFF" />
          <w:left w:val="single" w:sz="36" w:color="00FFFF" />
          <w:right w:val="single" w:sz="36" w:color="00FFFF" />
          <w:bottom w:val="single" w:sz="36" w:color="00FFFF" />
        </w:divBdr>
      </w:div>
    </w:divsChild>
  </w:div>
</w:divs>

```

The `divs` element specifies all of the margin and border information about the necessary HTML structures in the document; in this case, the `body` element and the nested `blockquote`. *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Divs](#)) is located in §A.1. *end note*]

17.15.2.9 `divsChild` (Child `div` Elements Contained within Current `div`)

This element specifies the set of HTML `div` or `blockquote` elements which are contained within the current HTML `div`, `body`, or `blockquote` element, establishing the parent/child hierarchy of the original set of these elements.

When an HTML document containing these objects is saved in the WordprocessingML format, WordprocessingML objects store a reference to their most immediate parent `div`, `body`, or `blockquote` element using the `divId` element.

However, since only a single reference is stored, this information is often insufficient to determine the appropriate parent/child hierarchy for the original HTML `div` data, so it can be applied appropriately. This element allows that hierarchy to be stored, as child HTML `div` elements are stored within the `childDivs` element.

[*Example:* Consider a simple HTML document defined as follows:

```

<html>
  <body>
    <div style=" margin-top:50px">
      <p>Paragraph one.</p>
      <div style="margin-left:50px">
        <p>Paragraph two.</p>
      </div>
    </div>
  </body>
</html>

```

If the outer and inner body and div elements were assigned id attributes of 1626542603 and 313534916 respectively, then the first paragraph would reference the div ID of the outer div (since it is contained within that HTML div element) and the second paragraph would reference the div ID of the inner div (since it is contained within the child HTML div element), as follows:

```

<w:p>
  <w:pPr>
    <w:divId w:val="1626542603" />
  </w:pPr>
  <w:r>
    <w:t>Paragraph one.</w:t>
  </w:r>
</w:p>
<w:p>
  <w:pPr>
    <w:divId w:val="313534916" />
  </w:pPr>
  <w:r>
    <w:t>Paragraph one.</w:t>
  </w:r>
</w:p>

```

However, this information alone is insufficient - it is unclear if the second div is contained within, or simply adjacent to, the first one.

In order to preserve this information, the correct hierarchy is stored within the web settings part:

```

<w:divs>
  <w:div w:id="1626542603">
    ...
    <w:divsChild>
      <w:div w:id="313534916">
        ...
      </w:div>
    </w:divsChild>
  </w:div>
</w:divs>

```

The divsChild element contains the second div as a child of the first div, specifying that the first div covers both paragraphs. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Divs](#)) is located in §A.1. *end note*]

17.15.2.10 doNotOrganizeInFolder (Do Not Place Supporting Files in Subdirectory)

This element specifies that applications shall not automatically place all supporting files (images which are part of this HTML web page, etc.) in a subdirectory when the contents of this WordprocessingML document are saved as a web page. Typically, applications which save a document as a web page consisting of multiple files save all supporting files in a subdirectory next to the main HTML file (in order to keep those files organized). This element specifies the files shall be placed in the same directory as the actual web page.

If this element is omitted from the document, then all supporting files should be saved into a subdirectory beneath the main web page file when this document is saved as a web page.

[*Example:* Consider a WordprocessingML document which contains the following content within the web settings part:

```

<w:webSettings>
  <w:doNotOrganizeInFolder w:val="true" />
</w:webSettings>

```

The doNotOrganizeInFolder element has a val attribute value of true, which specifies that applications should save all supplementary files in the same directory as the main web page HTML document when saving this WordprocessingML document as a web page. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.2.11 doNotRelyOnCSS (Do Not Rely on CSS for Font Face Formatting)

This element specifies whether applications can rely on the CSS properties for font face (the font-family property) when saving this WordprocessingML document as a web page. If this element is utilized, then the HTML font element should be used either in place of or in concert with these CSS properties in order to specify the font face formatting for the resulting web page.

If this element is omitted, then applications can choose to rely on the CSS properties for font face as desired.

[*Note:* This setting is intended for applications to save web pages which can be supported by legacy web browsers which do not support the reading of these CSS properties when attempting to read and display the resulting web page, in order to maximize the fidelity of the resulting output. *end note*]

[*Example:* Consider a WordprocessingML document which contains the following content within the web settings part:

```
<w:webSettings>
  <w:doNotRelyOnCSS w:val="true" />
</w:webSettings>
```

The doNotRelyOnCSS element has a val attribute value of true, which specifies that applications should include the HTML font element when saving this WordprocessingML document as a web page. For example, this output:

```
<span style='font-family:"Courier New"'>text</span>
```

This output would instead be saved as follows:

```
<font face="Courier New"><span style='font-family:"Courier
New"'>text</span></font>
```

end example]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.2.12 doNotSaveAsSingleFile (Recommend Web Page Format over Single File Web Page Format)

This element specifies that applications should recommend that new web page files generated using this WordprocessingML document use a multi-file web page format (HTML), rather than a single-file web page format (MHTML) when this document is saved as an HTML web page. This setting shall not prevent the use of the MHTML format; it shall only cause applications to recommend (via a default) a non single-file format when saving as a web page.

[*Note:* This setting is primarily intended for applications which explicitly support a "Save as Web Page..." action, in order to determine the default setting for the resulting web page. *end note*]

[*Example:* Consider a WordprocessingML document which contains the following content within the web settings part:

```
<w:webSettings>
  <w:doNotSaveAsSingleFile w:val="true" />
</w:webSettings>
```

The `doNotSaveAsSingleFile` element specifies that applications should recommend a multi-file web page format when this document is subsequently saved as a web page. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.2.13 `doNotUseLongFileNames` (Do Not Use File Names Longer than 8.3 Characters)

This element specifies that applications shall ensure that the file names for all files generated when saving this document as a web page do not exceed eight octets with a three octet extension. This includes all supporting files (images which are part of this HTML web page, etc.). The file names generated are not case-sensitive.

[*Note:* This setting is intended for applications to save web pages which can be supported by legacy web browsers which do not support the reading of long file names when attempting to read and display the resulting web page. *end note*]

[*Example:* Consider a WordprocessingML document which contains the following content within the web settings part:

```
<w:webSettings>
  <w:doNotUseLongFileNames w:val="true" />
</w:webSettings>
```

The `doNotUseLongFileNames` element specifies that applications should ensure that all file names generated when this document is subsequently saved as a web page do not exceed the 8.3 octet file name limitation. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.2.14 `encoding` (Output Encoding When Saving as Web Page)

This element specifies the encoding which shall be used for the contents of this WordprocessingML document when it is saved as an HTML web page. The set of encodings supported by this element shall be derived from the standard set of character set definitions provided at <http://www.iana.org/assignments/character-sets>.

If this element is omitted, then the default encoding for the current system shall be used when this document is saved as a web page. If the value of the `val` attribute is unknown or supported by an application, then the default encoding for the current system shall be used when this document is saved as a web page.

[*Example:* Consider a WordprocessingML document which contains the following content within the web settings part:

```
<w:webSettings>
  <w:encoding w:val="utf-8" />
</w:webSettings>
```

The encoding element's val attribute has a value of utf-8, which specifies that this document must be encoded in the UTF-8 format when it is saved as a web page. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

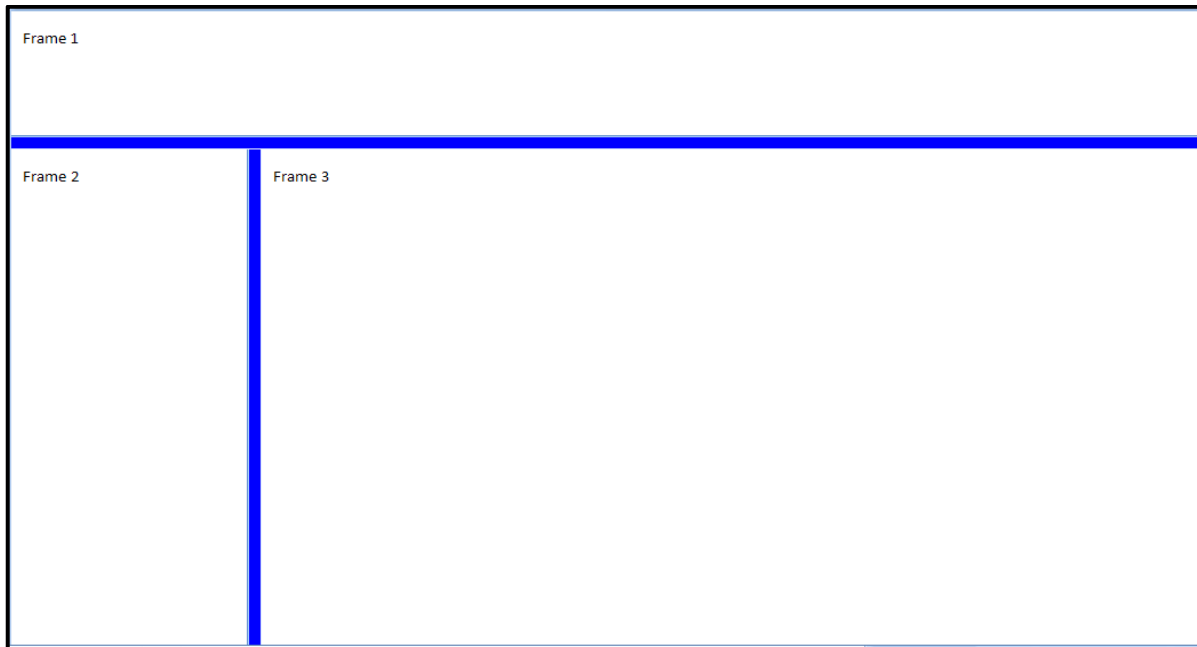
[*Note:* The W3C XML Schema definition of this element’s content model ([CT_String](#)) is located in §A.1. *end note*]

17.15.2.15 flatBorders (Frameset Splitter Border Style)

This element specifies the 3D style of the splitters within the frameset in this WordprocessingML document. This element shall only be honored on the root frameset for this document, and can be ignored for all nested framesets in this document. When this property is turned on, the borders for this frameset shall be flat (not 3D), otherwise they can be presented as 3D splitter when they are displayed.

If this element is omitted, then the default style of the splitter should be a 3D splitter.

[*Example:* Consider a frameset consisting of the following three frames:



The following properties define the presentation of the splitter bars within this frameset:

```
<w:frameset>
  <w:framesetSplitbar>
    <w:w w:val="200" />
    <w:color w:val="0000FF" />
    <w:flatBorders w:val="true" />
  </w:framesetSplitbar>
  ...
</w:frameset>
```

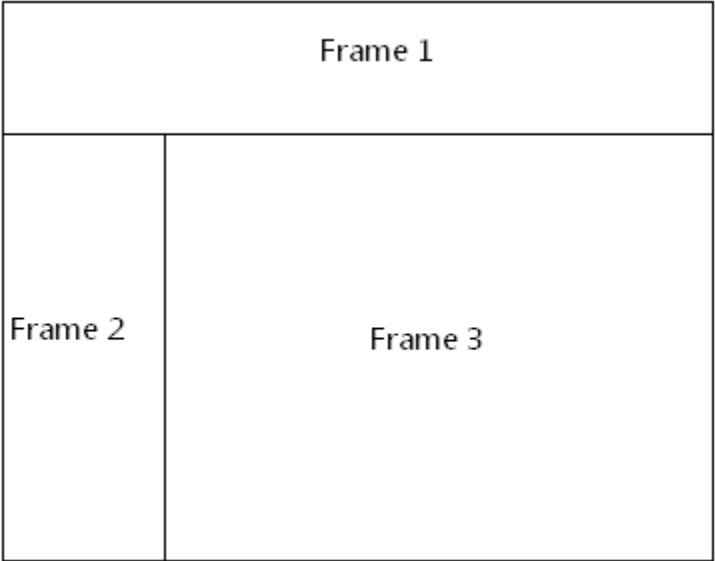
The flatBorders element's val attribute has a value of true, which specifies that the style of the splitters must be flat (the splitter might not be 3D when displayed). *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.2.16 frame (Single Frame Properties)

This element specifies the properties for a single frame within a frameset document. When a document defines a frameset using the frameset element; that frameset is composed of a set of frames, each of which is specified by a single frame element.

[*Example:* Consider a WordprocessingML document which serves as the frameset container for a frameset consisting of the following three frames:



The frameset properties for this document are specified by the following WordprocessingML within the web page settings:

```
<w:frameset>
...
<w:frame>
  <w:sz w:val="20%" />
  <w:name w:val="Frame 1" />
  <w:sourceFileName r:id="rId1" />
</w:frame>
<w:frameset>
...
</w:frameset>
</w:frameset>
```

The frame element specifies the set of properties for a single frame in the document. In this case, these properties (for the frame marked with Frame 1 in the diagram above) specify that the frame must have the following properties:

- A height of 20% of the height of the document
- A name of Frame 1
- The contents of the frame must be pulled from the document that is the target of the relationship with ID rId1

end example]

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Frame](#)) is located in §A.1. *end note]*

17.15.2.17 `frameLayout` (Frameset Layout)

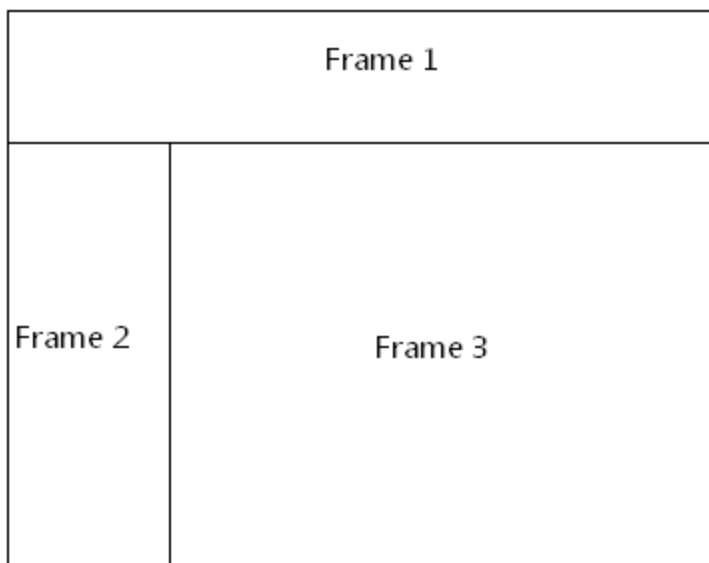
This element specifies the order in which the frames (and nested framesets) in a frameset shall be displayed. When a frameset is created, it can only contain frames which are stacked in one direction:

- Vertically (one on top of another)
- Horizontally (one next to another)

This element specifies how the frames in this frameset are stacked, which shall also be used to interpret the sizes defined by the `sz` element (§17.15.2.39) for each frame. In order to determine the ordering of the constituent frames within this frameset, the ordering of the child frame and frameset elements shall be used.

If this element is omitted, then the frames in this frameset shall be stacked vertically on top of one another (a row frameset).

[*Example:* Consider a WordprocessingML document which serves as the frameset container for a frameset consisting of the following three frames:



The frameset properties for this document are specified by the following WordprocessingML within the web page settings:

```
<w:frameset>
...
<w:frameLayout w:val="rows" />
<w:frame>
...
</w:frame>
<w:frameset>
  <w:frameLayout w:val="cols" />
  <w:frame>
```

```
...
</w:frame>
<w:frame>
...
</w:frame>
</w:frameset>
</w:frameset>
```

The `frameLayout` element specifies that the outer frameset is a consists of the single frame and the child frameset stacked vertically, and an inner nested frameset consisting of two frames stacked horizontally. *end example]*

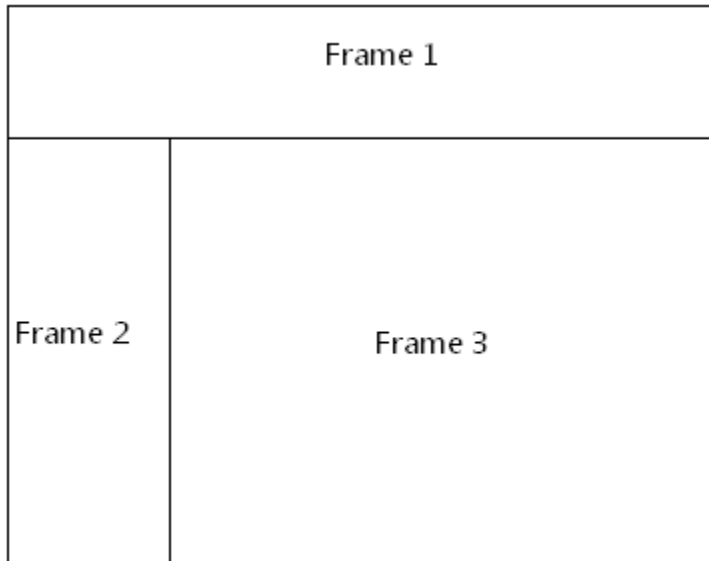
Attributes	Description
val (Frameset Layout Value)	<p>Specifies the type of layout which shall be used to display the contents of the frames and nested framesets within this frameset, as defined by the simple type referenced below.</p> <p>[<i>Example:</i> Consider a frameset definition within a WordprocessingML document which defines the following frameset layout setting:</p> <pre><w:frameset> <w:frameLayout w:val="cols" /> ... </w:frameset></pre> <p>The <code>val</code> attribute value of <code>cols</code> specifies that the contents of this frameset must be stacked horizontally (in columns). <i>end example]</i></p> <p>The possible values for this attribute are defined by the <code>ST_FrameLayout</code> simple type (§17.18.31).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_FrameLayout](#)) is located in §A.1. *end note]*

17.15.2.18 frameset (Nested Frameset Definition)

This element specifies a frameset which has been nested within another frameset within a WordprocessingML document. This WordprocessingML element is analogous to the `frameset` element in HTML (when that frameset is the child of another `frameset` element).

[*Example:* Consider a WordprocessingML document which serves as the frameset container for a frameset consisting of the following three frames:



The frameset properties for this document are specified by the following WordprocessingML within the web page settings:

```
<w:frameset>
  <w:frameLayout w:val="rows" />
  <w:frame>
    ...
  </w:frame>
  <w:frameset>
    <w:frameLayout w:val="cols" />
    <w:frame>
      ...
    </w:frame>
    <w:frame>
      ...
    </w:frame>
  </w:frameset>
</w:frameset>
```

The child frameset element specifies the frameset definition for the inner frameset; that frameset consists of two frames (Frame 2 and Frame 3 in the image above) which have been laid out horizontally as columns. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_Frameset](#)) is located in §A.1. *end note*]

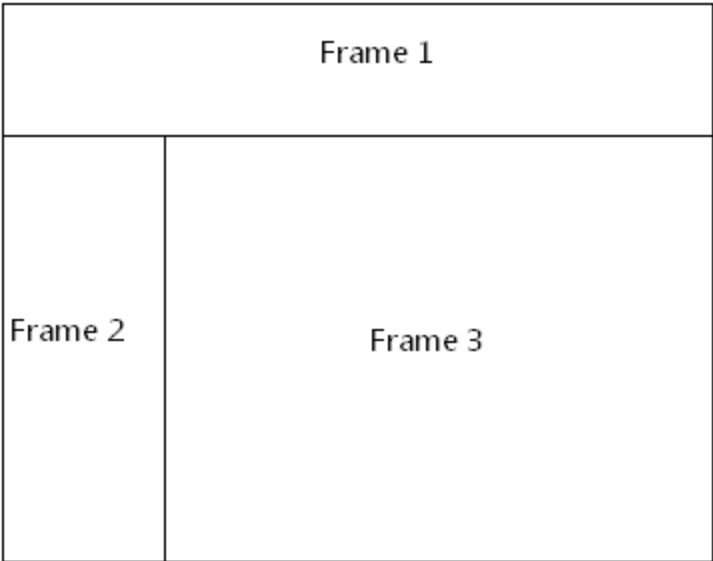
17.15.2.19 frameset (Root Frameset Definition)

This element specifies that this document is the container for a frameset. This WordprocessingML element is analogous to the frameset element in HTML.

When the frameset element is present within a document, that document shall serve as a frameset definition only; all of its normal document content shall therefore not be displayed as long as it contains at least one child frame or frameset element.

If this element is omitted, then the currently document shall not be treated as a frameset definition; its regular document content shall be displayed.

[Example: Consider a WordprocessingML document which serves as the frameset container for a frameset consisting of the following three frames:



The frameset properties for this document are specified by the following WordprocessingML within the web page settings:

```
<w:frameset>
  <w:frameLayout w:val="rows" />
  <w:frame>
    ...
  </w:frame>
</w:frameset>
<w:frameset>
  <w:frameLayout w:val="cols" />
  <w:frame>
    ...
  </w:frame>
  <w:frame>
    ...
  </w:frame>
</w:frameset>
```

```

    </w:frame>
  </w:frameset>
</w:frameset>

```

The parent frameset element specifies that the current document is a frameset definition; that frameset consists of a single frame and another nested frameset stacked vertically. *end example*

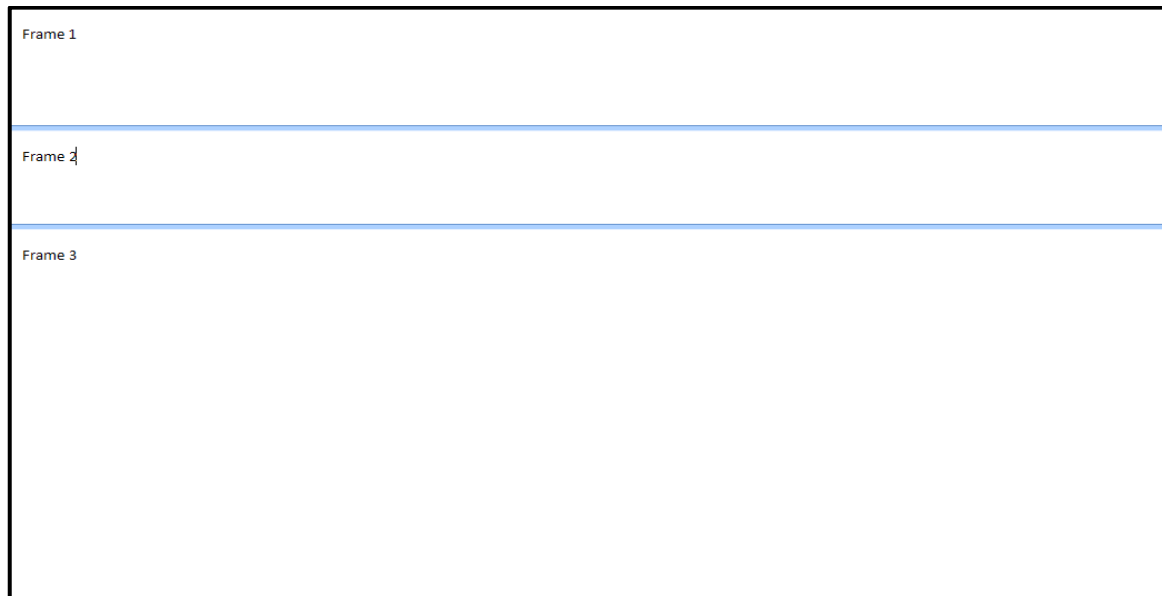
[*Note:* The W3C XML Schema definition of this element's content model ([CT Frameset](#)) is located in §A.1. *end note*]

17.15.2.20 framesetSplitbar (Frameset Splitter Properties)

This element specifies the properties for the splitters associated with this frameset. A *splitter* is a horizontal or vertical line which visually separates the contents of one frame from another within a frameset.

If this element is omitted, then the default parameters for each of the child frameset properties shall be used for all splitters in this frameset.

[*Example:* Consider a frameset consisting of the following three frames:



The following properties define the presentation of the splitter bars within this frameset:

```

<w:frameset>
  <w:framesetSplitbar>
    <w:w w:val="90" />
    <w:color w:val="auto" />
  </w:framesetSplitbar>
  ...
</w:frameset>

```

The `framesetSplitbar` element specifies the properties for all splitters in this frameset; in this case, those properties are that the splitter must be 4.5 points (90 twentieths of a point) wide, and that the color of the splitter must be automatically determined via the attribute value of `auto`. *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FramesetSplitbar](#)) is located in §A.1. *end note*]

17.15.2.21 `left` (Left Border for HTML `div`)

This element specifies the border which shall be displayed at the left of the boundaries of the current HTML `div` object.

If this element is omitted, then this HTML `div` object shall not have a left border.

[*Example:* Consider a simple HTML document defined as follows:

```
<html>
  <body>
    <div style=" border-left-style:solid; border-right-style:groove; border-
right-width:1px; border-top-style:dashed; border-top-width:3px; border-bottom-
style:outset; border-bottom-width:3px">
      <p>paragraph of text</p>
    </div>
  </body>
</html>
```

This HTML would therefore normally appear as follows (image scaled appropriately):



Now, when this document is saved in the WordprocessingML format, the information stored on the `div` elements is stored in the web setting part as follows:

```

<w:divs>
  <w:div w:id="1785730240">
    ...
    <w:divBdr>
      <w:top w:val="dashed" w:sz="18" w:space="7" w:color="auto" />
      <w:left w:val="single" w:sz="24" w:space="4" w:color="auto" />
      <w:bottom w:val="outset" w:sz="18" w:color="auto" />
      <w:right w:val="threeDEngrave" w:sz="6" w:color="auto" />
    </w:divBdr>
  </w:div>
</w:divs>

```

The left element specifies border information about the left border for the single HTML `div` structure in the document; in this case, a 3 point bottom border of type `single`. The initial 4 pixel border was converted to 3 points using the following logic:

$$4\text{px} * \frac{1\text{ inch}}{96\text{ px}} * \frac{576\text{ eighth points}}{1\text{ inch}} = 24\text{ eighth points (3 points)}$$

end example]

This element's content model is defined by the common border properties definition in §17.3.4.

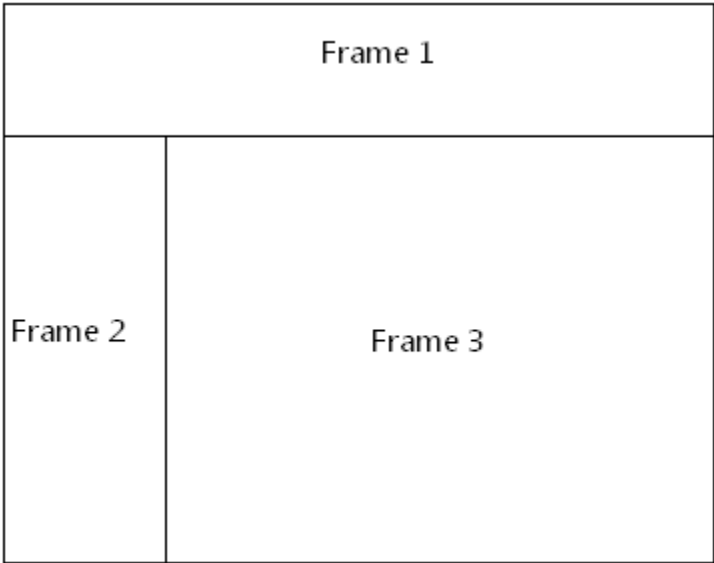
17.15.2.22 [linkedToFile \(Maintain Link to Existing File\)](#)

This element specifies that the file referenced by the `sourceFileName` element (§17.15.2.38) as the basis for the current frame shall not be changed, even when the file defined by the parent frameset is moved - i.e. the link shall remain exactly as specified.

[*Guidance:* Typically, when a document is incorporated into a frameset, a copy of that document is made such that all files encompassing the frameset are stored in a single subdirectory (so they can be moved as a single unit). However, if the link to the current file is absolute and must not be changed even when the location of the main frameset document, then this element must be set to indicate that setting. *end guidance*]

If this element is omitted, then a new file can be created as necessary when the parent frameset document is resaved to another location.

[*Example:* Consider a WordprocessingML document which serves as the frameset container for a frameset consisting of the following three frames:



The frameset properties for this document are specified by the following WordprocessingML within the web page settings:

```
<w:frameset>
...
<w:frame>
  <w:sz w:val="20%" />
  <w:name w:val="Frame 1" />
  <w:sourceFileName r:id="rId1" />
  <w:linkedToFile w:val="true" />
</w:frame>
<w:frameset>
...
</w:frameset>
</w:frameset>
```

The `linkedToFile` element specifies that the frame source location specified by the `sourceFileName` element (§17.15.2.38) must not be modified, even if the parent frameset document is resaved to another location. *end example*]

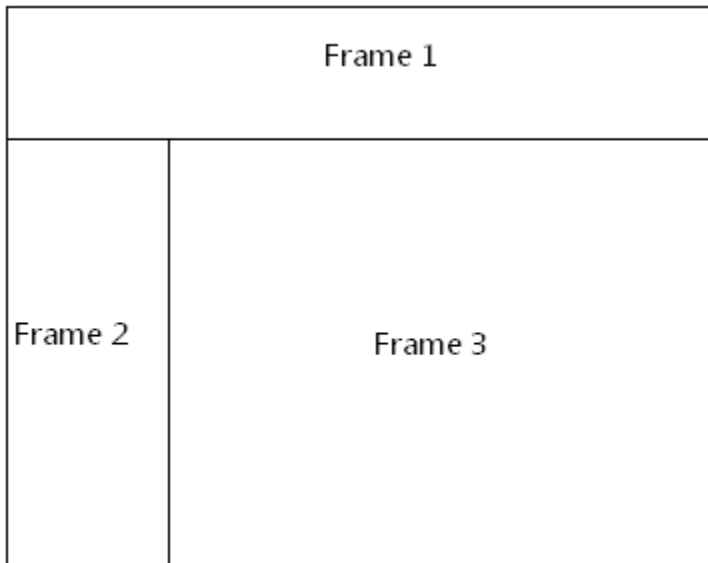
This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.2.23 `longDesc` (Frame Long Description)

This element specifies an explicit relationship whose target is the long description of the frame. This description should supplement the short description provided by the title element. This property is analogous to the `longdesc` attribute on the frame element in HTML.

If this element is omitted, then no long description shall be associated with the given frame.

[Example: Consider a WordprocessingML document which serves as the frameset container for a frameset consisting of the following three frames:



The frameset properties for this document are specified by the following WordprocessingML within the web page settings:

```
<w:frameset>
...
<w:frame>
  <w:name w:val="Frame 1" />
  <w:title w:val="Menu bar" />
  <w:longDesc r:id="rIdMenuBar" />
</w:frame>
<w:frameset>
  <w:title w:val="Navigation and document collection" />
  ...
  <w:frame>
    <w:name w:val="Frame 2" />
    <w:title w:val="Navigation bar" />
    <w:longDesc r:id="rIdNavBar" />
  </w:frame>
  <w:frame>
    <w:name w:val="Frame 3" />
    <w:title w:val="Documents" />
    <w:longDesc r:id="rIdDocs" />
  </w:frame>
</w:frameset>
</w:frameset>
```

The longDesc element specifies that the part targeted by the relationship with an id of rIdMenuBar must be used for supplementary information for Frame 1. Examining the contents of the corresponding relationship part item, we can see the targets for that relationship:

```
<Relationships ... >
...
  <Relationship Id="rIdMenuBar" TargetMode="External"
Type="http://purl.oclc.org/ooxml/officeDocument/relationships/hyperlink"
Target="myexample-desc.html#menubar" />
...
</Relationships>
```

The corresponding relationship part item shows that the long description supplementary information for Frame 1 is located at myexample-desc.html#menubar, where myexample-desc.html describes #menubar as “This frame provides links to the major sections of the site: Home, Resources, Links, Help.” *end example*]

Attributes	Description
id (Relationship to Part) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	<p>Specifies the relationship ID to a specified part.</p> <p>The specified relationship shall match the relationship type required by the parent element:</p> <ul style="list-style-type: none">• http://purl.oclc.org/ooxml/officeDocument/relationships/customXml for the contentPart element• http://purl.oclc.org/ooxml/officeDocument/relationships/footer for the footerReference element• http://purl.oclc.org/ooxml/officeDocument/relationships/header for the headerReference element• http://purl.oclc.org/ooxml/officeDocument/relationships/font for the embedBold, embedBoldItalic, embedItalic, or embedRegular elements• http://purl.oclc.org/ooxml/officeDocument/relationships/printerSettings for the printerSettings element• http://purl.oclc.org/ooxml/officeDocument/relationships/hyperlink for the longDesc or hyperlink element <p>[Example: Consider an XML element which has the following id attribute:</p> <pre><... r:id="rId10" /></pre> <p>The markup specifies the associated relationship part with relationship ID rId1 contains the corresponding relationship information for the parent XML element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_Rel](#)) is located in §A.1. *end note*]

17.15.2.24 `marBottom` (Bottom Margin for HTML div)

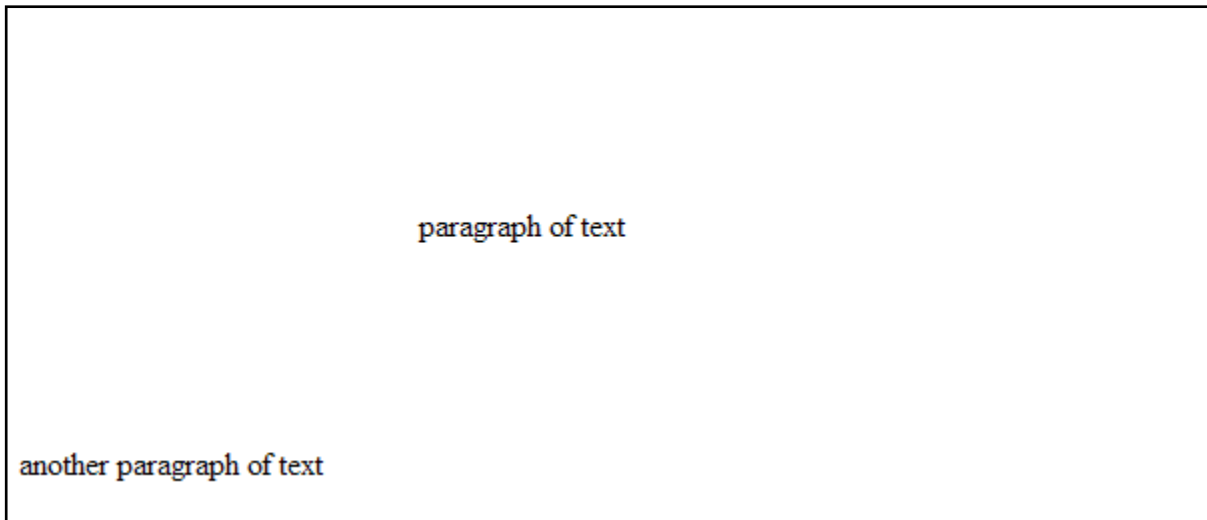
This element specifies the margin which shall be displayed at the bottom of the boundaries of the current HTML div object.

If this element is omitted, then this HTML div object shall not have a bottom margin.

[Example: Consider a simple HTML document defined as follows:

```
<html>
  <body>
    <div style="margin-top:100px; margin-left:200px; margin-right:50px; margin-
bottom:100px">
      <p>paragraph of text</p>
    </div>
    <p>another paragraph of text</p>
  </body>
</html>
```

This HTML would therefore normally appear as follows (image scaled appropriately):



Now, when this document is saved in the WordprocessingML format, the information stored on the div elements is stored in the web setting part as follows:

```
<w:divs>
  <w:div w:id="1785730240">
    <w:marLeft w:val="3000" />
    <w:marRight w:val="750" />
    <w:marTop w:val="1500" />
    <w:marBottom w:val="1500" />
  </w:div>
</w:divs>
```

The `marBottom` element specifies margin information about the bottom margin for the single HTML `div` structure in the document; in this case, a 75 point bottom margin. The initial 100 pixel margin was converted to 75 points using the following logic:

$$100\text{px} * \frac{1 \text{ inch}}{96 \text{ px}} * \frac{1440 \text{ twentieth points}}{1 \text{ inch}} = 1500 \text{ twentieth points (75 points)}$$

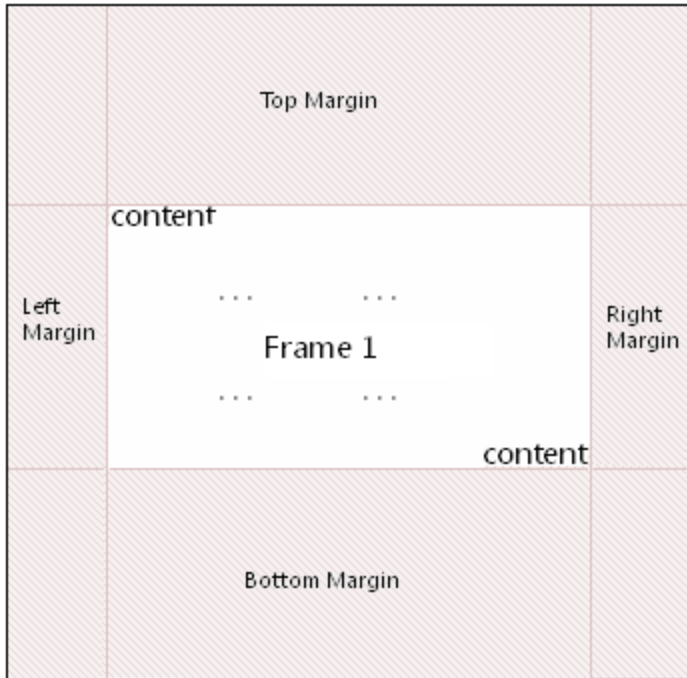
end example]

Attributes	Description
val (Positive or Negative Value in Twentieths of a Point)	<p>Specifies a positive or negative measurement in twentieths of a point (equivalent to 1/1440th of an inch).</p> <p>The contents of this measurement shall be interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider an attribute value of -720 whose type is <code>ST_SignedTwipsMeasure</code>. This attribute value specifies a value of negative one-half of an inch or -36 points (-720 twentieths of a point = -36 points = -0.5 inches). <i>end example]</i></p> <p>The possible values for this attribute are defined by the <code>ST_SignedTwipsMeasure</code> simple type (§17.18.81).</p>

[*Note:* The W3C XML Schema definition of this element’s content model (`CT_SignedTwipsMeasure`) is located in §A.1. *end note]*

17.15.2.25 `marH` (Top and Bottom Margin for Frame)

This element specifies the top and bottom margin height for a single frame in a frameset document, as follows:



This height is expressed in pixels.

If this element is omitted, then no top or bottom margin shall be used for this frame.

[*Example:* Consider a document that has a frame, where the margin height has been specified and is represented as the following WordprocessingML:

```
<w:frame>
  <w:marH w:val="594"/>
</w:frame>
```

The marH element has a val attribute value of 594, which specifies that this frame has a top and bottom margin value of 594 pixels, resulting in 594 pixels of space between the content and the top and bottom margins of the frame. *end example*]

Attributes	Description
val (Measurement in Pixels)	<p>Specifies a value whose contents shall contain a positive whole number, whose contents consist of a positive measurement in pixels.</p> <p>The contents of this measurement shall be interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider an attribute value of 960 whose simple type is ST_PixelsMeasure. This attribute value specifies a value of 960 pixels. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PixelsMeasure simple type (§17.18.67).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_PixelsMeasure](#)) is located in §A.1.
end note]

17.15.2.26 `marLeft` (Left Margin for HTML `div`)

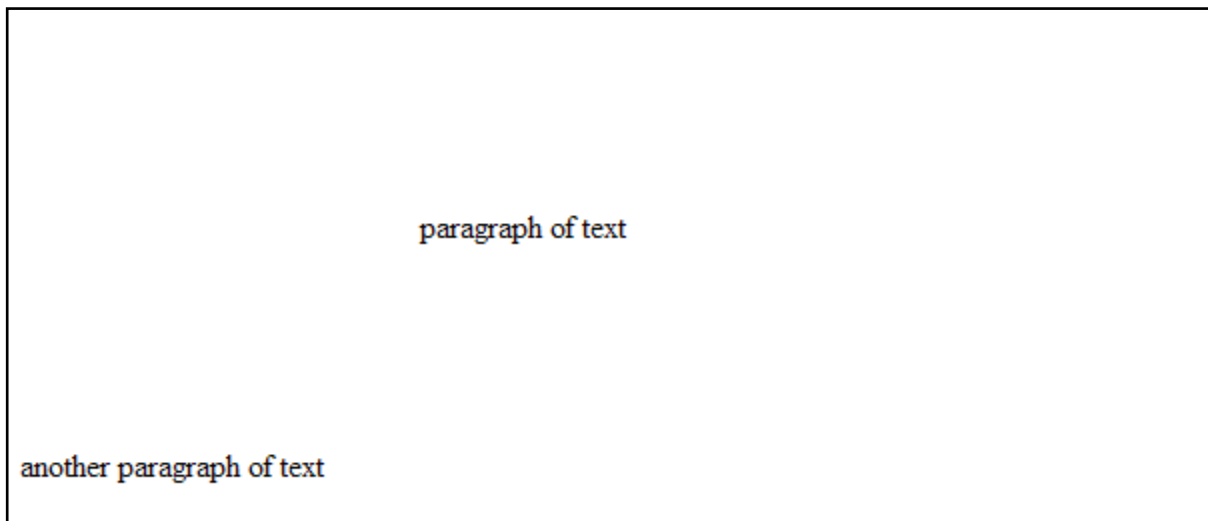
This element specifies the margin which shall be displayed at the left of the boundaries of the current HTML `div` object.

If this element is omitted, then this HTML `div` object shall not have a left margin.

[*Example:* Consider a simple HTML document defined as follows:

```
<html>
  <body>
    <div style="margin-top:100px; margin-left:200px; margin-right:50px; margin-
bottom:100px">
      <p>paragraph of text</p>
    </div>
    <p>another paragraph of text</p>
  </body>
</html>
```

This HTML would therefore normally appear as follows (image scaled appropriately):



Now, when this document is saved in the WordprocessingML format, the information stored on the `div` elements is stored in the web setting part as follows:

```

<w:divs>
  <w:div w:id="1785730240">
    <w:marLeft w:val="3000" />
    <w:marRight w:val="750" />
    <w:marTop w:val="1500" />
    <w:marBottom w:val="1500" />
  </w:div>
</w:divs>

```

The marLeft element specifies margin information about the left margin for the single HTML div structure in the document; in this case, a 150 point left margin. The initial 200 pixel margin was converted to 150 points using the following logic:

$$200\text{px} * \frac{1 \text{ inch}}{96 \text{ px}} * \frac{1440 \text{ twentieth points}}{1 \text{ inch}} = 3000 \text{ twentieth points (150 points)}$$

end example]

Attributes	Description
val (Positive or Negative Value in Twentieths of a Point)	<p>Specifies a positive or negative measurement in twentieths of a point (equivalent to 1/1440th of an inch).</p> <p>The contents of this measurement shall be interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider an attribute value of -720 whose type is ST_SignedTwipsMeasure. This attribute value specifies a value of negative one-half of an inch or -36 points (-720 twentieths of a point = -36 points = -0.5 inches). <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_SignedTwipsMeasure simple type (§17.18.81).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SignedTwipsMeasure](#)) is located in §A.1. *end note]*

17.15.2.27 marRight (Right Margin for HTML div)

This element specifies the margin which shall be displayed at the right of the boundaries of the current HTML div object.

If this element is omitted, then this HTML div object shall not have a right margin.

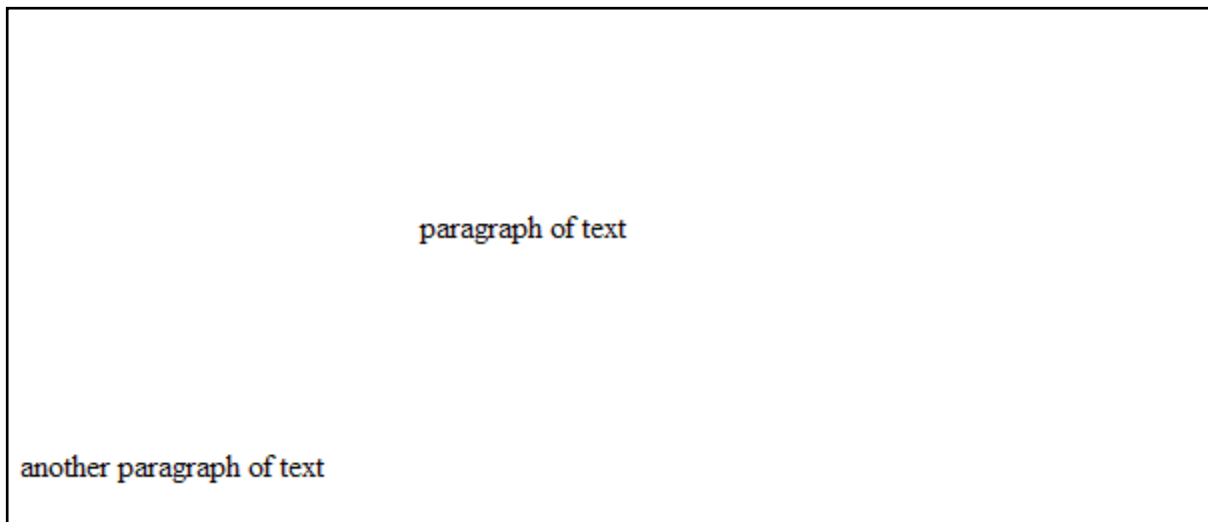
[*Example:* Consider a simple HTML document defined as follows:

```

<html>
  <body>
    <div style="margin-top:100px; margin-left:200px; margin-right:50px; margin-
bottom:100px">
      <p>paragraph of text</p>
    </div>
    <p>another paragraph of text</p>
  </body>
</html>

```

This HTML would therefore normally appear as follows (image scaled appropriately):



Now, when this document is saved in the WordprocessingML format, the information stored on the `div` elements is stored in the web setting part as follows:

```

<w:divs>
  <w:div w:id="1785730240">
    <w:marLeft w:val="3000" />
    <w:marRight w:val="750" />
    <w:marTop w:val="1500" />
    <w:marBottom w:val="1500" />
  </w:div>
</w:divs>

```

The `marRight` element specifies margin information about the right margin for the single HTML `div` structure in the document; in this case, a 37.5 point right margin. The initial 50 pixel margin was converted to 37.5 points using the following logic:

$$50\text{px} * \frac{1\text{ inch}}{96\text{ px}} * \frac{1440\text{ twentieth points}}{1\text{ inch}} = 750\text{ twentieth points (37.5 points)}$$

end example]

Attributes	Description
val (Positive or Negative Value in Twentieths of a Point)	<p>Specifies a positive or negative measurement in twentieths of a point (equivalent to 1/1440th of an inch).</p> <p>The contents of this measurement shall be interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider an attribute value of -720 whose type is ST_SignedTwipsMeasure. This attribute value specifies a value of negative one-half of an inch or -36 points (-720 twentieths of a point = -36 points = -0.5 inches). <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_SignedTwipsMeasure simple type (§17.18.81).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SignedTwipsMeasure](#)) is located in §A.1. *end note]*

17.15.2.28 marTop (Top Margin for HTML div)

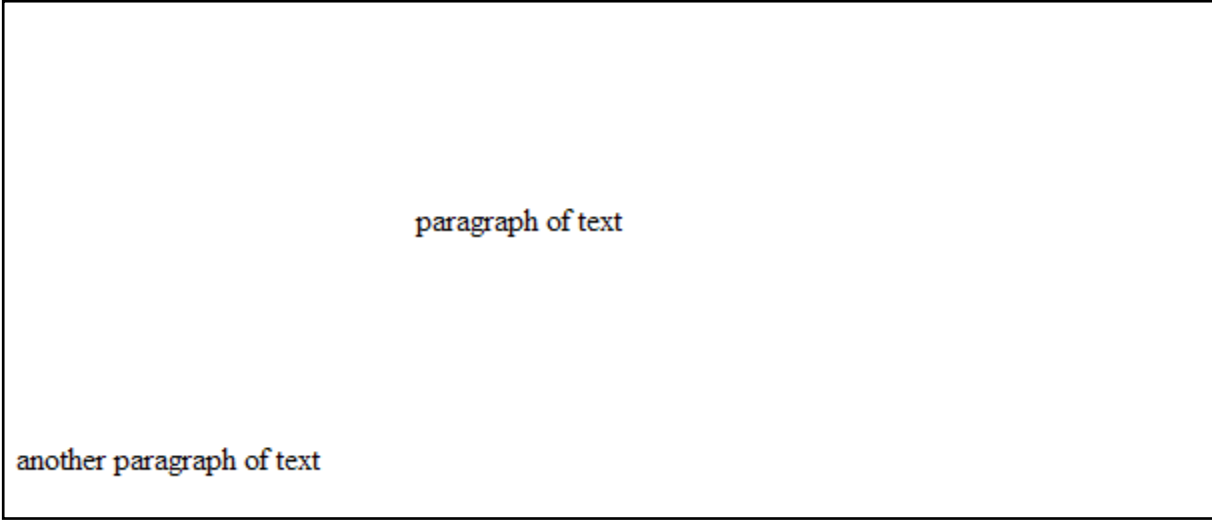
This element specifies the margin which shall be displayed at the top of the boundaries of the current HTML div object.

If this element is omitted, then this HTML div object shall not have a top margin.

[*Example:* Consider a simple HTML document defined as follows:

```
<html>
  <body>
    <div style="margin-top:100px; margin-left:200px; margin-right:50px; margin-
bottom:100px">
      <p>paragraph of text</p>
    </div>
    <p>another paragraph of text</p>
  </body>
</html>
```

This HTML would therefore normally appear as follows (image scaled appropriately):



Now, when this document is saved in the WordprocessingML format, the information stored on the `div` elements is stored in the web setting part as follows:

```
<w:divs>
  <w:div w:id="1785730240">
    <w:marLeft w:val="3000" />
    <w:marRight w:val="750" />
    <w:marTop w:val="1500" />
    <w:marBottom w:val="1500" />
  </w:div>
</w:divs>
```

The `marTop` element specifies margin information about the top margin for the single HTML `div` structure in the document; in this case, a 75 point top margin. The initial 100 pixel margin was converted to 75 points using the following logic:

$$100\text{px} * \frac{1 \text{ inch}}{96 \text{ px}} * \frac{1440 \text{ twentieth points}}{1 \text{ inch}} = 1500 \text{ twentieth points (75 points)}$$

end example]

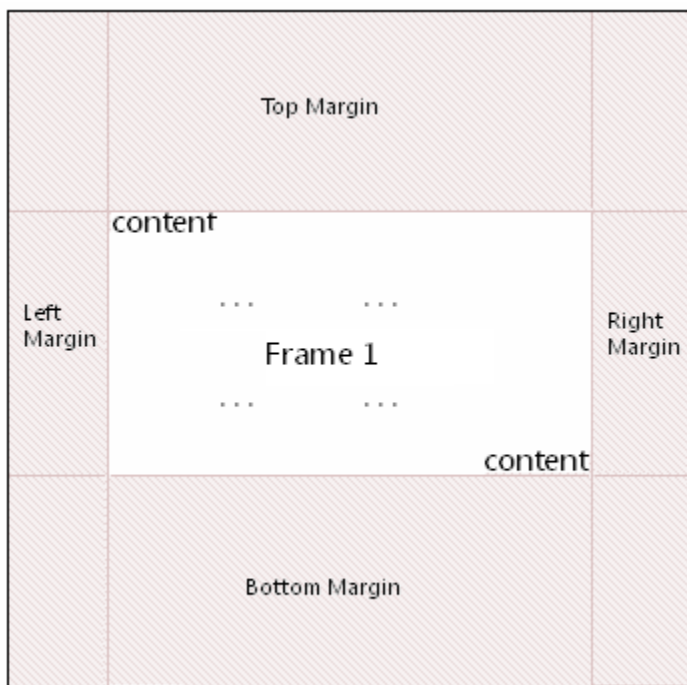
Attributes	Description
val (Positive or Negative Value in Twentieths of a Point)	<p>Specifies a positive or negative measurement in twentieths of a point (equivalent to 1/1440th of an inch).</p> <p>The contents of this measurement shall be interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider an attribute value of -720 whose type is ST_SignedTwipsMeasure. This attribute value specifies a value of negative one-half of an inch or -36 points (-720 twentieths of a point = -36 points = -0.5 inches). <i>end example]</i></p>

Attributes	Description
	The possible values for this attribute are defined by the <code>ST_SignedTwipsMeasure</code> simple type (§17.18.81).

[Note: The W3C XML Schema definition of this element's content model ([CT_SignedTwipsMeasure](#)) is located in §A.1. *end note*]

17.15.2.29 `marW` (Left and Right Margin for Frame)

This element specifies the left and right margin height for a single frame in a frameset document, as follows:



This height is expressed in pixels.

If this element is omitted, then no left or right margin shall be used for this frame.

[Example: Consider a document that has a frame, where the frame's margins have been specified and is represented as the following WordprocessingML:

```
<w:frame>
  <w:marW w:val="294"/>
</w:frame>
```

The `marW` element has a `val` attribute value of 294, which specifies that this frame has a left and right margin value of 294 pixels, resulting in 294 pixels of space between the content and the left and right margins of the frame. *end example*]

Attributes	Description
val (Measurement in Pixels)	<p>Specifies a value whose contents shall contain a positive whole number, whose contents consist of a positive measurement in pixels.</p> <p>The contents of this measurement shall be interpreted based on the context of the parent XML element.</p> <p>[<i>Example</i>: Consider an attribute value of 960 whose simple type is ST_PixelsMeasure. This attribute value specifies a value of 960 pixels. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PixelsMeasure simple type (§17.18.67).</p>

[*Note*: The W3C XML Schema definition of this element’s content model (CT_PixelsMeasure) is located in §A.1. *end note*]

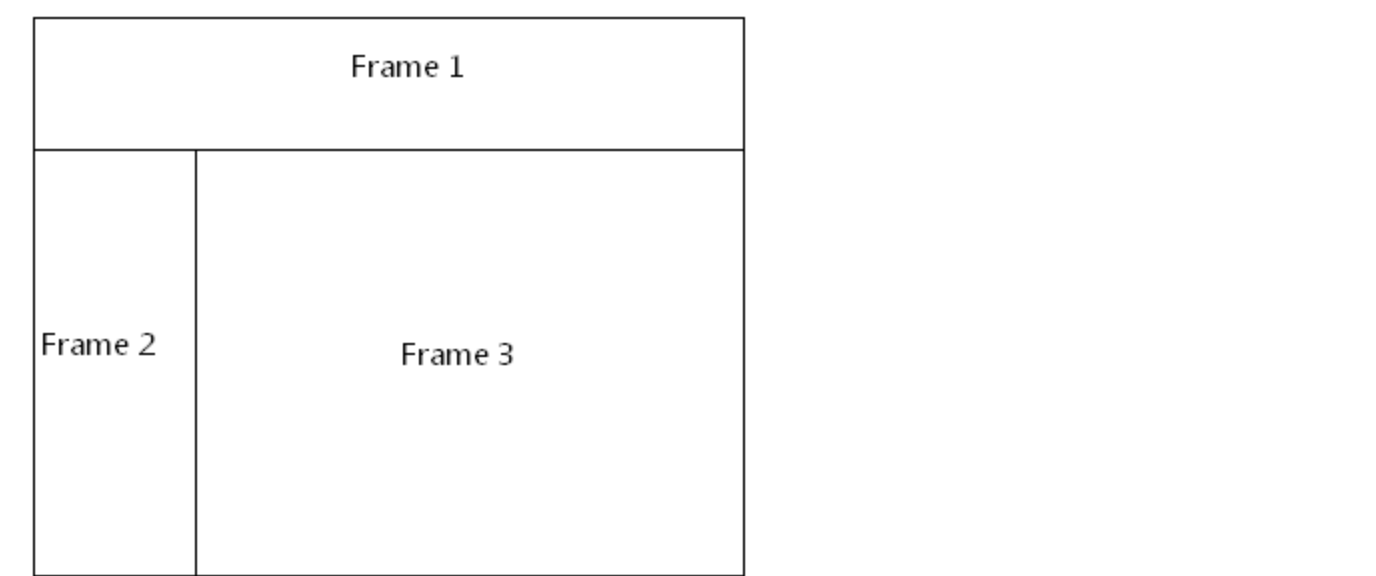
17.15.2.30 name (Frame Name)

This element specifies the name of a single frame within a frameset document. This property is analogous to the name attribute on the frame element in HTML.

[*Note*: The name of a frame can be used in web pages that reference a frame via targeted links, etc. *end note*]

If this element is omitted, then the current frame shall have no name associated with it.

[*Example*: Consider a WordprocessingML document which serves as the frameset container for a frameset consisting of the following three frames:



The frameset properties for this document are specified by the following WordprocessingML within the web page settings:

```
<w:frameset>
...
<w:frame>
  <w:name w:val="Frame 1" />
</w:frame>
<w:frameset>
...
<w:frame>
  <w:name w:val="Frame 2" />
</w:frame>
<w:frame>
  <w:name w:val="Frame 3" />
</w:frame>
</w:frameset>
</w:frameset>
```

The name element specifies the name for each frame within this frameset; in this case, the frames have names of Frame 1, Frame 2, and Frame 3 respectively. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element’s content model (CT_String) is located in §A.1. *end note*]

17.15.2.31 noBorder (Do Not Display Frameset Splitters)

This element specifies whether the splitters shall be displayed for the contents of the frameset in this WordprocessingML document. This element shall only be honored on the root frameset for this document, and can be ignored for all nested framesets in this document. If this element is present, then no splitters shall be displayed, and all other frameset splitter properties can be ignored.

If this element is omitted, then the splitters in this document shall be displayed as defined by the w and color elements.

[Example: Consider a frameset consisting of the following three frames:



The following properties define the presentation of the splitter bars within this frameset:

```

<w:frameset>
  <w:framesetSplitbar>
    <w:w w:val="200" />
    <w:color w:val="0000FF" />
  </w:framesetSplitbar>
  ...
</w:frameset>

```

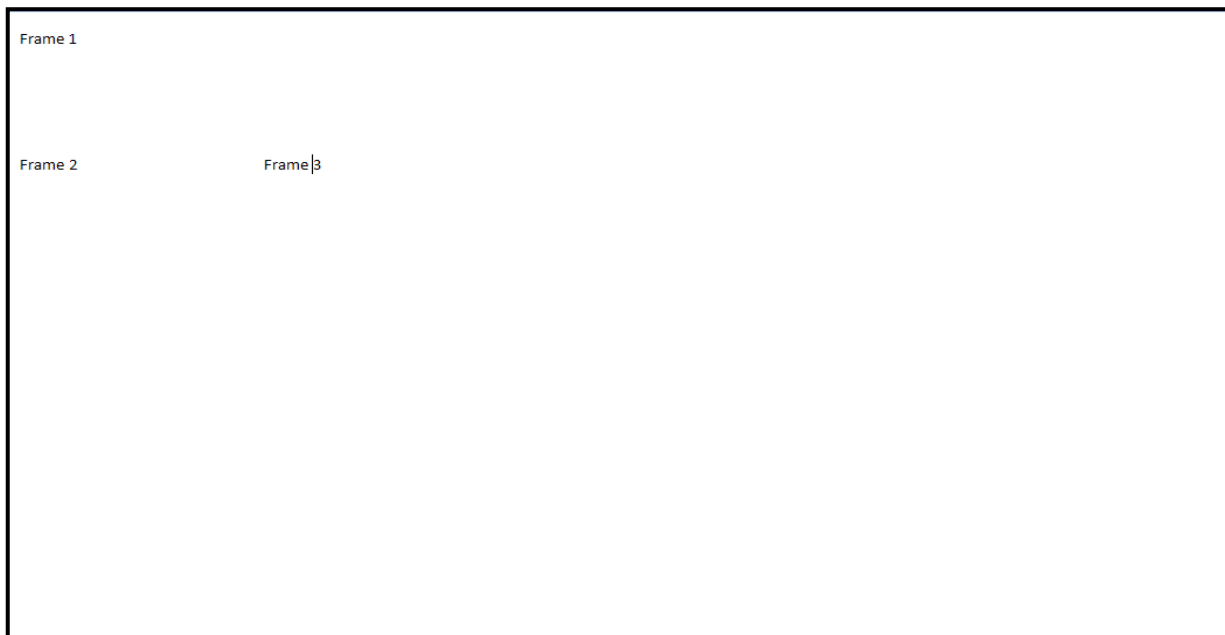
If the noBorder element is also specified:

```

<w:frameset>
  <w:framesetSplitbar>
    <w:w w:val="200" />
    <w:color w:val="0000FF" />
    <w:noBorder w:val="true" />
  </w:framesetSplitbar>
  ...
</w:frameset>

```

Then all frameset splitters are suppressed:



The noBorder element's val attribute has a value of true, which specifies that the splitters for this document must not be displayed. *end example*]

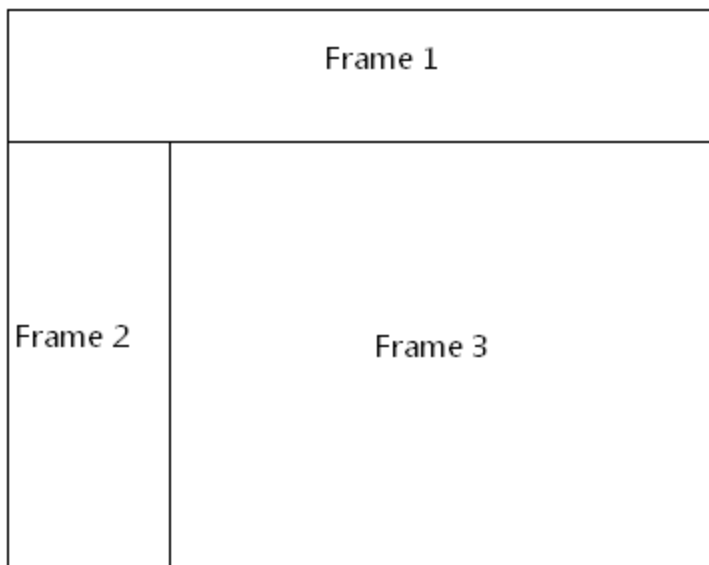
This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.2.32 noResizeAllowed (Frame Cannot Be Resized)

This element specifies whether or not the size of the current frame shall be modifiable (i.e. whether the frame can be resized) when the contents of this document are saved as HTML and displayed in a web browser. When this element is set, the size of the frame shall be set to its current values. This property is analogous to the `noresize` attribute on the `frame` element in HTML.

If this element is omitted, the size of the frame shall be modifiable (the frame can be resized when it is displayed).

[*Example:* Consider a WordprocessingML document which serves as the frameset container for a frameset consisting of the following three frames:



The frameset properties for this document are specified by the following WordprocessingML within the web page settings:

```
<w:frameset>
...
<w:frameset>
...
<w:frame>
  <w:name w:val="Frame 2" />
  <w:noResizeAllowed w:val="true" />
</w:frame>
...
</w:frameset>
</w:frameset>
```


The noResizeAllowed element has a val attribute of true, which specifies that the size of the frame specified by Frame 2 must not be modifiable (the two borders which intersect that frame cannot be resized). *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.2.33 optimizeForBrowser (Disable Features Not Supported by Target Web Profile)

This element specifies whether applications should attempt to customize the output for any web page produced from this document, as well as the HTML output to which it should be customized. [*Example*: This might involve blocking any output which is not supported by that target output profile. *end example*] The target output profile is identified by the contents of the target attribute.

[*Example*: Consider a document whose web settings part contains the following WordprocessingML:

```
<w:webSettings>
...
  <w:optimizeForBrowser w:target="W3C XHTML+CSS1" />
  <w:allowPNG w:val="on"/>
</w:webSettings>
```

The optimizeForBrowser element specifies that the output should be optimized for a specific output target. Since the value of the target attribute specifies a target of W3C XHTML 1.0 output using CSS 1, any HTML generated should fall within that profile. *end example*

Attributes	Description										
target (Target Output Profile)	<p>Specifies the version of HTML output targeted by the output of any web page produced by this document. This attribute shall only contain a string that represents an output profile defined by published standards and W3C recommendations. Product names shall not be used to define a profile.</p> <p>The following reserved values and their targets are listed below:</p> <table> <tr> <th>Value</th><th>Target</th></tr> <tr> <td>W3C XHTML+CSS1</td><td>W3C XHTML 1.0 + CSS 1</td></tr> <tr> <td>W3C HTML4+CSS1</td><td>W3C HTML 4.01 + CSS 1</td></tr> <tr> <td>W3C XHTML+CSS2</td><td>W3C XHTML 1.0 + CSS 2</td></tr> <tr> <td>W3C HTML4+CSS2</td><td>W3C HTML 4.01 + CSS 2</td></tr> </table> <p>[<i>Example</i>: For example, consider the following web publishing settings:</p> <pre><w:optimizeForBrowser w:target="W3C XHTML+CSS2"/></pre> <p>The target attribute explicitly declares that any web page generated from this document should target W3C XHTML 1.0 + CSS 2. <i>end example</i>]</p>	Value	Target	W3C XHTML+CSS1	W3C XHTML 1.0 + CSS 1	W3C HTML4+CSS1	W3C HTML 4.01 + CSS 1	W3C XHTML+CSS2	W3C XHTML 1.0 + CSS 2	W3C HTML4+CSS2	W3C HTML 4.01 + CSS 2
Value	Target										
W3C XHTML+CSS1	W3C XHTML 1.0 + CSS 1										
W3C HTML4+CSS1	W3C HTML 4.01 + CSS 1										
W3C XHTML+CSS2	W3C XHTML 1.0 + CSS 2										
W3C HTML4+CSS2	W3C HTML 4.01 + CSS 2										

Attributes	Description
	The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).
val (On/Off Value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off.</p> <p>[<i>Example:</i> For example, consider the following on/off property:</p> <pre data-bbox="451 722 743 751"><... w:val="false"/></pre> <p>The val attribute explicitly declares that the property is false. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_OptimizeForBrowser](#)) is located in §A.1. *end note*]

17.15.2.34 pixelsPerInch (Pixels per Inch for Graphics/Images)

This element specifies the number of pixels per inch (or density) that is used for the display of pictures or table cells when a WordprocessingML document is saved as a web page. The size that is specified by this element affects the size of the pictures or table cells relative to the size of text in the document. The pixels per inch (ppi) measurement is relative to the screen resolution, and the resulting physical dimensions of the resulting image or cell in pixels (which are used in web pages, but not for printed documents) are the result of the original dimensions (in inches) multiplied by the number of pixels per inch.

The range of values for this element is typically from 19 to 480 pixels per inch. The common settings for popular screen sizes are 72, 96, and 120 pixels per inch.

If this element is omitted, then a default size of 96 pixels per inch shall be used when determining the number of pixels for images and/or table cells within this document.

[*Note:* This setting is typically only specified if the target screen resolution for the web page is known, as defined by the targetScreenSz element (§17.15.2.41) to set the optimum screen size for the web page. *end note*]

[*Example:* Consider a WordprocessingML document which contains the following content within the web settings part:

```
<w:webSettings>
  <w:pixelsPerInch w:val="200" />
</w:webSettings>
```

The pixelsPerInch element's val attribute has a value of 200, which specifies that all inches to pixels conversions done when saving this web page must be done assuming a transformation of 200 pixels per inch. *end example]*

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <pre><... w:val="1512645511" /></pre> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DecimalNumber](#)) is located in §A.1. *end note]*

17.15.2.35 right (Right Border for HTML div)

This element specifies the border which shall be displayed at the right of the boundaries of the current HTML div object.

If this element is omitted, then this HTML div object shall not have a right border.

[*Example:* Consider a simple HTML document defined as follows:

```
<html>
  <body>
    <div style=" border-left-style:solid; border-right-style:groove; border-
right-width:1px; border-top-style:dashed; border-top-width:3px; border-bottom-
style:outset; border-bottom-width:3px">
      <p>paragraph of text</p>
    </div>
  </body>
</html>
```

This HTML would therefore normally appear as follows (image scaled appropriately):



Now, when this document is saved in the WordprocessingML format, the information stored on the `div` elements is stored in the web setting part as follows:

```
<w:divs>
  <w:div w:id="1785730240">
    ...
    <w:divBdr>
      <w:top w:val="dashed" w:sz="18" w:space="7" w:color="auto" />
      <w:left w:val="single" w:sz="24" w:space="4" w:color="auto" />
      <w:bottom w:val="outset" w:sz="18" w:color="auto" />
      <w:right w:val="threeDEngrave" w:sz="6" w:color="auto" />
    </w:divBdr>
  </w:div>
</w:divs>
```

The `right` element specifies border information about the right border for the single HTML `div` structure in the document; in this case, a 0.75 point bottom border of type `threeDEngrave`. The initial 1 pixel border was converted to 0.75 points using the following logic:

$$1\text{px} * \frac{1\text{ inch}}{96\text{ px}} * \frac{576\text{ eighth points}}{1\text{ inch}} = 6\text{ eighth points (0.75 points)}$$

end example]

This element's content model is defined by the common border properties definition in §17.3.4.

17.15.2.36 `saveSmartTagsAsXml` (Save Smart Tag Data in XML Property Bag)

This element specifies that the information pertaining to all smart tags (`<smart>`) in the current document shall be saved into a separate XML-based property bag at the head of the web page when this WordprocessingML document is saved as a web page.

[*Rationale*: This setting is typically used when saving documents known to contain smart tags as web pages, in order to allow the smart tag data within the web page to be processed as a separate XML document by a separate parser, even though the actual HTML content of the resulting web page cannot be parsed by an XML-based parser. *end rationale*]

If this element is omitted, then the smart tag data of this document shall not be saved into a separate XML-compliant property bag within the HTML output when this document is saved as a web page.

[*Example:* Consider a WordprocessingML document which contains the following content:

Stock symbol: MSFT

Date: 7/4/2006

This document might typically write out the following HTML content:

```
<p>Stock symbol: <st1:stockticker>MSFT</st1:stockticker></p>
<p>Date: <st1:date ls="trans" Month="7" Day="4"
Year="2006">7/4/2006</st1:date></p>
```

However, if the WordprocessingML document also contains the following content within the web settings part:

```
<w:webSettings>
  <w:saveSmartTagsAsXml w:val="true" />
</w:webSettings>
```

The saveSmartTagsAsXml element specifies that all smart tags in the document must also be saved into an XML property bag at the header of the file, for example:

```
<head>
...
<xml>
  <o:DocumentSmartTags>
    <st1:stockticker>MSFT</st1:stockticker>
    <st1:date ls="trans" Month="7" Day="4" Year="2006">7/4/2006</st1:date>
  </o:DocumentSmartTags>
</xml>
...
</head>
```

This header information is in addition to the normal HTML output. *end example*]

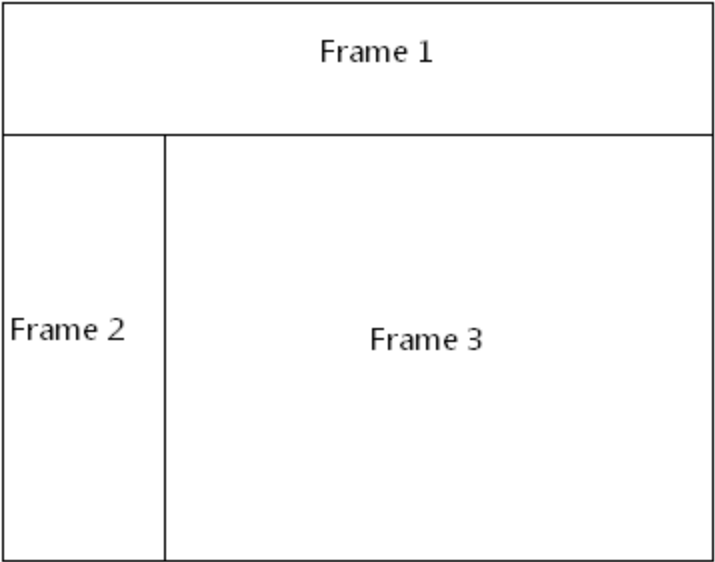
This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.2.37 scrollbar (Scrollbar Display Option)

This element specifies when a scrollbar shall be visible for the contents of the current frame. When this element is set, the val attribute determines exactly when the scrollbar shall be visible. This property is analogous to the scrolling attribute on the frame element in HTML.

If this element is omitted, the scrollbar shall only be displayed when the contents of the frame exceed the visible space for the frame (i.e. when the scrollbar is needed to display all of the content).

[*Example:* Consider a WordprocessingML document which serves as the frameset container for a frameset consisting of the following three frames:



The frameset properties for this document are specified by the following WordprocessingML within the web page settings:

```
<w:frameset>
...
<w:frameset>
...
  <w:frame>
    <w:name w:val="Frame 2" />
    <w:scrollbar w:val="auto" />
  </w:frame>
...
</w:frameset>
</w:frameset>
```

The scrollbar element has a val attribute of auto, which specifies that the frame must only display a scrollbar when it is needed to display all of its content. *end example]*

Attributes	Description
val (Scrollbar Display Option Value)	Specifies the criteria under which a scrollbar shall be displayed along with the contents of this frameset, as defined by the simple type referenced below. [<i>Example:</i> Consider a frameset definition within a WordprocessingML document which

Attributes	Description
	<p>defines the following scrollbar visibility setting:</p> <pre data-bbox="451 321 902 453"><w:frame> <w:scrollbar w:val="on" /> ... </w:frame></pre> <p>The val attribute value of on specifies that the scrollbar must always be displayed, even when it is not needed (i.e. when it would be displayed disabled). <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_FrameScrollbar simple type (§17.18.32).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FrameScrollbar](#)) is located in §A.1. *end note*]

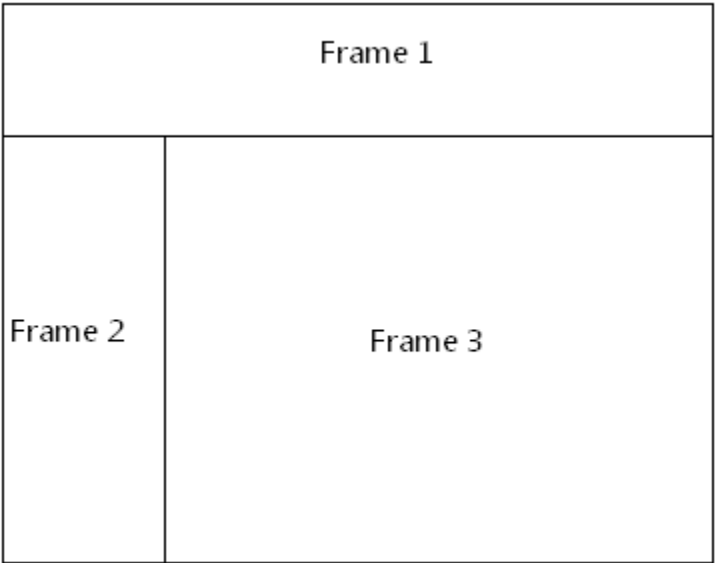
17.15.2.38 [sourceFileName](#) (Source File for Frame)

This element specifies the ID for the relationship which specifies the source file for a single frame within a frameset document.

The relationship referenced by this element's id attribute shall exist in the relationship part item for the Web Settings part, or this document shall be considered non-conformant. Also, the type of the relationship referenced by this element's id attribute shall be <http://purl.oclc.org/ooxml/officeDocument/relationships/frame>, or this document shall be considered non-conformant.

If this element is omitted, then no source file is present for the current frame, and one can be created dynamically as needed to display content within the frame.

[*Example:* Consider a WordprocessingML document which serves as the frameset container for a frameset consisting of the following three frames:



The frameset properties for this document are specified by the following WordprocessingML within the web page settings:

```
<w:frameset>
...
<w:frameset>
...
  <w:frame>
    <w:name w:val="Frame 2" />
    <w:sourceFileName r:id="rId5" />
  </w:frame>
...
</w:frameset>
</w:frameset>
```

The sourceFileName element specifies that the contents of this frame must be the contents of the file targeted by the relationship with ID rId5 in the web settings part's relationship part item. *end example*]

Attributes	Description
id (Relationship to Part) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the relationship ID to a specified part. The specified relationship shall match the relationship type required by the parent element: <ul style="list-style-type: none">• http://purl.oclc.org/ooxml/officeDocument/relationships/customXml for the contentPart element• http://purl.oclc.org/ooxml/officeDocument/relationships/footer for the footerReference element• http://purl.oclc.org/ooxml/officeDocument/relationships/header for the headerReference element

Attributes	Description
	<ul style="list-style-type: none"> • http://purl.oclc.org/ooxml/officeDocument/relationships/font for the embedBold, embedBoldItalic, embedItalic, or embedRegular elements • http://purl.oclc.org/ooxml/officeDocument/relationships/prINTERSettings for the printerSettings element • http://purl.oclc.org/ooxml/officeDocument/relationships/hyperlink for the longDesc or hyperlink element <p>[<i>Example:</i> Consider an XML element which has the following id attribute:</p> <pre><... r:id="rId10" /></pre> <p>The markup specifies the associated relationship part with relationship ID rId1 contains the corresponding relationship information for the parent XML element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Rel](#)) is located in §A.1. *end note*]

17.15.2.39 sz (Frame Size)

This element specifies the size for a single frame within a frameset.

This size shall be interpreted based on the contents of the frameLayout element (§17.15.2.17) for the parent frameset, as follows:

- If the val attribute on that element is cols, then this element specifies the width of the frame
- If the val attribute on that element is rows, then this element specifies the height of the frame

Once the axis of this measurement has been established using the criteria above, the actual value of the measurement shall be determined by the following:

- If the val attribute ends in an asterisk (*), then this measurement is a relative measurement (relative to all other frames in this frameset).
- If the val attribute ends in a percentage symbol (%), then this measurement is a percentage of the height and/or width of the parent window, respectively.
- Otherwise, the value of the val attribute specifies the size of the frame in pixels. This measurement shall be interpreted in the context of the pixelsPerInch element (§17.15.2.34) to determine the width of the resulting measurement in inches.

If this element is omitted, then no information shall be implied about the size of the current frame.

[*Example:* Consider a frameset consisting of the following three frames:



The following properties define the presentation of the top frame within this frameset:

```
<w:frameset>
...
<w:frame>
  <w:sz w:val="300" />
  <w:name w:val="Frame 1" />
</w:frame>
...
<w:pixelsPerInch w:val="150" />
</w:frameset>
```

The sz element's val attribute specifies that the size of this frame is 300 - which translates to a height of exactly 300 pixels tall. In addition, this document specifies that the intended number of pixels per inch for this measurement is 150, resulting in a 2" tall frame height. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre>

Attributes	Description
	<p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_String](#)) is located in §A.1. *end note*]

17.15.2.40 sz (Nested Frameset Size)

This element specifies the size for a frameset that has been nested within another frameset. If this size appears on a root frameset, then it can be ignored and the main frameset shall encompass the entire window.

This size shall be interpreted based on the contents of the frameLayout element (§17.15.2.17) for the parent frameset (not the current nested frameset), as follows:

- If the val attribute on that element is cols, then this element specifies the width of the frameset
- If the val attribute on that element is rows, then this element specifies the height of the frameset

Once the axis of this measurement has been established using the criteria above, the actual value of the measurement shall be determined by the following:

- If the val attribute ends in an asterisk (*), then this measurement is a relative measurement (relative to all other frames in this frameset).
- If the val attribute ends in a percentage symbol (%), then this measurement is a percentage of the height and/or width of the parent frameset, respectively.
- Otherwise, the value of the val attribute specifies the size of the frameset in pixels. This measurement shall be interpreted in the context of the pixelsPerInch element (§17.15.2.34) to determine the width of the resulting measurement in inches.

If this element is omitted, then no information shall be implied about the size of the current frameset.

[Example: Consider a nested frameset defined as follows:

```

<w:frameset>
...
  <w:frameset>
    <w:sz w:val="50%" />
    ...
  </w:frameset>
  ...
  <w:pixelsPerInch w:val="150" />
</w:frameset>

```

The sz element's val attribute specifies that the size of this nested frameset is 50% - which translates to a width of fifty percent of the width of the parent frameset's height. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre> <w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr> </pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre> <w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr> </pre> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_String](#)) is located in §A.1. *end note*]

17.15.2.41 targetScreenSz (Target Screen Size for Web Page)

This element specifies the ideal minimum target screen size (width by height, specified in pixels) on which web pages generated when saving this document is displayed. This setting can be used to optimize the output of web pages produced from this document.

If this element is omitted, then the target screen size for web pages produced from this document shall be assumed to be 800x600.

[*Example*: Consider a WordprocessingML document which contains the following content within the web settings part:

```
<w:webSettings>
  <w:targetScreenSz w:val="1600x1200" />
</w:webSettings>
```

The targetScreenSz element's val attribute has a value of 1600x1200, which specifies that a target screen size of 1600 by 1200 pixels must be assumed when saving this document as a web page. *end example*]

Attributes	Description
val (Target Screen Size Value)	<p>Specifies the target screen size for web pages produced by this document, as defined by the simple type referenced below.</p> <p>[<i>Example</i>: Consider a WordprocessingML document which contains the following content within the web settings part:</p> <pre><w:webSettings> <w:targetScreenSz w:val="1024x768" /> </w:webSettings></pre> <p>The val attribute has a value of 1024x768, which specifies that a target screen size of 1024 by 768 pixels must be assumed when saving this document as a web page. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TargetScreenSz simple type (§17.18.86).</p>

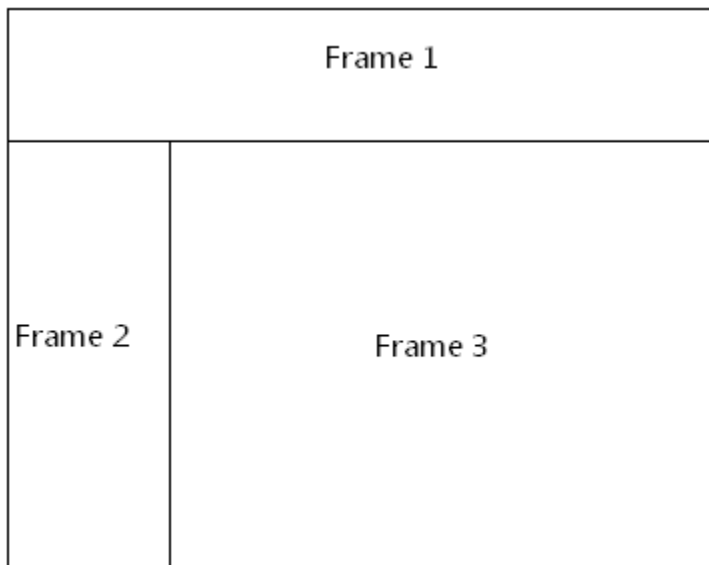
[*Note*: The W3C XML Schema definition of this element's content model ([CT_TargetScreenSz](#)) is located in §A.1. *end note*]

17.15.2.42 title (Frame or Frameset Title)

This element specifies advisory information about a single frame or frameset. The title information shall be stored in this element's val attribute. This property is analogous to the title attribute on the frame or frameset element in HTML.

If this element is omitted, then no title shall be associated with the given frame or frameset.

[*Example:* Consider a WordprocessingML document that serves as the frameset container for a frameset consisting of the following three frames:



The frameset properties for this document are specified by the following WordprocessingML within the web page settings:

```

<w:frameset>
  <w:title w:val="Our library of documents" />
  <w:frame>
    <w:name w:val="Frame 1" />
    <w:title w:val="Menu bar" />
  </w:frame>
  <w:frameset>
    <w:title w:val="Navigation and document collection" />
    ...
    <w:frame>
      <w:name w:val="Frame 2" />
      <w:title w:val="Navigation bar" />
    </w:frame>
    <w:frame>
      <w:name w:val="Frame 3" />
      <w:title w:val="Documents" />
    </w:frame>
  </w:frameset>
</w:frameset>

```

The title element specifies supplementary information for each frame and frameset. In this case, the frames have titles of “Menu bar”, “Navigation bar”, and “Documents”, respectively, while the framesets have titles of “Our library of documents”, and “Navigation and document collection”, respectively. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre data-bbox="451 499 954 604"><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre data-bbox="451 781 1084 919"><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_String](#)) is located in §A.1. *end note*]

17.15.2.43 top (Top Border for HTML div)

This element specifies the border which shall be displayed at the top of the boundaries of the current HTML div object.

If this element is omitted, then this HTML div object shall not have a top border.

[*Example:* Consider a simple HTML document defined as follows:

```
<html>
  <body>
    <div style=" border-left-style:solid; border-right-style:groove; border-
right-width:1px; border-top-style:dashed; border-top-width:3px; border-bottom-
style:outset; border-bottom-width:3px">
      <p>paragraph of text</p>
```

```

    </div>
  </body>
</html>

```

This HTML would therefore normally appear as follows (image scaled appropriately):



Now, when this document is saved in the WordprocessingML format, the information stored on the `div` elements is stored in the web setting part as follows:

```

<w:divs>
  <w:div w:id="1785730240">
    ...
    <w:divBdr>
      <w:top w:val="dashed" w:sz="18" w:space="7" w:color="auto" />
      <w:left w:val="single" w:sz="24" w:space="4" w:color="auto" />
      <w:bottom w:val="outset" w:sz="18" w:color="auto" />
      <w:right w:val="threeDEngrave" w:sz="6" w:color="auto" />
    </w:divBdr>
  </w:div>
</w:divs>

```

The top element specifies border information about the top border for the single HTML `div` structure in the document; in this case, a 2.25 point bottom border of type dashed. The initial 3 pixel border was converted to 2.25 points using the following logic:

$$3\text{px} * \frac{1 \text{ inch}}{96 \text{ px}} * \frac{576 \text{ eighth points}}{1 \text{ inch}} = 18 \text{ eighth points (2.25 points)}$$

end example]

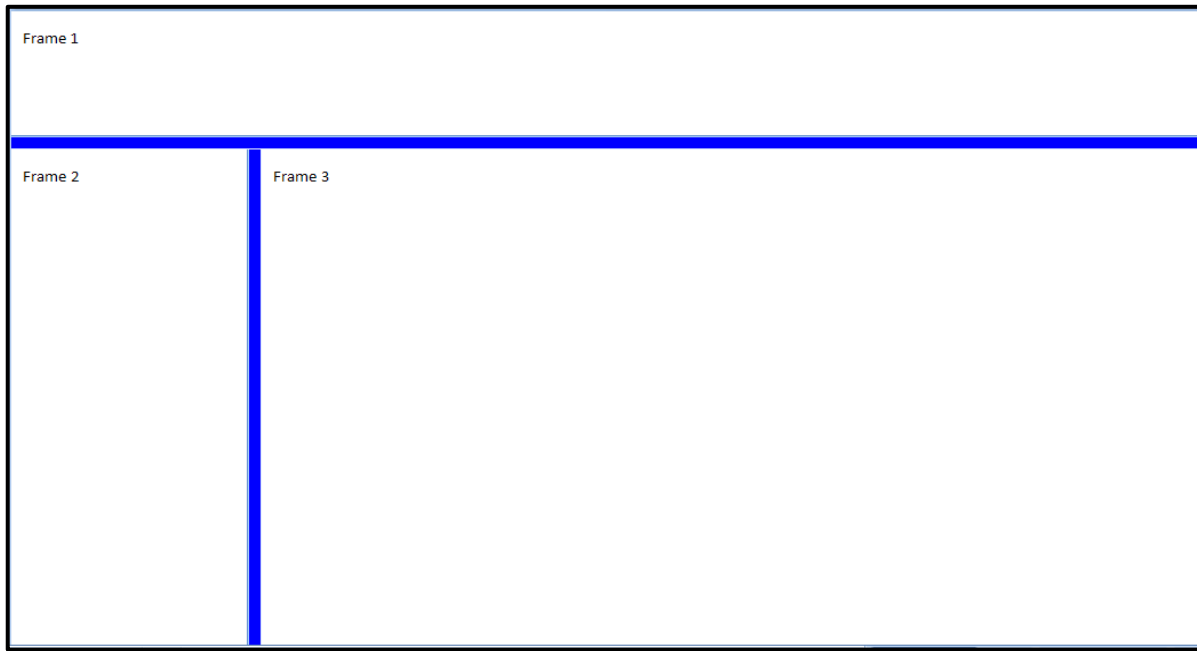
This element's content model is defined by the common border properties definition in §17.3.4.

17.15.2.44 `w` (Frameset Splitter Width)

This element specifies the width of the splitters within the frameset in this WordprocessingML document. This element shall only be honored on the root frameset for this document, and can be ignored for all nested framesets in this document.

If this element is omitted, then the default width of the splitters in this document shall be 4.5 points (90 twentieths of a point) wide. If the noBorder element (§17.15.2.31) is also specified, then this element shall be ignored and no splitters shall be displayed.

[*Example:* Consider a frameset consisting of the following three frames:



The following properties define the presentation of the splitter bars within this frameset:

```
<w:frameset>
  <w:framesetSplitbar>
    <w:w w:val="200" />
    <w:color w:val="0000FF" />
  </w:framesetSplitbar>
  ...
</w:frameset>
```

The w element's val attribute specifies that the splitter must be 10 points (200 twentieths of a point) wide when the contents of this document are displayed. *end example*]

Attributes	Description
val (Measurement in Twentieths of a Point)	<p>Specifies a positive measurement value, specified in twentieths of a point. This value is interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML element with a val attribute containing a positive measurement in twentieths of a point:</p> <pre><... w:val="720" /></pre>

Attributes	Description
	<p>The val attribute has a value of 720, specifying that this measurement value is 720 twentieths of a point (0.5"). This value is interpreted by the parent element as needed. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_TwipsMeasure](#)) is located in §A.1. *end note*]

17.15.2.45 webSettings (Web Page Settings)

This element specifies the set of web page settings that have been specified for a single WordprocessingML document. This element is the root element for the Web Settings part within a WordprocessingML document.

[*Example:* Consider the following WordprocessingML fragment for the web page settings in a WordprocessingML document:

```
<w:webSettings>
  ...
  <w:frameset>
    ...
  </w:frameset>
  <w:doNotUseLongFileNames w:val="true" />
  ...
</w:webSettings>
```

The webSettings element contains all of the web page settings for this document. In this case, the web page settings specified for this document are: a frameset defined using the frameset element (§17.15.2.19); and a setting specifying that when this file is saved as a web page, all resulting files must not exceed 8 octets with 3 octet extension using the doNotUseLongFileNames element (§17.15.2.13). *end example*

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_WebSettings](#)) is located in §A.1. *end note*]

17.15.3 Language Compatibility Settings

The last group of settings in WordprocessingML are language compatibility settings. *Language compatibility settings* are optional settings used to specify changes appropriate to a subset of languages, but not usually appropriate in others. [*Example:* The doNotLeaveBackslashAlone setting changes the visual appearance of a specific character to match user expectation based on a historical use of that character in some code pages – users who have used those code pages would expect one value; those who have not would expect another. *end example*]. The behavior of each setting is fully defined in this subclause.

If language compatibility settings are needed, they are stored in the Document Settings part.

[*Note:* Although these settings can be applied in any WordprocessingML document, they are often applied when the document is created in one of the following contexts.

In the case of ja-JP, ko-KR, zh-CN, zh-SG, zh-TW, zh-HK, zh-MO, ii-CN:

- doNotLeaveBackslashAlone
- doNotExpandShiftReturn
- balanceSingleByteDoubleByteWidth
- adjustLineHeightInTable
- ulTrailSpace
- spaceForUL

In the case of th-TH, lo-LA, km-KH, bo-CN, hy-AM:

- applyBreakingRules

end note]

17.15.3.1 `adjustLineHeightInTable` (Add Document Grid Line Pitch To Lines in Table Cells)

This element specifies whether a document grid defined using the `docGrid` element (§17.6.5) that specifies a line grid (manually adding additional pitch to each line in the section) shall also be applied to lines within table cells in this section.

Typically, when additional line pitch is added to all lines in a section via the document grid, it is not applied to text in tables. This element, when present with a `val` attribute value of `true` (or equivalent), specifies that additional line pitch shall be added to lines in table cells.

[*Example:* Consider a WordprocessingML document with a single section, whose document grid is defined such that 25.9 points of additional line pitch are added to each line in the section, as follows:

```
<w:docGrid w:type="lines" w:linePitch="518"/>
```

If text was entered into this section, the default behavior would have line pitch only added to lines which are not in a table cell:

This section has a character grid. This section has a character grid. This section has a character grid. This section has a character grid. This section has a character grid. This section has a character grid. This section has a character grid.

<p>This section has a character grid. This section has a character grid. This section has a character grid. This section has a character grid. This section has a character grid. This section has a character grid. This section has a character grid.</p>

This section has a character grid. This section has a character grid. This section has a character grid.

However, if this compatibility setting is turned on:

```
<w:compat>
  <w:adjustLineHeightInTable />
</w:compat>
```

Then all lines in this document would have the line pitch from the document grid added to them, resulting in the following output:

This section has a character grid. This section has a character grid. This section has a character grid. This section has a character grid. This section has a character grid. This section has a character grid. This section has a character grid.

<p>This section has a character grid. This section has a character grid. This section has a character grid. This section has a character grid. This section has a character grid. This section has a character grid. This section has a character grid.</p>

This section has a character grid. This section has a character grid. This section has a character grid.

end example]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.3.2 [applyBreakingRules \(Use Legacy Ethiopic and Amharic Line Breaking Rules\)](#)

This element specifies whether applications shall use a legacy set of line breaking rules when determining line breaks for text consisting of Ethiopic and/or Amharic characters.

Typically, when line breaking this text, applications should allow line breaks to occur after a character between the UTF-16 (hexadecimal) values 0x1361 and 0x1368 when those characters appear in the document's content. This element, when present with a `val` attribute value of `true` (or equivalent), specifies that when a line break would occur after a character between the UTF-16 hexadecimal values 0x1361 and 0x1368, the line break shall occur before all instances of these characters (i.e. no break opportunity shall be afforded after a character in this range).

[*Example:* Consider a WordprocessingML document with a series of Ethiopic characters in this range. The default presentation would have any line breaks pushed before or after these characters, ensuring that the characters remain together on a single line.

However, if this compatibility setting is turned on:

```
<w:compat>
  <w:applyBreakingRules />
</w:compat>
```

Then a line break opportunity must be afforded at any point in a range of these characters, as needed. *end example]*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.3.3 `balanceSingleByteDoubleByteWidth` (Balance Single Byte and Double Byte Characters)

This element specifies whether applications shall balance the width of Single Byte Character Set characters and Double Byte Character Set characters when rendering WordprocessingML documents. Specifically, this element specifies to adjust the fixed pitch fonts' half-width space character and full-width space character to attain a 1 to 2 ratio.

[*Note:* This element is used with East Asian content. Layout and line breaking for East Asian text is dependent on the character width. Half width characters (or Hankaku characters) are one half of an em wide, and full width characters (or Zenkaku characters) are one em wide. Legacy encoding often used a single byte to encode half-width characters and two bytes to encode full width characters. *end note]*

Typically, no adjustment is done on any character when it is displayed as part of a WordprocessingML document. This element, when present with a `val` attribute value of `true` (or equivalent), specifies that character sizes shall be adjusted as needed to meet the 1:2 ratio described above.

[*Example:* Consider a WordprocessingML document with both SBCS and DBCS characters. The default presentation would have the text displayed as follows:

言葉が example 生ま

However, if this compatibility setting is turned on:

```
<w:compat>
  <w:balanceSingleByteDoubleByteWidth />
</w:compat>
```

Then this character-level adjustment must be performed, resulting in the following output:

言葉が example 生ま

This adjustment is usually very minute in nature, therefore the result is better illustrated by showing how the characters after the English text were pushed out due to the width balancing of that text:

言葉が example 生ま

end example]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.3.4 compatSetting (Custom Compatibility Setting)

This element specifies a custom compatibility setting. The semantics for this element are implementation-defined. [*Note: This element can be used to store the transitional compatibility settings specified in Part 4 of ECMA-376. end note*]

[*Example:* Consider the following markup:

```
<w:compatSetting w:name="cooper" w:uri="http://www.example.com/exampleSetting"
w:val="1"/>
```

This custom compatibility setting specifies that:

- It is defined under the `http://www.example.com/exampleSetting` namespace.
- Its name is `cooper`.
- Its value is 1.

Beyond this, the properties of this setting are implementation-defined by the creator of the <http://www.example.com/exampleSetting> namespace. *end example*]

Attributes	Description
name (Name of Setting)	<p>Specifies the name of a custom compatibility setting.</p> <p>[<i>Example:</i> Consider the following markup:</p> <pre><w:compatSetting w:name="cooper" w:uri="http://www.example.com/exampleSetting" w:val="1"/></pre> <p>The name of this custom compatibility setting is cooper. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
uri (Namespace of Setting)	<p>Specifies the namespace under which the compatibility setting is defined.</p> <p>[<i>Example:</i> Consider the following markup:</p> <pre><w:compatSetting w:name="cooper" w:uri="http://www.example.com/exampleSetting" w:val="1"/></pre> <p>The namespace of this custom compatibility setting is http://www.example.com/exampleSetting. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
val (Value of Setting)	<p>Specifies the value of a custom compatibility setting.</p> <p>[<i>Example:</i> Consider the following markup:</p> <pre><w:compatSetting w:name="cooper" w:uri="http://www.example.com/exampleSetting" w:val="1"/></pre> <p>The value of this custom compatibility setting is 1. This value is interpreted using the implementation-defined behavior published by the creator of this property. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CompatSetting](#)) is located in §A.1. *end note*]

17.15.3.5 doNotExpandShiftReturn (Don't Justify Lines Ending in Soft Line Break)

This element specifies whether applications should fully justify the contents of incomplete lines which end in a soft line break when the parent paragraph is fully justified using the jc element (§17.3.1.13).

Typically, applications shall fully justify all lines in a paragraph when that setting is specified using the jc element except for the last line in the paragraph (the line ending with the paragraph mark). This element, when present with a val attribute value of true (or equivalent), specifies that any line which ends in a soft line break shall also not be fully justified when the paragraph specifies that setting.

[*Example:* Consider a WordprocessingML document with a paragraph whose first single line consists of East Asian characters followed by a soft paragraph mark. The default presentation would have the contents of that line fully justified:

ホルン^{金管楽器}もそうであるように、チェンバロ^(16～18世紀ごろ用いられた鍵盤楽器。後に発達してピアノになった。)

However, if this compatibility setting is turned on:

```
<w:compat>
  <w:doNotExpandShiftReturn />
</w:compat>
```

Then this line is not fully justified, as it ends with a soft line break, resulting in the following output:

ホルン^{金管楽器}もそうであるように、チェンバロ^(16～18世紀ごろ用いられた鍵盤楽器。後に発達してピアノになった。)

end example]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.3.6 doNotLeaveBackslashAlone (Display Backslash As Yen Sign)

This element specifies whether applications should autodisplay the backslash character using the yen character when displaying the contents of this document.

Typically, no automatic display-only conversion of one character to another is performed. This element, when present with a val attribute value of true (or equivalent), specifies that all occurrences of the backslash character (\, U+005C) shall automatically be displayed using the yen symbol (¥, U+00A5) when the contents of the document are displayed. This setting does not change the Unicode value of the character stored in the underlying WordprocessingML document.

[*Rationale:* In Japanese code page 932, 0x5C is the yen sign (whereas, in most other code pages, it is the reverse solidus—also known as the backslash). In order to accommodate the user expectation that this code point appear as the yen sign, this setting dictates that the character be remapped, for display only, to the Unicode character ¥, such that the expected appearance is maintained. *end rationale]*

[*Example:* Consider a WordprocessingML document containing the following:

Hello \ world.

The default presentation would have exactly that:

Hello \ world.

However, if this compatibility setting is turned on:

```
<w:compat>
  <w:doNotLeaveBackslashAlone />
</w:compat>
```

Then the backslash would be displayed as ¥, resulting in the following output:

Hello ¥ world.

end example]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.3.7 spaceForUL (Add Additional Space Below Baseline For Underlined East Asian Text)

This element specifies whether East Asian content in a WordprocessingML document which has been underlined using the `u` element shall have additional descent added to the properties of the font in order to ensure that there is adequate spacing between the characters in the font and the underlining applied to the text.

Typically, no adjustments are made to the contents of text runs containing East Asian text which have been underlined. This element, when present with a `val` attribute value of `true` (or equivalent), specifies that whenever the following conditions are met:

- The text run contains East Asian characters
- The text run is not using baseline font alignment as defined by the `textAlignment` property

That the larger of the following two values is added to the descent property of that font in order to provide additional padding between the text characters and the underline:

- 3 percent of the font size
- 40 twentieths of a point (31 twentieths of a point for Japanese text)

[*Example:* Consider a WordprocessingML document consisting of a single run of underlined Japanese text, as follows:

```

<w:p>
  <w:r>
    <w:rPr>
      <w:u w:val="double" />
    </w:rPr>
    <w:t>クリスタ/w:t>
  </w:r>
</w:p>

```

If this document is displayed, then the text is laid out along with the underline, as follows:



However, if this compatibility setting is turned on:

```

<w:compat>
  <w:spaceForUL />
</w:compat>

```

Then the additional descent specified using the logic above is added to the text, resulting in the following output:



end example]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.15.3.8 `ulTrailSpace` (Underline All Trailing Spaces)

This element specifies whether applications shall display underlining beneath all trailing spaces in the contents of a line when those contents are underlined. *Trailing spaces* are all space characters which are not followed by non-space characters on the same line.

Typically, applications do not display underlining on all trailing spaces which have the underline property applied to them. This element, when present with a `val` attribute value of `true` (or equivalent), specifies that all characters with underline applied, including trailing spaces, shall display underlining if it is applied to that content.

[*Example:* Consider a WordprocessingML document with the following line of Latin alphabetical character and punctuation, trailed by a series of spaces:

```
<w:r>
  <w:rPr>
    <w:u w:val="single"/>
  </w:rPr>
  <w:t>Example text. Example text. Example text. Example text. Example text.
</w:t>
</w:r>
```

The default presentation would have no underlining on those trailing spaces:

Example text. Example text. Example text. Example text. Example text.

However, if this compatibility setting is turned on:

```
<w:compat>
  <w:ulTrailSpace />
</w:compat>
```

Then all trailing spaces would be underlined, resulting in the following output:

Example text. Example text. Example text. Example text. Example text.

end example]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.16 Fields and Hyperlinks

Most text in a word processing document is static; that is, unless it is directly changed as the result of editing, its contents remain the same, no matter how the rest of the document might change. However, certain useful pieces of information can change value over the life of a document. Consider the case of a reference to a page number, as in "For more information on this topic, see page 56." Clearly, hard coding the page number as 56 means that that number needs to be manually replaced as the document's size or layout is changed. Even a simple change to any margin, line spacing, or font size can invalidate such references.

Fields provide a mechanism for placeholders, such as page reference numbers, that can be added to a document such that those placeholders are replaced by their corresponding values when the document is rendered for display or print. Other applications for fields include, but are not limited to, automatic numbering of tables and figures, document creation and current date and time, document author information, and the computation of totals for a table column.

A *field* is a set of codes that instructs a WordprocessingML consumer to insert text, graphics, page numbers, and other material into a document automatically. [*Example:* The DATE field causes the current date to be inserted.

end example] The text or graphics inserted into a document when a consumer carries out a field's codes is referred to as the *field result* (or *field value*) for that field. The default value for a field result is an empty string. The act of carrying out a field's codes is referred to as a *field update*. A field update shall be carried out such that the content contained within the field result correctly reflects the intended semantics of the field codes (as defined in the subclauses of §17.16.5). For a simple field defined via the fldSimple element (§17.16.19), this means replacing its child elements with the appropriate WordprocessingML content; for a complex field represented by use of properly matched fldChar elements (§17.16.18), this means replacing any content between the fldChar element with an fldCharType attribute value of separate and an fldCharType attribute value of end. As to when any field is updated is outside the scope of ECMA-376.

17.16.1 Syntax

The syntax rules in this subclause follow the system shown in ISO/IEC 14977: literal text is surrounded by double-quotes (or by apostrophes); the left-square-bracket and right-square-bracket designate the start and end of an option; the left-curly-bracket and right-curly-bracket designate the start and end of a sequence of one-or-more items; the vertical-line indicates an alternative; and each rule ends with a semicolon. Whenever hyphen is used as the exception-symbol (as per ISO/IEC 14977), it is surrounded by white space, and further clarified by a comment.

The syntax rules below were derived from the field-specific rules in the detailed definitions shown in §17.16.5.*.

[*Note*: In order to produce an automated verifier, field-specific rules in subclauses 17.16.5.* must also be considered. *end note*]

When used in narrative, production names are set in an italic style, as in *comparison*, *field-argument*, and *switches*.

The syntax of a field is as follows:

```
field=
    field-type, [switches] ;
field-type=
    date-and-time |
    document-automation |
    document-information |
    document-property |
    equations-and-formulas |
    index-and-tables |
    links-and-references |
    mail-merge |
    numbering |
    user-information |
    form-field | user-defined-field ;
user-defined-field=
    letter, {letter} ;
```

```

date-and-time=
    "CREATEDATE" | "DATE" | "EDITTIME" | "PRINTDATE" |
    "SAVEDATE" | "TIME" ;
document-automation=
    "COMPARE", comparison |
    "DOCVARIABLE", field-argument |
    "GOTOBUTTON", 2 * field-argument |
    "IF", comparison, 2 * field-argument |
    "MACROBUTTON", 2 * field-argument |
    "PRINT", field-argument |
    "PRIVATE" ;
document-information=
    "FILENAME" | "FILESIZE" | "LASTSAVEDBY" | "NUMCHARS" |
    "NUMPAGES" | "NUMWORDS" | "TEMPLATE" ;
document-property=
    "AUTHOR", [field-argument] |
    "COMMENTS", [field-argument] |
    "DOCPROPERTY", docprop-category |
    "KEYWORDS", [field-argument] |
    "SUBJECT", [field-argument] |
    "TITLE", [field-argument] ;
equations-and-formulas=
    "=", expression |
    "ADVANCE" |
    "SYMBOL", field-argument ;
index-and-tables=
    "INDEX" |
    "RD", field-argument |
    "TA" |
    "TC", field-argument |
    "TOA" |
    "TOC" |
    "XE", field-argument ;

```

```

links-and-references=
    "AUTOTEXT", field-argument |
    "AUTOTEXTLIST", field-argument |
    "BIBLIOGRAPHY" |
    "CITATION", field-argument |
    "HYPERLINK", field-argument |
    "INCLUDEPICTURE", field-argument |
    "INCLUDETTEXT", field-argument, [field-argument] |
    "LINK", 2 * field-argument, [field-argument] |
    "NOTEREF", field-argument |
    "PAGEREF", field-argument |
    "QUOTE", field-argument |
    ["REF"], field-argument | (* see §17.16.5.51 *)
    "STYLEREF", field-argument ;

mail-merge=
    "ADDRESSBLOCK" |
    "ASK", 2 * field-argument |
    "DATABASE" |
    "FILLIN", [field-argument] |
    "GREETINGLINE" |
    "MERGEFIELD", field-argument |
    "MERGEREC" |
    "MERGESEQ" |
    "NEXT" |
    "NEXTIF", comparison |
    "SET", 2 * field-argument |
    "SKIPIF", comparison ;

numbering=
    "LISTNUM", [field-argument] |
    "PAGE" |
    "REVNUM" |
    "SECTION" |
    "SECTIONPAGES" |
    "SEQ", identifier, [field-argument] ;

user-information=
    "USERADDRESS", [field-argument] |
    "USERINITIALS", [field-argument] |
    "USERNAME", [field-argument] ;

form-field=
    "FORMCHECKBOX" | "FORMDROPDOWN" | "FORMTEXT" ;

bookmark-name=
    identifier ;

```

```

cell-name=
    column-name, row-name ;
cell-range=
    cell-name, colon, cell-name |
    row-name, colon, row-name |
    column-name, colon, column-name ;
cell-reference=
    cell-name |
    cell-name, { comma, cell-name } |
    cell-range ;
character=
    as defined by the production Char in the XML 1.0 specification, §2.2.
colon=
    ":" ;
column-name=
    letter + [{letter}] ; (* allowing for A, ... Z, AA, ..., ZZ, AAA, ... column
naming *)
comma=
    "," ;
comparison=
    expression, comparison-operator, expression ;
comparison-operator=
    "=" | "<>" | "<" | "<=" | ">" | ">=" ;
constant=
    number ;
date-and-time-formatting-switch=
    "@", switch-argument (* as defined in §17.16.4.1 *) ;
docprop-category=
    "AUTHOR" | "BYTES" | "CATEGORY" | "CHARACTERS" |
    "CHARACTERSWITHSPACES" | "COMMENTS" |
    "COMPANY" | "CREATETIME" | "HYPERLINKBASE" |
    "KEYWORDS" | "LASTPRINTED" | "LASTSAVEDBY" |
    "LASTSAVEDTIME" | "LINES" | "MANAGER" |
    "NAMEOFAPPLICATION" | "ODMADOCID" | "PAGES" |
    "PARAGRAPHS" | "REVISIONNUMBER" | "SECURITY" |
    "SUBJECT" | "TEMPLATE" | "TITLE" |
    "TOALEDITINGTIME" | "WORDS" ;
double-quote=
    '"' ; (* one double-quote character *)

```

```

expression=
    "(" , expression , ")" |
    comparison |
    constant |
    prefix-operator , expression |
    expression , infix-operator , expression |
    field |
    bookmark-name , [cell-reference] |
    function |
    cell-reference |
    text |
    double-quote , text , double-quote ;
field-argument=
    text |
    double-quote , text , double-quote ;
field-specific-switch=
    "\", character , [character] , [field-argument] ;
    (* no whitespace is permitted after the backslash,
    also see definition of each field in §17.16.5 *)
formatting-switch=
    date-and-time-formatting-switch |
    numeric-formatting-switch |
    general-formatting-switch ;
fractional-part=
    decimal-digit {decimal-digit} ;
full-stop=
    "." ; (* also known as “period” *)

```



```

function=
  "ABS(", expression, ")" |
  "AND(", expression, ",", expression, ")" |
  "AVERAGE(", list, ")" |
  "COUNT(", list, ")" |
  "DEFINED(", expression, ")" |
  "FALSE" |
  "INT(", expression, ")" |
  "MAX(", list, ")" |
  "MIN(", list, ")" |
  "MOD(", expression, ",", expression, ")" |
  "NOT(", expression, ")" |
  "OR(", expression, ",", expression, ")" |
  "PRODUCT(", list, ")" |
  "ROUND(", expression, ",", expression, ")" |
  "SIGN(", expression, ")" |
  "SUM(", list, ")" |
  "TRUE" ;
general-formatting-switch=
  "\*", switch-argument ; (* as defined in §17.16.4.3 *)
identifier=
  character + [{character}] ;
infix-operator=
  "-" | "^" | "*" | "/" | "%" | "+" | "-" | "=" |
  "<>" | "<" | "<=" | ">" | ">=" ; (* see §17.16.3.3 *)
letter=
  "a"|"b"|"c"|"d"|"e"|"f"|"g"|"h"|"i"|"j"|"k"|"l"|"m" |
  "n"|"o"|"p"|"q"|"r"|"s"|"t"|"u"|"v"|"w"|"x"|"y"|"z" |
  "A"|"B"|"C"|"D"|"E"|"F"|"G"|"H"|"I"|"J"|"K"|"L"|"M" |
  "N"|"O"|"P"|"Q"|"R"|"S"|"T"|"U"|"V"|"W"|"X"|"Y"|"Z" ;
list=
  expression, {list-separator, expression} ;
list-separator=
  comma | semicolon ;
  (* depending on the document's listSeparator, §17.15.1.56*)
number=
  whole-number-part, [full-stop] |
  full-stop, fractional-part |
  whole-number-part, full-stop, fractional-part ;
numeric-formatting-switch=
  "\#", switch-argument ;      (* as defined in §17.16.4.2 *)
prefix-operator=
  "-" ;

```

```

row-name=
    whole-number-part ;
semicolon=
    ";" ;
switch-argument=
    text |
    double-quote, text, double-quote ;
switches=
    {field-specific-switch}, [formatting-switch] ;
text=
    character, {character} ;
whole-number-part=
    decimal-digit, {decimal-digit} ;

```

Formulas (also called expressions) are discussed in §17.16.3, constants are discussed in §17.16.3.1, bookmarks are discussed in §17.16.3.2, operators are discussed in §17.16.3.3, functions are discussed in §17.16.3.4, table cell references are discussed in §17.16.3.5, and formatting switches are discussed in §17.16.4.

The semantics of a field having a *user-defined-field type* are unspecified.

If the *text* in a *field-argument* or *switch-argument* contains white space, the delimiting double-quote characters shall be present; otherwise, they are optional. To include a double-quote character in *text*, it shall be preceded with a backslash (\). [Example: The field argument "\"name\"" results in the argument's actually being "name". end example] To include a backslash character in *text*, it shall be preceded with another backslash (\). [Example: File system pathnames on some systems use a backslash as a directory separator, as in the field

```
INCLUDETEXT "E:\\ReadMe.txt"
```

in which case, each such separator needs to be preceded with a backslash, as shown above. end example]

Arbitrary amount of white space can occur before the first token, after the last token, and between successive tokens, including no white space at all, except that in a *field-specific-switch*, no white space is permitted between the initial "\" token and the *character* that follows it.

[Example: Here are examples of some fields:

```

DATE
DATE \@ "dddd, MMMM dd, yyyy"
DATE \@ "dddd, MMMM dd, yyyy" \h

```

The field result of all three is today's date: The first field uses some implementation-defined format and the Gregorian calendar; the second field uses the specified format and the Gregorian calendar; and the third field uses the specified format and the Hijri lunar calendar. When rendered in a US-English context on December 31, 2005, the results of these fields were as follows:

12/31/2005
 Saturday, December 31, 2005
 AsSabt, Thoul Ki'dah 30, 1426

end example]

The names of fields are alphabetic tokens [*Example*: Some field-type names are ASK, COMMENTS, NEXT, and SET. *end example*]. These tokens are called *field-type names*. Field-type names are case-insensitive. [*Example*: The field-type names DATE, Date, dAtE, and date are equivalent. *end example*]

The *characters* immediately following the “\” in *field-specific-switch* are case-insensitive. [*Example*: \b and \B are equivalent. *end example*]

There is no ordering of *field-specific-switch* entries in *switches*.

17.16.2 XML representation

Fields shall be implemented in XML using either of two approaches:

- As a *simple field implementation*, using the fldSimple element, or
- As a *complex field implementation*, using a set of runs involving the fldChar and instrText elements.

For a simple field implementation, only one element, fldSimple, shall be used, in which case, its instr attribute shall contain a *field*, and the body of the element shall contain the most recently updated field result. [*Example*: Here is the corresponding XML for a simple field implementation of DATE:

```
<w:fldSimple w:instr="DATE">
  <w:r>
    <w:t>12/31/2005</w:t>
  </w:r>
</w:fldSimple>
```

end example]

For a complex field implementation, a set of runs shall be used with each run containing, in sequence, the following elements:

- fldChar with attribute fldCharType value begin,
- One or more instrText elements, which, collectively, contain a complete *field*,
- Optionally,
 - fldChar with attribute fldCharType value separate, which separates the field from its field result,
 - Any number of runs and paragraphs that contains the most recently updated field result, and
- fldChar with attribute fldCharType value end.

[*Note*: Fields that are for display purposes only have no need to, and do not, store a field result. *end note*][*Example*: Here is the corresponding XML for a complex field implementation of DATE:

```
<w:r>
  <w:fldChar w:fldCharType="begin"/>
</w:r>
<w:r>
  <w:instrText xml:space="preserve"> DATE </w:instrText>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="separate"/>
</w:r>
<w:r>
  <w:t>12/31/2005</w:t>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="end"/>
</w:r>
```

end example]

[*Note*: Every simple field implementation for a given field has a corresponding complex field implementation. However, not every complex field implementation has a corresponding simple field implementation. If some characters in a *field* have different run properties than others, that field must be implemented using multiple runs, and that requires that complex field implementation be used. For an example, see §17.16.4.3, where the first letter of a DATE field is made bold, underlined, and red, while the other letters have none of these properties. *end note*]

As shown in §17.16.1, the *instruction* of one *field* can be another *field*, allowing fields to nest. In such cases, the XML run sequence for the inner field is defined at the point of reference for that inner field, inside the outer field's XML run sequence. [*Example*: Consider the following sentence:

It's IF DATE \@ "M-d" <> "1-1" "not " new year's day.

The IF field contains the nested field DATE \@ "M-d". When updated, on January 1 of any year, the result sentence is "It's new year's day." On all other days of the year, the resulting sentence is "It's not new year's day."

Here is one way of writing the corresponding XML:

```
<w:r>
  <w:t xml:space="preserve">It's </w:t>
</w:r>
<w:r ...>
  <w:fldChar w:fldCharType="begin"/>
</w:r>
```

```

<w:r>
  <w:instrText xml:space="preserve">IF </w:instrText>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="begin"/>
</w:r>
<w:r>
  <w:instrText xml:space="preserve"> DATE \@ "M-d" </w:instrText>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="separate"/>
</w:r>
<w:r ...>
  <w:instrText>1-4</w:instrText>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="end"/>
</w:r>
<w:r>
  <w:instrText>&lt;&gt;"1-1" "not "</w:instrText>
</w:r>
<w:r ...>
  <w:fldChar w:fldCharType="separate"/>
</w:r>
<w:r ...>
  <w:t xml:space="preserve">not </w:t>
</w:r>
<w:r ...>
  <w:fldChar w:fldCharType="end"/>
</w:r>
<w:r>
  <w:t>new year's day!</w:t>
</w:r>

```

end example]

17.16.3 Formulas and expressions

A field instruction can involve a calculation via a *formula*, which is simply an *expression* that is an arbitrary complex arithmetic expression involving constants (§17.16.3.1), bookmarks that refer to *expressions* (§17.16.3.2), arithmetic and logical operators (§17.16.3.3), functions (§17.16.3.4), values of cells in a table (§17.16.3.5), and *fields* that result in a single value. *expression* can contain grouping parentheses to document the default precedence or to override it.

All arithmetic terms in an *expression* are real numbers. Infinities and NaN (Not-a-Number) are not supported. [Example: In the expression 1/3, although the operands appear to be integers, they are, in fact real numbers, and the result is 0.33. end example]

17.16.3.1 Constants

A constant is a number. Exponents are not supported.

[Example: Here are some constants: 1234, 1234.560, 1234., and .1234. end example]

17.16.3.2 Bookmarks

Any arbitrary piece of text and/or graphics in a WordprocessingML document can be assigned a name, called a *bookmark*. If a bookmark references text that represents an *expression*, that bookmark's name can be used as an operand in another *expression*. If a whole field is bookmarked, its bookmark name can also be used as an operand in an *expression*. [Example: Given that X is a bookmark for the text 4, Y is a bookmark for the text 2, and Result is a bookmark for the following field:

=X + Y

the field

=Result * 10

has the result 60. end example]

17.16.3.3 Operators

The *operators* permitted in *expression* are:

Operators		
Operator	Description	Precedence
-	Unary minus	highest
^	Powers and roots	
*	Multiplication	
/	Division	
%	Percentage	
+	Addition	
-	Subtraction	
=	Equal to	
<>	Not equal to	
<	Less than	lowest
<=	Less than or equal to	
>	Greater than	

Operators		
>=	Greater than or equal to	

Operators in *expression* having the same precedence associate left-to-right.

[*Example:* Given that X is a bookmark for the text 4, and Y is a bookmark for the text 2, the field

$$=((-1 + X^2) * 3 - Y)/2$$

produces the result 21.5. *end example*]

The equality, inequality, and relational operators yield 1 for true and 0 for false. An expression with value 0 tests logically false while one with any non-zero value tests true.

17.16.3.4 Functions

A *function* is a predefined procedure that computes and returns a result. Functions defined below with a parameter list of *list* accept two or more arguments separated by commas (,) or semicolons (;). As to which separator is permitted, is defined by the document's listSeparator (§17.15.1.56) element. Arguments to functions can be constants, formulas, or bookmark names that refer to constants or formulas. The functions AVERAGE, COUNT, MAX, MIN, PRODUCT, and SUM can also accept references to table cells as arguments. In the context of a table cell, functions taking a *list* also accept a single argument that designates a named-list of contiguous cells (§17.16.3.5). Function names are not case-sensitive, and white space can occur between a function's name and its argument list, if any.

The functions supported are as follows:

Functions	
Function	Description
ABS(<i>x</i>)	Returns the absolute value of <i>x</i> .
AND(<i>x</i> , <i>y</i>)	Returns 1 if the logical expressions <i>x</i> and <i>y</i> are both true; otherwise, it returns 0.
AVERAGE(<i>list</i>)	Returns the average value of the items in <i>list</i> .
COUNT(<i>list</i>)	Returns the number of items in <i>list</i> .
DEFINED(<i>x</i>)	Returns 1 if the expression <i>x</i> is well formed; otherwise, it returns 0.
FALSE	Returns 0.
INT(<i>x</i>)	Returns the value of the integer part of <i>x</i> .
MAX(<i>list</i>)	Returns the largest value in <i>list</i> .
MIN(<i>list</i>)	Returns the smallest value in <i>list</i> .
MOD(<i>x</i> , <i>y</i>)	Returns the value $x - ny$, for some integer n such that, if y is nonzero, the result has the same sign as x and magnitude less than the

Functions	
	<p>magnitude of y. If y is zero, a diagnostic shall be issued. (y need not be a whole number.) [Example: MOD(21, 5) results in 1 MOD(21, -5) results in 1 MOD(-21, 5) results in -1 MOD(-21, -5) results in -1 <i>end example</i>]</p>
NOT(x)	Returns 0 if the logical expression x is true, or 1 if the expression is false.
OR(x, y)	Returns 1 if either or both logical expressions x and y are true; otherwise, it returns 0.
PRODUCT($list$)	Returns the result of multiplying together all members in $list$.
ROUND(x, y)	Returns the value of x rounded to the specified number of decimal places indicated by floor(y), where floor has the mathematical meaning. If y is negative, any fractional part is discarded and the integer part of the value is rounded to the corresponding power of 10.
SIGN(x)	Returns 1 if x is positive; returns 0 if x is zero; and returns -1 if x is negative.
SUM($list$)	Returns the sum of the items in $list$.
TRUE	Returns 1.

17.16.3.5 Table cell references

Items in a WordprocessingML table are organized into rows and columns with the box formed by the intersection of a row and column being called a *cell*. Cells have names such as A1, A2, B1, B2, and so on, with the letter representing a column and the number representing a row. The cell at the top-left corner of each table is named A1. Column letters are not case-sensitive.

A *cell reference* shall be one of the following:

- The name of a cell.
- A comma-separated set of cell names.
- A cell range where a colon (:) is used to separate the first and last cells in a designated range of cells that has a contiguous rectangular shape. Specifying a row or column's name only as the first and last cell in a range, selects that whole row or column, regardless of the number of rows and columns the table has now or might have in the future.

An *expression* inside a table's cell can have operands that are references to other cells in that table.

[Example: Consider a table with three rows (1, 2, and 3) and two columns (A and B):

A1 + B1	Returns the sum of the contents of cells A1 and B1.
SUM(A1,B2,A3)	Returns the sum of the contents of the list of cells.
SUM(B1:B3)	Returns the sum of the contents of all cells between B1 and B3, inclusive.
SUM(B:B)	Returns the sum of the contents of all cells in column B (even if new rows are added later).
SUM(A1:B2)	Returns the sum of the contents of all (four) cells in the rectangular grid delimited by A1 and B2, inclusive.
SUM(1:1,2:2)	Returns the sum of the contents of all cells in rows 1 and 2.

end example]

When used in a table cell, the functions taking a *list* argument can have a single argument of ABOVE, BELOW, LEFT, or RIGHT, spelled in any case combination. Such lists designate, respectively, all the cells above, below, to the left of, or to the right of that cell. However, the designated range terminates if a cell with blank or non-numeric contents is reached, except that if the first cell is blank, it is treated as containing 0. [Example: Given the following table:

12	=COUNT(BELOW)	
	10	
2	20	=SUM(LEFT)
3	xxx	
=AVERAGE(ABOVE)	40	

AVERAGE(ABOVE) results in 2.5, the average of cells A4 and A3; COUNT(BELOW) results in 2, B2 and B3; and SUM(LEFT) results in 22, the sum of B3 and A3. *end example]*

An *expression* used outside a table or in a cell of one table can refer to cells in a second table by making a bookmark to that second table and qualifying cell names in that table by their table name using the form

(tableBookmarkName cellReference)

[Example: Given that Table1 is a bookmark for a 3x2 table, =SUM(Table1 A1:A3) book results in the sum of column A's cells. *end example]*

17.16.4 Field formatting

The result of a field has a *format*, either by default or because that field contains a *formatting-switch*. There are three kinds of field formatting: date and time (§17.16.4.1), numeric (§17.16.4.2), and general (§17.16.4.3).

17.16.4.1 Date and time formatting

date-and-time-formatting-switch=
 \@ *switch-argument* ;

A *date-and-time-formatting-switch* specifies the format of a date or time result. [Note: This switch is sometimes called a *picture* switch because it allows the use of symbols to represent the format of the field result. *end note*] If the result of a field is not a date or time, this switch has no effect.

If no *date-and-time-formatting-switch* is present, a date or time result is formatted in an implementation-defined manner.

A date and time *switch-argument* is made up of a series of *picture items*.

Date Formatting Picture Items	
Picture Item	Description
aaa	<p>Formats the day of the week or month in an abbreviated form according to the language specified by the lang element (§17.3.2.20) on the run containing the field instructions:</p> <ul style="list-style-type: none"> • If the lang element is ja-JP or ko-KR, display in the corresponding language. • For all other lang element values, display picture item as text. <p>Multiple instances of the picture item create repeated content.</p>
A	<p>Formats the day of the month as a number without a leading zero for single-digit days in Japanese numerals.</p> <p>Multiple instances of the picture item create repeated content.</p>
bb	<p>Formats the year as a 2-digit number according to the language specified by the lang element (§17.3.2.20) on the run containing the field instructions:</p> <ul style="list-style-type: none"> • If the lang element is zh-TW, zh-CN, zh-HK, zh-SG, or zh-MO, use the Gregorian year [ISO 8601] . • For all other lang element values, use Thai Buddhist Era year <p>This picture item can modify the behaviour of other picture items.</p> <p>Multiple instances of the picture item create repeated content unless the pattern contains the “bbbb” picture item. Those portions are formatted following the description outlined for the “bbbb” picture item.</p>
bbbb	<p>Formats the year as a 4-digit number according to the language specified by the lang element (§17.3.2.20) on the run containing the field instructions:</p> <ul style="list-style-type: none"> • If the lang element is ZH-TW, zh-CN, zh-HK, zh-SG, or zh-MO, use the Gregorian year [ISO 8601] • For all other lang element values, use Thai Buddhist Era year <p>This picture item can modify the behaviour of other picture items.</p> <p>Multiple instances of the picture item create repeated content.</p>
BB	<p>Formats the year as a 2-digit number.</p>

Date Formatting Picture Items	
	<p>Defaults to the Gregorian [ISO 8601] calendar, but also responds to the \s and \h switches.</p> <p>Multiple instances of the picture item create repeated content as specified by the following:</p> <ol style="list-style-type: none"> Working from the text direction of the run, create as many groups as possible that contain “BBBB” in each group. Format each group using the description outlined for the “BBBB” picture item. Repeat step 1 for groups of “BB” using the description for that picture item.
BBBB	<p>Formats the year as a 4-digit number.</p> <p>Defaults to the Gregorian calendar [ISO 8601], but also responds to the \s and \h switches.</p> <p>Multiple instances of the picture item create repeated content as specified by the “BB” picture item description.</p>
d	<p>Formats the day of the week or day of the month as a number without a leading zero for single-digit days.</p> <p>Defaults to the Gregorian calendar [ISO 8601], but also changes in the presence of the \s and \h switches, and the bb or bbbb picture item (to the Thai Buddhist Era calendar).</p> <p>Multiple instances of the picture item create repeated content as specified by the following:</p> <ol style="list-style-type: none"> Working from the text direction of the run, create as many groups as possible that contain “dddd” in each group. Format each group using the description outlined for the “dddd” picture item. Repeat step 1 for groups of “ddd”, “dd”, and “d” using the respective description for each picture item group.
dd	<p>Formats the day of the week or day of the month as a number with a leading zero0 for single-digit days.</p> <p>Defaults to the Gregorian calendar [ISO 8601], but also changes in the presence of the \s and \h switches, and the bb or bbbb picture item (to the Thai Buddhist Era calendar).</p> <p>Multiple instances of the picture item create repeated content as specified by the “d” picture item description.</p>
ddd	<p>Formats the day of the week or month in its abbreviated form according to the language specified by the lang element (§17.3.2.20) on the run containing the field instructions.</p> <p>Defaults to the Gregorian calendar [ISO 8601], but also changes in the presence</p>

Date Formatting Picture Items	
	<p>of the \s and \h switches, and the bb, bbbb, ๑๑๑๑, ๑๑, ๑๑๑๑, ๑๑๑, ๑๑, ๑, ๑๑๑๑, ๑๑๑, ๑๑, ๑, and ๑ picture item (to the Thai Buddhist Era calendar).</p> <p>Multiple instances of the picture item create repeated content as specified by the “d” picture item description.</p>
dddd	<p>Formats the day of the week as its full name according to the language specified by the lang element (§17.3.2.20) on the run containing the field instructions.</p> <p>Defaults to the Gregorian calendar [ISO 8601], but also changes in the presence of the \s and \h switches, and the bb, bbbb, ๑๑๑๑, ๑๑, ๑๑๑๑, ๑๑๑, ๑๑, ๑, ๑๑๑๑, ๑๑๑, ๑๑, ๑, and ๑ picture item (to the Thai Buddhist Era calendar).</p> <p>Multiple instances of the picture item create repeated content as specified by the “d” picture item description.</p>
D	<p>Formats the day of the week or day of the month as a number without a leading zero for single-digit days.</p> <p>Defaults to the Gregorian calendar [ISO 8601], but also changes in the presence of the \s and \h switches, and the bb or bbbb picture item (to the Thai Buddhist Era calendar).</p> <p>Multiple instances of the picture item create repeated content as specified by the following:</p> <ol style="list-style-type: none"> 1. Working from the text direction of the run, create as many groups as possible that contain “DDDD” in each group. Format each group using the description outlined for the “DDDD” picture item. 2. Repeat step 1 for groups of “DDD”, “DD”, and “D” using the respective description for each picture item group.
DD	<p>Formats the day of the month as a two-digit number (with a leading zero for single-digit days).</p> <p>Defaults to the Gregorian calendar [ISO 8601], but also changes in the presence of the \s and \h switches, and the bb or bbbb picture item (to the Thai Buddhist Era calendar).</p> <p>Multiple instances of the picture item create repeated content as specified by the “D” picture item description.</p>
DDD	<p>Formats the day of the week in an abbreviated form according to the language specified by the lang element (§17.3.2.20) on the run containing the field instructions.</p> <p>Defaults to the Gregorian calendar [ISO 8601], but also changes in the presence of the \s and \h switches, and the bb or bbbb, ๑๑๑๑, ๑๑, ๑๑๑๑, ๑๑๑, ๑๑, ๑, ๑๑๑๑, ๑๑๑, ๑๑, ๑, and ๑ picture item (to the Thai Buddhist Era calendar).</p>

Date Formatting Picture Items	
	Multiple instances of the picture item create repeated content as specified by the “D” picture item description.
DDDD	<p>Formats the day of the week as its full name according to the language specified by the lang element (§17.3.2.20) on the run containing the field instructions.</p> <p>Defaults to the Gregorian calendar [ISO 8601], but also changes in the presence of the \s and \h switches, and the bb, bbbb, ๒๒๒๒, ๒๒๒, ๒๒๒, ๒๒, ๒, ๒๒๒, ๒๒, ๒, and ๒ picture item (to the Thai Buddhist Era calendar).</p> <p>Multiple instances of the picture item create repeated content as specified by the “D” picture item description.</p>
e	<p>Formats the Japanese Emperor Era era with no leading zero for single-digit years.</p> <p>Multiple instances of the picture item create repeated content as specified by the following:</p> <ol style="list-style-type: none"> 1. Working from the text direction of the run, create as many groups as possible that contain “ee” in each group. Format each group using the description outlined for the “ee” picture item. 2. Repeat step 1 for groups of “e” using the description for that picture item.
ee	<p>Formats the Japanese Emperor Era era with a leading zero for single-digit years.</p> <p>Multiple instances of the picture item create repeated content as specified by the “e” picture item description.</p>
E	<p>Formats the era according to the language specified by the lang element (§17.3.2.20) on the run containing the field instructions:</p> <ul style="list-style-type: none"> • If the lang element is ja-JP, display the Japanese Emperor Era era with no leading zero for single-digit years in the corresponding language. • If the lang element is zh-TW, display the Taiwanese year in the corresponding language. • For all other values, display the Gregorian year [ISO 8601] as a four-digit number using ja-JP. <p>Multiple instances of the picture item create repeated content as specified by the following:</p> <ol style="list-style-type: none"> 1. Working from the text direction of the run, create as many groups as possible that contain “EE” in each group. Format each group using the description outlined for the “EE” picture item. 2. Repeat step 1 for groups of “E” using the description for that picture item.
EE	Formats the Gregorian year [ISO 8601] as a four-digit number, according to the language specified by the lang element (§17.3.2.20) on the run containing the field instructions.

Date Formatting Picture Items	
	<ul style="list-style-type: none"> • If the lang element is ja-JP, zh-TW, zh-CN, zh-HK, zh-SG, or zh-MO display in the corresponding language. • For all other lang element values, display in ja-JP. <p>Multiple instances of the picture item create repeated content as specified by the “E” picture item description.</p>
g	<p>Formats the era according to the language specified by the lang element (§17.3.2.20) on the run containing the field instructions:</p> <p>If the lang element is ko-KR or zh-TW, display nothing. For all other lang element values, display Japanese Emperor Era era as its abbreviated form in en-US.</p> <p>Multiple instances of the picture item create repeated content as specified by the following:</p> <ol style="list-style-type: none"> 1. Working from the text direction of the run, create as many groups as possible that contain “ggg” in each group. Format each group using the description outlined for the “ggg” picture item. 2. From the remaining values, repeat step 1 for groups of “gg” using the description for that picture item. 3. From the remaining values, repeat step 1 for groups of “g” using the description for that picture item.
gg	<p>Formats the era according to the language specified by the lang element (§17.3.2.20) on the run containing the field instructions:</p> <ul style="list-style-type: none"> • If the lang element is ja-JP, display the Japanese Emperor Era era as its abbreviated form in the corresponding language. • If the lang element is ko-KR, display the Korean Tangun era as its full name in the corresponding language. • If the lang element is zh-TW, display the Taiwanese era as its full name in the corresponding language. • For all other lang element values, display the Japanese Emperor Era era as its abbreviated form in ja-JP. <p>Multiple instances of the picture item create repeated content as specified by the “g” picture item description.</p>
ggg	<p>Formats the era according to the language specified by the lang element (§17.3.2.20) on the run containing the field instructions:</p> <ul style="list-style-type: none"> • If the lang element is ja-JP, display the Japanese Emperor Era era as its full name in the corresponding language. • If the lang element is ko-KR, display the Korean Tangun era as its full name in the corresponding language. • If the lang element is zh-TW, display the Taiwanese era as its full name in the corresponding language. • For all other lang element values, display the Japanese Emperor Era era as its full name in ja-JP.

Date Formatting Picture Items	
	Multiple instances of the picture item create repeated content as specified by the “g” picture item description.
G	<p>Formats the era according to the language specified by the lang element (§17.3.2.20) on the run containing the field instructions.</p> <ul style="list-style-type: none"> • If the lang element is ko-KR or zh-TW, display nothing. • For all other lang element values, display the Japanese Emperor Era era as its abbreviated form in ja-JP. <p>Multiple instances of the picture item create repeated content as specified by the following:</p> <ol style="list-style-type: none"> 1. Working from the text direction of the run, create as many groups as possible that contain “GG” in each group. Format each group using the description outlined for the “GG” picture item. 2. Repeat step 1 for groups of “G” using the description for that picture item.
GG	<p>Formats the era according to the language specified by the lang element (§17.3.2.20) on the run containing the field instructions.</p> <ul style="list-style-type: none"> • If the lang element is ko-KR, display the Korean Tangun era as its full name in the corresponding language. • If the lang element is zh-TW, display the Taiwanese era as its full name in the corresponding language. • For all other lang element values, display the Japanese Emperor Era era as its full name in ja-JP. <p>Multiple instances of the picture item create repeated content as specified by the “G” picture item description.</p>
M	<p>Formats the month as a number without a leading zero for single-digit months. Defaults to the Gregorian calendar [ISO 8601], but also changes in the presence of the \s and \h switches, and the bb or bbbb picture item (to the Thai Buddhist Era calendar).</p> <p>Multiple instances of the picture item create repeated content as specified by the following:</p> <ol style="list-style-type: none"> 1. Working from the text direction of the run, create as many groups as possible that contain “MMMM” in each group. Format each group using the description outlined for the “MMMM” picture item. 2. Repeat step 1 for groups of “MMM”, “MM”, and “M” using the respective description for each picture item group.
MM	<p>Formats the month as a number with a leading zero for single-digit months.</p> <p>Defaults to the Gregorian calendar [ISO 8601], but also changes in the presence of the \s and \h switches, and the bb or bbbb picture item (to the Thai Buddhist Era calendar).</p>

Date Formatting Picture Items	
	Multiple instances of the picture item create repeated content as specified by the “M” picture item description.
MMM	<p>Formats the month in its abbreviated form according to the language specified by the lang element (§17.3.2.20) on the run containing the field instructions.</p> <p>Defaults to the Gregorian calendar [ISO 8601], but also changes in the presence of the \s and \h switches, and the bb, bbbb, ๑๑๑๑, ๑๑, ๑๑๑๑, ๑๑๑, ๑๑, ๑, ๑๑๑๑, ๑๑๑, ๑๑, and ๑ picture item (to the Thai Buddhist Era calendar).</p> <p>Multiple instances of the picture item create repeated content as specified by the “M” picture item description.</p>
MMMM	<p>Formats the month as its full name according to the language specified by the lang element (§17.3.2.20) on the run containing the field instructions.</p> <p>Defaults to the Gregorian calendar [ISO 8601], but also changes in the presence of the \s and \h switches, and the bb, bbbb, ๑๑๑๑, ๑๑, ๑๑๑๑, ๑๑๑, ๑๑, ๑, ๑๑๑๑, ๑๑๑, ๑๑, and ๑ picture item (to the Thai Buddhist Era calendar).</p> <p>Multiple instances of the picture item create repeated content as specified by the “M” picture item description.</p>
n	<p>Formats the Japanese Emperor Era era with no leading zero for single-digit years.</p> <p>Multiple instances of the picture item create repeated content as specified by the following:</p> <ol style="list-style-type: none"> 1. Working from the text direction of the run, create as many groups as possible that contain “nn” in each group. Format each group using the description outlined for the “nn” picture item. 2. Repeat step 1 for groups of “n” using the description for that picture item.
nn	<p>Formats the Japanese Emperor Era era with leading zero for single-digit years.</p> <p>Multiple instances of the picture item create repeated content as specified by the “n” picture item description.</p>
O	<p>Formats the month as a number without a leading zero for single-digit months in Japanese numerals.</p> <p>Multiple instances of the picture item create repeated content.</p>
w	<p>Formats the day of the week in an abbreviated form according to the language specified by the lang element (§17.3.2.20) on the run containing the field instructions:</p> <ul style="list-style-type: none"> • If the lang element is ja-JP or ko-KR, display in the corresponding language. • For all other lang element values, display picture item as literal text.

Date Formatting Picture Items	
	Multiple instances of the picture item create repeated content.
W	<p>Formats the day of the week in an abbreviated form according to the language specified by the lang element (§17.3.2.20) on the run containing the field instructions:</p> <ul style="list-style-type: none"> • If the lang element is ja-JP, ko-KR, zh-TW, zh-CN, zh-HK, zh-SG, or zh-MO, display in the corresponding language. • For all other lang element values, display the picture item as literal text. <p>Multiple instances of the picture item create repeated content.</p>
y	<p>Formats the year as a 2-digit number.</p> <p>Defaults to the Gregorian calendar [ISO 8601], but also changes in the presence of the \s and \h switches.</p> <p>Multiple instances of the picture item create repeated content as specified by the following:</p> <ol style="list-style-type: none"> 1. Working from the text direction of the run, create as many groups as possible that contain “yyyy” in each group. Format each group using the description outlined for the “yyyy” picture item. 2. Repeat step 1 for groups of “yy” and “y” using the respective description for each picture item group.
yy	<p>Formats the year as a 2-digit number.</p> <p>Defaults to the Gregorian calendar [ISO 8601], but also changes in the presence of the \s and \h switches.</p> <p>Multiple instances of the picture item create repeated content as specified by the “y” picture item description.</p>
yyyy	<p>Formats the year as a 4-digit number.</p> <p>Defaults to the Gregorian calendar [ISO 8601], but also changes in the presence of the \s and \h switches.</p> <p>Multiple instances of the picture item create repeated content as specified by the “y” picture item description.</p>
Y	<p>Formats the year as a 2-digit number.</p> <p>Defaults to the Gregorian calendar [ISO 8601], but also changes in the presence of the \s and \h switches, and the bb, bbbb, ๒๕๒๕, and ๒๕๒๕ picture item (to the Thai Buddhist Era calendar).</p> <p>Multiple instances of the picture item create repeated content as specified by the following:</p>

Date Formatting Picture Items	
	<ol style="list-style-type: none"> Working from the text direction of the run, create as many groups as possible that contain “YYYY” in each group. Format each group using the description outlined for the “YYYY” picture item. Repeat step 1 for groups of “YY” and “Y” using the respective description for each picture item group.
YY	<p>Formats the year as a 2-digit number.</p> <p>Defaults to the Gregorian calendar [ISO 8601], but also changes in the presence of the \s and \h switches, and the bb, bbbb, לולול, and לולול picture item (to the Thai Buddhist Era calendar).</p> <p>Multiple instances of the picture item create repeated content as specified by the “Y” picture item description.</p>
YYYY	<p>Formats the year as a 4-digit number.</p> <p>Defaults to the Gregorian calendar [ISO 8601], but also changes in the presence of the \s and \h switches, and the bb, bbbb, לולול, and לולול picture item (to the Thai Buddhist Era calendar).</p> <p>Multiple instances of the picture item create repeated content as specified by the “Y” picture item description.</p>
ג	<p>Formats the day of the month as a number without a leading zero for single-digit days in Thai numerals.</p> <p>This picture item can modify the behaviour of other picture items.</p> <p>Multiple instances of the picture item create repeated content as specified by the following:</p> <ol style="list-style-type: none"> Working from the text direction of the run, create as many groups as possible that contain “גגגג” in each group. Format each group using the description outlined for the “גגגג” picture item. Repeat step 1 for groups of “גגג”, “גג” and “ג” using the respective description for each picture item group.
גג	<p>Formats the day of the month as a two-digit number (with a leading zero for single-digit days) in Thai numerals.</p> <p>This picture item can modify the behaviour of other picture items.</p> <p>Multiple instances of the picture item create repeated content as specified by the “ג” picture item description.</p>
גגג	<p>Formats the Thai Buddhist Era day of the week in its abbreviated form in Thai.</p> <p>This picture item can modify the behaviour of other picture items.</p>

Date Formatting Picture Items	
	Multiple instances of the picture item create repeated content as specified by the “จ” picture item description.
จจจ	<p>Formats the Thai Buddhist Era day of the week as its full name in Thai.</p> <p>This picture item can modify the behaviour of other picture items.</p> <p>Multiple instances of the picture item create repeated content as specified by the “จ” picture item description.</p>
ด	<p>Formats the Thai Buddhist Era month as a number without a leading zero for single-digit months in Thai numerals.</p> <p>This picture item can modify the behaviour of other picture items.</p> <p>Multiple instances of the picture item create repeated content as specified by the following:</p> <ol style="list-style-type: none"> 1. Working from the text direction of the run, create as many groups as possible that contain “ดดดด” in each group. Format each group using the description outlined for the “ดดดด” picture item. 2. Repeat step 1 for groups of “ดดด”, “ดด” and “ด” using the respective description for each picture item group.
ดด	<p>Formats the Thai Buddhist Era month as a two-digit number (with a leading zero for single-digit months) in Thai numerals.</p> <p>This picture item can modify the behaviour of other picture items.</p> <p>Multiple instances of the picture item create repeated content as specified by the “ด” picture item description.</p>
ดดด	<p>Formats the Thai Buddhist Era month in its abbreviated form.</p> <p>This picture item can modify the behaviour of other picture items.</p> <p>Multiple instances of the picture item create repeated content as specified by the “ด” picture item description.</p>
ดดดด	<p>Formats the Thai Buddhist Era month as its full name.</p> <p>This picture item can modify the behaviour of other picture items.</p> <p>Multiple instances of the picture item create repeated content as specified by the “ด” picture item description.</p>
ปป	<p>Formats the Gregorian year as a 2-digit number using Thai numerals.</p> <p>This picture item can modify the behaviour of other picture items.</p> <p>Multiple instances of the picture item create repeated content as specified by</p>

Date Formatting Picture Items	
	<p>the following:</p> <ol style="list-style-type: none"> 1. Working from the text direction of the run, create as many groups as possible that contain “๑๑๑๑” in each group. Format each group using the description outlined for the “๑๑๑๑” picture item. 2. Repeat step 1 for groups of “๑๑” using the description for that picture item.
๑๑๑๑	<p>Formats the Gregorian year [ISO 8601] as a 4-digit number using Thai numerals.</p> <p>This picture item can modify the behaviour of other picture items.</p> <p>Multiple instances of the picture item create repeated content as specified by the “๑๑” picture item description.</p>

Time Formatting Picture Items	
Picture Item	Description
C	<p>Formats the seconds as a number using Japanese numerals without a leading zero for single-digit seconds.</p> <p>Multiple instances of the picture item create repeated content.</p>
hor H	<p>Formats the hour on a 12-hr clock without a leading zero for single-digit hours.</p> <p>Multiple instances of the picture item create repeated content as specified by the following:</p> <ol style="list-style-type: none"> 1. Working from the text direction of the run, create as many groups as possible that contain “hh” in each group. Format each group using the description outlined for the “hh” picture item. 2. Repeat step 1 for groups of “h” using the description for that picture item. <p>Formats the hour without a leading 0 for single-digit hours.</p>
hh	<p>Formats the hour on a 12-hr clock with a leading zero for single-digit hours.</p> <p>Multiple instances of the picture item create repeated content as specified by the “h” picture item description.</p>
hh or HH	<p>Formats the hour with a leading 0 for single-digit hours.</p>
H	<p>Formats the hour on a 24-hr clock without a leading zero for single-digit hours.</p> <p>Multiple instances of the picture item create repeated content as specified by the following:</p> <ol style="list-style-type: none"> 1. Working from the text direction of the run, create as many groups as possible that contain “HH” in each group. Format each group using the description outlined for the “HH” picture item. 2. Repeat step 1 for groups of “H” using the description for that picture

Time Formatting Picture Items	
	item.
HH	<p>Formats the hour on a 24-hr clock with a leading zero for single-digit hours.</p> <p>Multiple instances of the picture item create repeated content as specified by the “H” picture item description.</p>
l	<p>Formats the minutes without a leading zero for single-digit days in Japanese numerals.</p> <p>Multiple instances of the picture item create repeated content.</p>
m	<p>Formats the minutes without a leading zero for single-digit minutes.</p> <p>Multiple instances of the picture item create repeated content as specified by the following:</p> <ol style="list-style-type: none"> 1. Working from the text direction of the run, create as many groups as possible that contain “mm” in each group. Format each group using the description outlined for the “mm” picture item. 2. Repeat step 1 for groups of “m” using the description for that picture item.
mm	<p>Formats the minutes with a leading zero for single-digit minutes.</p> <p>Multiple instances of the picture item create repeated content as specified by the “m” picture item description.</p>
r	<p>Formats the hour on a 12-hr clock, without a leading zero for single-digit hours, according to the language specified by the lang element (§2.3.2.18) on the run containing the field instructions, as follows:</p> <ul style="list-style-type: none"> • If the lang element is ja-JP, ko-KR, zh-TW, zh-CN, zh-HK, zh-SG, or zh-MO, display in the corresponding language. • For all other lang element values, display in zh-TW. <p>Multiple instances of the picture item create repeated content as specified by the following:</p> <ol style="list-style-type: none"> 1. Working from the text direction of the run, create as many groups as possible that contain “rr” in each group. Format each group using the description outlined for the “rr” picture item. 2. Repeat step 1 for groups of “r” using the description for that picture item.
rr	<p>Formats the hour on a 12-hr clock, without a leading zero for single-digit hours along with 12-hour clock indicators, according to the language specified by the lang element (§2.3.2.18) on the run containing the field instructions, as follows:</p> <ul style="list-style-type: none"> • If the lang element is ja-JP, ko-KR, zh-TW, zh-CN, zh-HK, zh-SG, or zh-MO, display in the corresponding language.

Time Formatting Picture Items	
	<ul style="list-style-type: none"> For all other lang element values, display in zh-TW. <p>Multiple instances of the picture item create repeated content as specified by the “r” picture item description.</p>
R	<p>Formats the hour on a 24-hr clock, without a leading zero for single-digit hours, according to the language specified by the lang element (§2.3.2.18) on the run containing the field instructions, as follows:</p> <ul style="list-style-type: none"> If the lang element is ja-JP, ko-KR, zh-TW, zh-CN, zh-HK, zh-SG, or zh-MO, display in the corresponding language. For all other lang element values, display in zh-TW. <p>Multiple instances of the picture item create repeated content as specified by the following:</p> <ol style="list-style-type: none"> Working from the text direction of the run, create as many groups as possible that contain “RR” in each group. Format each group using the description outlined for the “RR” picture item. Repeat step 1 for groups of “R” using the description for that picture item.
RR	<p>Formats the hour on a 12-hr clock as Arabic numerals, without a leading zero for single-digit hours and 12-hour clock indicators, according to the language specified by the lang element (§2.3.2.18) on the run containing the field instructions, as follows:</p> <ul style="list-style-type: none"> If the lang element is ja-JP, ko-KR, zh-TW, zh-CN, zh-HK, zh-SG, or zh-MO, display in the corresponding language. For all other lang element values, display in zh-TW. <p>Multiple instances of the picture item create repeated content as specified by the “R” picture item description.</p>
s	<p>Formats the seconds without a leading zero for single-digit seconds.</p> <p>Multiple instances of the picture item create repeated content as specified by the following:</p> <ol style="list-style-type: none"> Working from the text direction of the run, create as many groups as possible that contain “ss” in each group. Format each group using the description outlined for the “ss” picture item. Repeat step 1 for groups of “s” using the description for that picture item.
ss	<p>Formats the seconds as a two-digit number (with a leading zero for single-digit seconds).</p> <p>Multiple instances of the picture item create repeated content as specified by the “s” picture item description.</p>

Time Formatting Picture Items	
S	<p>Formats the seconds without a leading zero for single-digit seconds.</p> <p>Multiple instances of the picture item create repeated content as specified by the following:</p> <ol style="list-style-type: none"> 1. Working from the text direction of the run, create as many groups as possible that contain “SS” in each group. Format each group using the description outlined for the “SS” picture item. 2. Repeat step 1 for groups of “S” using the description for that picture item.
SS	<p>Formats the seconds as a two-digit number (with a leading zero for single-digit seconds).</p> <p>Multiple instances of the picture item create repeated content as specified by the “S” picture item description.</p>
am/pm or AM/PM	<p>Formats the uppercase 12-hour clock indicators according to the language specified by the lang element (§2.3.2.18) on the run containing the field instructions.</p> <p>Multiple instances of the picture item creates repeated content. Formats using an am/AM or pm/PM suffix.</p>
AMPM or PMAM or JAM/JPM or JPM/JAM	<p>Formats the uppercase or lowercase 12-hour clock indicators according to the language specified by the lang element (§2.3.2.18) on the run containing the field instructions.</p> <p>Multiple instances of the picture item create repeated content.</p>
am/pm or pm/am or A/P or P/A or a/p or p/a	<p>Formats the uppercase or lowercase 12-hour clock indicators according to the language specified by the lang element (§2.3.2.18) on the run containing the field instructions.</p> <p>Multiple instances of the picture item create repeated content.</p>
h	<p>Formats the hour on a 24-hr clock without a leading zero for single-digit hours.</p> <p>Multiple instances of the picture item create repeated content as specified by the following:</p> <ol style="list-style-type: none"> 1. Working from the text direction of the run, create as many groups as possible that contain “hh” in each group. Format each group using the description outlined for the “hh” picture item. 2. Repeat step 1 for groups of “h” using the description for that picture item.
hh	<p>Formats the hour on a 24-hr clock as a two-digit number (with a leading zero for single-digit hours).</p> <p>Multiple instances of the picture item create repeated content as specified by the “h” picture item description.</p>

Time Formatting Picture Items	
nn	<p>Formats the minutes with a leading zero for single-digit minutes.</p> <p>Multiple instances of the picture item create repeated content as specified by the following:</p> <ol style="list-style-type: none"> 1. Working from the text direction of the run, create as many groups as possible that contain “nn” in each group. Format each group using the description outlined for the “nn” picture item. 2. Repeat step 1 for groups of “n” using the description for that picture item.
n	<p>Formats the minutes without a leading zero for single-digit minutes.</p> <p>Multiple instances of the picture item create repeated content as specified by the “nn” picture item description..</p>
tt	<p>Formats the seconds with a leading zero for single-digit seconds.</p> <p>Multiple instances of the picture item create repeated content as specified by the following:</p> <ol style="list-style-type: none"> 1. Working from the text direction of the run, create as many groups as possible that contain “tt” in each group. Format each group using the description outlined for the “tt” picture item. 2. Repeat step 1 for groups of “t” using the description for that picture item.
t	<p>Formats the seconds without a leading zero for single-digit seconds.</p> <p>Multiple instances of the picture item create repeated content as specified by the “tt” picture item description.</p>

Miscellaneous Formatting Picture Items	
Picture Item	Description
Other character	Includes the specified character in the result at that position. [<i>Note</i> : Commonly used characters are colon (:), hyphen (-), asterisk (*), slash (/), and space. <i>end note</i>]
'text'	Includes <i>text</i> in the result.
`numbered-item`	Includes, in Arabic numerals, the number of the preceding item numbered as a caption or resulting from a SEQ field (§17.16.5.56). <i>numbered-item</i> shall be the same name as <i>identifier</i> in that SEQ field.

[*Example*: When updated in a US-English context on the date and time shown below, the following fields produced these results:

DATE \@ "M/d/yyyy"	1/3/2006
DATE \@ "dddd, MMMM dd, yyyy"	Tuesday, January 03, 2006
DATE \@ "MMMM d, yyyy"	January 3, 2006
DATE \@ "M/d/yy"	1/3/06
DATE \@ "yyyy-MM-dd"	2006-01-03
DATE \@ "d-MMM-yy"	3-Jan-06
DATE \@ "M.d.yyyy"	1.3.2006
DATE \@ "MMM. d, yy"	Jan. 3, 06
DATE \@ "d MMMM yyyy"	3 January 2006
DATE \@ "MMMM yy"	January 06
DATE \@ "MMM-yy"	Jan-06
DATE \@ "M/d/yyyy h:mm am/pm"	1/3/2006 5:28 PM
DATE \@ "M/d/yyyy h:mm:ss am/pm"	1/3/2006 5:28:34 PM
DATE \@ "h:mm am/pm"	5:28 PM
DATE \@ "h:mm:ss am/pm"	5:28:34 PM
DATE \@ "HH:mm"	17:28
DATE \@ "'Today is 'HH:mm:ss"	Today is 17:28:34

end example]

17.16.4.2 Numeric formatting

numeric-formatting-switch=
\# *switch-argument* ;

A *numeric-formatting-switch* specifies the format of a numeric result. If the result of a field is not a number, this switch has no effect.

If no *numeric-formatting-switch* is present, a numeric result is formatted without leading spaces or trailing fractional zeros. If the result is negative, a leading minus sign is present. If the result is a whole number, no radix point is present.

A numeric *switch-argument* is made up of a series of *picture items*.

Numeric Formatting Picture Items	
Picture Item	Description
0	Specifies the requisite numeric positions to display in the result. If the result does not include a digit in that position, 0 is displayed. [Example: In a US-English context, =4+5 \# 00.00 displays "09.00". end example]
#	Specifies the requisite numeric positions to display in the result. If the result does not include a digit in that position, a space is displayed. Extra fractional digits are rounded off. [Example: =9+6 \# \$\$\$\$ displays "\$ 15". end example]
x	Drops digits to the left of the x placeholder. If the placeholder is to the right of the decimal point, the result is rounded to that place. [Example: In a US-English context, =111053+111439 \# x## displays "492", =1/8 \# 0.00x displays "0.125", and =3/4 \# .x displays ".8". end example]
.	Indicates the radix-point position. [Example: In a US-English context, =95.4 \# \$\$\$\$.00 displays "\$ 95.40". end example] The radix-point character displayed is locale-specific.
,	Separates groups of three digits. [Example: In a US-English context, =2456800 \# \$#,###,### displays "2,456,800". end example] The separator character displayed is locale-specific.
-	Prepends a minus sign to a negative result, or prepends a space if the result is positive or 0. [Example: =80-90 \# -## displays "-10", while =90-80 \# -## displays " 80". end example]
+	Prepends a plus sign to a positive result, a minus sign to a negative result, or a space if the result is 0. [Example: =90-80 \# +## displays "+10", and =80-90 \# +## displays "-10". end example]
Other character	Includes the specified character in the result at that position. [Example: =33 \# ##% displays "33%". end example]
'text'	Includes text in the result. [Example: In a US-English context, if Price is a bookmark for 26.5, =Price*15% \# "##0.00 'is the sales tax'" displays "\$ 3.98 is the sales tax". end example]
`numbered-item`	Includes, in Arabic numerals, the number of the preceding item numbered as a caption or resulting from a SEQ field (§17.16.5.56). <i>numbered-item</i> shall be the same name as <i>identifier</i> in that SEQ field. [Example: =SUM(A1:D4) \# "##0.00 'is the total of Table' `table`" displays "456.34 is the total of Table 2". end example]
<i>positive-result ; negative-result</i>	Specifies different sets of picture items for positive and negative results. A zero value uses the positive picture. [Example: =Sales95 \# \$#,##0.00; - \$#,##0.00 displays that bookmark's positive values using \$#,##0.00, and it's negative values using - \$#,##0.00. end example]
<i>positive-result ; negative-result ; zero-result</i>	Specifies different sets of picture items for positive, negative, and zero results. [Example: =Sales95 \# \$#,##0.00; - \$#,##0.00; \$0 displays that bookmark's positive values using \$#,##0.00, it's negative values using - \$#,##0.00, and its zero values using \$0. end example]

17.16.4.3 General formatting

general-formatting-switch=
`* switch-argument ;`

A *general-formatting-switch* specifies a variety of formats for a numeric or text result. If the result type of a field does not correspond to the format specified, this switch has no effect.

A *switch-argument* is made up of a series of *picture items*.

17.16.4.3.1 General formatting - Numeric Values

The following *switch-arguments* apply to fields whose field result is a numeric value. If the result type of the field is not numeric, then these switches have no effect. If the field result varies based on the language of the field instructions, those variations are noted inline:

General Formatting Switch Arguments	
Switch Argument	Description
AIUEO	Formats a numeric result using hiragana characters in the traditional a-i-u-e-o order. [Example: 1 * AIUEO results in ア. end example] Corresponds to an ST_NumberFormat enumeration value of aiueoFullWidth.
ALPHABETIC	Formats a numeric result as one or more occurrences of an uppercase alphabetic Latin character. Value 1 results in the letter A, value 2 results in the letter B, and so on up to value 26, which results in the letter Z. For values greater than 26, 26 is repeatedly subtracted from the value until the result is 26 or less. The result value determines which letter to use, and the same letter is repeated for each time 26 was subtracted from the original value. [Example: =54 * ALPHABETIC results in "BBB" as subtracting 26 from 54 two times, produces the value 2, which is represented by the letter B. end example] Corresponds to an ST_NumberFormat value of upperLetter.
alphabetic	Formats a numeric result as one or more occurrences of an lowercase alphabetic Latin character. Value 1 results in the letter a, value 2 results in the letter b, and so on up to value 26, which results in the letter z. For values greater than 26, 26 is repeatedly subtracted from the value until the result is 26 or less. The result value determines which letter to use, and the same letter is repeated for each time 26 was subtracted from the original value. [Example: =52 * alphabetic results in "zz" as subtracting 26 from 52 one time, produces the value 26, which is represented by the letter z. end example] Corresponds to an ST_NumberFormat enumeration value of lowerLetter.
Arabic	Formats a numeric result using Arabic cardinal numerals. [Example: For page 123, PAGE * Arabic results in "123". end example] Corresponds to an ST_NumberFormat enumeration value of decimal.
ARABICABJAD	Formats a numeric result using ascending Abjad numerals. [Example: 12 * ARABICABJAD results in ١٢. end example] Corresponds to an ST_NumberFormat enumeration value of arabicAbjad.
ARABICALPHA	Formats a numeric result using characters in the Arabic alphabet. [Example:

General Formatting Switch Arguments	
	<p>12 * ARABICABJAD results in ١٢. <i>end example</i></p> <p>Corresponds to an ST_NumberFormat enumeration value of arabicAlpha.</p>
ArabicDash	<p>Formats a numeric result using Arabic cardinal numerals, with a prefix of "- " and a suffix of "- ". [Example: For page 123, PAGE * ArabicDash results in "- 123 -". <i>end example</i>]</p> <p>Corresponds to an ST_NumberFormat enumeration value of numberInDash.</p>
BAHTTEXT	<p>Formats a numeric result in the following form:</p> <ul style="list-style-type: none"> • If the value is an integer, it is displayed using the . Thai counting system, with บาทถ้วน appended to the result. • If the value includes a fractional value, the fractional part is rounded to two decimal places, and the resulting value is displayed in the form integer-part-in-Thai-counting format บาท fractional-part-in-Thai-counting format สตางค์. <p>[Example: 1 * BAHTTEXT results in หนึ่งบาทถ้วน. <i>end example</i>]</p> <p>Corresponds to an ST_NumberFormat enumeration value of bahtText.</p>
CardText	<p>Formats a numeric result as lowercase cardinal text. [Example: For page 123, PAGE * CardText results in "one hundred twenty-three". <i>end example</i>]</p> <p>Corresponds to an ST_NumberFormat enumeration value of cardinalText.</p>
CHINESENUM1	<p>Formats a numeric result using ascending numbers from the appropriate counting system. [Example: 10 * CHINESENUM1 results in 十. <i>end example</i>]</p> <p>Corresponds to an ST_NumberFormat enumeration value of chineseCounting (zh-CN) or taiwaneseCounting (zn-TW).</p>
CHINESENUM2	<p>Formats a numeric result using sequential numbers from the appropriate legal format. [Example: 123 * CHINESENUM2 results in 壹佰貳拾參. <i>end example</i>]</p> <p>Corresponds to an ST_NumberFormat enumeration value of chineseLegalSimplified (zh-CN) or ideographLegalTraditional (zh-TW).</p>
CHINESENUM3	<p>Formats a numeric result using sequential numbers from the appropriate counting thousand system. [Example: 10 * CHINESENUM3 results in 一百二十三. <i>end example</i>]</p> <p>Corresponds to an ST_NumberFormat enumeration value of chineseCountingThousand (zh-CN) or taiwaneseCountingThousand (zh-TW).</p>
CHOSUNG	<p>Formats a numeric result using sequential numbers from the Korean Chosung format. [Example: 1 * CHOSUNG results in ㄱ. <i>end example</i>]</p> <p>Corresponds to an ST_NumberFormat enumeration value of chosung.</p>
CIRCLENUM	<p>Formats a numeric result using decimal numbering enclosed in a circle, using the enclosed alphanumeric glyph character for numbers in the range 1–20. For non-negative numbers outside this range, formats them as with ARABIC. [Example: 12 * CIRCLENUM results in ⑫. <i>end example</i>]</p> <p>Corresponds to an ST_NumberFormat enumeration value of decimalEnclosedCircle.</p>
DBCHAR	<p>Formats a numeric result using double-byte Arabic numbering. [Example: 123 * DBCHAR results in ١٢٣. <i>end example</i>]</p>

General Formatting Switch Arguments	
	Corresponds to an ST_NumberFormat enumeration value of decimalFullWidth.
DBNUM1	Formats a numeric result using sequential digital ideographs, using the appropriate character. [Example: 12 * DBNUM1 results in 一二. end example] Corresponds to an ST_NumberFormat enumeration value of ideographDigital (ja-JP) or koreanDigital (ko-KR).
DBNUM2	Formats a numeric result using sequential numbers from the appropriate counting system. [Example: 12 * DBNUM2 results in 十二. end example] Corresponds to an ST_NumberFormat enumeration value of japaneseCounting (ja-JP) or koreanCounting (ko-KR).
DBNUM3	Formats a numeric result using sequential numbers from the appropriate legal counting system. [Example: 12 * DBNUM3 results in 壹拾貳. end example] Corresponds to an ST_NumberFormat enumeration value of japaneseLegal (ja-JP) or koreanLegal (ko-KR).
DBNUM4	Formats a numeric result using sequential numbers from the appropriate digital counting system. [Example: 12 * DBNUM4 results in 一二. end example] Corresponds to an ST_NumberFormat enumeration value of japaneseDigitalTenThousand (ja-JP) or koreanDigital2 (ko-KR) or taiwaneseDigital (zh-TW).
DollarText	Formats a numeric result in the following form: <i>integer-part-as-cardinal-text</i> and <i>nn/100</i> The fractional part is rounded to two decimal places, <i>nn</i> , and is formatted using Arabic cardinal numerals. [Example: =1234.567 * DollarText results in "one thousand two hundred thirty-four and 57/100". end example] Corresponds to an ST_NumberFormat enumeration value of dollarText.
GANADA	Formats a numeric result using sequential numbers from the Korean Ganada format. [Example: 12 * GANADA results in E1. end example] Corresponds to an ST_NumberFormat enumeration value of ganada.
GB1	Formats a numeric result using decimal numbering followed by a period, using the enclosed alphanumeric glyph character. [Example: 12 * GB1 results in 12.. end example] Corresponds to an ST_NumberFormat enumeration value of decimalEnclosedFullstop.
GB2	Formats a numeric result using decimal numbering enclosed in parenthesis, using the enclosed alphanumeric glyph character. [Example: 12 * GB2 results in (12). end example] Corresponds to an ST_NumberFormat enumeration value of decimalEnclosedParen.
GB3	Formats a numeric result using decimal numbering enclosed in a circle, using the enclosed alphanumeric glyph character. Once the specified sequence reaches 11, the numbers can be replaced with non-enclosed equivalents. [Example:

General Formatting Switch Arguments	
	12 * GB3 results in 12. <i>end example</i> Corresponds to an ST_NumberFormat enumeration value of decimalEnclosedCircleChinese.
GB4	Formats a numeric result using decimal numbering enclosed in a circle, using the enclosed alphanumeric glyph character. Once the specified sequence reaches 11, the numbers can be replaced with non-enclosed equivalents. [Example: 12 * GB4 results in 12. <i>end example</i>] Corresponds to an ST_NumberFormat enumeration value of ideographEnclosedCircle.
HEBREW1	Formats a numeric result using Hebrew numerals. [Example: 123 * HEBREW1 results in קכ"ג. <i>end example</i>] Corresponds to an ST_NumberFormat enumeration value of hebrew1.
HEBREW2	Formats a numeric result using the Hebrew alphabet. [Example: 123 * HEBREW2 results in תתתתתת. <i>end example</i>] Corresponds to an ST_NumberFormat enumeration value of hebrew2.
Hex	Formats the numeric result using uppercase hexadecimal digits. [Example: For page 355, PAGE * Hex results in "FF". <i>end example</i>] Corresponds to an ST_NumberFormat enumeration value of hex.
HINDIARABIC	Formats a numeric result using Hindi numbers. [Example: 123 * HINDIARABIC results in १२३. <i>end example</i>] Corresponds to an ST_NumberFormat enumeration value of hindiNumbers.
HINDICARDTEXT	Formats a numeric result using sequential numbers from the Hindi counting system. [Example: 123 * HINDICARDTEXT results in एक सौ तेईस. <i>end example</i>] Corresponds to an ST_NumberFormat enumeration value of hindiCounting.
HINDILETTER1	Formats a numeric result using Hindi vowels. [Example: 123 * HINDILETTER1 results in ठठठठ. <i>end example</i>] Corresponds to an ST_NumberFormat enumeration value of hindiVowels.
HINDILETTER2	Formats a numeric result using Hindi consonants. [Example: 123 * HINDILETTER2 results in ओओओओओओओ. <i>end example</i>] Corresponds to an ST_NumberFormat enumeration value of hindiConsonants.
IROHA	Formats a numeric result using the Japanese iroha. [Example: 12 * IROHA results in 才. <i>end example</i>] Corresponds to an ST_NumberFormat enumeration value of irohaFullWidth.
KANJINUM1	Formats a numeric result using a Japanese style using the appropriate counting system. [Example: 12 * KANJINUM1 results in 一二. <i>end example</i>] Corresponds to an ST_NumberFormat enumeration value of koreanDigital (ko-KR), ideographDigital (ja-JP), chineseCounting (zh-CN), or taiwaneseCounting (zh-TW).
KANJINUM2	Formats a numeric result using the appropriate counting system. [Example:

General Formatting Switch Arguments	
	<p>12 * KANJINUM2 results in 十二. <i>end example</i></p> <p>Corresponds to an ST_NumberFormat enumeration value of koreanCounting (ko-KR), chineseCountingThousand (ja-JP), chineseLegalSimplified (zh-CN), or ideographLegalTraditional (zh-TW).</p>
KANJINUM3	<p>Formats a numeric result using the appropriate counting system. [Example: 12 * KANJINUM3 results in 壹拾貳. <i>end example</i>]</p> <p>Corresponds to an ST_NumberFormat enumeration value of koreanLegal (ko-KR) or japaneseLegal (ja-JP) or chineseCountingThousand (zh-CN) or taiwaneseCountingThousand (zh-TW).</p>
Ordinal	<p>Formats a numeric result using lowercase ordinal Arabic numerals. [Example: =32 * Ordinal results in "32nd". <i>end example</i>]</p> <p>Corresponds to an ST_NumberFormat enumeration value of ordinal.</p>
OrdText	<p>Formats a numeric result as lowercase ordinal text. Apart from being used to round off the whole number part, the fractional part is not used. [Example: =1234.567 * OrdText results in "one thousand two hundred thirty-fifth". <i>end example</i>]</p> <p>Corresponds to an ST_NumberFormat enumeration value of ordinalText.</p>
Roman	<p>Formats a numeric result using uppercase Roman numerals. [Example: For page 123, PAGE * Roman results in "CXXIII". <i>end example</i>]</p> <p>Corresponds to an ST_NumberFormat enumeration value of upperRoman.</p>
roman	<p>Formats a numeric result using lowercase Roman numerals. [Example: For page 123, PAGE * roman results in "cxxiii". <i>end example</i>]</p> <p>Corresponds to an ST_NumberFormat enumeration value of lowerRoman.</p>
SBCHAR	<p>Formats a numeric result using single-byte Arabic numbering. [Example: 123 * SBCHAR results in 123. <i>end example</i>]</p> <p>Corresponds to an ST_NumberFormat enumeration value of decimalHalfWidth.</p>
THAIARABIC	<p>Formats a numeric result using Thai numbers. [Example: 123 * THAIARABIC results in ๑๒๓. <i>end example</i>]</p> <p>Corresponds to an ST_NumberFormat enumeration value of thaiNumbers.</p>
THAICARDTEXT	<p>Formats a numeric result using sequential numbers from the Thai counting system. [Example: 123 * THAICARDTEXT results in หนึ่งร้อยยี่สิบสาม. <i>end example</i>]</p> <p>Corresponds to an ST_NumberFormat enumeration value of thaiCounting.</p>
THAILETTER	<p>Formats a numeric result using Thai letters. [Example: 30 * THAILETTER results in ๓๐. <i>end example</i>]</p> <p>Corresponds to an ST_NumberFormat enumeration value of thaiLetters.</p>
VIETCARDTEXT	<p>Formats a numeric result using Vietnamese numerals. [Example: 12 * VIETCARDTEXT results in mười hai. <i>end example</i>]</p> <p>Corresponds to an ST_NumberFormat enumeration value of vietnameseCounting.</p>
ZODIAC1	<p>Formats a numeric result using sequential numerical traditional ideographs.</p>

General Formatting Switch Arguments	
	[<i>Example: 1 * ZODIAC1 results in 甲. end example</i>] Corresponds to an ST_NumberFormat enumeration value of ideographTraditional.
ZODIAC2	Formats a numeric result using sequential zodiac ideographs. [<i>Example: 1 * ZODIAC2 results in 子. end example</i>] Corresponds to an ST_NumberFormat enumeration value of ideographZodiac.
ZODIAC3	Formats a numeric result using sequential traditional zodiac ideographs. [<i>Example: 1 * ZODIAC3 results in 甲子. end example</i>] Corresponds to an ST_NumberFormat enumeration value of ideographZodiacTraditional.

17.16.4.3.2 General formatting - String Values

The following *switch-arguments* apply to fields whose field result is a string value:

General Formatting Switch Arguments	
Switch Argument	Description
Caps	Capitalizes the first letter of each word. [<i>Example: USERNAME "mary smith" * Caps results in "Mary Smith", whereas USERNAME "marysmith" * Caps results in "Marysmith". end example</i>]
FirstCap	Capitalizes the first letter of the first word. [<i>Example: USERNAME "mary smith" * FirstCap results in "Mary smith". end example</i>]
Lower	All letters are lowercase. [<i>Example: USERNAME "Mary Smith" * Lower results in "mary smith". end example</i>]
Upper	All letters are uppercase. [<i>Example: USERNAME "Mary Smith" * Upper results in "MARY SMITH". end example</i>]

17.16.4.3.3 General formatting - Field Result Formatting

The following *switch-arguments* apply to any field result, and provide directions to applications regarding the formatting which should be applied to a field result after a field update has been performed. As discussed in §17.16, as to when a field update is performed is outside the scope of ECMA-376.

The general formatting switch argument CHARFORMAT is an instruction that specifies formatting intended for application to the field result after a field update. If this switch is present, the formatting of the run containing the first instrText element after the fldChar element with a fldCharType attribute value of begin is applied to all runs in the field result whenever a new field result is generated. [*Example: In a US-English context, on January 4, 2006, the field DATE * CHARFORMAT results in "1/4/2006". However, if the first run within the field instructions (containing the D in DATE) is bold, the field DATE * CHARFORMAT results in "**1/4/2006**". If that D is italic, the field DATE * CHARFORMAT results in "*1/4/2006*". If that D is bold, underlined, and red, the field **DATE** * CHARFORMAT results in "**1/4/2006**".*

The XML for the bold, underlined, red case is as follows:

```
<w:r>
  <w:fldChar w:fldCharType="begin"/>
</w:r>
<w:r>
  <w:instrText xml:space="preserve"> </w:instrText>
</w:r>
<w:r ...>
  <w:rPr>
    <w:b/>
    <w:color w:val="ED1C24"/>
    <w:u w:val="single"/>
  </w:rPr>
  <w:instrText>D</w:instrText>
</w:r>
<w:r>
  <w:instrText xml:space="preserve">ATE </w:instrText>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="separate"/>
</w:r>
<w:r ...>
  <w:t>1/4/2006</w:t>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="end"/>
</w:r>
```

Then use of the CHARFORMAT switch would cause the new field result to reuse the formatting on the first run in the field instructions, like this:

```
<w:r>
  <w:fldChar w:fldCharType="begin"/>
</w:r>
<w:r>
  <w:instrText xml:space="preserve"> </w:instrText>
</w:r>
```

```

<w:r ...>
  <w:rPr>
    <w:b/>
    <w:color w:val="ED1C24"/>
    <w:u w:val="single"/>
  </w:rPr>
  <w:instrText>D</w:instrText>
</w:r>
<w:r>
  <w:instrText xml:space="preserve">ATE /* CHARFORMAT</w:instrText>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="separate"/>
</w:r>
<w:r ...>
  <w:rPr>
    <w:b/>
    <w:color w:val="ED1C24"/>
    <w:u w:val="single"/>
  </w:rPr>
  <w:t>1/4/2006</w:t>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="end"/>
</w:r>

```

end example]

If a format specified directly in the first run of a field's *field-type* name conflicts with a general formatting switch, the general formatting switch is ignored. [*Example*: If the first run is set in small caps and the switch * Lower is also used, that switch is ignored. *end example]*

The general formatting switch argument MERGEFORMAT is used to specify an instruction regarding the formatting which is applied to the field result after a field update. If this switch is present, it specifies that applications that perform field updates should preserve the formatting of the existing field result when a new field result is generated, by applying the following logic:

- Delete all text from the current field result (leaving the paragraph and run structure intact).
- Insert the new field result text into the existing run/paragraph structure.
 - If the new text does not fill the existing structure, delete the superfluous runs/paragraphs.
 - If the new text overflows the existing structure, add additional runs/paragraphs as needed.

[*Example*: Consider the following field:

TIME \@ "HH:mm:ss" * MERGEFORMAT

When it is updated, the result might be 12:22:27, for example. If the seconds part of the displayed field result was underlined by the use of direct formatting within the original WordprocessingML, as in 12:22:27, when that field is next updated, the seconds underlining is preserved.

If the original XML generated for this field is:

```
<w:r>
  <w:fldChar w:fldCharType="begin"/>
</w:r>
<w:r>
  <w:instrText xml:space="preserve"> TIME \@ "HH:mm:ss" \* MERGEFORMAT
</w:instrText>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="separate"/>
</w:r>
<w:r ...>
  <w:t>17:02:</w:t>
</w:r>
<w:r ...>
  <w:rPr>
    <w:u w:val="single"/>
  </w:rPr>
  <w:t>32</w:t>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="end"/>
</w:r>
```

then use of the MERGEFORMAT switch would cause the new field result to reuse that structure, like this:

```
<w:r>
  <w:fldChar w:fldCharType="begin"/>
</w:r>
<w:r>
  <w:instrText>TIME \@ "HH:mm:ss" \* MERGEFORMAT</w:instrText>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="separate"/>
</w:r>
<w:r ...>
  <w:t>12:22:</w:t>
</w:r>
```

```
<w:r ...>
  <w:rPr>
    <w:u w:val="single"/>
  </w:rPr>
  <w:t>27</w:t>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="end"/>
</w:r>
```

and omitting it would direct an application that it could replace it with a single new run, like this:

```
<w:r>
  <w:fldChar w:fldCharType="begin"/>
</w:r>
<w:r>
  <w:instrText>TIME \@ "HH:mm:ss"</w:instrText>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="separate"/>
</w:r>
<w:r>
  <w:t>12:22:27</w:t>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="end"/>
</w:r>
```

end example]

17.16.5 Field definitions

Each of the subclauses below this subclause describes a separate field, and each description contains a section marked **Syntax**. That section contains pieces of the field grammar as they pertain to that specific field. These pieces are presented in a slightly simpler form to aid in the understanding of the description. In those sections, the left-square-bracket and right-square-bracket designate the start and end of an option, as used in ISO/IEC 14977. However, the field-name, the open-parenthesis and the close-parenthesis designate actual literal text, as does each comma. [*Note*: Therefore, in a strict presentation according to ISO/IEC 14977, each field-name, open-parenthesis and close-parenthesis would appear with double-quotes surrounding each instance. *end note*]

The set of fields is divided into the following functional categories:

Category	Description	Fields
Date and Time	Inserts the current date and/or time, or date and/or	CREATEDATE (§17.16.5.11), DATE (§17.16.5.13), EDITTIME (§17.16.5.16),

Category	Description	Fields
	time of some kind of event.	PRINTDATE (§17.16.5.47), SAVEDATE (§17.16.5.53), TIME (§17.16.5.65)
Document Automation	Provides functionality for automated document processing.	COMPARE (§17.16.5.10), DOCVARIABLE (§17.16.5.15), GOTOBUTTON (§17.16.5.23), IF (§17.16.5.26), MACROBUTTON (§17.16.5.34), PRINT (§17.16.5.46)
Document Information	Inserts or stores information about the document.	AUTHOR (§17.16.5.4), COMMENTS (§17.16.5.9), DOCPROPERTY (§17.16.5.14), FILENAME (§17.16.5.17), FILESIZE (§17.16.5.18), KEYWORDS (§17.16.5.30), LASTSAVEDBY (§17.16.5.31), NUMCHARS (§17.16.5.41), NUMPAGES (§17.16.5.42), NUMWORDS (§17.16.5.43), SUBJECT (§17.16.5.60), TEMPLATE (§17.16.5.64), TITLE (§17.16.5.66)
Equations and Formulas	Defines formulas and calculates results; inserts symbols.	= <i>formula</i> (§17.16.3), ADVANCE (§17.16.5.2), SYMBOL (§17.16.5.61)
Form Fields	Defines fields that support insertion of data through form controls.	FORMCHECKBOX (§17.16.5.20), FORMDROPDOWN (§17.16.5.21), FORMTEXT (§17.16.5.22)
Index and Tables	Defines entries for, and builds, a table of contents, table of figures, or table of authorities.	INDEX (§17.16.5.29), RD (§17.16.5.50), TA (§17.16.5.62), TC (§17.16.5.63), TOA (§17.16.5.67), TOC (§17.16.5.68), XE (§17.16.5.72)
Links and References	Inserts information from another place in the same document or from a different document or file.	AUTOTEXT (§17.16.5.5), AUTOTEXTLIST (§17.16.5.6), BIBLIOGRAPHY (§17.16.5.7), CITATION (§17.16.5.8) HYPERLINK (§17.16.5.25), INCLUDEPICTURE (§17.16.5.27), INCLUDETTEXT (§17.16.5.28), LINK (§17.16.5.32), NOTEREF (§17.16.5.40), PAGEREF (§17.16.5.45), QUOTE (§17.16.5.49), REF (§17.16.5.51), STYLEREF (§17.16.5.59)
Mail Merge	Defines information that is to be used in a mail merge. A <i>mail merge</i> is a process by which a data set (e.g., of names and addresses) is combined with a WordprocessingML document to produce a customized document for	ADDRESSBLOCK (§17.16.5.1), ASK (§17.16.5.3), COMPARE (§17.16.5.10), DATABASE (§17.16.5.12), FILLIN (§17.16.5.19), GREETINGLINE (§17.16.5.24), IF (§17.16.5.26), MERGEFIELD (§17.16.5.35), MERGEREC (§17.16.5.36), MERGESEQ (§17.16.5.37), NEXT (§17.16.5.38), NEXTIF (§17.16.5.39), SET (§17.16.5.57), SKIPIF (§17.16.5.58)

Category	Description	Fields
	each record in said data set. In other words, a <i>mail merge</i> is an operation by which an application replaces certain fields with the data in each record from a corresponding data source (see §17.14 for additional information).	
Numbering	Specifies numbering for document items such as sections and pages; also bar codes.	LISTNUM (§17.16.5.33), PAGE (§17.16.5.44), REVNUM (§17.16.5.52), SECTION (§17.16.5.54), SECTIONPAGES (§17.16.5.55), SEQ (§17.16.5.56)
User Information	Referencethe name, initials, or address of a user account under which the document is manipulated. [<i>Note</i> : These fields can be used in documents to allow applications to perform implementation-defined updates under a particular user's context (if such a context exists); for example, to add the address of the current user to a generic form letter. <i>end note</i>]	USERADDRESS (§17.16.5.69), USERINITIALS (§17.16.5.70), USERNAME (§17.16.5.71)

17.16.5.1 ADDRESSBLOCK

Syntax:

ADDRESSBLOCK [*switches*]

Description: Represents an address block. An *address block* is a block of text specifying information appropriate for a postal mailing address, in the order required by the destination country. [*Example*: An address block for the Canadian postal system might consist of:

```
<<RECIPIENT NAME>>
<<POSTAL ADDRESS>>
<<CITY>>, <<PROVINCE>>, Canada
<<POSTAL CODE>>
```

end example]

Field Value: The address block.

Switches: Zero or more of the following *field-specific-switches*.

<code>\c field-argument</code>	<i>text</i> in this switch's <i>field-argument</i> specifies whether to include the name of the country/region: a value of 0 causes the country/region to be omitted; a value of 1 causes it to be included (regardless of any value given for <code>\e</code>), and a value of 2 causes country/region to be included, but only if it is different from any and all specified values for <code>\e</code> .																								
<code>\d</code>	Specifies that the address is to be formatted according to the country/region of the recipient as defined by POST*CODE (Universal Postal Union 2006). If this switch is not used, then addresses are formatted according to the ordering defined by the <code>\f</code> switch. If that switch is also omitted, addresses are formatted according to some implementation-specific preference.																								
<code>\e field-argument</code>	<i>text</i> in this switch's <i>field-argument</i> specifies a country/region to exclude from the address block. [Note: This is useful when your mailing contains a mix of domestic and international recipients. <i>end note</i>] To exclude more than one country or region, use a <code>\e</code> switch for each one, as multiple <code>\e</code> switches are permitted.																								
<code>\f field-argument</code>	<p><i>text</i> in this switch's <i>field-argument</i> specifies the name and address format by providing a template of merge-field placeholders in the following format: "<<_ + MAPPED NAME + "_>>" (< = U+003C; > = U+003E; _ = U+005F), where MAPPED NAME corresponds to a value specified by the mappedName element (§17.14.23).</p> <p>The following possible values of MAPPED NAME and corresponding mapped merge field names are reserved:</p> <table border="1"> <thead> <tr> <th>MAPPED NAME</th><th>Merge Field Name</th></tr> </thead> <tbody> <tr> <td>TITLE0</td><td>Title</td></tr> <tr> <td>FIRST0</td><td>First Name</td></tr> <tr> <td>LAST0</td><td>Last Name</td></tr> <tr> <td>SUFFIX0</td><td>Suffix</td></tr> <tr> <td>COMPANY</td><td>Company</td></tr> <tr> <td>STREET1</td><td>Address 1</td></tr> <tr> <td>STREET2</td><td>Address 2</td></tr> <tr> <td>CITY</td><td>City</td></tr> <tr> <td>STATE</td><td>State</td></tr> <tr> <td>POSTAL</td><td>Postal Code</td></tr> <tr> <td>COUNTRY</td><td>Country or Region</td></tr> </tbody> </table> <p>[Example: Using these values, a U.S. postal address might be specified as follows:</p> <pre>\f "<<_TITLE0_ >><<_FIRST0_>><< _LAST0_>><< _SUFFIX0_>> <<_COMPANY_>></pre>	MAPPED NAME	Merge Field Name	TITLE0	Title	FIRST0	First Name	LAST0	Last Name	SUFFIX0	Suffix	COMPANY	Company	STREET1	Address 1	STREET2	Address 2	CITY	City	STATE	State	POSTAL	Postal Code	COUNTRY	Country or Region
MAPPED NAME	Merge Field Name																								
TITLE0	Title																								
FIRST0	First Name																								
LAST0	Last Name																								
SUFFIX0	Suffix																								
COMPANY	Company																								
STREET1	Address 1																								
STREET2	Address 2																								
CITY	City																								
STATE	State																								
POSTAL	Postal Code																								
COUNTRY	Country or Region																								

	<<_STREET1_>> <<_STREET2_>> <<_CITY_>><<, _STATE_>><< _POSTAL_>><<_COUNTRY_>>" <i>end example]</i>
\l <i>field-argument</i>	<i>text</i> in this switch's <i>field-argument</i> specifies the language ID used to format the address. The default is to use the language ID of the first character of the document. This language ID is specified in the format defined by ST_Lang (§22.9.2.6)

17.16.5.2 ADVANCE

Syntax:

ADVANCE [*switches*]

Description: When text within a document is rendered, typically, each character is displayed immediately following the previous piece of content (another character, an image, and so on), according to the lexical order of the underlying WordprocessingML. The presence of this field moves the starting point at which the text that lexically follows the field is displayed to the right or left, up or down, or to a specific horizontal or vertical position. It does not affect the display of other run content (e.g., images). The switches used by this field can cause text to overlap when it is displayed. If the text is displayed within the constraints of a fixed page, repositioned text is not display if it is moved beyond the print margins of the current page (even if the target location would logically appear on a previous/following page).

Field Value: None.

Switches: Zero or more of the following *field-specific-switches*.

\d <i>field-argument</i>	Moves the text that follows the field down by the integral number of points specified by <i>text</i> in this switch's <i>field-argument</i> .
\l <i>field-argument</i>	Moves the text that follows the field left by the integral number of points specified by <i>text</i> in this switch's <i>field-argument</i> .
\r <i>field-argument</i>	Moves the text that follows the field right by the integral number of points specified by <i>text</i> in this switch's <i>field-argument</i> .
\u <i>field-argument</i>	Moves the text that follows the field up by the integral number of points specified by <i>text</i> in this switch's <i>field-argument</i> .
\x <i>field-argument</i>	Moves the text that follows the field the integral number of points specified by <i>text</i> in this switch's <i>field-argument</i> from the left edge of the column, frame, or text box.
\y <i>field-argument</i>	Moves the text that follows the field the integral number of points specified by <i>text</i> in this switch's <i>field-argument</i> . This shift is the vertical position relative to the page. The entire line of text that contains the field is moved. This switch is ignored if it specifies a location outside the page margins or if the switch is used inside any of the following: table, text box, footnote, endnote, annotation, header, or footer.

[Example: When the following WordprocessingML is displayed:

```
<w:r>
  <w:t>XX</w:t>
</w:r>
<w:fldSimple w:instrText="ADVANCE \u 6"/>
<w:r>
  <w:t>XX</w:t>
</w:r>
<w:fldSimple w:instrText="ADVANCE \d 12"/>
<w:r>
  <w:t>XX</w:t>
</w:r>
<w:fldSimple w:instrText="ADVANCE \l 20"/>
<w:r>
  <w:t>+</w:t>
</w:r>
<w:fldSimple w:instrText="ADVANCE \x 150"/>
<w:r>
  <w:t>ZZ</w:t>
</w:r>
```

The results are:

```
XXXX
  XX      ZZ
```

end example]

17.16.5.3 ASK

Syntax:

ASK *field-argument-1* *field-argument-2* [*switches*]

field-argument-1:
field-argument

field-argument-2:
field-argument

Description: Prompts the user to enter information and assigns the bookmark designated by *field-argument-1* to represent the user's response. *text* in *field-argument-2* specifies the prompt text, which is displayed in a dialog box. The prompt is displayed each time the ASK field is updated. A response remains assigned to the bookmark until a new response is entered. Represents information needed to elicit and store a response (where a response is any string of characters, including the empty string). When a field update is performed, the text specified by

field-argument-2 is intended for use when requesting the response, and the resulting response is stored within the bookmark (§17.18.29) whose name attribute matches the value specified by *field-argument-1*.

Field Value: None.

Switches: Zero or more of the following *field-specific-switches*.

<code>\d <i>field-argument</i></code>	The <i>text</i> in this switch's <i>field-argument</i> specifies a default response if one is not entered. If no default response is specified, the <i>field</i> result remains unchanged. To specify a blank entry as the default, <i>field-argument</i> shall be "".
<code>\o</code>	When used in a mail merge main document, this causes the display of the prompt once instead of each time a new data record is merged. The same response is inserted in each resulting merged document.

[Example: When the following fields are updated and "John" is entered as the response,

```
ASK AskResponse "What is your first name?"
Hello REF AskResponse.
```

the result is

```
Hello John.
```

end example]

17.16.5.4 AUTHOR

Syntax:

```
AUTHOR [ field-argument ] [ switches ]
```

Description: Retrieves, and optionally sets, the document author's name, as recorded in the Creator element of the Core File Properties part or, if *field-argument* is present, the name specified by *text* in *field-argument*. Specifying a *field-argument* shall change Creator to *text*.

Field Value: The document author's name.

Switches: One of the following *general-formatting-switches*: * Caps, * FirstCap, * Lower, or * Upper.

[Example: Consider the case in which the Creator element is as follows:

```
<Creator>William Jones</Creator>
```

and the following field is updated:

AUTHOR

The result is:

William Jones

Updating the following field:

AUTHOR "Tony Caruso"

causes the Creator element to take on the specified value. *end example*]

17.16.5.5 AUTOTEXT

Syntax:

AUTOTEXT *field-argument*

Description: References the AutoText entry (§17.12.5) that meets the following conditions:

- The val attribute of the gallery element (§17.12.9) has a value of autoTxt.
- The val attribute of the name element (§17.12.13) has the value specified by *text* in *field-argument*.

When a field update is performed, the field result is the WordprocessingML contents of the AutoText entry.

Field Value: The WordprocessingML content of the specified AutoText entry.

Switches: None.

[*Example:* Assuming the following entries are defined with values of current page number, salutation, and a notice:

```
AUTOTEXT "- PAGE -"
AUTOTEXT "Yours truly,"
AUTOTEXT Confidential
```

when evaluated, they might produce the following results.

```
- 13 -
Yours truly,
CONFIDENTIAL
```

end example]

17.16.5.6 AUTOTEXTLIST

Syntax:

AUTOTEXTLIST *field-argument* [*switches*]

Description: Creates a shortcut menu based on AutoText entries in the active template. The list can vary based on the styles applied to the AutoText entries. *text* in *field-argument* is inserted into the document.

A complex field XML implementation shall be used, and the *field-argument* text shall be placed in one or more runs between the separate and end parts of the fldChar element.

Field Value: *text* in *field-argument*.

Switches: Zero or more of the following *field-specific-switches*.

<code>\s <i>field-argument</i></code>	Specifies that the list is to contain entries based on the style specified by <i>text</i> in this switch's <i>field-argument</i> . Without this switch, entries of the current paragraph style appear. If there are no entries for the current style, all entries appear. The style can be a paragraph style or a character style.
<code>\t <i>field-argument</i></code>	<i>text</i> in this switch's <i>field-argument</i> specifies the text to show in the ScreenTip.

[Example: The field:

```
{ AUTOTEXTLIST "List of salutations" \s Salutation \t "Choose a salutation" }
```

causes the following to be displayed: In the document, the Salutation list; in the ScreenTip, Choose a salutation, and on the shortcut menu, the list of entries whose style is Salutation.

end example]

17.16.5.7 BIBLIOGRAPHY

Syntax:

BIBLIOGRAPHY [*switches*]

Description: Retrieves and displays the contents of the document's Bibliography part in the bibliographic style specified within the SelectedStyle attribute of the Sources (§22.6.2.60) element of the Bibliography part.

Field Value: The formatted bibliographic data for all sources in the current document.

Switches: Zero or more of the following *field-specific-switches*.

<code>\l <i>field-argument</i></code>	The <i>text</i> in this switch's <i>field-argument</i> specifies the language ID that shall be used in to format the bibliographic sources in the document that do not specify a locale using the LCID (§22.6.2.39) element. This language ID is specified in the format defined by ST_Lang (§22.9.2.6)
<code>\f <i>field-argument</i></code>	The <i>text</i> in this switch's <i>field-argument</i> specifies the language ID that shall be used to filter the bibliographic data to only the sources in the document that use that language. This language ID is specified in the format defined by ST_Lang (§22.9.2.6)

<code>\m <i>field-argument</i></code>	The <i>text</i> in this switch's <i>field-argument</i> specifies that only the source with a Tag (§22.6.2.65) element value matching <i>field-argument</i> shall be displayed in the bibliography.
---------------------------------------	--

[Example: Consider a document with bibliographic data for ECMA-376:

Author: Ecma International

Title: Office Open XML Document Interchange Specification

Year: 2006

Month: October

the following field is updated:

BIBLIOGRAPHY /l 1033

The result for MLA is:

Ecma International. Office Open XML Document Interchange Specification. October 2006.

And for APA:

Ecma International. (2006, October). Office Open XML Document Interchange Specification.

end example]

17.16.5.8 CITATION

Syntax:

CITATION *field-argument* [*switches*]

Description: Displays the contents of the Source (§22.6.2.59) element with a Tag (§22.6.2.65) element value matching *field-argument* using the bibliographic style specified within the SelectedStyle attribute of the Sources (§22.6.2.60) element of the Bibliography part.

Field Value: The comments relating to the current document.

Switches: Zero or more of the following *field-specific-switches*.

<code>\l <i>field-argument</i></code>	The <i>text</i> in this switch's <i>field-argument</i> specifies the language ID which shall be used in conjunction with the specified bibliographic style to format the citation in the document. This language ID is specified in the format defined by ST_Lang (§22.9.2.6)
<code>\f <i>field-argument</i></code>	The <i>text</i> in this switch's <i>field-argument</i> specifies the prefix which shall be prepended to the citation.

<code>\s field-argument</code>	The <i>text</i> in this switch's <i>field-argument</i> specifies the suffix which shall be appended to the citation.
<code>\p field-argument</code>	The <i>text</i> in this switch's <i>field-argument</i> specifies the page number associated with the citation.
<code>\v field-argument</code>	The <i>text</i> in this switch's <i>field-argument</i> specifies the volume number associated with the citation.
<code>\n</code>	Specifies that the author information shall be suppressed from the citation.
<code>\t</code>	Specifies that the title information shall be suppressed from the citation.
<code>\y</code>	Specifies that the year information shall be suppressed from the citation.
<code>\m field-argument</code>	The <i>text</i> in this switch's <i>field-argument</i> specifies the Tag (§22.6.2.65) element value for another source to be included in this citation's field result.

[Example: Consider a case with bibliographic data for ECMA-376:

Tag: Ecma01

Author: Ecma International

Title: Office Open XML Document Interchange Specification

Year: 2006

Month: October

the following field is updated:

CITATION Ecma01 /1 1033

The result for MLA is:

(Ecma International)

And for APA:

(Ecma International, 2006)

end example]

17.16.5.9 COMMENTS

Syntax:

COMMENTS [*field-argument*] [*switches*]

Description: Retrieves, and optionally sets, the comments relating to the current document, as recorded in the Description element of the Core File Properties part or, if *field-argument* is present, the comments specified by *text* in *field-argument*. Specifying a field-argument shall change Description to *text*.

Field Value: The comments relating to the current document.

Switches: One of the following *general-formatting-switches*: * Caps, * FirstCap, * Lower, or * Upper.

[*Example*: Consider the case in which the Description element is as follows:

<Description>Once upon a time, in a land far, far away ...</Description>

and the following field is updated:

COMMENTS

The result is:

Once upon a time, in a land far, far away ...

Updating the following field:

COMMENTS "I came, I saw, I was not impressed."

causes the Description element to take on the specified value. *end example*]

17.16.5.10 COMPARE

Syntax:

COMPARE *comparison* [*switches*]

Description: Compares the values designated by the two *expressions* in *comparison* using the operator designated by *comparison-operator*. [*Note*: This field can be used to create compound logical comparisons with AND and OR functions in a formula, and then by using the result of the formula in an IF field. *end note*]

[*Note*: *comparison-operator* can be any one of the six relational and equality operators specified for *operator* (§17.16.3.3). *end note*]

If *comparison-operator* is = or <>, the left-hand *expression* operand can contain a question mark (?) to represent any single character, or an asterisk (*) to represent any string of characters. The expression shall be enclosed in quotation marks so that it is compared as a character string.

Field Value: 1 if the comparison is true, or 0 if the comparison is false.

Switches: None.

[*Example*: Consider the case in which the IF field in the following example is inserted into a mail merge main document. The COMPARE fields examine the data fields CustomerNumber and CustomerRating as each data record is merged. The OR function of the formula returns the value 1 if at least one of the data fields indicates poor credit, in which case the first text in quotation marks is printed:

```
{ IF { = OR ( { COMPARE { MERGEFIELD CustomerNumber } >= 4 },  
  { COMPARE { MERGEFIELD CustomerRating } <= 9 } ) } = 1  
  "Credit not acceptable" "Credit acceptable" }
```

The following COMPARE field results in the value 1 if any value in the PostalCode data field is the range 98500–98599:

```
{ COMPARE "{ MERGEFIELD PostalCode }" = "985*" }
```

end example]

17.16.5.11 **CREATEDATE**

Syntax:

```
CREATEDATE [ switches ]
```

Description: Retrieves the date and time at which the document was created, as recorded in the DateCreated element of the Core File Properties part. By default, the Gregorian calendar is used and the *date-and-time-formatting-switch* used is implementation-defined.

Field Value: The date and time at which the document was created.

Switches: Zero or one *date-and-time-formatting-switch* and zero or one of the following *field-specific-switches*.

\h	Use the Hijri Lunar or Hebrew Lunar calendar, depending on the language specified by the lang element (§17.3.2.20).
\s	Use the Saka Era calendar.

[Example: Consider the case in which the DateCreated element is as follows:

```
<DateCreated>2006-01-05T03:31:00Z</DateCreated>
```

and the following fields are updated in a US-English context that is UTC -5:

```
CREATEDATE  
CREATEDATE \@ "dddd, MMMM dd, yyyy HH:mm:ss"  
CREATEDATE \@ "dddd, MMMM dd, yyyy HH:mm:ss" \h  
CREATEDATE \@ "dddd, MMMM dd, yyyy HH:mm:ss" \s
```

the results are:

```
1/4/2006 10:31:00 PM  
Wednesday, January 04, 2006 22:31:00  
AlArbia'a, Thoul Hijjah 04, 1426 22:31:00  
Budhavara, Pausa 14, 1927 22:31:00
```

end example]

17.16.5.12 DATABASE

Syntax:

DATABASE [*switches*]

DATABASE [*switches*]

Description: Inserts the results of a database query into a WordprocessingML table. If the number of columns is 62 or more, the field inserts the results of a query in columns separated by tabs. The DATABASE field contains all the information needed to connect to a database and perform an SQL query. Each time the field is updated, the database is queried again.

Field Value: The results of a database query as a WordprocessingML table.

Switches: Zero or more of the following *field-specific-switches*.

<code>\b <i>field-argument</i></code>	The <i>text</i> in this switch's <i>field-argument</i> specifies which attributes of the format set by the \l switch are to be applied to the table. If the \l switch is blank, the \b switch value shall be 16 (AutoFit). <i>text</i> can have a value that is the bitwise-or of any combination of the following: 0, None 1, Borders 2, Shading 4, Font 8, Color 16, AutoFit 32, Heading Rows 64, Last Row 128, First Column 256, Last Column
<code>\c <i>field-argument</i></code>	The <i>text</i> in this switch's <i>field-argument</i> specifies a connection to the data.
<code>\d <i>field-argument</i></code>	The <i>text</i> in this switch's <i>field-argument</i> specifies the complete path and file name of the database. Used for all database queries except a query to an SQL database table using ODBC.
<code>\f <i>field-argument</i></code>	The <i>text</i> in this switch's <i>field-argument</i> specifies the integral record number of the first data record to insert
<code>\h</code>	Inserts the field names from the database as column headings in the resulting table.
<code>\l <i>field-argument</i></code>	The <i>text</i> in this switch's <i>field-argument</i> specifies the format that is to be applied to the result of the database query. If this switch is used and the \b switch doesn't specify the table attributes, an unformatted table is inserted.
<code>\o <i>field-argument</i></code>	Inserts data at the beginning of a merge. By adding the \o switch to

	the database field, it only gets the data for the database field at the beginning of a merge instead of once for each record merged. This is a performance optimization and should only be used when the database field doesn't rely on record specific information to gather.
<code>\s <i>field-argument</i></code>	The <i>text</i> in this switch's <i>field-argument</i> specifies a set of SQL instructions. Each quotation mark in the instructions shall be preceded by a backslash (\).
<code>\t <i>field-argument</i></code>	The <i>text</i> in this switch's <i>field-argument</i> specifies the integral record number of the last data record to insert.

[Example: The following field results from a query to a database through ODBC:

```
{ DATABASE \d "C:\\Data\\Sales93.mdb" \c "DSN=MS Access Database;
  DBQ=C:\\Data\\Sales93.mdb; FIL=RedISAM"
  \s "select * from \"Customer List\"\" \f "2445" \t "2486" \l "2"
```

end example]

17.16.5.13 DATE

Syntax:

DATE [*switches*]

DATE [*switches*]

Description: The current date and time. If no calendar is specified via a *field-specific-switch* or *date-and-time-formatting-switch*, the Gregorian calendar [ISO 8601, §3.2.1] is used. As specified in §17.16.4.1, if no *date-and-time-formatting-switch* is present, a date or time result is formatted in an implementation-defined manner.

Field Value: The current date and time.

Switches: Zero or one *date-and-time-formatting-switch* and zero or one of the following *field-specific-switches*.

<code>\h</code>	Use the Hijri Lunar or Hebrew Lunar calendar, depending on the language specified by the lang element (§17.3.2.20).
<code>\l</code>	When a field update is performed, if no <i>date-and-time-formatting-switch</i> is used, this switch is an instruction specifying that the field shall use the <i>date-and-time-formatting-switch</i> last used by the hosting application when inserting a new DATE field. If there is no last-used date format available, then the <i>date-and-time-formatting-switch</i> used is implementation-defined.
<code>\s</code>	Use the Saka Era calendar.

[*Example*: Consider the case in which the following fields are updated in a US-English context by an application with a default *date-and-time-formatting-switch* of M/d/yyyy on 2006-01-05T19:09:01:

DATE

DATE \@ "dddd, MMMM dd, yyyy HH:mm:ss"

DATE \@ "dddd, MMMM dd, yyyy HH:mm:ss" \h

DATE \@ "dddd, MMMM dd, yyyy HH:mm:ss" \s

the results are:

1/5/2006

Thursday, January 05, 2006 19:09:01

AlKhamis, Thoul Hijjah 05, 1426 19:09:01

Bruhaspathivara, Pausa 15, 1927 19:09:01

end example]

[*Note*: For some *date-and-time-formatting-switches*, the DATE and TIME (§17.16.5.65) fields can produce the same result. *end note*]

17.16.5.14 DOCPROPERTY

Syntax:

DOCPROPERTY *docprop-category* [*switches*]

Description: Retrieves the indicated document information. For some combinations of DOCPROPERTY and *docprop-category*, there is an equivalent field, in which case, the description for the combination can be obtained from that field. For those combinations not having an equivalent field, the description is shown directly. When used directly, some of the equivalent fields allow the value of the designated property to be changed. However, when the corresponding DOCPROPERTY field is used, such values shall not be changed. This is indicated in the following table by "Read-only operation."

docprop-category	Corresponding Field	Description
AUTHOR	AUTHOR (§17.16.5.4)	Read-only operation.
BYTES	FILESIZE (§17.16.5.18)	
CATEGORY	No equivalent	The contents of the Category element of the Core File Properties part.
CHARACTERS	NUMCHARS (§17.16.5.41)	
CHARACTERSWITHSPACES	No equivalent	Like NUMCHARS, but includes all white space characters as well.
COMMENTS	COMMENTS (§17.16.5.7)	Read-only operation.

docprop-category	Corresponding Field	Description
COMPANY	No equivalent	The contents of the Company element of the Application-Defined File Properties part.
CREATETIME	CREATEDATE (§17.16.5.11)	
HYPERLINKBASE	No equivalent	The contents of the HyperlinkBase element of the Application-Defined File Properties part.
KEYWORDS	No equivalent	The contents of the Keywords element of the Core File Properties part.
LASTPRINTED	PRINTDATE (§17.16.5.47)	
LASTSAVEDBY	LASTSAVEDBY (§17.16.5.31)	
LASTSAVEDTIME	SAVEDATE (§17.16.5.53)	
LINES	No equivalent	The contents of the Lines element of the Application-Defined File Properties part.
MANAGER	No equivalent	The contents of the Manager element of the Application-Defined File Properties part.
NAMEOFAPPLICATION	No equivalent	The contents of the Application element of the Application-Defined File Properties part.
ODMADOCID		
PAGES	NUMPAGES (§17.16.5.42)	
PARAGRAPHS	No equivalent	The contents of the Paragraphs element of the Application-Defined File Properties part.
REVISIONNUMBER	REVNUM (§17.16.5.52)	
SECURITY	No equivalent	The contents of the DocSecurity element of

docprop-category	Corresponding Field	Description
		the Application-Defined File Properties part.
SUBJECT	SUBJECT (§17.16.5.60)	Read-only operation.
TEMPLATE	TEMPLATE (§17.16.5.64)	
TITLE	TITLE (§17.16.5.66)	Read-only operation.
TOTALEDITINGTIME	EDITTIME (§17.16.5.16)	
WORDS	No equivalent	The contents of the Words element of the Application-Defined File Properties part.

Field Value: The indicated document information.

17.16.5.15 DOCVARIABLE

Syntax:

DOCVARIABLE *field-argument*

DOCVARIABLE field-argument

Description: Inserts the string assigned to the document variable designated by *text* in *field-argument*. Each WordprocessingML document has a collection of variables. This field is used to access and display the contents of docVar (§17.15.1.31) elements in the Document Settings part.

Field Value: The value of the specified document variable.

Switches: None.

17.16.5.16 EDITTIME

Syntax:

EDITTIME [*switches*]

Description: Retrieves the total editing time, in minutes, since the document was created, as recorded in the TotalTime element of the Application-Defined File Properties part. By default, the *numeric-formatting-switch* or *general-formatting-switch* used is implementation-defined.

Field Value: The total editing time, in minutes.

Switches: Zero or one *numeric-formatting-switch* or *general-formatting-switch*.

[*Example:* Consider the case in which the TotalTime element is as follows:

<TotalTime>930</TotalTime>

and the following fields are updated in a US-English context:

```
EDITTIME
EDITTIME \* OrdText
EDITTIME \# "#,##0"
```

the results are:

```
930
nine hundred thirtieth
930
```

end example]

17.16.5.17 FILENAME

Syntax:

FILENAME [*switches*]

Description: Retrieves the name of the current document from its storage location.

Field Value: The name of the current document.

Switches: One of the following *general-formatting-switches*: * Caps, * FirstCap, * Lower, or * Upper, and zero or one of the following *field-specific-switches*.

\p	Include the full file path name.
----	----------------------------------

[*Example:* Consider the case in which the following fields are updated:

```
FILENAME \* Upper
FILENAME \p
```

the results might be:

```
FIELD DEMO SUITE.DOCX
E:\Std\OOXML\Fields\Field Demo Suite.docx
http://example.com/files/myFile.docx
```

end example]

17.16.5.18 FILESIZE

Syntax:

FILESIZE [*switches*]

Description: The size of the WordprocessingML package in bytes, or the empty string if the size of the package cannot be determined when a field update is performed. [*Example:* If the package is being streamed, and its size

is not yet known by the application reading that stream. *end example*] [*Note*: This information is not stored inside the document's XML. *end note*]

Field Value: The size of the current document in bytes.

Switches: Zero or one *numeric-formatting-switch* or *general-formatting-switch* and zero or one of the following *field-specific-switches*.

\k	Round to the nearest thousand bytes.
\m	Round to the nearest million bytes.

[*Example*: Consider the case in the document's size is 4,660,736 bytes and the following fields are updated:

FILESIZE \# #,##0

FILESIZE \k

FILESIZE \m

the results are:

4,660,736

4661

5

end example]

17.16.5.19 FILLIN

Syntax:

FILLIN [*field-argument*] [*switch*]

Description: Prompts the user to enter text. *text* in *field-argument* contains the prompt. The prompt is displayed each time the field is updated. When a new document is created based on a template containing FILLIN fields, those fields are updated automatically.

Field Value: The user's response.

Switches: Zero or more of the following *field-specific-switches*.

\d <i>field-argument</i>	The <i>text</i> in this switch's <i>field-argument</i> specifies a default response if one is not entered. If no default response is specified, the most recent response is used. To specify a blank entry as the default, <i>field-argument</i> shall be "".
\o	When used in a mail merge main document, this causes the display of the prompt once instead of each time a new data record is merged. The same response is inserted in each resulting merged document.

[*Example:* The following FILLIN field helps the user fill in the correct information by displaying the patient name from the current data record:

FILLIN "Please enter the appointment time for MERGEFIELD PatientName :"

end example]

17.16.5.20 FORMCHECKBOX

Syntax:

FORMCHECKBOX

Description: Inserts a check box style form field which, when the editing of form fields is enabled using the documentProtection element (§17.15.1.29), can be checked and unchecked. An instance of this field shall be accompanied by a use of the ffData element (§17.16.17) which contains the form field's properties.

Field Value: A check box based on the properties of the ffData element (§17.16.17).

Switches: None.

[*Example:* Consider the following fields:

FORMCHECKBOX

Assuming the appropriate properties are used in the child XML elements of the field, a check box is displayed.

end example]

17.16.5.21 FORMDROPDOWN

Syntax:

FORMDROPDOWN

Description: Inserts a drop-down list style form field which, when the editing of form fields is enabled using the documentProtection element (§17.15.1.29), can be used to select an entry in the list. An instance of this field shall be accompanied by a use of the ffData element (§17.16.17) which contains the form field's properties.

Field Value: A drop-down list based on the properties of the ffData element (§17.16.17).

Switches: None.

[*Example:* Consider the following fields:

FORMDROPDOWN

Assuming the appropriate properties are used in the child XML elements of the field, a drop-down list is displayed.

end example]

17.16.5.22 FORMTEXT

Syntax:

FORMTEXT

Description: Inserts a text box style form field which, when the editing of form fields is enabled using the documentProtection element (§17.15.1.29), can be typed into. An instance of this field shall be accompanied by a use of the ffData element (§17.16.17) which contains the form field's properties.

Field Value: A text box based on the properties of the ffData element (§17.16.17).

Switches: None.

[*Example:* Consider the following fields:

FORMTEXT

Assuming the appropriate properties are used in the child XML elements of the field, a text box is displayed.

end example]

17.16.5.23 GOTOBUTTON

Syntax:

GOTOBUTTON *field-argument-1* *field-argument-2*

field-argument-1:
expression

field-argument-2:
expression

Description: Inserts a jump command, such that when it is activated, the insertion point of the document is moved to the location specified by *text* in *field-argument-1*. *text* can be a bookmark, a page number, or some other item (as described below). The page number can be a reference resulting from a REF field. The other items than can be locations are:

a <i>n</i>	annotation
f <i>n</i>	footnote
l <i>n</i>	line
p <i>n</i>	page
s <i>n</i>	section

where *n* is an integer that designates the *n*th occurrence of the corresponding item (which is not necessarily the item numbered *n*).

text in *field-argument-2* is the text or graphic "button" that appears in the document, such that it can be selected to activate the jump. [Note: The BOOKMARK and INCLUDEPICTURE fields make for some interesting button possibilities. *end note*] The text or graphic shall appear on one line in the field result; otherwise, an error occurs.

Field Value: None.

Switches: None.

[Example: Consider the following fields:

```
GOTOBUTTON MyBookmark Dest
GOTOBUTTON p3 Page
GOTOBUTTON "f 2" Footnote
```

When the Dest "button" is activated, the insertion point becomes the location marked by MyBookmark. When Page is activated, the insertion point becomes the beginning of the third page. When Footnote is activated, the insertion point becomes the marker of the second footnote, at the place it is used in the document, not in any footnote list.

end example]

17.16.5.24 GREETINGLINE

Syntax:

GREETINGLINE [*switches*]

Description: Inserts a mail merge greeting line.

Field Value: The greeting line.

Switches: Zero or more of the following *field-specific-switches*.

<code>\c <i>field-argument</i></code>	The <i>text</i> in this switch's <i>field-argument</i> specifies the text to include in the merge field if the name field in the data source is blank.
<code>\c <i>field-argument</i></code>	The <i>text</i> in this switch's <i>field-argument</i> specifies the format of the name included in the field.
<code>\l <i>field-argument</i></code>	The <i>text</i> in this switch's <i>field-argument</i> specifies the language ID used to format the name. it defaults to the language ID of the first character of the document. This language ID is specified in the format defined by ST_Lang (§22.9.2.6)

17.16.5.25 HYPERLINK

Syntax:

HYPERLINK *field-argument* [*switches*]

Description: When selected, causes control to jump to the location specified by *text* in *field-argument*. That location can be a bookmark or a URL.

Field Value: None.

Switches: Zero or more of the following *field-specific-switches*.

<code>\l <i>field-argument</i></code>	<i>text</i> in this switch's <i>field-argument</i> specifies a location in the file, such as a bookmark, where this hyperlink jumps.
<code>\m</code>	Appends coordinates to a hyperlink for a server-side image map.
<code>\n</code>	Causes the destination site to be opened in a new web browser window.
<code>\o <i>field-argument</i></code>	<i>text</i> in this switch's <i>field-argument</i> specifies the ScreenTip text for the hyperlink.
<code>\t <i>field-argument</i></code>	<p><i>text</i> in this switch's <i>field-argument</i> specifies the target to which the link should be redirected. Use this switch to link from a frames page to a page that you want to appear outside of the frames page. The permitted values for <i>text</i> are:</p> <ul style="list-style-type: none"> • <code>_top</code>, whole page (the default) • <code>_self</code>, same frame • <code>_blank</code>, new web browser window • <code>_parent</code>, parent frame

[Example:

```
HYPERLINK http://www.example.com/
HYPERLINK "E:\\ReadMe.txt"
```

end example]

17.16.5.26 IF

Syntax:

`IF comparison field-argument-1 field-argument-2`

field-argument-1:
expression

field-argument-2:
expression

Description: Compares the values designated by the *expressions* in *comparison* using the operator designated by *comparison-operator*.

[Note: *comparison-operator* can be any one of the six relational and equality operators specified for operator (§17.16.3.3). end note]

If *comparison-operator* is = or <>, the left-hand *expression* operand can contain a question mark (?) to represent any single character, or an asterisk (*) to represent any string of characters.

Field Value: *field-argument-1* if the comparison is true; otherwise, *field-argument-2*.

Switches: None.

[*Example:* The following example specifies that if the customer order is greater than or equal to 100 units, the result is "Thanks"; but if the customer order is fewer than 100 units, the result is "The minimum order is 100 units":

```
{IF order >= 100 "Thanks" "The minimum order is 100 units" }
```

For other examples, see §17.16.2, and the COMPARE field (§17.16.5.10) and the QUOTE field (§17.16.5.48). *end example*]

17.16.5.27 INCLUDEPICTURE

Syntax:

INCLUDEPICTURE *field-argument* [*switches*]

Description: Retrieves the picture named by *field-argument* and displays it as the field result. *Field-argument* specifies the location of the picture using an IRI.

[*Note:* A list of possible image formats is provided in §15.2.14. *end note*]

Field Value: The specified picture.

Switches: Zero or more of the following *field-specific-switches*.

\c <i>field-argument</i>	If <i>text</i> in this switch's <i>field-argument</i> identifies the graphics filter to be used.
\d	Reduce the file size by not storing graphics data with the document.

[*Example:*

```
INCLUDEPICTURE "file:///g:/photos/Ellen%20in%20slo.jpg"
```

end example]

17.16.5.28 INCLUDETTEXT

Syntax:

INCLUDETTEXT *field-argument-1* [*field-argument-2*] [*switches*]

field-argument-1:
field-argument

field-argument-2:
field-argument

Description: Inserts all or part of the text and graphics contained in the document named by *field-argument-1*. *field-argument-1* specifies the location of the document using an IRI (Duerst and Suignard 2005). If the document is a WordprocessingML document, the portion marked by the optional bookmark *field-argument-2* is inserted. If no such bookmark is specified here, the whole document is inserted. If the document is an XML file, the fragment referred to by an XPath expression in the \x switch is inserted. If no such switch is specified, the whole XML file is inserted.

If *field-argument-1* contains white space, it shall be enclosed in double quotes.

[Note: A list of possible text formats is provided in §11.3.1. *end note*]

Field Value: The specified text and graphics.

Switches: Zero or more of the following *field-specific-switches*.

\!	Prevents this field from being updated unless all fields in the inserted text are first updated in their original document.
\c <i>field-argument</i>	Specifies that the file specified by <i>field-argument-2</i> shall be processed by a document filter whose name matches the corresponding <i>field-argument</i> value. Possible <i>field-argument</i> values are implementation-defined.
\e	Specifies the encoding applied to the data within the file referenced by <i>field-argument-1</i> . If this argument is omitted, applications should attempt to determine the encoding by reading the file's contents if possible.
\m	Specifies the MIME type of the file referenced by <i>field-argument-1</i> , as defined by http://www.iana.org/assignments/media-types/ . If this argument is omitted, applications should attempt to determine the file type from its contents if possible.
\n <i>field-argument</i>	The <i>text</i> in this switch's <i>field-argument</i> specifies a namespace mapping for XPath queries. This switch is required if the \x switch refers to an element by name in an XML file that declares a namespace.
\t <i>field-argument</i>	The <i>text</i> in this switch's <i>field-argument</i> specifies an XSLT for formatting XML data.
\x <i>field-argument</i>	The <i>text</i> in this switch's <i>field-argument</i> specifies the XPath for returning a fragment of data in an XML file.

[Example: The following field inserts the portion of the WordprocessingML document referred to by the bookmark Summary:

```
INCLUDETEXT "file:///C:/Winword/Port Development RFP" Summary
```

The following field inserts the Name element of the XML document Resume.xml and applies the XSLT Display.xsl to it:

```
INCLUDETEXT "file:///C:/Resume.xml" \n xmlns:a=\"resume-schema\"
\t "file:///C:/display.xsl" \x a:Resume/a:Name
```

end example]

17.16.5.29 INDEX

Syntax:

```
INDEX [ switches ]
```

Description: Builds an index using the index entries specified by XE fields (§17.16.5.72), and inserts that index at this place in the document. Each index entry and subentry is a separate paragraph unless the \r switch is used, in which case, an index entry and all its subentries together make up a paragraph.

Field Value: The index.

Switches: Zero or more of the following *field-specific-switches*.

\b <i>field-argument</i>	Builds an index for the portion of the document marked by the bookmark indicated by <i>text</i> in this switch's <i>field-argument</i> .
\c <i>field-argument</i>	Builds an index having the number of columns per page specified by <i>text</i> in this switch's <i>field-argument</i> . That number can be 1–4. Without this switch, the number of columns is 1.
\d <i>field-argument</i>	The <i>text</i> in this switch's <i>field-argument</i> specifies a sequence of characters that is used to separate sequence numbers and page numbers when the \s switch is used. By default, a hyphen (-) is used.
\e <i>field-argument</i>	The <i>text</i> in this switch's <i>field-argument</i> specifies a sequence of characters that is used to separate an index entry and its first page number. By default, a comma (,) and space sequence is used. If <i>text</i> contains a horizontal tab character, the page number list is right justified in the column.
\f <i>field-argument</i>	Builds an index using only those entries having the entry type (§17.16.5.72) specified by <i>text</i> in this switch's <i>field-argument</i> . Without this switch, all entries included.
\g <i>field-argument</i>	The <i>text</i> in this switch's <i>field-argument</i> specifies a sequence of characters that is used to separate the start and end of a page range. By default, an en dash is used.
\h <i>field-argument</i>	Builds an index such that the <i>text</i> in this switch's <i>field-argument</i> occurs as a heading—formatted with the Index Heading style—at the start of each set of entries for any given letter. If the first letter in <i>text</i> is A or a, that letter is replaced with the corresponding letter for each letter set. To replace the default heading with a blank line, use a space as <i>text</i> . [Example:

	<p>INDEX \h "a Entries Follow" \c "1" \z "1033"</p> <p>F Entries Follow fox, 1</p> <p>Q Entries Follow quick brown fox. See Fox</p> <p><i>end example]</i></p>
\k <i>field-argument</i>	<p>The <i>text</i> in this switch's <i>field-argument</i> specifies a sequence of characters that is used to separate an index entry and its cross reference (as produced by an XE entry (§17.16.5.72) having a \t switch). By default, a period (.) and space sequence is used. [Example: The quick brown fox{ XE "fox" } jumps over the lazy dog. The quick brown fox jumps over the lazy dog. The quick brown fox jumps over the lazy dog. The quick brown fox{ XE "quick brown fox" \t "See Fox" } jumps over the lazy dog. The quick brown fox jumps over the lazy dog.</p> <p>INDEX \k <test> \c "1" \z "1033"</p> <p>fox, 1 quick brown fox <test>See Fox</p> <p><i>end example]</i></p>
\l <i>field-argument</i>	<p>The <i>text</i> in this switch's <i>field-argument</i> specifies a sequence of characters that is used to separate two page numbers in a page number list. By default, a comma (,) and space sequence is used.</p>
\p <i>field-argument</i>	<p>Builds an index using only those entries whose first letter is in the range of letters specified by <i>text</i> in this switch's <i>field-argument</i>. The letter range has the form <i>startLetter-endLetter</i>. If <i>startLetter</i> is !, entries whose first character is not a letter, are also included, as are the letters starting from A. The letters in the range can be either upper- or lowercase.</p>
\r	<p>Runs subentries into the same line as the main entry. Colons (:) separate main entries from subentries; semicolons (;) separate subentries.</p>
\s <i>field-argument</i>	<p>The <i>text</i> in this switch's <i>field-argument</i> is used as a sequence name, and the sequence number is included along with the page number, these numbers being separated by a hyphen (-), by default. Use the \d switch to specify a separator character other than the default.</p>
\y	<p>Enables the use of yomi text for index entries.</p>
\z <i>field-argument</i>	<p>The <i>text</i> in this switch's <i>field-argument</i> specifies the language ID used to generate the index. This language ID is specified in the format defined by ST_Lang (§22.9.2.6)</p>

[Example: The index produced using the corresponding set of index entries and the field INDEX \c "1" \e "tab" \g " to " \h "A" \z "1033" is:

B

behavior

implementation-defined 2

documenting 3

I

item

package-relationship See package-relationship item

O

Office Open XML 2, 3, 4

X

XML 1 to 4

end example]

17.16.5.30 **KEYWORDS**

Syntax:

KEYWORDS [*field-argument*] [*switches*]

Description: Retrieves, and optionally sets, the document's keywords, as recorded in the Keywords element of the Core File Properties part or, if *field-argument* is present, the subject specified by *text* in *field-argument*. Specifying a *field-argument* shall change Keywords to *text*. The Keywords element contains a string of text whose format and semantics is unspecified by ECMA-376.

Field Value: The document's keywords

Switches: One of the following *general-formatting-switches*: * Caps, * FirstCap, * Lower, or * Upper.

[*Example:* Consider the case in which the Keywords element is as follows:

<Keywords>switch, field, syntax</Keywords>

and the following field is updated:

KEYWORDS

The result is:

switch, field, syntax

Updating the following field:

KEYWORDS "field, formatting, switch, syntax"

causes the Subject element to take on the given value. *end example*]

17.16.5.31 LASTSAVEDBY

Syntax:

LASTSAVEDBY [*switches*]

Description: Retrieves the name of the user who last modified and saved the current document, as recorded in the LastModifiedBy element of the Core File Properties part.

Field Value: The name of the user who last modified and saved the current document.

Switches: One of the following *general-formatting-switches*: * Caps, * FirstCap, * Lower, or * Upper.

[*Example:* Consider the case in which the LastModifiedBy element is as follows:

```
<LastModifiedBy>Elizabeth Martin</LastModifiedBy>
```

and the following field is updated:

```
LASTSAVEDBY \* Upper
```

the result might be:

```
ELIZABETH MARTIN
```

end example]

17.16.5.32 LINK

Syntax:

LINK *field-argument-1* *field-argument-2* [*field-argument-3*] [*switches*]

field-argument-1:
field-argument

field-argument-2:
field-argument

field-argument-3:
field-argument

Description: For information copied from another application, this field links that information to its original source file. The application type of the link information is specified by *field-argument-1*. The name and location of the source file is specified by *field-argument-2*. *field-argument-3* specifies the portion of the source file that's being linked. [*Example:* If the source file is a SpreadsheetML document, the reference might be to a cell reference or a named range. For a WordprocessingML document, it might be a bookmark. *end example*]

Field Value: None.

Switches: Zero or more of the following *field-specific-switches*.

\a	Causes this field to be updated automatically.
\b	Inserts the linked object as a bitmap.
\d	Don't store the graphic data with the document, thus reducing the file size.
\f <i>field-argument</i>	Causes the linked object to update its formatting in a particular way, according to the integral value of <i>text</i> in this switch's <i>field-argument</i> . The possible values are: <ul style="list-style-type: none"> • 0 Maintain the formatting of the source file • 1 Not supported • 2 Match the formatting of the destination document • 3 Not supported • 4 Maintain the formatting of the source file, if the source file is a SpreadsheetML workbook • 5 Match the formatting of the destination document, if the source file is a SpreadsheetML workbook
\h	Inserts the linked object as HTML format text.
\p	Inserts the linked object as a picture.
\r	Inserts the linked object in rich-text format (RTF).
\t	Inserts the linked object in text-only format.
\u	Inserts the linked object as Unicode text.

[*Example:* The following example inserts a range of cells from a SpreadsheetML worksheet. The \a switch ensures that the information is updated in the WordprocessingML document whenever the worksheet is changed:

```
{ LINK Excel.Sheet.8 "C:\\My Documents\\Profits.xls"
  "Sheet1!R1C1:R4C4" \a \p }
```

end example]

17.16.5.33 LISTNUM

Syntax:

LISTNUM [*field-argument*] [*switches*]

Description: Computes the next value from a specific level of a numbering definition, or a specific value from a specific level of a numbering definition.

The terms numbering definition and level are used as defined in §17.9. Within the context of this field, determining the numbering definition is equivalent to reading the value of the numId element (§17.9.18), and determining the level is equivalent to reading to value of the ilvl element (§17.9.3). [*Rationale:* This field is

distinct from the numbering defined by the syntax in §17.9. This syntax stores the numbering as run content, rather than a paragraph property. This allows multiple numbered items to occur in a single paragraph; at locations other than the start of the paragraph, etc. *end rationale*]

For LISTNUM fields, the associated numbering definition is calculated using the first of the following conditions met:

- If *field-argument* is NumberValue, OutlineDefault, or LegalDefault, all items with each value are part of a single numbering definition.
- If the current paragraph has numbering applied, all items within that paragraph are part of its numbering definition.
- If field-argument is present, the field belongs to the numbering definition used by level one of the abstract numbering definition (§17.9.1) whose name element (§17.9.13) matches *field-argument*. If no such list exists, then the field shall behave as though field-argument was omitted.
- If *field-argument* has been omitted, the field belongs to the same numbering definition as the last instance of a LISTNUM field or numbered paragraph present in the document.

Once the numbering definition has been determined, the level is calculated as follows:

- If the \l switch is present, the value of that switch overrides all subsequent rules.
- If *field-argument* is NumberValue, OutlineDefault, or LegalDefault:
 - The first instance of the field is level one.
 - Each instance of the field which occurs at the start of the paragraph preceded only by other LISTNUM fields (or nothing) increments the level by one. [*Example: A LISTNUM field with no field-argument inserted as the first item in a paragraph using level one of a numbering definition is at level two. end example*]
 - The first instance of the field which occurs after other paragraph content increments the level by one, and all subsequent LISTNUM fields belong to the same level. [*Example: Consider the following paragraph content: {LISTNUM} {LISTNUM} test {LISTNUM} test2 {LISTNUM} {LISTNUM}. Within this paragraph, the first two instances of the field are levels one and two, and the third through fifth instances of the field are part of level three. end example*]
- If *field-argument* has any other value:
 - If the current paragraph has numbering applied, that paragraph numbering resets the level to one.
 - Each LISTNUM field which occurs at the start of the paragraph preceded only by other LISTNUM fields (or nothing) increments the level by one. [*Example: A LISTNUM field with no field-argument inserted as the first item in a paragraph using level one of a numbering definition is at level two. end example*]
 - The first LISTNUM field which occurs after other paragraph content increments the level by one, and all subsequent LISTNUM fields belong to the same level. [*Example: Consider the following paragraph content: {LISTNUM} {LISTNUM} test {LISTNUM} test2 {LISTNUM}*

{LISTNUM}. Within this paragraph, the first two instances of the field are levels one and two, and the third through fifth instances of the field are part of level three. *end example*]

- Fields in paragraphs with no numbering applied start at the same level as the last instance of a LISTNUM field or numbered paragraph present in the document.

The XML generated for a complex field implementation shall not have the optional field value stored.

Although the value of a LISTNUM field is calculated as a consecutive-valued non-negative integer, once a value is computed, the corresponding integer is rendered in the appropriate format, as described below. In all possible display methods, the list entry value is considered to be a number, and the list to be a numbered list. There are nine levels of list, and the result style used for each is determined based on the *field-argument* as follows:

- If the *field-argument* is NumberValue, OutlineDefault, or LegalDefault, the formatting is based on the table below.
- For any other value, the formatting is based on the abstract numbering definition (§17.9.1) whose name element (§17.9.13) matches *field-argument*. If no such list exists, then the field shall behave as though *field-argument* was omitted.
- If *field-argument* has been omitted:
 - If the current paragraph has numbering applied, the field shall take on the format of the next level of the corresponding numbering definition. [*Example*: A LISTNUM field inserted into a paragraph using level one of a numbering definition is displayed in the format defined by level two of that numbering definition. *end example*]
 - If not, the field takes on the numbering format of the last instance of a LISTNUM field or numbered paragraph present in the document.

The following tables describe the predefined sequences NumberValue, OutlineDefault, and LegalDefault. The formats described are used as defined by ST_NumberFormat (§17.18.59).

Level	NumberValue Value Content and Format
1	The decimal format followed immediately by ")". [<i>Example</i> : "3)", "9)", and "15)". <i>end example</i>].
2	The lowerLetter format followed immediately by ")". [<i>Example</i> : "c)", "i)", and "o)". <i>end example</i>].
3	The lowerRoman format followed immediately by ")". [<i>Example</i> : "iii)", "ix)", and "xv)". <i>end example</i>].
4	The decimal format surrounded by "(" and ")", without any intervening white space. [<i>Example</i> : "(3)", "(9)", and "(15)". <i>end example</i>].
5	The lowerLetter format surrounded by "(" and ")", without any intervening white space. [<i>Example</i> : "(c)", "(i)", and "(o)". <i>end example</i>].
6	The lowerRoman format surrounded by "(" and ")", without any intervening white space. [<i>Example</i> : "(iii)", "(ix)", and "(xv)". <i>end example</i>].
7	The decimal format followed immediately by ".". [<i>Example</i> : "3.", "9.", and "15.". <i>end example</i>].

Level	NumberValue Value Content and Format
8	The lowerLetter format followed immediately by ".". [Example: "c.", "i.", and "o.". end example].
9	The lowerRoman format followed immediately by ".". [Example: "iii.", "ix.", and "xv.". end example].

Level	OutlineDefault Value Content and Format
1	The upperRoman format followed immediately by ".". [Example: "III.", "IX.", and "XV.". end example].
2	The upperLetter format followed immediately by ".". [Example: "C.", "I.", and "O.". end example].
3	The decimal format followed immediately by ".". [Example: "3.", "9.", and "15.". end example].
4	The lowerLetter format followed immediately by ")". [Example: "(c)", "(i)", and "(o)". end example].
5	The decimal format surrounded by "(" and ")", without any intervening white space. [Example: "(3)", "(9)", and "(15)". end example].
6	The lowerLetter format surrounded by "(" and ")", without any intervening white space. [Example: "(c)", "(i)", and "(o)". end example].
7	The lowerLetter format defined by ST_NumberFormat surrounded by "(" and ")", without any intervening white space. [Example: "(iii)", "(ix)", and "(xv)". end example].
8	The lowerLetter format surrounded by "(" and ")", without any intervening white space. [Example: "(c)", "(i)", and "(o)". end example].
9	The lowerRoman format surrounded by "(" and ")", without any intervening white space. [Example: "(iii)", "(ix)", and "(xv)". end example].

Level	LegalDefault Value Content and Format
1	The decimal format followed immediately by ".". [Example: "3.", "9.", and "15.". end example].
2–9	A sequence consisting of the last number from each previous level (delimited by "." followed immediately by the next value at this level and "." (all in the decimal format). [Example: "1.3.", "2.4.9.", and "1.3.7.2.15.". end example].

Field Value: The next value, or a specific value, from the numbering definition which this instance of the LISTNUM field belongs to (as described above).

Switches: Zero or more of the following *field-specific-switches*.

<code>\l field-argument</code>	<i>text</i> in this switch's <i>field-argument</i> is an integer that specifies the level in the list, overriding the default behavior of the field. If <code>\l</code> is omitted, for a new series, the default value is 3; otherwise, the current level is continued.
<code>\s field-argument</code>	<i>text</i> in this switch's <i>field-argument</i> is an integer that specifies the starting value for this field. If <code>\s</code> is omitted, for a new series, the default value is 1; otherwise, the current series numbering is continued.

[*Example:* When the following fields are updated:

We need to perform the following functions: LISTNUM NumberDefault \l 3 \s 1 Get approval for the project. LISTNUM Arrange for funding. LISTNUM Hire staff.

The results are:

We need to perform the following functions: i) Get approval for the project. ii) Arrange for funding. iii) Hire staff.

When the following fields are updated:

```
LISTNUM NumberDefault \l 3 \s 1
LISTNUM
LISTNUM NumberDefault
LISTNUM NumberDefault \s 3
LISTNUM
LISTNUM NumberDefault \l 1
LISTNUM
LISTNUM NumberDefault \l 1 \s 1
LISTNUM LegalDefault \l 1 \s 1
LISTNUM LegalDefault
LISTNUM LegalDefault \l 1
LISTNUM LegalDefault \s 4
LISTNUM LegalDefault
```

The results are:

```
i)
ii)
iii)
iii)
iv)
2)
3)
1)
1.1.1.
1.1.2.
2.
2.1.4.
2.1.5.
```

end example]

17.16.5.34 MACROBUTTON

Syntax:

MACROBUTTON *field-argument-1 field-argument-2*

field-argument-1:
field-argument

field-argument-2:
field-argument

Description: Allows the macro or command designated by *text* in *field-argument-1* to be run. *text* in *field-argument-2* designates the text or graphic to appear as the "button" that is selected to run the macro or command. The mechanism by which the command specified by *text* in *field-argument-1* is located and/or executed by an application is implementation-defined.

Field Value: *field-argument-2*.

Switches: None.

17.16.5.35 MERGEFIELD

Syntax:

MERGEFIELD *field-argument* [*switches*]

Description: Retrieves the name of a data field designated by *text* in *field-argument* within the merge characters in a mail merge main document. When the main document is merged with the selected data source, information from the specified data field is inserted in place of the merge field.

The name designated by *text* shall match exactly the field name in the header record.

Field Value: The name of a data field designated by *text* in *field-argument*.

Switches: Zero or more of the following *field-specific-switches*.

<code>\b <i>field-argument</i></code>	The <i>text</i> in this switch's <i>field-argument</i> specifies the text to be inserted before the MERGEFIELD field if the field is not blank.
<code>\f <i>field-argument</i></code>	The <i>text</i> in this switch's <i>field-argument</i> specifies the text to be inserted after the MERGEFIELD field if the field is not blank.
<code>\m</code>	Specifies that the MERGEFIELD field is a mapped field.
<code>\v</code>	Enables character conversion for vertical formatting.

[*Example:* Placing the following three MERGEFIELD fields together and using the \f switch ensures that the three fields have spaces between them, but only if the designated field information is present in the data source.

```
MERGEFIELD CourtesyTitle \f " " MERGEFIELD FirstName \f " "
MERGEFIELD LastName
```

end example]

17.16.5.36 MERGEREC

Syntax:

MERGEREC

Description: When an application uses the contents of this document to perform a mail merge, this field is an instruction that the *field result* display the number of the corresponding data record in the merged document. The number reflects the sequential order of the data records that were selected and possibly sorted for merging with the active main document. It does not indicate the actual order of the records as they occur in the physical data source. [Note: A personnel database might contain thousands of records. However, to send a form letter to employees who've reached their five-year anniversary with your company, you'd select as your data source only the records of those five-year employees, a much smaller set of records. To print a physical record number, you must include a record number field in the data source and insert the corresponding merge field in the main document. *end note*]

Field Value: The literal text «MERGEREC» unless a mail merge is being performed, in which case, the number of the data record being merged.

Switches: None.

[Example: The following example uses a MERGEREC field inside a formula to create unique invoice numbers. When the main document is merged with the data source, the number resulting from the MERGEREC field is added to the numbers representing the date and time the invoices are printed.

Invoice Number: = { PRINTDATE \@ "MMddyyyyHHmm" + MERGEREC }

The result might be:

Invoice Number for record 12, printed on Feb. 13, 2003 at 9:46:
02132003094612

end example]

17.16.5.37 MERGESEQ

Syntax:

MERGESEQ

Description: Counts the number of data records that were successfully merged with the main document. Merged records are numbered starting from 1 each time documents are merged. [Note: The number might be different from the value inserted by the MERGEREC field. *end note*]

Field Value: The number of data records that were successfully merged with the main document.

Switches: None.

[*Example:* Consider the case in which only records 10–25 are merged. The MERGESEQ number corresponding to the first data record merged is 1, even though the MERGEREC number for that data record is 10. *end example*]

17.16.5.38 NEXT

Syntax:

NEXT

Description: Merges the next data record into the current resulting merged document, rather than starting a new merged document. [*Note:* This field is used when setting up a mailing label and envelope main document during a mail merge. *end note*]

Field Value: None.

Switches: None.

[*Example:* The following fields print three sets of names and phone numbers in each resulting merged document:

```
MERGEFIELD Name MERGEFIELD Phone
NEXT MERGEFIELD Name MERGEFIELD Phone
NEXT MERGEFIELD Name MERGEFIELD Phone
```

end example]

17.16.5.39 NEXTIF

Syntax:

NEXTIF *comparison*

Description: Compares the values designated by the *expressions* in *comparison* using the operator designated by *comparison-operator*. If the comparison is true, the next data record is merged into the current merge document. (Merge fields that follow the NEXTIF in the main document are replaced by values from the next data record rather than the current data record.) If the comparison is false, the next data record is merged into a new merge document.

[*Note:* *comparison-operator* can be any one of the six relational and equality operators specified for *operator* (§17.16.3.3). *end note*]

A NEXTIF fields shall not be used in a footnote, an endnote, annotation, a header, a footer, or a data source. A NEXTIF field shall not be nested within any field.

If *comparison-operator* is = or <>, the right-hand *expression* operand can contain a question mark (?) to represent any single character, or an asterisk (*) to represent any string of characters. The expression shall be enclosed in quotation marks so that it is compared as a character string.

Field Value: None.

Switches: None.

17.16.5.40 NOTEREF

Syntax:

NOTEREF *field-argument* [*switches*]

Description: Inserts the mark of the footnote or endnote that is marked by the bookmark specified by *text* in *field-argument*.

Field Value: The mark of the footnote or endnote.

Switches: Zero or more of the following *field-specific-switches*.

\f	For a footnote, inserts the reference mark with the same character formatting as the Footnote Reference style. For an endnote, inserts the reference mark with the same character formatting as the Endnote Reference style.
\h	Inserts a hyperlink to the bookmarked endnote or footnote.
\p	Inserts the relative position of the footnote or endnote. If the NOTEREF field occurs before the bookmark, the result is "below". If the NOTEREF field occurs after the bookmark, the result is "above".

[Example: Consider the case in which a bookmark called F10 marks the footnote of interest. When the field

... (see note { NOTEREF F10 }).

is updated, the result might be:

... (see note 5).

end example]

17.16.5.41 NUMCHARS

Syntax:

NUMCHARS [*switches*]

Description: Retrieves the number of characters in the current document, as recorded in the Characters element of the Application-Defined File Properties part.

Field Value: The number of characters in the current document.

Switches: Zero or one *numeric-formatting-switch* or *general-formatting-switch*.

[Example: Consider the case in the document has 6,183 words and the following fields are updated:

NUMCHARS

NUMCHARS \# #,##0

the results are:

6183

6,183

end example]

17.16.5.42 Numpages

Syntax:

Numpages [*switches*]

Description: Retrieves the number of pages in the current document, as recorded in the Pages element of the Application-Defined File Properties part.

Field Value: The number of pages in the current document.

Switches: Zero or one *numeric-formatting-switch* or *general-formatting-switch*.

[*Example:* Consider the case in the document has 19 pages and the following fields are updated:

Numpages \# #,##0

Numpages * OrdText

the results are:

19

nineteenth

end example]

17.16.5.43 Numwords

Syntax:

Numwords [*switches*]

Description: Retrieves the number of words in the current document, as recorded in the Words element of the Application-Defined File Properties part.

Field Value: The number of words in the current document.

Switches: Zero or one *numeric-formatting-switch* or *general-formatting-switch*.

[*Example:* Consider the case in the document has 1,243 words and the following fields are updated:

NUMWORDS
NUMWORDS \# #,##0

the results are:

1243
1,243

end example]

17.16.5.44 PAGE

Syntax:

PAGE [*switches*]

Description: Retrieves the number of the current page.

Field Value: The number of the current page.

Switches: Zero or more *general-formatting-switches*.

[*Example:* When the current page number is 19 and the following fields are updated:

PAGE
PAGE * ArabicDash
PAGE * ALPHABETIC
PAGE * roman

the results are:

19
- 19 -
S
xix

end example]

17.16.5.45 PAGeref

Syntax:

PAGeref *field-argument* [*switches*]

Description: Inserts the number of the page containing the bookmark specified by *text* in *field-argument* for a cross-reference.

Field Value: The number of the page containing the bookmark.

Switches: Zero or one of the *general-formatting-switches*, zero or one of the *numeric-formatting-switches*, and zero or more of the following *field-specific-switches*.

<code>\h</code>	Creates a hyperlink to the bookmarked paragraph.
<code>\p</code>	Causes the field to display its position relative to the source bookmark. If the PAGEREF field is on the same page as the bookmark, it omits "on page #" and returns "above" or "below" only. If the PAGEREF field is not on the same page as the bookmark, the string "on page #" is used.

[*Example:* Consider the case in which a bookmark called `Worldpop1990` marks the table containing figures for 1990. When the field

The world population in 1991 was 5 billion; for 1990 figures,
see the table { PAGEREF Worldpop1990 \p }.

is updated, the position of the table is inserted in place of the field. The result is one of the following::

... see the table above.
... see the table below.
... see the table on page 27.

end example]

17.16.5.46 PRINT

Syntax:

PRINT *field-argument* [*switches*]

Description: An instruction to send the printer-specific control code characters specified by *text* in *field-argument* to the selected printer when the document is printed.

Field Value: None.

Switches: Zero or more of the following *field-specific-switches*.

<code>\p <i>field-argument-1</i> <i>field-argument-2</i></code>	<p>Allows PostScript strings to be sent to the printer as native PostScript codes. PostScript commands embedded in the document are carried out in the order in which they are inserted.</p> <p>The y-coordinate space used for PostScript commands is as follows: The graphics origin (0,0) is in the lower-left corner of the page, and the positive directions are up and to the right. PostScript drawing instructions take place within a drawing rectangle. The graphics origin is translated to the lower-left corner of the drawing rectangle.</p> <p><i>text</i> in this switch's <i>field-argument-1</i> defines the drawing rectangle on which the subsequent PostScript instructions operate.</p> <p><i>text</i> in this switch's <i>field-argument-2</i> contains the PostScript instructions.</p>
---	---

17.16.5.47 PRINTDATE

Syntax:

PRINTDATE [*switches*]

Description: Retrieves the date and time on which the document was last printed, as recorded in the LastPrinted element of the Core File Properties part. By default, the Gregorian calendar is used and the *date-and-time-formatting-switch* used is implementation-defined. For a document that has never been printed, the date and time corresponds to 0000-00-00T00:00:00 local time and each text component is XXX.

Field Value: The date and time on which the document was last printed.

Switches: Zero or one *date-and-time-formatting-switch* and zero or one of the following *field-specific-switches*.

\h	Use the Hijri Lunar or Hebrew Lunar calendar, depending on the language specified by the lang element (§17.3.2.20).
\s	Use the Saka Era calendar.

[Example: Consider the case in which the LastPrinted element is as follows:

<LastPrinted>2006-01-06T19:58:00Z</LastPrinted>

and the following fields are updated in a US-English context that is UTC -5:

PRINTDATE
PRINTDATE \@ "dddd, MMMM dd, yyyy HH:mm:ss"

the results are:

1/6/2006 2:58:00 PM
Friday, January 06, 2006 14:58:00

For a document that has never been printed, the result is:

0/0/0000 0:00:00 AM
XXX, XXX 00, 0000 00:00:00

end example]

17.16.5.48 PRIVATE

Syntax:

PRIVATE

Description: Provides a private storage area. This field is used to store data for documents converted from other file formats. The field contains data needed for converting a document back to its original file format.

A PRIVATE field is formatted as hidden text.

Field Value: None.

Switches: None.

17.16.5.49 QUOTE

Syntax:

QUOTE *field-argument*

Description: Retrieves the text specified by *text* in *field-argument*. This text can include any other fields except SYMBOL.

Field Value: The specified text.

Switches: One or more of the *date-and-time-formatting-switch*, *general-formatting-switch*, or *date-and-time-formatting-switches*, depending on the type of *field-argument*.

[*Example:* When the current month is January and the following field is updated:

```
Last month was QUOTE IF DATE \@ "M" = 1 "12" "=" DATE \@ "M" - 1"/1/2000 \@
"MMMM".
```

the result is:

```
Last month was December.
```

end example]

17.16.5.50 RD

Syntax:

RD *field-argument* [*switches*]

Description: *field-argument* identifies a file to include when creating a table of contents, a table of authorities, or an index using a TOC (§17.16.5.68), TOA (§17.16.5.67), or INDEX field (§17.16.5.29). RD fields that reference a series of files shall be in the same order as the files in the final document. If the location includes a long file name containing spaces, *field-argument* shall contain delimiting quotes. A single backslash in the file path shall be preceded directly by a backslash.

For a complex field implementation in XML the optional field-value storage is not needed.

Field Value: None.

Switches: One of the following *field-specific-switches*:

\p	Indicates that the path is relative to the current document.
----	--

[*Example:* The following fields inserted into one document create a table of contents that includes entries from the three referenced documents:

```
{ TOC }
{ RD C:\\Manual\\Chapters\\Chapter1.doc }
{ RD C:\\Manual\\Chapters\\Chapter2.doc }
{ RD C:\\Manual\\Chapters\\Chapter3.doc }
```

end example]

17.16.5.51 REF

Syntax:

[REF] *field-argument* [*switches*]

Description: Inserts the text or graphics represented by the bookmark specified by *text* in *field-argument*. The bookmark shall be defined in the current document. Provided the bookmark name is not exactly the same as a field name, the REF prefix can be omitted. If the text marked by the bookmark contains a paragraph mark, the text preceding the REF field assumes the formatting of the paragraph in the bookmark.

Field Value: The specified text or graphics.

Switches: One of the following *general-formatting-switches*: * Caps, * FirstCap, * Lower, or * Upper, and zero or one of the following *field-specific-switches*.

\d <i>field-argument</i>	<i>text</i> in this switch's <i>field-argument</i> specifies the character sequence that is used to separate sequence numbers and page numbers.
\f	Increments footnote, endnote, and annotation numbers that are marked by the bookmark, and inserts the corresponding footnote, endnote, and comment text.
\h	Creates a hyperlink to the bookmarked paragraph.
\n	For a referenced paragraph, causes the field result to have the entire paragraph number without trailing periods. No information about prior levels is displayed unless it is included as part of the current level.
\p	Causes the field result to contain the position relative to the source bookmark using the word "above" or "below." If the REF field appears in the document before the bookmark, it evaluates to "below". If the REF field appears after the bookmark, it evaluates to "above". If the REF field appears within the bookmark, an error is returned. This switch can also be used in conjunction with the \n, \r, and \w switches, in which case, "above" or "below" is appended to the end of the field result.
\r	Inserts the entire paragraph number of the bookmarked paragraph in relative context—or relative to its position in the numbering scheme —without trailing periods.
\t	Causes the REF field to suppress non-delimiter or non-numerical text when used in conjunction with the \n, \r, or \w switch.

<code>\w</code>	Inserts the paragraph number of the bookmarked paragraph in full context from anywhere in the document.
-----------------	---

[*Example:* The following field

```
REF _Ref116788778 \r \h
```

makes a hyperlink reference. This kind of field is commonly used, to indicate forward references within a document. *end example*]

17.16.5.52 REVNUM

Syntax:

```
REVNUM
```

Description: Retrieves the document's revision number (which indicates the number of times the document has been saved), as recorded in the Revision element of the Core File Properties part.

Field Value: The document's revision number.

Switches: None.

[*Example:* Consider the case in which the Revision element is as follows:

```
<Revision>11</Revision>
```

and the following field is updated:

```
REVNUM
```

The result is:

```
11
```

end example]

17.16.5.53 SAVEDATE

Syntax:

```
SAVEDATE [ switches ]
```

Description: Retrieves the date and time on which the document was last saved, as recorded in the DateModified element of the Core File Properties part. By default, the Gregorian calendar is used and the *date-and-time-formatting-switch* used is implementation-defined. For a document that has never been saved, the date and time corresponds to 0000-00-00T00:00:00 local time and each text component is XXX.

Field Value: The date and time on which the document was last saved.

Switches: Zero or one *date-and-time-formatting-switch* and zero or one of the following *field-specific-switches*.

\h	Use the Hijri Lunar or Hebrew Lunar calendar, depending on the language specified by the lang element (§17.3.2.20).
\s	Use the Saka Era calendar.

[Example: Consider the case in which the DateModified element is as follows:

```
<DateModified>2006-01-06T20:15:00Z</DateModified>
```

and the following fields are updated in a US-English context that is UTC -5:

```
SAVEDATE
SAVEDATE \@ "dddd, MMMM dd, yyyy HH:mm:ss"
```

the results are:

```
1/6/2006 3:15:00 PM
Friday, January 06, 2006 15:15:00
```

For a document that has never been saved, the result is:

```
0/0/0000 0:00:00 AM
XXX, XXX 00, 0000 00:00:00
```

end example]

17.16.5.54 SECTION

Syntax:

```
SECTION [ switches ]
```

Description: Retrieves the number of the current section.

Field Value: The number of the current section.

Switches: Zero or more *general-formatting-switches*.

[Example: When the current section number is 19 and the following fields are updated:

```
SECTION
SECTION \* ArabicDash
SECTION \* ALPHABETIC
SECTION \* roman
```

the results are:

19
 - 19 -
 S
 xix

end example]

17.16.5.55 SECTIONPAGES

Syntax:

SECTIONPAGES [*switches*]

Description: Retrieves the number of the current page within the current section.

Field Value: The number of the current page within the current section.

Switches: Zero or more *general-formatting-switches*.

[*Example:* When the current page number within the current section is 19 and the following fields are updated:

```
SECTIONPAGES
SECTIONPAGES \* ArabicDash
SECTIONPAGES \* ALPHABETIC
SECTIONPAGES \* roman
```

the results are:

19
 - 19 -
 S
 xix

end example]

17.16.5.56 SEQ

Syntax:

SEQ *identifier* [*field-argument*] [*switches*]

Description: Sequentially numbers chapters, tables, figures, and other user-defined lists of items in a document. If an item and its SEQ field are added, deleted, or moved, updating the remaining SEQ fields in the document reflects the new sequence. A SEQ field in a header, footer, annotation, or footnote shall not affect the sequence numbering that results from SEQ fields in the document text.

[*Note:* The LISTNUM field also produces automatic numbering and can be a better alternative when creating a complex numbered list. *end note]*

identifier is the name assigned to the series of items that are to be numbered. [Example: *identifier* might be Equation, Figure, Table, or Thing, as the user deems appropriate for a caption. end example] *identifier* shall start with a Latin letter and shall consist of no more than 40 Latin letters, Arabic digits, and underscores. (See the TOC field (§17.16.5.68) switches \c and \s for uses of *identifier*.)

text in *field-argument* specifies a bookmark name that refers to an item elsewhere in the document rather than in the current location.

Field Value: The next number in the sequence.

Switches: Zero or one of the *numeric-formatting-switches*, or zero or more of the following *field-specific-switches*. If no *numeric-formatting-switch* is present, * Arabic is used.

\c	Repeats the closest preceding sequence number. [Note: This is useful for inserting chapter numbers in headers or footers. end note]
\h	Hides the field result unless a <i>general-formatting-switch</i> is also present.[Note: This switch can be used to refer to a SEQ field in a cross-reference without printing the number. end note]
\n	Inserts the next sequence number for the specified item. This is the default.
\r <i>field-argument</i>	Resets the sequence number to the integer number specified by <i>text</i> in this switch's <i>field-argument</i> .
\s <i>field-argument</i>	Resets the sequence number to the built-in (integer) heading level specified by <i>text</i> in this switch's <i>field-argument</i> .

[Example: When the following fields are updated:

```
SEQ Figure
SEQ Figure \* roman
SEQ Figure \n
SEQ Figure \c : ...
SEQ Figure \h : ...
SEQ Figure
SEQ Figure \r 1
SEQ Figure
```

the results are:

Figure 1
 Figure ii
 Figure 3
 Figure 3: ...
 Figure : ...
 Figure 5
 Figure 10
 Figure 11

end example]

17.16.5.57 SET

Syntax:

SET *field-argument-1* *field-argument-2*

field-argument-1:
field-argument

field-argument-2:
field-argument

Description: Defines the bookmark name specified by *field-argument-1* to represent the information specified by *field-argument-2*.

Field Value: None.

Switches: None.

[*Example:* Consider the following:

```
SET EnteredBy "Paul Smith"
SET UnitCost 25.00
SET Quantity FILLIN "Enter number of items ordered:"
SET SalesTax 10%
SET TotalCost = (UnitCost * Quantity) + ((UnitCost * Quantity) * SalesTax)
Total cost: TotalCost \# "$#0.00"
Thank you for your order,
EnteredBy
```

end example]

17.16.5.58 SKIPIF

Syntax:

SKIPIF *comparison*

Description: Compares the values designated by the *expressions* in *comparison* using the operator designated by *comparison-operator*. If the comparison is true, SKIPIF cancels the current merge document, moves to the

next data record in the data source, and starts a new merge document. If the comparison is false, the current merge document is continued.

[*Note: comparison-operator* can be any one of the six relational and equality operators specified for *operator* (§17.16.3.3). *end note*]

If *comparison-operator* is = or <>, the right-hand *expression* operand can contain a question mark (?) to represent any single character, or an asterisk (*) to represent any string of characters. The expression shall be enclosed in quotation marks so that it is compared as a character string.

Field Value: None.

Switches: None.

[*Example:* Inserted into a mail merge main document, the following field examines the contents of the Order field for the current data record. If the field contains a number less than 100, no merged document is produced for that data record.

```
SKIPIF MERGEFIELD Order < 100
```

end example]

17.16.5.59 STYLeref

Syntax:

```
STYLeref field-argument [ switches ]
```

Description: Inserts the nearest piece of text prior to this field that is formatted by the style whose name is specified by *text* in *field-argument*. The style can be a paragraph style or a character style.

When this field is used in a header or footer, it results in the first or the last text formatted with the specified style on the current page, allowing for dictionary-style headers or footers.

The location at which a STYLeref field is inserted determines the direction searched for the style, as follows:

- In document text, by default, the search goes backward from the STYLeref field. If the style isn't found, the search goes forward from the STYLeref field.
- In footnotes, annotations, and endnotes, the search goes backward from the footnote, annotation, or endnote reference mark. If the style isn't found, the search goes forward from the reference mark.
- In headers and footers in a printed document, the search is applied to the current page, by default, from top to bottom, for the specified style. If the style isn't found, the search goes from the top of the page to the beginning of the document, and then from the bottom of the page to the end of the document. If the \l switch is used, the search goes from the bottom of the page to the beginning and then to the end of the document.

- In headers and footers in an electronic document, the search goes on in the section that contains the `STYLEREF` field, from the beginning, for the specified style. If the style isn't found, the search goes from the end of the section to the end of the document.

Field Value: The nearest piece of text prior to this field that is formatted by the style whose name is specified by *text* in *field-argument*.

Switches: Zero or more of the following *field-specific-switches*.

<code>\l</code>	Inserts the nearest text following the field.
<code>\n</code>	Inserts the paragraph number of the referenced paragraph exactly as it appears in the document.
<code>\p</code>	Inserts the relative position of the referenced paragraph as being "above" or "below".
<code>\r</code>	Inserts the paragraph number of the referenced paragraph exactly in relative context.
<code>\t</code>	When used with the <code>\n</code> , <code>\r</code> , or <code>\w</code> switch, causes non-delimiter and non-numerical text to be suppressed.
<code>\w</code>	Inserts the paragraph number of the referenced paragraph in full context, from anywhere in the document.

[*Example:* When the following field is inserted in a header, it displays the contents of the first paragraph formatted with the style "Heading 3" on the current page:

On this page: { `STYLEREF "Heading 3"` }

To print the first and last names that appear on each page in a membership directory, for example, apply a character style called `Last Name` to each member's last name. Then insert the following fields in the header:

{ `STYLEREF "Last Name"` } — { `STYLEREF "Last Name" \l` }

end example]

17.16.5.60 SUBJECT

Syntax:

`SUBJECT [field-argument] [switches]`

Description: Retrieves, and optionally sets, the document's subject, as recorded in the Subject element of the Core File Properties part or, if *field-argument* is present, the subject specified by *text* in *field-argument*. Specifying a *field-argument* shall change Subject to *text*.

Field Value: The document's subject.

Switches: One of the following *general-formatting-switches*: * Caps, * FirstCap, * Lower, or * Upper.

[*Example:* Consider the case in which the Title element is as follows:

<Subject>A specification for fields</Subject>

and the following field is updated:

SUBJECT

The result is:

A specification for fields

Updating the following field:

SUBJECT "A specification for WordprocessingML Fields"

causes the Subject element to take on the given value. *end example*]

17.16.5.61 SYMBOL

Syntax:

SYMBOL *field-argument* [*switches*]

Description: Retrieves the character whose code point value is specified in decimal or hexadecimal (by using a leading 0x or 0X) by *text* in *field-argument*. The formatting switches over ride any formatting applied directly to the result.

The XML generated for a complex field implementation shall not have the optional field value stored.

Field Value: The specified character.

Switches: Zero or more of the following *field-specific-switches*.

\a	Interprets <i>text</i> in <i>field-argument</i> as the value of an ANSI character.
\f <i>field-argument</i>	Interprets <i>text</i> in the switch's <i>field-argument</i> as the name of the font from which the character whose value is specified by <i>text</i> in the field's <i>field-argument</i> . By default, the font used is that for the current text run.
\h	Inserts the symbol without affecting the line spacing of the paragraph. If large symbols are inserted with this switch, text above the symbol might be overwritten.
\j	Interprets <i>text</i> in <i>field-argument</i> as the value of a Windows-31J character.
\s <i>field-argument</i>	Interprets <i>text</i> in the switch's <i>field-argument</i> as the integral font size in points.
\u	Interprets <i>text</i> in <i>field-argument</i> as the value of a Unicode character.

[*Example:* Consider the case in which the following fields are updated:

```
SYMBOL 65
SYMBOL 66 \a
SYMBOL 67 \u
SYMBOL 0x20ac \u
SYMBOL 68
SYMBOL 68 \f Symbol
SYMBOL 40 \f Wingdings \s 24
```

the results are:

A
B
C
€
D
△
☎

end example]

17.16.5.62 TA

Syntax:

TA [*switches*]

Description: Defines the text and page number for a table of authorities entry, which is used by a TOA field (§17.16.5.67).

Field Value: None.

Switches: Zero or one of the following *field-specific-switches*.

\b	Applies bold formatting to the page number for the entry. If the table of authorities style for the entry already has bold formatting, \b removes it.
\c <i>field-argument</i>	<i>text</i> in this switch's <i>field-argument</i> specifies the integral entry category, which is a number that corresponds to the order of categories. The number determines how citations are grouped in tables of authorities. If \c is omitted, category 1 is the default.
\i	Applies italic formatting to the page number for the entry. If the table of authorities' style for the entry already has italic formatting, \i removes it.

<code>\l <i>field-argument</i></code>	<i>text</i> in this switch's <i>field-argument</i> defines the long citation for the entry.
<code>\r <i>field-argument</i></code>	Inserts as the entry's page number the range of pages marked by the bookmark specified by <i>text</i> in this switch's <i>field-argument</i> .
<code>\s <i>field-argument</i></code>	<i>text</i> in this switch's <i>field-argument</i> defines the short citation for the entry.

[*Example*: Given the following fields occurring on page 2:

```
TA \l "Hotels v. Leisure Time" \c 2
TA \l "Baldwin v. Alberti, 58 Wn. 2d 243 (1961)"
   \s "Baldwin v. Alberti" \c 1 \b
```

the table of authorities produced by INDEX \e "tab" \c "1" \z "1033" is:

Cases

Baldwin v. Alberti, 58 Wn. 2d 243 (1961)..... 2

Statutes

Hotels v. Leisure Time..... 2

end example]

17.16.5.63 TC

Syntax:

TC *field-argument* [*switches*]

Description: Defines the text and page number for a table of contents (including a table of figures) entry, which is used by a TOC field (§17.16.5.68). The text of the entry is *text* in *field-argument*.

Field Value: None.

Switches: Zero or one of the following *field-specific-switches*.

<code>\f <i>field-argument</i></code>	The type of items collected in a particular contents list. Use a unique list type identifier (typically a letter from A-Z) for each type of list. For example, to build a list of illustrations, mark each illustration with a field such as TC "Illustration 1" \f i , where i indicates only illustration entries. If no list type is specified, the entry is listed in a table of contents.
<code>\l <i>field-argument</i></code>	The level of the TC entry. [<i>Example</i> : The field TC "Entering Data" \l 4 marks a level-4 entry, and applies the built-in style

	TOC 4 to that entry in the table of contents. <i>end example</i>
	If no level is specified, level 1 is assumed.
\n	Omits the page number for the entry.

17.16.5.64 TEMPLATE

Syntax:

TEMPLATE [*switches*]

Description: The file name of the template used by the current document.

Field Value: The file name of the template used by the current document, as specified by the target of the relationship specified by the id attribute of the attachedTemplate element (§17.15.1.6), or the empty string if no such element exists.

Switches: One of the following *general-formatting-switches*: * Caps, * FirstCap, * Lower, or * Upper, and zero or one of the following *field-specific-switches*.

\p	Include the full file path name.
----	----------------------------------

[*Example:* Consider the case in which the following fields are updated:

TEMPLATE * Upper

TEMPLATE \p

the results might be:

NORMAL.DOTM

C:\Templates\Normal.dotm

end example]

17.16.5.65 TIME

Syntax:

TIME [*switches*]

Description: The current date and time. As specified in Date and Time Formatting (§17.16.4.1), if no *date-and-time-formatting-switch* is present, a date or time result is formatted in an implementation-defined manner.

Field Value: The current date and time.

Switches: Zero or one *date-and-time-formatting-switch*.

[*Example:* Consider the case in which the following fields are updated on the given date and time:

TIME

TIME \@ "dddd, MMMM dd, yyyy HH:mm:ss"

the results are:

```
1:59 PM
Friday, January 06, 2006 13:59:42
```

end example]

[*Note:* For some *date-and-time-formatting-switches*, the DATE (§17.16.5.13) and TIME fields can produce the same result. *end note]*

17.16.5.66 TITLE

Syntax:

```
TITLE [ field-argument ] [ switches ]
```

Description: Retrieves, and optionally sets, the document's title, as recorded in the Title element of the Core File Properties part or, if *field-argument* is present, the name specified by *text* in *field-argument*. Specifying a *field-argument* shall change Title to *text*.

Field Value: The document's title.

Switches: One of the following *general-formatting-switches*: * Caps, * FirstCap, * Lower, or * Upper.

[*Example:* Consider the case in which the Title element is as follows:

```
<Title>My Life's Story</Title>
```

and the following field is updated:

```
TITLE
```

The result is:

```
My Life's Story
```

Updating the following field:

```
TITLE "My Life, the Fantasy" \* Upper
```

causes the Title element to take on the value My Life, the Fantasy while the result is:

```
MY LIFE THE FANTASY
```

end example]

17.16.5.67 TOA

Syntax:

TOA [*switches*]

Description: Builds a table of authorities (that is, a list of the references in a legal document, such as references to cases, statutes, and rules, along with the numbers of the pages on which the references appear) using the entries specified by TA fields (§17.16.5.62).

Field Value: The table of authorities.

Switches: Zero or more of the following *field-specific-switches*.

<code>\b field-argument</code>	Includes entries only from the portion of the document marked by the bookmark specified by <i>text</i> in this switch's <i>field-argument</i> .
<code>\c field-argument</code>	<i>Includes the entries whose integral category is that specified by text in this switch's field-argument.</i>
<code>\d field-argument</code>	Used in conjunction with \s to specify the character sequence that separates the sequence numbers and page numbers. If \d is omitted, a hyphen (-) is used.
<code>\e field-argument</code>	<i>text</i> in this switch's <i>field-argument</i> specifies the character sequence that separates a table of authorities entry and its page number. If \e is not specified, a tab stop with leader dots is used.
<code>\f</code>	Removes the formatting of the entry text in the document from the entry in the table of authorities.
<code>\g field-argument</code>	<i>text</i> in this switch's <i>field-argument</i> specifies the character sequence that separates the pages in a page range. If \g is omitted, an en dash (–) is used.
<code>\h</code>	Includes the category heading for the entries in a table of authorities.
<code>\l field-argument</code>	<i>text</i> in this switch's <i>field-argument</i> specifies the character sequence that separates multiple page references. If \l is omitted, a comma (,) and space are used.
<code>\p</code>	Replaces five or more different page references to the same authority with "passim", which is used to indicate that a word or passage occurs frequently in the work cited.
<code>\s field-argument</code>	Includes a case or section number before the page number. The entry shall be numbered with a SEQ field (§17.16.5.56), and <i>text</i> in this switch's <i>field-argument</i> shall match the identifier in the SEQ field.

[Example: See TA (§17.16.5.62). end example]

17.16.5.68 TOC

Syntax:

TOC [*switches*]

Description: Builds a table of contents (which can also be a table of figures) using the entries specified by TC fields (§17.16.5.63), their heading levels, and specified styles, and inserts that table at this place in the document. Each table entry is a separate paragraph.

Field Value: The table of contents.

Switches: Zero or more of the following *field-specific-switches*.

<code>\a <i>field-argument</i></code>	Includes captioned items, but omits caption labels and numbers. The identifier designated by <i>text</i> in this switch's <i>field-argument</i> corresponds to the caption label. Use <code>\c</code> to build a table of captions with labels and numbers.
<code>\b <i>field-argument</i></code>	Includes entries only from the portion of the document marked by the bookmark named by <i>text</i> in this switch's <i>field-argument</i> .
<code>\c <i>field-argument</i></code>	Includes figures, tables, charts, and other items that are numbered by a SEQ field (§17.16.5.56). The sequence identifier designated by <i>text</i> in this switch's <i>field-argument</i> , which corresponds to the caption label, shall match the identifier in the corresponding SEQ field.
<code>\d <i>field-argument</i></code>	When used with <code>\s</code> , the <i>text</i> in this switch's <i>field-argument</i> defines the separator between sequence and page numbers. The default separator is a hyphen (-).
<code>\f <i>field-argument</i></code>	Includes only those TC fields whose identifier exactly matches the <i>text</i> in this switch's <i>field-argument</i> (which is typically a letter).
<code>\h</code>	Makes the table of contents entries hyperlinks.
<code>\l <i>field-argument</i></code>	Includes TC fields that assign entries to one of the levels specified by <i>text</i> in this switch's <i>field-argument</i> as a range having the form <i>startLevel-endLevel</i> , where <i>startLevel</i> and <i>endLevel</i> are integers, and <i>startLevel</i> has a value equal-to or less-than <i>endLevel</i> . TC fields that assign entries to lower levels are skipped.
<code>\n <i>field-argument</i></code>	Without <i>field-argument</i> , omits page numbers from the table of contents. Page numbers are omitted from all levels unless a range of entry levels is specified by <i>text</i> in this switch's <i>field-argument</i> . A range is specified as for <code>\l</code> .
<code>\o <i>field-argument</i></code>	Uses paragraphs formatted with all or the specified range of built-in heading styles. Headings in a style range are specified by <i>text</i> in this switch's <i>field-argument</i> using the notation specified as for <code>\l</code> , where each integer corresponds to the style with a style ID of HeadingX (e.g. 1 corresponds to Heading1). If no heading range is specified, all heading levels used in the document are listed.
<code>\p <i>field-argument</i></code>	<i>text</i> in this switch's <i>field-argument</i> specifies a sequence of characters that separate an entry and its page number. The default is a tab with leader dots.
<code>\s <i>field-argument</i></code>	For entries numbered with a SEQ field (§17.16.5.56), adds a prefix

	to the page number. The prefix depends on the type of entry. <i>text</i> in this switch's <i>field-argument</i> shall match the identifier in the SEQ field.
\t <i>field-argument</i>	Uses paragraphs formatted with styles other than the built-in heading styles. <i>text</i> in this switch's <i>field-argument</i> specifies those styles as a set of comma-separated doublets, with each doublet being a comma-separated set of style name and table of content level. \t can be combined with \o.
\u	Uses the applied paragraph outline level.
\w	Preserves tab entries within table entries.
\x	Preserves newline characters within table entries.
\z	Hides tab leader and page numbers in Web layout view.

[*Example*: The index produced using the corresponding set of index entries and the field TOC \o "3-3" \h \z \t "Heading 1,1,Heading 2,2,Appendix 1,1,Appendix 2,2,Unnumbered Heading,1" is:

1. Introduction	1
2. Syntax.....	2
3. XML representation.....	4
4. Formulas and expressions.....	6
4.1 Constants.....	6
4.2 Bookmarks.....	6
4.3 Operators.....	6
4.4 Functions.....	7
4.5 Table cell references.....	8
...	
Annex A. Index.....	12

end example]

17.16.5.69 USERADDRESS

Syntax:

USERADDRESS [*field-argument*] [*switches*]

Description: Retrieves the current user's postal address or, if *field-argument* is present, the address specified by *text* in *field-argument*. Specifying a field-argument shall not change the address of the current user.

Field Value: If a particular user's context exists, the current user's postal address; otherwise, an empty string.

Switches: One of the following *general-formatting-switches*: * Caps, * FirstCap, * Lower, or * Upper.

[*Example:* Given the current user's address, the following fields:

```
USERADDRESS
```

```
USERADDRESS "10 Top Secret Lane, Chiswick" \* Upper
```

produce results of:

```
114 Rue du Rhône
CH-1204 Geneva
Switzerland
```

```
10 TOP SECRET LANE, CHISWICK
```

end example]

17.16.5.70 USERINITIALS

Syntax:

```
USERINITIALS [ field-argument ] [ switches ]
```

Description: Retrieves the current user's initials or, if *field-argument* is present, the initials specified by *text* in *field-argument*. Specifying a field-argument shall not change the initials of the current user.

Field Value: If a particular user's context exists, the current user's initials; otherwise, an empty string.

Switches: One of the following *general-formatting-switches*: * Caps, * FirstCap, * Lower, or * Upper.

[*Example:* Given a current user with initials "DW", the following fields:

```
USERINITIALS \* Lower
```

```
USERINITIALS "JaJ"
```

```
USERINITIALS "jaJ" \* Upper
```

produce results of:

```
dw
JaJ
JAJ
```


end example]

17.16.5.71 USERNAME

Syntax:

USERNAME [*field-argument*] [*switches*]

Description: Retrieves the current user's name or, if *field-argument* is present, the name specified by *text* in *field-argument*. Specifying a field-argument shall not change the name of the current user.

Field Value: If a particular user's context exists, the current user's name; otherwise, an empty string.

Switches: One of the following *general-formatting-switches*: * Caps, * FirstCap, * Lower, or * Upper.

[*Example:* Given a current user of "David Williams", the following fields:

```
USERNAME \* Lower
USERNAME "John Jones"
USERNAME "Mary Smith" \* Upper
```

produce results of:

```
david williams
John Jones
MARY SMITH
```

end example]

17.16.5.72 XE

Syntax:

XE *field-argument* [*switches*]

Description: Defines the text and page number for an index entry, which is used by an INDEX field (§17.16.5.29). The text of the entry is *text* in *field-argument*. To indicate a subentry, the main entry text and the subentry text shall be separated by a colon (:). Subentries beyond one level are permitted.

Field Value: None.

Switches: Zero or one of the following *field-specific-switches*.

\b	Applies bold formatting to the entry's page number. However, if the index style for that entry is already bold, this switch removes that formatting for that entry.
\f <i>field-argument</i>	The <i>text</i> in this switch's <i>field-argument</i> defines an index entry type. If an INDEX field has the same \f switch and <i>field-argument</i> , this entry is included in the resulting index; otherwise, it is excluded.

<code>\i</code>	Applies italic formatting to the entry's page number. However, if the index style for that entry is already italic, this switch removes that formatting for that entry.
<code>\r <i>field-argument</i></code>	Instead of the entry's page number, uses the range of pages marked by the bookmark specified by <i>text</i> in this switch's <i>field-argument</i> .
<code>\t <i>field-argument</i></code>	Uses <i>text</i> from <i>field-argument</i> in place of a page number. [Note: Useful for "See ..." or "See also ..." entries. <i>end note</i>]
<code>\y <i>field-argument</i></code>	Specifies that the <i>text</i> from <i>field-argument</i> defines the yomi (first phonetic character for sorting indexes) for the index entry.

[Example: Given the following fields spread over a series of pages, and a multi-page bookmark called OOXMLPageRange:

```
XE "Office Open XML" \b
XE "syntax" \f "Introduction"
XE "behavior:implementation-defined" \b
XE "Office Open XML" \i
XE "behavior:implementation-defined:documenting" \b
XE "grammar" \f "Introduction" \b
XE "Office Open XML"
XE "item: package-relationship" \t "See package-relationship item"
XE "XML" \r OOXMLPageRange
XE "grammar" \f "Introduction"
XE "production" \f "Introduction"
```

the index produced by INDEX \e "tab" \c "1" \z "1033" is:

behavior

implementation-defined	2
documenting	3

item

package-relationship	See package-relationship item
Office Open XML	2, 3, 4
XML	1–4

and that produced by INDEX \f "Introduction" \e "tab" \c "1" \z "1033" is:

grammar	3, 5
---------------	------

production 5

syntax 2

end example]

17.16.6 calcOnExit (Recalculate Fields When Current Field Is Modified)

This element specifies that the current contents of all fields within the current WordprocessingML document shall be recalculated from their field codes when the contents of the parent form field are modified. [*Note:* It is at the discretion of an application to determine the scope of a single modification, for example, when the user moves the insertion point in a user interface, or after each keystroke, etc. *end note*]

If this element is omitted, then modification of the contents of the current field shall not result in all fields in the current document being recalculated.

[*Example:* Consider the following WordprocessingML fragment for the contents of two fields in a document:

```
<w:bookmarkStart w:name="Text1" ... />
<w:r>
  <w:fldChar w:fldCharType="begin">
    <w:ffData>
      <w:calcOnExit/>
      ...
    </w:ffData>
  </w:fldChar>
</w:r>
<w:r>
  <w:instrText> FORMTEXT </w:instrText>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="separate"/>
</w:r>
<w:r>
  <w:t>1</w:t>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="end"/>
</w:r>
<w:bookmarkEnd ... />
<w:fldSimple w:instr="=Text1+10">
  <w:r>
    <w:t>11</w:t>
  </w:r>
</w:fldSimple>
```

The first field above (the text form field) has a current value of 1, but also has the calcOnExit element present (therefore inheriting its default attribute value of true). This means that if the value of this form field is changed to 10, that all fields in the document must automatically be updated, resulting in the second field's value being automatically changed to 20. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.16.7 checkBox (Checkbox Form Field Properties)

This element specifies a set of properties which shall be associated with the parent FORMCHECKBOX checkbox form field (§17.16.5.20) within the document.

If the parent form field is not a checkbox (i.e. its field code does not have a value of FORMCHECKBOX), then these properties can be ignored.

[*Example:* Consider the following WordprocessingML fragment for the properties of a checkbox form field:

```
<w:ffData>
  <w:checkBox>
    <w:size w:val="20" />
    <w:checked w:val="true" />
  </w:checkBox>
</w:ffData>
```

The checkBox element specifies that it contains a set of properties for the parent checkbox form field. In this case, these properties specify that the size of the checkbox must be exactly 10 points via the size element (§17.16.29), and that the current state of the checkbox must be checked via the checked element (§17.16.8). *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FFCheckBox](#)) is located in §A.1. *end note*]

17.16.8 checked (Checkbox Form Field State)

This element specifies the current state for a checkbox form field. This value shall be used to specify the current value for a checkbox as explicitly chosen for that checkbox, as opposed its default value, which is specified using the default element (§17.16.12).

If this element is omitted, then the parent form field checkbox has no state, and its state shall be determined based on the value of the default element in the checkbox form field properties.

[*Example:* Consider the following WordprocessingML fragment for the properties of a checkbox form field:

```

<w:ffData>
  <w:checkBox>
    ...
    <w:checked w:val="true" />
  </w:checkBox>
</w:ffData>

```

The checked element specifies that the current state of the checkbox is checked (via an attribute value of true). *end example]*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.16.9 ddList (Drop-Down List Form Field Properties)

This element specifies a set of properties which shall be associated with the parent FORMDROPDOWN drop-down list form field (§17.16.5.21) within the document.

If the parent form field is not a drop-down list (i.e. its field code does not have a value of FORMDROPDOWN), then these properties can be ignored.

[*Example:* Consider the following WordprocessingML fragment for the properties of a drop-down list form field:

```

<w:ffData>
  <w:ddList>
    <w:listEntry w:val="One" />
    <w:listEntry w:val="Two" />
    <w:listEntry w:val="Three" />
  </w:ddList>
</w:ffData>

```

The ddList element specifies that it contains a set of properties for the parent drop-down list form field. In this case, these properties specify that the drop-down list must contain three entries of One, Two, and Three via the listEntry elements (§17.16.25). *end example]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FFDDLlist](#)) is located in §A.1. *end note]*

17.16.10 default (Default Text Box Form Field String)

This element specifies the default string for the parent text box form field. This string is the content which shall be displayed in the document story within this form field if its current run contents are empty (i.e. there is not actual content within the text box). If the type (§17.16.34) of the current form field is calculation, then this string shall hold the calculation to be performed.

If this element is omitted, then the current text box form field shall not have a default value.

[*Example:* Consider the following WordprocessingML fragment for a text box form field:

```
<w:fldChar w:fldCharType="begin">
  <w:ffData>
    <w:textInput>
      <w:default w:val="No content."/>
    </w:textInput>
  </w:ffData>
</w:fldChar>
```

The default element specifies the default value of the text box form field to be `No content`. Since the form field does not contain any value, this is the content which must be displayed when the contents of the form field are displayed by an application. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the <code>val</code> attribute is the ID of the associated paragraph style's <code>styleId</code>.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p>In this case, the decimal number in the <code>val</code> attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element’s content model (`CT_String`) is located in §A.1. *end note*]

17.16.11 default (Default Drop-Down List Item Index)

This element specifies the zero-based index of the default entry for the parent drop-down list form field. This index value is the value within the drop-down list which shall be displayed in the document story within this form field if no element is selected (i.e. the result element (§17.16.28) is omitted).

If this element is omitted, then the current drop-down list form field shall have a default value of 0 (its first entry). If the attribute value references an index value which does not exist (i.e. a negative number or a number that exceeds the number of items in the drop-down list), then this value can be ignored and the current drop-down list form field shall have a default value of 0 (its first entry).

[*Example:* Consider the following WordprocessingML fragment for a drop-down list form field:

```
<w:fldChar w:fldCharType="begin">
  <w:ffData>
    <w:ddList>
      <w:default w:val="1" />
      <w:listEntry w:val="One" />
      <w:listEntry w:val="Two" />
      <w:listEntry w:val="Three" />
    </w:ddList>
  </w:ffData>
</w:fldChar>
```

The default element specifies the index of the default value of the drop-down list form field to be 1. Since the form field does not contain a result element, this is the index of the content which must be displayed when the contents of the form field are displayed by an application. In this case, the resulting default value text is Two. *end example*]

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <pre><... w:val="1512645511" /></pre> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DecimalNumber](#)) is located in §A.1.
end note]

17.16.12 default (Default Checkbox Form Field State)

This element specifies the default checkbox state for the parent checkbox form field. This value determines the checkbox state when its current run contents are empty (i.e. there is not actual content within the drop-down list).

If this element is omitted, then the current checkbox form field shall have a default value of 0 (unchecked).

[*Example:* Consider the following WordprocessingML fragment for a checkbox list form field:

```
<w:fldChar w:fldCharType="begin">
  <w:ffData>
    <w:checkBox>
      <w:default w:val="true" />
    </w:checkBox>
  </w:ffData>
</w:fldChar>
```

The default element specifies the default state of the checkbox form field to be true. Since the form field does not contain any run content, this is the state which must be displayed when the contents of the form field are displayed by an application. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.16.13 delInstrText (Deleted Field Code)

This element specifies that this run contains deleted field codes (§17.16.5) within a complex field in the document. The delInstrText element shall be used for all runs containing field codes which are part of a region of text that is contained in a deleted region using the del element (§17.13.5.14).

If this element is not contained within a del element, then the document is non-conformant. If this element is contained within a run which is not part of a complex field's field codes, then it should be handled as regular deleted text.

[*Example:* Consider a complex field within a WordprocessingML document which was changed from a text box form field to a checkbox form field with revision tracking enabled. This field would therefore be represented as follows:


```

<w:fldChar w:fldCharType="begin" />
<w:ins>
  <w:r>
    <w:instrText>FORMCHECKBOX</w:instrText>
  </w:r>
</w:ins>
<w:del>
  <w:r>
    <w:delInstrText>FORMFIELDTEXT</w:delInstrText>
  </w:r>
</w:del>
<w:fldChar w:fldCharType="separate" />
...
<w:fldChar w:fldCharType="end" />

```

The deleted field code is contained in a delInstrText node, while the inserted (and current) field code is contained in an instrText node. *end example*]

Attributes	Description
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	<p>Specifies how white space should be handled for the contents of this element using the W3C space preservation rules.</p> <p>[<i>Example:</i> Consider the following run contained within a WordprocessingML document:</p> <pre> <w:r> <w:t> significant whitespace </w:t> </w:r> </pre> <p>Although there are three spaces on each side of the text content in the run, that whitespace has not been specifically marked as significant, therefore it is subject to the space preservation rules currently specified in that run's scope. <i>end example</i>]</p> <p>The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Text](#)) is located in §A.1. *end note*]

17.16.14 enabled (Form Field Enabled)

This element specifies whether the parent form field shall behave as though it is enabled or disabled when it is displayed in the document. This setting shall have no effect on the behavior of this form field unless the document's Settings part specifies that the documentProtection element for the current document is in a state allowing the filling in of form fields.

If this element is omitted, then the parent form field shall be in its enabled state when the document settings specify that the document allows the filling-in of form fields.

[*Example:* Consider the following WordprocessingML fragment for a text box form field:

```
<w:r>
  <w:fldChar w:fldCharType="begin" >
    <w:ffData>
      <w:enabled w:val="false"/>
      <w:textInput>
        ...
      </w:textInput>
    </w:ffData>
  </w:fldChar>
</w:r>
<w:r>
  <w:instrText> FORMTEXT </w:instrText>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="separate"/>
</w:r>
<w:r>
  <w:t>1</w:t>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="end"/>
</w:r>
```

The enabled element specifies that the state of the current text box form field is disabled; therefore this text box must not be editable within the current document even when the state of the documentProtection element specifically allows the editing of form fields. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.16.15 entryMacro (Script Function to Execute on Form Field Entry)

This element specifies a subroutine in a scripting language which should be executed when the when the run contents of the parent form field are entered. The language and location of this subroutine can be determined using any method desired by an application. [*Note:* It is at the discretion of an application to determine the scope and timing of "entering" a form field, for example, when the user moves the insertion point in a user interface or upon each operation by an application without a user interface, etc. *end note*]

If this element is omitted, then no subroutine shall be associated with entering the run contents of the parent form field. If this element specifies a macro which cannot be located or is not supported by an application, then its value can be ignored, but shall not be lost upon resaving the file.

[*Example:* Consider the following WordprocessingML fragment for the properties of a checkbox form field:

```

<w:ffData>
  <w:entryMacro w:val="TestEntryFunction" />
  <w:checkBox>
    ...
  </w:checkBox>
</w:ffData>

```

The entryMacro element specifies that any application which processes this file should attempt to locate and execute a scripting subroutine called TestEntryFunction when the contents of the checkbox are entered. If this subroutine cannot be located or executed, then this setting is silently ignored. *end example*

Attributes	Description
val (Name of Script Function)	<p>Specifies the name of a single scripting subroutine which shall be associated with the parent element. Its use is specifies based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment for the properties of a form field:</p> <pre> <w:ffData> <w:exitMacro w:val="HelloWorld" /> </w:ffData> </pre> <p>The val attribute specifies that a script function called HelloWorld must be used in the context of the parent element; in this case, to execute when the field is exited. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_MacroName simple type (§17.18.51).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_MacroName](#)) is located in §A.1. *end note*]

17.16.16 exitMacro (Script Function to Execute on Form Field Exit)

This element specifies a subroutine in a scripting language which should be executed when the when the run contents of the parent form field are exited. The language and location of this subroutine can be determined using any method desired by an application. [*Note:* It is at the discretion of an application to determine the scope and timing of "exiting" a form field, for example, when the user moves the insertion point in a user interface or upon each operation by an application without a user interface, etc. *end note*]

If this element is omitted, then no subroutine shall be associated with exiting the run contents of the parent form field. If this element specifies a macro which cannot be located or is not supported by an application, then its value can be ignored, but shall not be lost upon resaving the file.

[*Example:* Consider the following WordprocessingML fragment for the properties of a form field:

```
<w:ffData>
  <w:exitMacro w:val="TestExitFunction" />
</w:ffData>
```

The exitMacro element specifies that any application which processes this file should attempt to locate and execute a scripting subroutine called TestExitFunction when the contents of the form field are exited. If this subroutine cannot be located or executed, then this setting is silently ignored. *end example*]

Attributes	Description
val (Name of Script Function)	<p>Specifies the name of a single scripting subroutine which shall be associated with the parent element. Its use is specifies based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment for the properties of a form field:</p> <pre><w:ffData> <w:exitMacro w:val="HelloWorld" /> </w:ffData></pre> <p>The val attribute specifies that a script function called HelloWorld must be used in the context of the parent element; in this case, to execute when the field is exited. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_MacroName simple type (§17.18.51).</p>

[*Note:* The W3C XML Schema definition of this element’s content model (CT_MacroName) is located in §A.1. *end note*]

17.16.17 ffData (Form Field Properties)

This element specifies a set of properties which shall be associated with the parent form field within the document. This form field can be of any of the following types (with the associated field codes in parentheses):

- Checkbox (FORMCHECKBOX)
- Drop-down List (FORMDROPDOWN)
- Text box (FORMTEXT)

If this element is present and the field codes for the document do not specify a form field of one of these types, then the document shall be considered non-conformant.

If this element is omitted, then the properties associated with the parent form field shall be determined based on their default values.

[*Example:* Consider the following WordprocessingML fragment for a text box form field:

```

<w:r>
  <w:fldChar w:fldCharType="begin">
    <w:ffData>
      <w:name w:val="TextTextBox" />
      <w:enabled w:val="false"/>
      <w:textInput>
        <w:maxLength w:val="10" />
      </w:textInput>
    </w:ffData>
  </w:fldChar>
</w:r>
<w:r>
  <w:instrText> FORMTEXT </w:instrText>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="separate"/>
</w:r>
<w:r>
  <w:t>1</w:t>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="end"/>
</w:r>

```

The `ffData` element specifies the set of properties for this text box form field; in this example, a form field name of `TestTextBox` via the `name` element (§17.16.27), a disabled state via the `enabled` element (§17.16.14), and a maximum character length of 10 Unicode scalar values via the `maxLength` element (§17.16.26). *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_FFDData](#)) is located in §A.1. *end note*]

17.16.18 fldChar (Complex Field Character)

This element specifies the presence of a complex field character at the current location in the parent run. A *complex field character* is a special character which delimits the start and end of a complex field or separates its field codes from its current field result.

A complex field is defined via the use of the two required complex field characters: a *start character*, which specifies the beginning of a complex field within the document content; and an *end character*, which specifies the end of a complex field. This syntax allows multiple fields to be embedded (or "nested") within each other in a document.

As well, because a complex field can specify both its field codes and its current result within the document, these two items are separated by the optional *separator character*, which defines the end of the field codes and

the beginning of the field contents. The omission of this character shall be used to specify that the contents of the field are entirely field codes (i.e. the field has no result).

[*Example:* Consider the following complex field definition within a WordprocessingML document:

```
<w:r>
  <w:fldChar w:fldCharType="begin" />
</w:r>
<w:r>
  <w:instrText>AUTHOR</w:instrText>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="separate" />
</w:r>
<w:r>
  <w:t>Rex Jaeschke</w:t>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="end" />
</w:r>
```

The three fldChar elements specify:

- The beginning of the field, using the type attribute value of start
- The separator between the field codes and the current field results, using the type attribute value of separate
- The end of the field, using the type attribute value of end

end example]

If a complex field is not closed before the end of a document story, then no field shall be generated and each individual run shall be processed as if the field characters did not exist (i.e. the contents of all field code run content shall not be displayed, and the field results shall be displayed as literal text).

[*Example:* Consider the following WordprocessingML document:

```

<w:body>
  <w:p>
    <w:r>
      <w:fldChar w:fldCharType="begin" />
    </w:r>
    <w:r>
      <w:instrText>AUTHOR</w:instrText>
    </w:r>
    <w:r>
      <w:fldChar w:fldCharType="separate" />
    </w:r>
    <w:r>
      <w:t>Rex Jaeschke</w:t>
    </w:r>
  </w:p>
</w:body>

```

The complex field is technically incorrect since no end character exists in the main document story. The resulting content must be interpreted as though no field characters exist, resulting in only the literal text Rex Jaeschke being displayed in the document. *end example]*

Attributes	Description
dirty (Field Result Invalidated)	<p>Specifies that this field has been flagged by an application to indicate that its current results are no longer correct (stale) due to other modifications made to the document, and these contents should be updated before they are displayed if this functionality is supported by the next processing application.</p> <p><i>[Rationale:</i> This functionality allows applications with limited subsets of the full functionality of ECMA-376 to process Word Open XML documents without needing to understand and update all fields based on the semantics for their field codes.</p> <p>For example, an application can add a new paragraph and flag the table of contents as dirty, without needing to understand anything about how to recalculate that field's content. <i>end rationale]</i></p> <p>If this attribute is omitted, then its value shall be assumed to be false. If the type of the current field character is not start, then his setting can be ignored.</p> <p><i>[Example:</i> Consider the following WordprocessingML for a complex field:</p> <pre> ... <w:r> <w:fldChar w:fldCharType="begin" w:dirty="true"/> </w:r> <w:r> <w:instrText>TOC /l 1-3</w:instrText> </pre>

Attributes	Description
	<pre> </w:r> <w:r> <w:fldChar w:fldCharType="separate"/> </w:r> ... </pre> <p>The dirty attribute value of true specifies that the contents of this field are no longer current based on the contents of the document, and should be recalculated whenever an application with this functionality reads the document. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
fldCharType (Field Character Type)	<p>Specifies the type of the current complex field character in the document.</p> <p>[<i>Example:</i> Consider the following WordprocessingML for a complex field character:</p> <pre> ... <w:fldChar w:fldCharType="separate" /> ... </pre> <p>The type attribute value of separate specifies that this is a complex field separator character; therefore it is being used to separate the field codes from the field contents in a complex field. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_FldCharType simple type (§17.18.29).</p>
fldLock (Field Should Not Be Recalculated)	<p>Specifies that the parent complex field shall not have its field result recalculated, even if an application attempts to recalculate the results of all fields in the document or a recalculation is explicitly requested.</p> <p>If this attribute is omitted, then its value shall be assumed to be false. If the type of the current field character is not start, then this setting can be ignored.</p> <p>[<i>Example:</i> Consider the following WordprocessingML for a complex field:</p> <pre> <w:r> <w:fldChar w:fldCharType="begin" w:fldLock="true"/> </w:r> ... <w:r> <w:fldChar w:fldCharType="separate"/> </w:r> <w:r> <w:t>field result</w:t> </w:r> <w:r> <w:fldChar w:fldCharType="end" /> </pre>

Attributes	Description
	<p><code></w:r></code></p> <p>The <code>fldLock</code> attribute value of <code>true</code> specifies that the contents of this field must remain <code>field result</code> regardless of the actual result of the current field codes. <i>end example</i></p> <p>The possible values for this attribute are defined by the <code>ST_OnOff</code> simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element's content model (`CT_FldChar`) is located in §A.1. *end note*]

17.16.19 fldSimple (Simple Field)

This element specifies the presence of a simple field at the current location in the document. The semantics of this field are defined via its field codes (§17.16.5).

[Example: Consider the following WordprocessingML fragment for a simple field:

```
<w:fldSimple w:instr="FILENAME">
  <w:r>
    <w:t>Example Document.docx</w:t>
  </w:r>
</w:fldSimple>
```

The `fldSimple` element defines a `FILENAME` field (§17.16.5.17) using the simple field syntax. The current field result for the field is `Example Document.docx`. *end example*

Attributes	Description
dirty (Field Result Invalidated)	<p>Specifies that this field has been flagged by an application to indicate that its current results are no longer correct (stale) due to other modifications made to the document, and these contents should be updated before they are displayed if this functionality is supported by the next processing application.</p> <p>[<i>Rationale</i>: This functionality allows applications with limited subsets of the full functionality of ECMA-376 to process Word Open XML documents without needing to understand and update all fields based on the semantics for their field codes.</p> <p>For example, an application can add a new paragraph and flag the table of contents as dirty, without needing to understand anything about how to recalculate that field's content. <i>end rationale</i>]</p> <p>If this attribute is omitted, then its value shall be assumed to be <code>false</code>.</p> <p>[Example: Consider the following WordprocessingML for a simple field:</p> <pre><w:fldSimple w:instr="AUTHOR" w:dirty="true"/></pre>

Attributes	Description
	<p>The dirty attribute value of true specifies that the contents of this field are no longer current based on the contents of the document, and should be recalculated whenever an application with this functionality reads the document. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
fldLock (Field Should Not Be Recalculated)	<p>Specifies that the parent field shall not have its field result recalculated, even if an application attempts to recalculate the results of all fields in the document or a recalculation is explicitly requested.</p> <p>If this attribute is omitted, then its value shall be assumed to be false.</p> <p>[<i>Example:</i> Consider the following WordprocessingML for a simple field:</p> <pre data-bbox="451 751 1209 926"><w:fldSimple w:instr="AUTHOR" w:fldLock="true"> <w:r> <w:t>Rex Jaeschke</w:t> </w:r> </w:fldSimple></pre> <p>The fldLock attribute value of true specifies that the contents of this field must remain Rex Jaeschke regardless of the actual result of the current field codes. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
instr (Field Codes)	<p>Specifies the field codes for the simple field. The possible field codes are defined in §17.16.5.</p> <p>[<i>Example:</i> Consider the following WordprocessingML for a simple field:</p> <pre data-bbox="451 1297 1209 1472"><w:fldSimple w:instr="AUTHOR" w:fldLock="true"> <w:r> <w:t>Rex Jaeschke</w:t> </w:r> </w:fldSimple></pre> <p>The instr attribute specifies the field codes for this simple field to be AUTHOR. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SimpleField](#)) is located in §A.1. *end note*]

17.16.20 format (Text Box Form Field Formatting)

This element specifies the field formatting which shall be applied to the contents of the parent form field whenever those contents are modified. The type of formatting which is applied to the field depends on the value of its type element (§17.16.34), as follows:

- When the type is equal to `currentDate`, `currentTime`, or `date`, a date formatting string using the syntax defined in §17.16.4.1
- When the type is equal to `calculated` or `number`, a number formatting string using the syntax defined in §17.16.4.2
- When the type is equal to `regular`, a text formatting string defined as follows:

Argument	Description
Uppercase	All letters are uppercase. [<i>Example: Mary Smith results in MARY SMITH. end example</i>]
Lowercase	All letters are lowercase. [<i>Example: Mary Smith results in mary smith. end example</i>]
First capital	Capitalizes the first letter of the first word. [<i>Example: Mary Smith results in Mary smith. end example</i>]
Title case	Capitalizes the first letter of each word. [<i>Example: Mary Smith results in Mary Smith. end example</i>]

[*Example: Consider the following WordprocessingML fragment for the properties of a text box form field:*

```
<w:ffData>
  <w:textInput>
    <w:type w:val="number" />
    <w:maxLength w:val="4" />
    <w:format w:val="0.00" />
  </w:textInput>
</w:ffData>
```

The `format` element specifies the field formatting which is applied to the input to the field (in this case, a grouping of number formatting picture items as the type element specifies a value of `number`). If a value of 8 was entered into this field, the formatted result would be *8.00. end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[<i>Example: Consider the following WordprocessingML fragment:</i></p>

Attributes	Description
	<pre data-bbox="451 283 954 388"><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p data-bbox="414 420 1409 457">The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p data-bbox="414 493 925 529">However, consider the following fragment:</p> <pre data-bbox="451 567 1079 703"><w:sdtPr> <w:alias w:val="SDT Title Example" /> ... </w:sdtPr></pre> <p data-bbox="414 735 1477 844">In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i>]</p> <p data-bbox="414 877 1339 949">The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_String](#)) is located in §A.1. *end note*]

17.16.21 helpText (Associated Help Text)

This element specifies optional help text which shall be associated with the parent form field. The method or user interface by which this help text can be surfaced is not defined by ECMA-376.

If this element is omitted, then no help text shall be associated with the current form field.

[Example: Consider the following WordprocessingML fragment for a drop-down list form field:

```
<w:r>
  <w:fldChar w:fldCharType="begin">
    <w:ffData>
      <w:helpText w:type="text" w:val="Example help text."/>
      <w:ddlList>
        ...
      </w:ddlList>
    </w:ffData>
  </w:fldChar>
</w:r>
<w:r>
  <w:instrText> FORMDROPDOWN </w:instrText>
</w:r>
```

```

<w:r>
  <w:fldChar w:fldCharType="end"/>
</w:r>

```

The `helpText` element specifies the help text for the parent form field - in this case, literal help text consisting of the string `Example help text`. *end example*

Attributes	Description
type (Help Text Type)	<p>Specifies the type of help text which is specified by this element, defined by the simple type below.</p> <p>If this attribute is omitted, then its value shall be assumed to be <code>text</code>.</p> <p>[<i>Example</i>: Consider the following WordprocessingML fragment for a form field:</p> <pre> <w:ffData> <w:helpText w:type="text" w:val="Example help text." /> </w:ffData> </pre> <p>The <code>type</code> attribute has a value of <code>text</code>, which specifies that the text in the <code>val</code> attribute is the literal help text for this form field. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_InfoTextType</code> simple type (§17.18.43).</p>
val (Help Text Value)	<p>Specifies the help text for the current form field. Based on the value of the <code>type</code> attribute, the contents of this field shall be interpreted as follows:</p> <ul style="list-style-type: none"> When the <code>type</code> attribute value is <code>text</code>, contains the literal help text for the form field. When the <code>type</code> attribute value is <code>autoText</code>, contains the name of a glossary document entry which contains the help text for the form field. <p>[<i>Example</i>: Consider the following WordprocessingML fragment for a form field:</p> <pre> <w:ffData> <w:helpText w:type="autoText" w:val="HelpText" /> </w:ffData> </pre> <p>The text in the <code>val</code> attribute is the name of a glossary document entry containing the help text for this form field, since the <code>type</code> attribute has a value of <code>autoText</code>. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_FFHelpTextVal</code> simple type (§17.18.25).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_FFHelpText](#)) is located in §A.1. *end note*]

17.16.22 hyperlink (Hyperlink)

This element specifies the presence of a hyperlink at the current location in the document.

[*Example:* Consider the following WordprocessingML fragment for a hyperlink:

```
<w:hyperlink r:id="rId10">
  <w:r>
    <w:t>Click here</w:t>
  </w:r>
</w:hyperlink>
```

The hyperlink element defines a hyperlink whose display text is `Click here`, and whose target is specified by the relationship with an `Id` attribute value of `rId10`. *end example*]

Attributes	Description
<p>anchor (Hyperlink Anchor)</p>	<p>Specifies the name of a bookmark in the current document which shall be the target of this hyperlink.</p> <p>If this attribute is omitted, then the default behavior shall be to navigate to the start of the document. If a hyperlink target is also specified using the <code>r:id</code> attribute, then this attribute shall be ignored. If no bookmark exists in the current document with the given bookmark name, then the default behavior shall be to navigate to the start of the document.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment for a hyperlink:</p> <pre><w:hyperlink w:anchor="chapter3"> <w:r> <w:t>Go to Chapter Three</w:t> </w:r> </w:hyperlink></pre> <p>The anchor attribute specifies that the target of the current hyperlink must be the text contained within the bookmark <code>chapter3</code> within the document. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>
<p>docLocation (Location in Target Document)</p>	<p>Specifies a location in the target of the hyperlink that has no bookmarks. The method by which the contents of this attribute are linked to document text is outside the scope of ECMA-376.</p> <p>If this attribute is omitted, then no location shall be associated with the parent hyperlink. If the anchor attribute is also specified, then this attribute can be ignored when the hyperlink is invoked.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment for a hyperlink:</p>

Attributes	Description
	<pre><w:hyperlink r:id="rId9" w:docLocation="table"> <w:r> <w:t>Click Here</w:t> </w:r> </w:hyperlink></pre> <p>The docLocation attribute specifies that the target of the current hyperlink must be a region targeted by the string table within the target document. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
history (Add To Viewed Hyperlinks)	<p>Specifies whether the target of the parent hyperlink (as specified via the r:id attribute) shall be added to a list of viewed hyperlinks when it is invoked.</p> <p>If this attribute is omitted, then its value shall be assumed to be false.</p> <p>[Example: Consider the following WordprocessingML fragment for a hyperlink:</p> <pre><w:hyperlink r:id="rId9" w:history="true"> <w:r> <w:t>http://www.example.com</w:t> </w:r> </w:hyperlink></pre> <p>The history attribute value of true specifies that the target of the current hyperlink must be added to a list of visited hyperlinks when invoked within the document. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>
id (Hyperlink Target) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	<p>Specifies the ID of the relationship whose target shall be used as the target for this hyperlink.</p> <p>If this attribute is omitted, then there shall be no external hyperlink target for the current hyperlink - a location in the current document can still be target via the anchor attribute. If this attribute exists, it shall supersede the value in the anchor attribute.</p> <p>[Example: Consider the following WordprocessingML fragment for a hyperlink:</p> <pre><w:hyperlink r:id="rId9"> <w:r> <w:t>http://www.example.com</w:t> </w:r> </w:hyperlink></pre> <p>The id attribute value of rId9 specifies that relationship in the associated relationship part item with a corresponding Id attribute value must be navigated to when this</p>

Attributes	Description												
	<p>hyperlink is invoked. For example, if the following XML is present in the associated relationship part item:</p> <pre><Relationships xmlns="..."> <Relationship Id="rId9" Mode="External" Target=http://www.example.com /> </Relationships></pre> <p>The target of this hyperlink would therefore be the target of relationship rId9 - in this case, <code>http://www.example.com</code>. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>												
tgtFrame (Hyperlink Target Frame)	<p>Specifies a frame within the parent HTML frameset for the target of the parent hyperlink when one exists. All values specified by this element shall be handled as follows:</p> <table><tr><th>Value</th><th>Description</th></tr><tr><td>_top</td><td>Open hyperlink target in the full region of the current window.</td></tr><tr><td>_self</td><td>Open hyperlink target in the same frame as the hyperlink appears.</td></tr><tr><td>_parent</td><td>Open hyperlink target in the parent of the current frame, or the current frame if this frame has no parent.</td></tr><tr><td>_blank</td><td>Open hyperlink target in a new web browser window.</td></tr><tr><td>all other values</td><td>Open hyperlink target in the frame with the specified name. If no frame exists with this name, open in the current frame. If this string does not begin with an alphabetic character, it shall be ignored.</td></tr></table> <p>If this attribute is omitted, then no target frame information shall be associated with the parent hyperlink. If the current document is not part of a frameset, then this information can be ignored.</p> <p>[Example: Consider the following WordprocessingML fragment for a hyperlink:</p>	Value	Description	_top	Open hyperlink target in the full region of the current window.	_self	Open hyperlink target in the same frame as the hyperlink appears.	_parent	Open hyperlink target in the parent of the current frame, or the current frame if this frame has no parent.	_blank	Open hyperlink target in a new web browser window.	all other values	Open hyperlink target in the frame with the specified name. If no frame exists with this name, open in the current frame. If this string does not begin with an alphabetic character, it shall be ignored.
Value	Description												
_top	Open hyperlink target in the full region of the current window.												
_self	Open hyperlink target in the same frame as the hyperlink appears.												
_parent	Open hyperlink target in the parent of the current frame, or the current frame if this frame has no parent.												
_blank	Open hyperlink target in a new web browser window.												
all other values	Open hyperlink target in the frame with the specified name. If no frame exists with this name, open in the current frame. If this string does not begin with an alphabetic character, it shall be ignored.												

Attributes	Description
	<pre data-bbox="456 285 1143 453"><w:hyperlink r:id="rId9" w:tgtFrame="_top"> <w:r> <w:t>http://example.com</w:t> </w:r> </w:hyperlink></pre> <p data-bbox="415 491 1451 558">The <code>tgtFrame</code> attribute value of <code>_top</code> specifies that the target of this hyperlink must be displayed in the full extents of the current window. <i>end example</i></p> <p data-bbox="415 596 1341 663">The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>
tooltip (Associated String)	<p data-bbox="415 680 1463 785">Specifies a string which can be surfaced in a user interface as associated with the parent hyperlink. The method by which this string is surfaced by an application is outside the scope of ECMA-376.</p> <p data-bbox="415 823 1373 890">If this attribute is omitted, then no associated string shall be linked to the parent hyperlink in the document.</p> <p data-bbox="415 928 1349 961">[Example: Consider the following WordprocessingML fragment for a hyperlink:</p> <pre data-bbox="456 999 1240 1167"><w:hyperlink r:id="rId9" w:tooltip="Click here!"> <w:r> <w:t>http://example.com</w:t> </w:r> </w:hyperlink></pre> <p data-bbox="415 1205 1479 1272">The <code>tooltip</code> attribute value specifies that the parent hyperlink has the associated string of <code>Click here!</code>, which can be used as desired. <i>end example</i></p> <p data-bbox="415 1310 1341 1377">The possible values for this attribute are defined by the <code>ST_String</code> simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Hyperlink](#)) is located in §A.1. *end note*]

17.16.23 `instrText` (Field Code)

This element specifies that this run contains field codes (§17.16.5) within a complex field in the document.

If this element is contained within a run which is not part of a complex field's field codes, then it and its contents should be treated as regular text. If this element is contained within a `del` element, then the document is non-conformant.

[*Example:* Consider a complex checkbox field within a WordprocessingML. This field would be represented as follows:

```
<w:r>
  <w:fldChar w:fldCharType="begin" />
</w:r>
<w:r>
  <w:instrText>FORMCHECKBOX</w:instrText>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="separate" />
</w:r>
...
<w:r>
  <w:fldChar w:fldCharType="end" />
</w:r>
```

The field code is contained in an `instrText` node which occurs within the field codes portion of the complex field (i.e. before the separator character). *end example*

Attributes	Description
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	<p>Specifies how white space should be handled for the contents of this element using the W3C space preservation rules.</p> <p>[<i>Example:</i> Consider the following run contained within a WordprocessingML document:</p> <pre><w:r> <w:t> significant whitespace </w:t> </w:r></pre> <p>Although there are three spaces on each side of the text content in the run, that whitespace has not been specifically marked as significant, therefore it is subject to the space preservation rules currently specified in that run's scope. <i>end example</i>]</p> <p>The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Text](#)) is located in §A.1. *end note*]

17.16.24 label (Form Field Label)

This element specifies the label identifier associated with the current form field. The identifier representing the label shall be stored on this element’s `val` attribute and is used to reference the unique identifier value of a structured document tag. The contents of the structured document tag resolved by a specific unique identifier shall be used as the label content for the form field that references that specific unique identifier of the structured document tag. If multiple instances of the label element are present, the labels referenced are

ordered from most general to most specific. [Example: A form element for specifying country name might reference the label for these three items (in order): “Sender”, “Home Address”, and “Country”. *end example*]

If this element is omitted or the value of the label identifier cannot be resolved, then no label shall be associated with the given form field.

[Example: Consider the following text box form field, which references a structured document tag as a label:

```
<w:sdt>
  <w:sdtPr>
    <w:id w:val="5" />
  </w:sdtPr>
  <w:sdtContent>
    <w:p>
      <w:r>
        <w:t>Name</w:t>
      </w:r>
    </w:p>
  </w:sdtContent>
</w:sdt>
...
<w:ffData>
  <w:name w:val="TextTextBox" />
  <w:enabled />
  <w:textInput />
  <w:label w:val="5" />
</w:ffData>
```

The label element specifies that the text box form field uses the contents of the structured document tag with an identifier value of 5 as a label source. In this example, the label contents is “Name”. *end example*]

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[Example: Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <pre><... w:val="1512645511" /></pre> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).

[Note: The W3C XML Schema definition of this element’s content model ([CT_DecimalNumber](#)) is located in §A.1. *end note*]

17.16.25 listEntry (Drop-Down List Entry)

This element specifies the presence of a single drop-down list entry within the parent drop-down list form field in the document. The order of appearance of the series of listEntry elements in the WordprocessingML markup shall dictate the order of the entries in the drop-down list when it is displayed.

[Example: Consider the following WordprocessingML fragment for the properties of a drop-down list form field:

```
<w:ffData>
  <w:ddList>
    <w:listEntry w:val="One" />
    <w:listEntry w:val="Two" />
    <w:listEntry w:val="Three" />
  </w:ddList>
</w:ffData>
```

The three listEntry elements each specify one drop-down list entry for the parent drop-down list form field. In this case, these properties specify that the drop-down list must contain three entries of One, Two, and Three in that order when displayed. *end example*]

Attributes	Description
val (String Value)	<p>Specifies that its contents contain a string.</p> <p>The contents of this string are interpreted based on the context of the parent XML element.</p> <p>[Example: Consider the following WordprocessingML fragment:</p> <pre><w:pPr> <w:pStyle w:val="Heading1" /> </w:pPr></pre> <p>The value of the val attribute is the ID of the associated paragraph style's styleId.</p> <p>However, consider the following fragment:</p> <pre><w:sdtPr> <w:alias w:val="SDT Title Example" /></pre>

Attributes	Description
	<p>...</p> <p></w:sdtPr></p> <p>In this case, the decimal number in the val attribute is the caption of the nearest ancestor structured document tag. In each case, the value is interpreted in the context of the parent element. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_String](#)) is located in §A.1. *end note*]

17.16.26 maxLength (Text Box Form Field Maximum Length)

This element specifies the maximum length of text which should be allowed within the parent text box form field before any formatting specified by the format element (§17.16.20). If the current contents of this field exceed the specified value when the document is loaded, that violation shall not result in an error, but the application shall prevent the addition of any additional characters until the contents are brought below that limit.

If this element is omitted, then there shall be no limit on the number of characters in the parent text box form field.

[Example: Consider the following WordprocessingML fragment for the properties of a text box form field:

```
<w:ffData>
  <w:textInput>
    <w:type w:val="number" />
    <w:maxLength w:val="4" />
    <w:format w:val="0.00" />
  </w:textInput>
</w:ffData>
```

The maxLength element specifies that the contents of this form field should not be allowed to exceed four characters when edited by an application. *end example*

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[Example: Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p>

Attributes	Description
	<p><... w:val="1512645511" /></p> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_DecimalNumber](#)) is located in §A.1. *end note*]

17.16.27 name (Form Field Name)

This element specifies the name of the current form field.

[Example: Consider the following WordprocessingML fragment for a text box form field:

```
<w:r>
  <w:fldChar w:fldCharType="begin">
    <w:ffData>
      <w:name w:val="FirstName" />
      <w:textInput>
        ...
      </w:textInput>
    </w:ffData>
  </w:fldChar>
</w:r>
<w:r>
  <w:instrText> FORMTEXT </w:instrText>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="separate"/>
</w:r>
<w:r>
  <w:t>1</w:t>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="end"/>
</w:r>
```

The name element specifies that the name of the current form field is `FirstName`. *end example*]

Attributes	Description
val (Form Field Name Value)	<p>Specifies the name of the form field.</p> <p>If this attribute is omitted, then the parent form field shall have no name.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment for a form field:</p> <pre><w:ffData> <w:name w:val="ExampleFieldName"/> </w:ffData></pre> <p>The val attribute specifies that the name of the current form field is ExampleFieldName. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_FFName simple type (§17.18.26).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FFName](#)) is located in §A.1. *end note]*

17.16.28 result (Drop-Down List Selection)

This element specifies the zero-based index of the currently selected entry for the parent drop-down list form field.

If this element is omitted, then the current drop-down list form field shall have the selection specified by the value of the default element (§17.16.11). If the attribute value references an index value which does not exist (i.e. a negative number or a number that exceeds the number of items in the drop-down list), then this value can be ignored and the current drop-down list form field shall have the selection specified by the value of the default element.

[*Example:* Consider the following WordprocessingML fragment for a drop-down list form field:

```
<w:r>
  <w:fldChar w:fldCharType="begin">
    <w:ffData>
      <w:ddList>
        <w:default w:val="1" />
        <w:result w:val="2" />
        <w:listEntry w:val="One" />
        <w:listEntry w:val="Two" />
        <w:listEntry w:val="Three" />
      </w:ddList>
    </w:ffData>
  </w:fldChar>
</w:r>
<w:r>
  <w:instrText> FORMDROPDOWN </w:instrText>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="end"/>
</w:r>
```

The result element specifies the index of the currently selected value of the drop-down list form field to be 2. In this case, the resulting default value text is Three. *end example*]

Attributes	Description
val (Decimal Number Value)	<p>Specifies that the contents of this attribute contains a decimal number.</p> <p>The contents of this decimal number are interpreted based on the context of the parent XML element.</p> <p>[Example: Consider the following numeric WordprocessingML property of simple type ST_DecimalNumber:</p> <div><... w:val="1512645511" /></div> <p>The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DecimalNumber simple type (§17.18.10).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_DecimalNumber](#)) is located in §A.1. *end note*]

17.16.29 size (Checkbox Form Field Size)

This element specifies the exact size for the parent checkbox form field. The resulting field shall be displayed in this point size regardless of the size specified by the formatting of its corresponding content in the document via the style hierarchy.

[*Example:* Consider the following WordprocessingML fragment for the properties of a checkbox form field:

```
<w:ffData>
  <w:checkBox>
    <w:size w:val="20" />
    <w:checked w:val="true" />
  </w:checkBox>
</w:ffData>
```

The size element specifies that the checkbox must be displayed in a ten point font size, regardless of the formatting which would normally be applied to this text via the style hierarchy. *end example*]

Attributes	Description
val (Half Point Measurement)	<p>Specifies a positive measurement specified in half-points (1/144 of an inch).</p> <p>The contents of this attribute value are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment:</p> <pre><... w:val="30" /></pre> <p>The value in the val attribute is 30, which is equivalent to 15 points (30 half-points).</p> <p>This value is interpreted in the context of the parent element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_HpsMeasure simple type (§17.18.42).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_HpsMeasure](#)) is located in §A.1. *end note*]

17.16.30 sizeAuto (Automatically Size Form Field)

This element specifies that the parent checkbox form field shall be formatted using the point size which is applied to its field characters via the style hierarchy.

[*Example:* Consider the following WordprocessingML fragment for the properties of a checkbox form field:

```

<w:r>
  <w:rPr>
    <w:sz w:val="40"/>
  </w:rPr>
  <w:fldChar w:fldCharType="begin">
    <w:ffData>
      <w:checkBox>
        <w:sizeAuto />
        <w:checked w:val="true" />
      </w:checkBox>
    </w:ffData>
  </w:fldChar>
</w:r>

```

The sizeAuto element specifies that the checkbox must be displayed in the point size of the formatting which would normally be applied to this text via the style hierarchy. In this case, this size is the twenty points specified via the direct formatting on the parent run. *end example*]

This element's content model is defined by the common boolean property definition in §17.17.4.

17.16.31 statusText (Associated Status Text)

This element specifies optional status text which shall be associated with the parent form field. The method or user interface by which this status text can be surfaced is not defined by ECMA-376.

If this element is omitted, then no status text shall be associated with the current form field.

[*Example:* Consider the following WordprocessingML fragment for a drop-down list form field:

```

<w:r>
  <w:fldChar w:fldCharType="begin">
    <w:ffData>
      <w:statusText w:type="text" w:val="Example status text."/>
      <w:ddList>
        ...
      </w:ddList>
    </w:ffData>
  </w:fldChar>
</w:r>
<w:r>
  <w:instrText> FORMDROPDOWN </w:instrText>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="end"/>
</w:r>

```

The `statusText` element specifies the status text for the parent form field - in this case, literal text consisting of the string `Example status text.` *end example*]

Attributes	Description
type (Status Text Type)	<p>Specifies the type of status text which is specified by this element, defined by the simple type below.</p> <p>If this attribute is omitted, then its value shall be assumed to be <code>text</code>.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment for a form field:</p> <pre><w:ffData> <w:statusText w:type="text" w:val="Example status text." /> </w:ffData></pre> <p>The <code>type</code> attribute has a value of <code>text</code>, which specifies that the text in the <code>val</code> attribute is the literal status text for this form field. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_InfoTextType</code> simple type (§17.18.43).</p>
val (Status Text Value)	<p>Specifies the status text for the current form field. Based on the value of the <code>type</code> attribute, the contents of this field shall be interpreted as follows:</p> <ul style="list-style-type: none"> • When the <code>type</code> attribute value is <code>text</code>, contains the literal status text for the form field. • When the <code>type</code> attribute value is <code>autoText</code>, contains the name of a glossary document entry which contains the status text for the form field. <p>[<i>Example:</i> Consider the following WordprocessingML fragment for a form field:</p> <pre><w:ffData> <w:statusText w:type="autoText" w:val="MyStatusText" /> </w:ffData></pre> <p>The text in the <code>val</code> attribute is the name of a glossary document entry containing the status text for this form field, since the <code>type</code> attribute has a value of <code>autoText</code>. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_FFStatusTextVal</code> simple type (§17.18.27).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FFStatusText](#)) is located in §A.1. *end note*]

17.16.32 `tabIndex` (Form Field Navigation Order Index)

This element specifies the position of the current form field in the navigation (tab) order used in the document. The tabbing index shall be stored on this element's `val` attribute and is analogous to the `tabIndex` attribute in HTML.

Objects that support tab index shall be navigated by consumers in the following order:

- Objects for which the XML specifies a non-zero `tabIndex` value are navigated first. Navigation proceeds with the element with the lowest resolved value of `tabIndex` to the element with the highest resolved value of `tabIndex`.
- Objects that specify identical resolved values of `tabIndex` is navigated in the lexical order in which the elements appear in the underlying WordprocessingML.
- Objects for which the XML does not specify an index or objects for which the XML specifies a resolved `tabIndex` value of 0 are navigated last. These objects are navigated in the lexical order in which they appear in the underlying WordprocessingML.

[*Example:* Consider the following two text box form fields where form field specifies a tab index:

```
<w:ffData>
  <w:name w:val="FirstName" />
  <w:enabled />
  <w:textInput />
  <w:tabIndex w:val="1" />
</w:ffData>
...
<w:ffData>
  <w:name w:val="LastName" />
  <w:enabled />
  <w:textInput />
  <w:tabIndex w:val="2" />
</w:ffData>
```

The `tabIndex` element specifies that the `FirstName` form field must be the first content to be reached via tabbing, whereas the `LastName` form field must be the second content to be reached via tabbing. *end example*]

Attributes	Description
<code>val</code> (Positive Decimal Number Value)	<p>Specifies that the contents of this attribute contains a positive decimal number.</p> <p>The contents of this positive decimal number are interpreted based on the context of the parent XML element.</p> <p>[<i>Example:</i> Consider the following numeric WordprocessingML property of type <code>ST_UnsignedDecimalNumber</code>:</p>

Attributes	Description
	<p data-bbox="456 285 711 315"><... w:val="15" /></p> <p data-bbox="415 354 1438 422">The value of the val attribute is a decimal number whose value must be interpreted in the context of the parent element. <i>end example</i></p> <p data-bbox="415 462 1443 529">The possible values for this attribute are defined by the ST_UnsignedDecimalNumber simple type (§22.9.2.16).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_UnsignedDecimalNumber](#)) is located in §A.1. *end note*]

17.16.33 textInput (Text Box Form Field Properties)

This element specifies a set of properties which shall be associated with the parent FORMTEXT text box form field (§17.16.5.22) within the document.

If the parent form field is not a text box (i.e. its field code does not have a value of FORMTEXT), then these properties can be ignored.

[Example: Consider the following WordprocessingML fragment for the properties of a text box form field:

```
<w:ffData>
  <w:textInput>
    <w:maxLength w:val="4" />
    ...
    <w:type w:val="number" />
  </w:textInput>
</w:ffData>
```

The textInput element specifies that it contains a set of properties for the parent text box form field. In this case, these properties specify that the drop-down list must contain no more than four characters via the maxLength element (§17.16.26), and that its contents must contain a number via the type element (§17.16.34). *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_FFTextInput](#)) is located in §A.1. *end note*]

17.16.34 type (Text Box Form Field Type)

This element specifies the type of the contents of the current text box form field. This element shall not be used to prevent the successful loading of any contents in the field, but shall be used to parse the formatting specified in the format element (§17.16.20) and should be used to prevent the addition of illegal content when its contents are edited by an application.

If this element is omitted, then its default value shall be assumed to be regular.

[*Example:* Consider the following WordprocessingML fragment for the properties of a text box form field:

```
<w:ffData>
  <w:textInput>
    <w:type w:val="number" />
    <w:maxLength w:val="4" />
    <w:format w:val="0.00" />
  </w:textInput>
</w:ffData>
```

The type element specifies that the contents of this form field should be handled as a number by an application.
end example]

Attributes	Description
val (Text Box Form Field Type Values)	<p>Specifies the type of the text box form field, as defined by the simple type referenced below.</p> <p>[<i>Example:</i> Consider the following WordprocessingML fragment for the properties of a text box form field:</p> <pre><w:ffData> <w:textInput> <w:type w:val="currentDate" /> </w:textInput> </w:ffData></pre> <p>The val attribute value of currentDate specifies that the contents of this form field should be the current date when the field is updated. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_FFTextType simple type (§17.18.28).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_FFTextType](#)) is located in §A.1. *end note]*

17.17 Miscellaneous Topics

This section covers topics not covered elsewhere within the WordprocessingML documentation.

17.17.1 Subdocuments

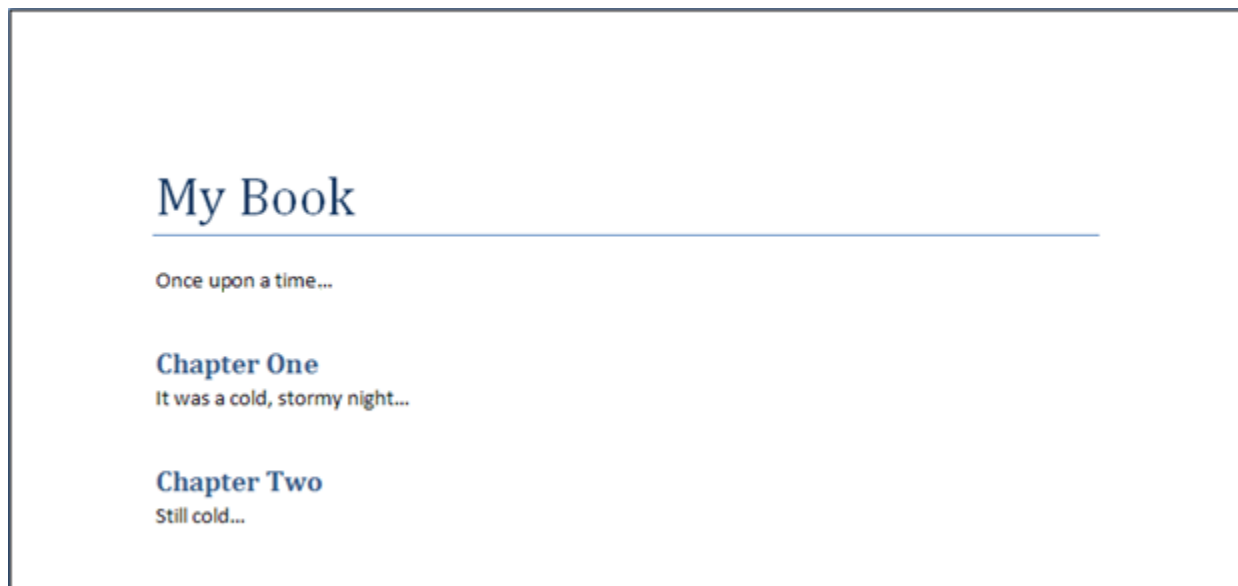
Within a WordprocessingML document, it is sometimes necessary to break a large document into two or more separate WordprocessingML document files, allowing each of these files to be distributed, edited, and handled independently.

[*Example*: A book might consist of five chapters, each edited by a separate author. The editor for the book would therefore desire to create six WordprocessingML documents - one for each author to work on their chapter, and a main document which collates the content of the five chapters appropriately. *end example*]

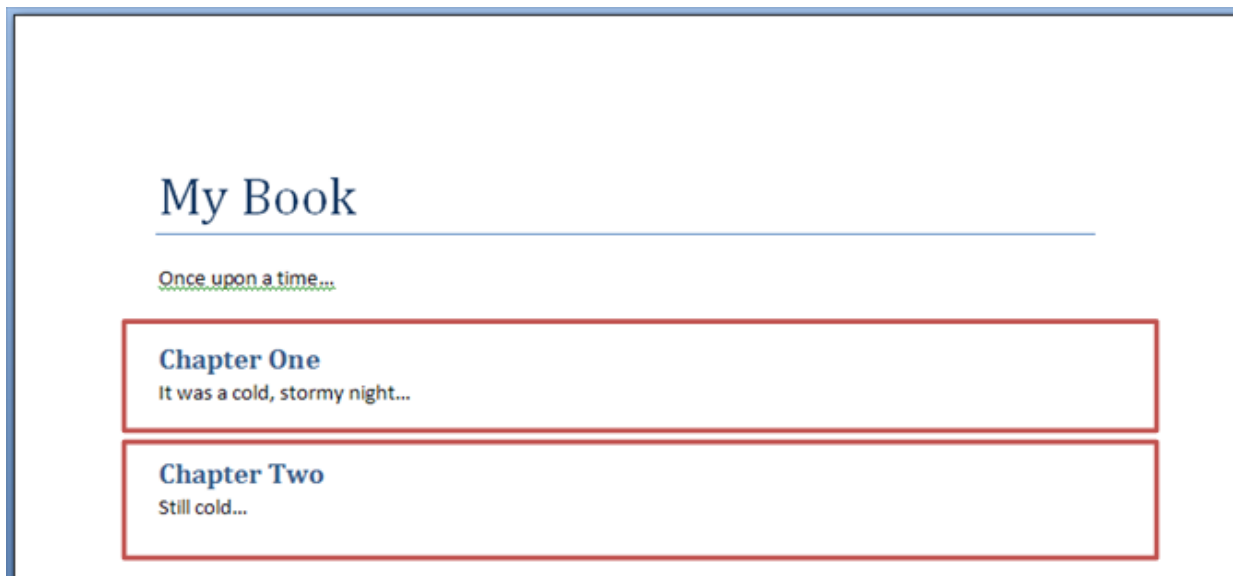
When a WordprocessingML document is comprised of other WordprocessingML documents in this way, the resulting documents are called a master document and its subdocuments.

- A *subdocument* is a WordprocessingML document - there is no specific information in a document which classifies it as such, other than that it is incorporated into another document.
- A *master document* is a document which incorporates one or more subdocuments (as well as optional WordprocessingML content) to create a larger document

[*Example*: Consider a WordprocessingML document which is being used to write a book:



To allow this document to be written by multiple authors, each chapter in the book is placed in a separate file (the sections highlighted in red below):



The result is three WordprocessingML documents:

- A master document (containing the title of the book, the first paragraph, and references to the subdocuments for each chapter)
- Two subdocuments (one for each chapter)

end example]

17.17.1.1 subDoc (Anchor for Subdocument Location)

This element specifies a location within a master document for the insertion of the contents of a specified subdocument. The specified subdocument's contents should appear at the specified location within the master document as needed, but shall remain part of the separate file specified by the subdocument location. The location of the subdocument shall be specified by the relationship whose Id attribute matches the id attribute on this element.

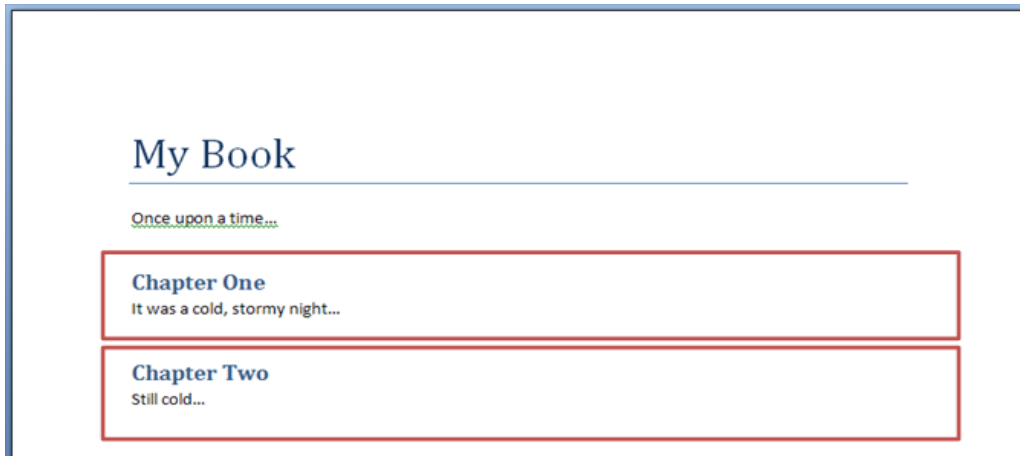
If the relationship type of the relationship specified by this element is not <http://purl.oclc.org/ooxml/officeDocument/relationships/subDocument>, is not present, or does not have a TargetMode attribute value of External, then the document shall be considered non-conformant.

When a subdocument is displayed at the specified location within the master document, the following logic determines how the styles and formatting of the subdocument and associated master document shall be handled:

- All direct formatting in the subdocument is retained.
- For each style in each subdocument:
 - If a style with the same styleId attribute value exists in the master document, display the contents of the subdocument using the style in the master document.

- Otherwise, import the style into the master document and display the content using the original style.
- If a subsequent subdocument also contains a style with the same styleId attribute value, the latter's style is ignored and the content is displayed using the version of the style imported into the master document.

[Example: Consider a book consisting of three chapters, two of which have been divided into subdocuments as follows (the red rectangle indicates the bounds of each subdocument's contents):



The resulting master document would consist of its own WordprocessingML content as well as subdocument anchors in the appropriate locations:

```
<w:body>
  <w:p>
    ...
    <w:r>
      <w:t>My Book</w:t>
    </w:r>
  </w:p>
  <w:p>
    <w:r>
      <w:t>Once upon a time...</w:t>
    </w:r>
  </w:p>
  <w:p>
    <w:subDoc r:id="subDocRel1" />
  </w:p>
```

```
<w:p>
  <w:subDoc r:id="subDocRel2" />
</w:p>
<w:sectPr>
  ...
</w:sectPr>
</w:body>
```

The two subDoc elements specify that the subdocuments targeted by the relationships with an ID of subDocRel1 and subDocRel2 must be imported in that order after the content of the first two paragraphs of content. Examining the contents of the corresponding relationship part item, we can see the targets for those relationships:

```
<Relationships ... >
...
<Relationship Id="subDocRel1" TargetMode="External"
Type="http://purl.oclc.org/ooxml/officeDocument/relationships/subDocument"
Target="Chapter1.docx" />
<Relationship Id="subDocRel2" TargetMode="External"
Type="http://purl.oclc.org/ooxml/officeDocument/relationships/subDocument"
Target="Chapter2.docx" />
...
</Relationships>
```

The corresponding relationship part item shows that the two files to be imported are located in the same location as the current file and name Chapter1.docx and Chapter2.docx respectively. *end example*]

Attributes	Description
<p>id (Relationship to Part)</p> <p>Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships</p>	<p>Specifies the relationship ID to a specified part.</p> <p>The specified relationship shall match the relationship type required by the parent element:</p> <ul style="list-style-type: none"> • http://purl.oclc.org/ooxml/officeDocument/relationships/customXml for the contentPart element • http://purl.oclc.org/ooxml/officeDocument/relationships/footer for the footerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/header for the headerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/font for the embedBold, embedBoldItalic, embedItalic, or embedRegular elements • http://purl.oclc.org/ooxml/officeDocument/relationships/printerSettings for the printerSettings element • http://purl.oclc.org/ooxml/officeDocument/relationships/hyperlink for the longDesc or hyperlink element

Attributes	Description
	<p>[<i>Example:</i> Consider an XML element which has the following id attribute:</p> <pre data-bbox="451 321 743 352"><... r:id="rId10" /></pre> <p>The markup specifies the associated relationship part with relationship ID rId1 contains the corresponding relationship information for the parent XML element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Rel](#)) is located in §A.1. *end note*]

17.17.2 Alternative Format Import

When generating WordprocessingML documents, it is sometimes necessary to include existing document content (henceforth called *external content*) within the document. External content in a document is typically included because it was stored in a format other than the WordprocessingML format defined by ECMA-376.

As described in §11.3.1, conforming producers shall not create WordprocessingML packages which utilize this mechanism.

In order to facilitate the inclusion of such content without requiring its conversion as a prerequisite to its inclusion in a document, WordprocessingML includes the facility for applications to implement the import of external content in any format as part of a WordprocessingML document. This functionality, called external content import, allows the inclusion of content of an arbitrary content type within the WordprocessingML package, which shall then be opened and merged into the main document when the package is consumed by applications which understand that content type.

[*Example:* Consider a WordprocessingML document which is being created based on the following existing HTML content:

```
<html ... >
  <body style="margin-left:200px;margin-top:50px">
    <p>Paragraph one.</p>
    <blockquote style="border:5px solid #00FFFF">Paragraph in a
blockquote.</blockquote>
    <p>Paragraph two.</p>
  </body>
</html>
```

This content could be converted to its WordprocessingML equivalents using the XML syntax defined by ECMA-376, or a more basic tool can use the external content import to include the HTML document within a WordprocessingML package, allowing a subsequent consumer of that content to import the resulting HTML. When the resulting WordprocessingML package is opened, the HTML document must be read (if it is an

alternate format understood by the consuming application) and migrated into the appropriate location in the main WordprocessingML document. *end example]*

17.17.2.1 altChunk (Anchor for Imported External Content)

This element specifies a location within a document for the insertion of the contents of a specified file containing external content to be imported into the main WordprocessingML document. The specified file's contents should appear at the specified location within the document, and can henceforth be emitted as regular WordprocessingML without distinction to its origin. The location of the external content to be imported shall be specified by the relationship whose Id attribute matches the id attribute on this element.

If the relationship type of the relationship specified by this element is not `http://purl.oclc.org/ooxml/officeDocument/relationships/aFChunk`, is not present, or does not have a TargetMode attribute value of `Internal`, then the document shall be considered non-conformant. If an application cannot process external content of the content type specified by the targeted part, then it should ignore the specified alternate content but continue to process the file. If possible, it should also provide some indication that unknown content was not imported.

[*Example:* Consider a WordprocessingML document consisting of contents which must be imported from the following HTML document:

```
<html ... >
  <body style="margin-left:200px;margin-top:50px">
    <p>Paragraph one.</p>
    <blockquote style="border:5px solid #00FFFF">Paragraph in a
blockquote.</blockquote>
    <p>Paragraph two.</p>
  </body>
</html>
```

The resulting WordprocessingML host document would consist of its own WordprocessingML content as well as an external content import anchor in the appropriate location:

```
<w:body>
  <w:altChunk r:id="altChunk1" />
  <w:p/>
  <w:sectPr>
    ...
  </w:sectPr>
</w:body>
```

The altChunk element specifies that the external content targeted by the relationship with an ID of altChunk1 must be imported at the beginning of the document. Examining the contents of the corresponding relationship part item, we can see the targets for that relationship:

```

<Relationships ... >
  ...
  <Relationship Id="altChunk1" TargetMode="Internal"
Type="http://purl.oclc.org/ooxml/officeDocument/relationships/aFChunk" Target="import.htm"
/>
  ...
</Relationships>

```

The corresponding relationship part item shows that the file to be imported is located next to the main document and is named `import.htm`. *end example*]

Attributes	Description
id (Relationship to Part) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	<p>Specifies the relationship ID to a specified part containing alternate content for import.</p> <p>If the specified relationship does not match the relationship type required by the parent element, then this document shall be considered to be non-conformant.</p> <p>[<i>Example</i>: Consider an XML element which has the following id attribute:</p> <pre><... r:id="rId10" /></pre> <p>The markup specifies the associated relationship part with relationship ID <code>rId1</code> contains the corresponding relationship information for the parent XML element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_RelationshipId</code> simple type (§22.8.2.1).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_AltChunk](#)) is located in §A.1. *end note*]

17.17.2.2 altChunkPr (External Content Import Properties)

This element specifies the set of properties which shall be applied to the import of the external content specified by the parent `altChunk` element. Within ECMA-376, only one property is specified.

[*Example*: Consider a WordprocessingML document consisting of contents which contains an external content import anchor in the appropriate location:

```

<w:body>
  <w:altChunk r:id="altChunk1">
    <w:altChunkPr>
      <w:matchSrc w:val="false" />
    </w:altChunkPr>
  </w:altChunk>
</w:p>

```

```

    <w:sectPr>
    ...
  </w:sectPr>
</w:body>

```

The altChunkPr element specifies the set of properties applied to the external content import when importing the specified content. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_AltChunkPr](#)) is located in §A.1. *end note*]

17.17.2.3 matchSrc (Keep Source Formatting on Import)

This element specifies if any style definitions present in the imported content shall be overridden by identical styles present in the host WordprocessingML document. If this element's val attribute is true, then any style exists in both the imported content and main document shall be maintained on the imported content by redefining the style name and/or ID as needed. Conversely, if this element's val attribute is false, any style which exists in both the imported content and main document shall apply the style form the main document in place of the style in the imported content.

If this element is omitted, then styles from the main document shall override identical styles from the imported content.

[Example: Consider a WordprocessingML document consisting of contents which contains an external content import anchor in the appropriate location:

```

<w:body>
  <w:altChunk r:id="altChunk1">
    <w:altChunkPr>
      <w:matchSrc w:val="true" />
    </w:altChunkPr>
  </w:altChunk>
  <w:p/>
  <w:sectPr>
  ...
</w:sectPr>
</w:body>

```

The matchSrc element has a val attribute value of true, which specifies that conflicting styles must be maintained when importing the specified content. For example, if the Heading 1 style was defined in both places, then applications must ensure that the resulting document does not lose either instance of its formatting as appropriate. *end example*

This element's content model is defined by the common boolean property definition in §17.17.4.

17.17.3 Roundtripping Alternate Content

Office Open XML defines a mechanism for the storage of content which is not defined by ECMA-376, for example extensions developed by future software applications which leverage the Office Open XML formats. This mechanism allows for the storage of a series of alternative representations of content, of which the consuming application should use the first alternative whose requirements are met.

[*Example:* Consider an application which creates a new paragraph property intended to make the colors of its text change colors randomly when it is displayed. This functionality is not defined in ECMA-376, and so the application might choose to create an alternative representation setting a different manual color on each character for clients which do not understand this extension using an AlternateContent block as follows:

```
<ve:AlternateContent xmlns:ve="...">
  <ve:Choice Requires="colors" xmlns:colors="urn:randomTextColors">
    <w:p>
      <w:pPr>
        <colors:random colors:val="true" />
      </w:pPr>
      <w:r>
        <w:t>Random colors!</w:t>
      </w:r>
    </w:p>
  </ve:Choice>
  <ve:Fallback>
    <w:p>
      <w:r>
        <w:rPr>
          <w:color w:val="FF0000" />
        </w:rPr>
        <w:t>R</w:t>
      </w:r>
      <w:r>
        <w:rPr>
          <w:color w:val="00FF00" />
        </w:rPr>
        <w:t>a</w:t>
      </w:r>
      ...
    </w:p>
  </ve:Fallback>
</ve:AlternateContent>
```

The Choice element that requires the new color extensions uses the random element in its namespace, and the Fallback element allows clients that do not support this namespace to see an appropriate alternative representation. *end example*]

These alternate content blocks can occur at any location within a WordprocessingML document, and applications shall handle and process them appropriately (taking the appropriate choice).

However, WordprocessingML does not explicitly define a set of locations where applications shall attempt to store and roundtrip all non-taken choices whenever possible. This behavior is therefore application-defined.

[*Example:* If an application does not understand the colors extension, the resulting file (if alternate choices are to be preserved would appear as follows:

```
<ve:AlternateContent xmlns:ve="...">
  <ve:Choice Requires="colors" xmlns:colors="urn:randomTextColors">
    ...
  </ve:Choice>
  <ve:Fallback>
    ...
  </ve:Fallback>
</ve:AlternateContent>
```

The file would then appear as follows after the choice is processed:

```
<w:p>
  <w:r>
    <w:rPr>
      <w:color w:val="FF0000" />
    </w:rPr>
    <w:t>R</w:t>
  </w:r>
  <w:r>
    <w:rPr>
      <w:color w:val="00FF00" />
    </w:rPr>
    <w:t>a</w:t>
  </w:r>
  ...
</w:p>
```

The state of the alternate choices (preserved or not) is dependent on the application hosting the file. Preserving the content involves storing each non-taken choice while the file is being edited, and writing out the file with an AlternateContent block when it is resaved. *end example*]

17.17.4 Boolean Property (CT_OnOff)

This common complex type specifies a boolean attribute used throughout WordprocessingML.

Attributes	Description
val (On/Off Value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off.</p> <p>[<i>Example:</i> For example, consider the following on/off property:</p> <pre><... w:val="false"/></pre> <p>The val attribute explicitly declares that the property is false. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[*Note:* The W3C XML Schema definition of this complex type's content model ([CT_OnOff](#)) is located in §A.1. *end note*]

17.18 Simple Types

This is the complete list of simple types dedicated to WordprocessingML.

17.18.1 ST_AnnotationVMerge (Table Cell Vertical Merge Revision Type)

This simple type specifies the possible values for the vertical merge setting which applied to a table cell by a cell merge (or split) revision.

[*Example:* Consider a two row by two column table in which the cells in the second column are merged, and this change is tracked as a revision. The annotation on the last cell in the table would appear as follows:

```
<w:tc>
  <w:tcPr>
    <w:cellMerge ... w:vMerge="cont" />
  </w:tcPr>
  ...
</w:tc>
```

The vmerge attribute value of cont specifies that the revision on the table cell resulted in it being merged with the previous set of vertically merged cells above it (whether that was one cell or many). *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
cont (Vertically Merged Cell)	Specifies that the revision resulted in this cell being vertically merged with the cell above it.
rest (Vertically Split Cell)	Specifies that the revision resulted in this cell being vertically split from the one above it.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_AnnotationVMerge](#)) is located in §A.1. *end note*]

17.18.2 ST_Border (Border Styles)

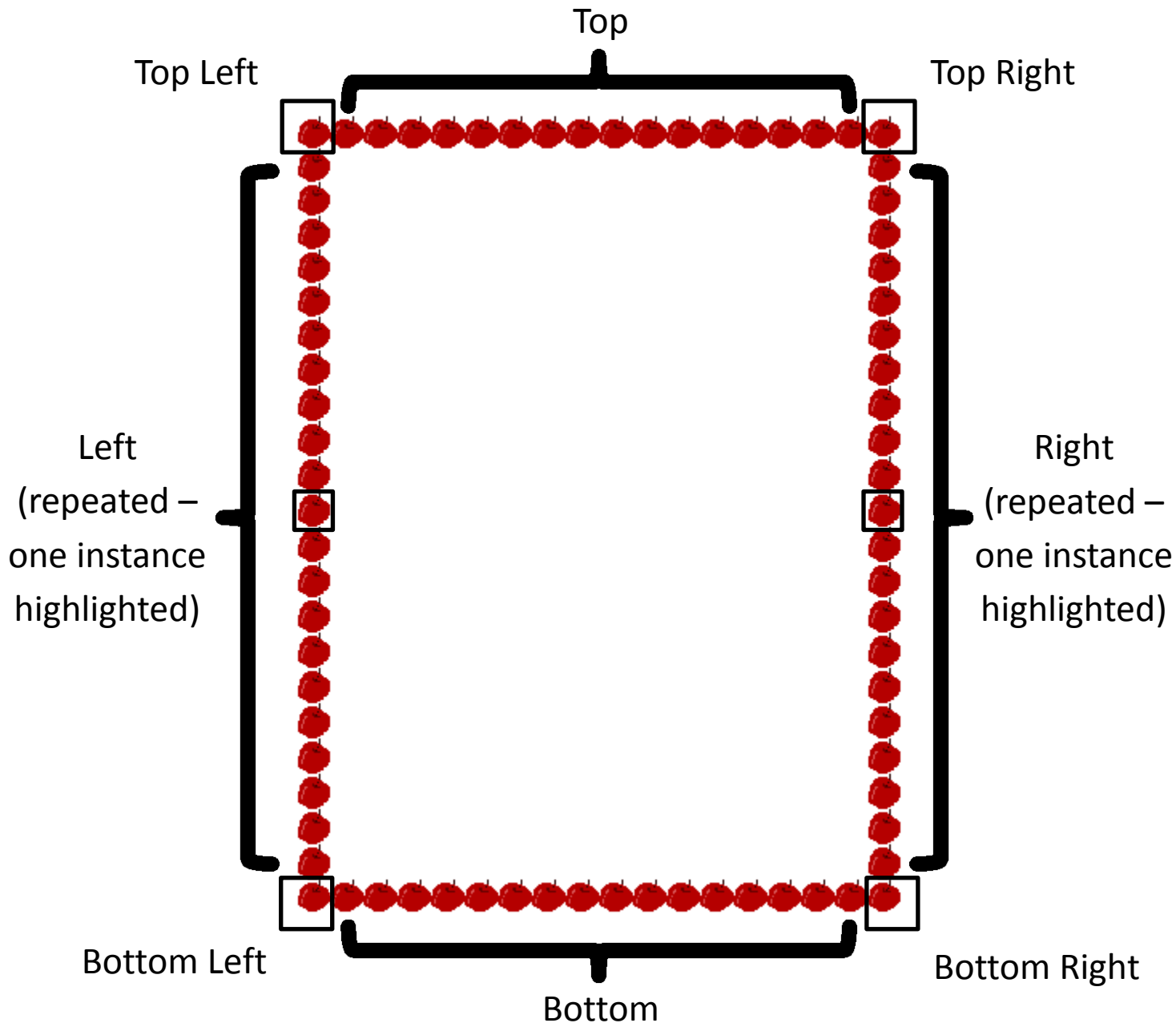
This simple type specifies the kinds of borders which can be specified for WordprocessingML objects which have a border.

Borders can be separated into two types:

- *Line borders*, which specify a pattern to be used when drawing a line around the specified object.
- *Art borders*, which specify a repeated image to be used when drawing a border around the specified object.

Line borders can be specified on any object which allows a border, however, art borders can only be used as a border at the page level - the borders under the pgBorders element (§17.6.10).

For art borders, each border definition is specified by the combination of eight images, as follows:



For the edge borders (top, bottom, left, and right), the border image is repeated as necessary to span the distance between the two intersecting corners. Electronic normative definitions of each piece of border art are included in Annex F.









[*Example:* Consider a left border resulting in the following WordprocessingML:












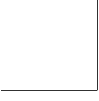

```
<w:left w:val="single" .../>
```









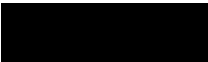


This border's val is single, indicating that the border style is a single line border. *end example*]

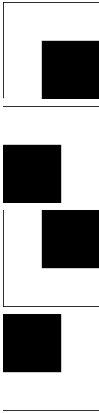
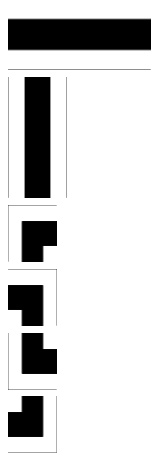
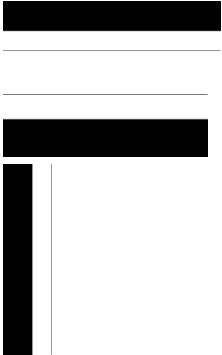
This simple type's contents are a restriction of the W3C XML Schema string datatype.









This simple type is restricted to the values listed in the following table:













Enumeration Value	Description
apples (Apples Art Border)	Specifies an art border using the following images: All Sides: 
archedScallops (Arched Scallops Art Border)	Specifies an art border using the following images: All Sides: 
babyPacifier (Baby Pacifier Art Border)	Specifies an art border using the following images: All Sides: 
babyRattle (Baby Rattle Art Border)	Specifies an art border using the following images: All Sides: 
balloons3Colors (Three Color Balloons Art Border)	Specifies an art border using the following images: All Sides: 
balloonsHotAir (Hot Air Balloons Art Border)	Specifies an art border using the following images: All Sides: 
basicBlackDashes (Black Dash Art Border)	Specifies an art border using the following images: Top and Bottom:  Left and Right: 




Enumeration Value	Description
	<p>Top Left: </p> <p>Top Right: </p> <p>Bottom Left: </p> <p>Bottom Right: </p>
basicBlackDots (Black Dot Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
basicBlackSquares (Black Square Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
basicThinLines (Thin Line Art Border)	<p>Specifies an art border using the following images:</p> <p>Top and Bottom: </p> <p>Left and Right: </p> <p>Top Left: </p> <p>Top Right: </p> <p>Bottom Left: </p> <p>Bottom Right: </p>
basicWhiteDashes (White Dash Art Border)	<p>Specifies an art border using the following images:</p> <p>Top and Bottom: </p>


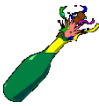


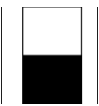
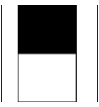



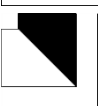

Enumeration Value	Description
	<div>Left and Right:</div> <div>Top Left:</div> <div>Top Right:</div> <div>Bottom Left:</div> <div>Bottom Right:</div>
basicWhiteDots (White Dot Art Border)	<div>Specifies an art border using the following images:</div> <div>All Sides:</div>
basicWhiteSquares (White Square Art Border)	<div>Specifies an art border using the following images:</div> <div>All Sides:</div>
basicWideInline (Wide Inline Art Border)	<div>Specifies an art border using the following images:</div> <div>Top:</div> <div>Bottom:</div> <div>Left:</div> <div>Right:</div>



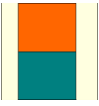


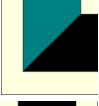

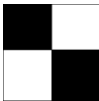




Enumeration Value	Description
	<div> <div>Top Left:</div> <div>Top Right:</div> <div>Bottom Left:</div> <div>Bottom Right:</div> </div> 
basicWideMidline (Wide Midline Art Border)	<p>Specifies an art border using the following images:</p> <div> <div>Top and Bottom:</div> <div>Left and Right:</div> <div>Top Left:</div> <div>Top Right:</div> <div>Bottom Left:</div> <div>Bottom Right:</div> </div> 
basicWideOutline (Wide Outline Art Border)	<p>Specifies an art border using the following images:</p> <div> <div>Top:</div> <div>Bottom:</div> <div>Left:</div> </div> 










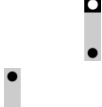
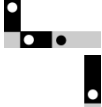
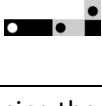
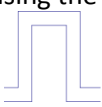
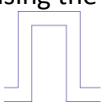
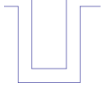
Enumeration Value	Description
	<div>  </div> <p>Right:</p> <div>  </div> <p>Top Left:</p> <div>  </div> <p>Top Right:</p> <div>  </div> <p>Bottom Left:</p> <div>  </div> <p>Bottom Right:</p>
bats (Bats Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides:</p> <div>  </div>
birds (Birds Art Border)	<p>Specifies an art border using the following images:</p> <p>Top, Bottom, Top Left, Top Right, Bottom Left and</p> <div>  </div> <p>Bottom Right:</p> <p>Left and Right:</p> <p>[Note: Second image is blank. end note]</p>
birdsFlight (Birds Flying Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides:</p> <div>  </div>
cabins (Cabin Art Border)	<p>Specifies an art border using the following images:</p>

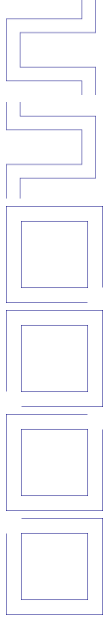





Enumeration Value	Description
	<p>All Sides:</p> 
cakeSlice (Cake Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides:</p> 
candyCorn (Candy Corn Art Border)	<p>Specifies an art border using the following images:</p> <p>Top:</p>  <p>Bottom:</p>  <p>Left:</p>  <p>Right:</p>  <p>Top Left:</p>  <p>Top Right:</p>  <p>Bottom Left:</p>  <p>Bottom Right:</p> 
celticKnotwork (Knot Work Art Border)	<p>Specifies an art border using the following images:</p> <p>Top:</p>  <p>Bottom:</p> 












Enumeration Value	Description
	<div>Left:</div> <div>Right:</div> <div>Top Left:</div> <div>Top Right:</div> <div>Bottom Left:</div> <div>Bottom Right:</div> 
certificateBanner (Certificate Banner Art Border)	<div>Specifies an art border using the following images:</div> <div>Top:</div> <div>Bottom:</div>  <div>Left:</div> <div>[Note: Image is blank. end note]</div> <div>Right:</div> <div>[Note: Image is blank. end note]</div> <div>Top Left:</div> <div>Top Right:</div> <div>Bottom Left:</div> <div>Bottom Right:</div> 















Enumeration Value	Description
chainLink (Chain Link Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
champagneBottle (Champagne Bottle Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
checkedBarBlack (Black and White Bar Art Border)	<p>Specifies an art border using the following images:</p> <p>Top: </p> <p>Bottom: </p> <p>Left: </p> <p>Right: </p> <p>Top Left: </p> <p>Top Right: </p> <p>Bottom Left: </p> <p>Bottom Right: </p>
checkedBarColor (Color Checked Bar Art Border)	<p>Specifies an art border using the following images:</p> <p>Top: </p>













Enumeration Value	Description
	<div data-bbox="1117 247 1214 323"></div> <p data-bbox="824 317 927 344">Bottom:</p> <div data-bbox="1117 344 1214 449"></div> <p data-bbox="824 422 883 449">Left:</p> <div data-bbox="1117 449 1214 554"></div> <p data-bbox="824 527 899 554">Right:</p> <div data-bbox="1117 554 1214 659"></div> <p data-bbox="824 632 932 659">Top Left:</p> <div data-bbox="1117 659 1214 764"></div> <p data-bbox="824 737 948 764">Top Right:</p> <div data-bbox="1117 764 1214 869"></div> <p data-bbox="824 842 980 869">Bottom Left:</p> <div data-bbox="1117 869 1214 974"></div> <p data-bbox="824 947 997 974">Bottom Right:</p>
checkered (Checkerboard Art Border)	<p data-bbox="824 1058 1425 1085">Specifies an art border using the following images:</p> <div data-bbox="1019 1085 1117 1184"></div> <p data-bbox="824 1163 932 1190">All Sides:</p>
christmasTree (Christmas Tree Art Border)	<p data-bbox="824 1281 1425 1308">Specifies an art border using the following images:</p> <div data-bbox="1019 1308 1117 1407"></div> <p data-bbox="824 1386 932 1413">All Sides:</p>
circlesLines (Circles And Lines Art Border)	<p data-bbox="824 1503 1433 1530">Specifies an art border using the following images:</p> <div data-bbox="1117 1556 1214 1598"></div> <p data-bbox="824 1608 883 1635">Top:</p> <div data-bbox="1117 1677 1214 1719"></div> <p data-bbox="824 1709 932 1736">Bottom:</p> <div data-bbox="1117 1740 1175 1839"></div> <p data-bbox="824 1814 883 1841">Left:</p>







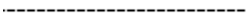
Enumeration Value	Description
	<p>Right:</p>  <p>Top Left:</p>  <p>Top Right:</p>  <p>Bottom Left:</p>  <p>Bottom Right:</p> 
circlesRectangles (Circles and Rectangles Art Border)	<p>Specifies an art border using the following images:</p> <p>Top:</p>  <p>Bottom:</p>  <p>Left:</p>  <p>Right:</p>  <p>Top Left:</p>  <p>Top Right:</p>  <p>Bottom Left:</p>  <p>Bottom Right:</p> 
classicalWave (Wave Art Border)	<p>Specifies an art border using the following images:</p> <p>Top:</p>  <p>Bottom:</p> 














Enumeration Value	Description
	<p>Left:</p> <p>Right:</p> <p>Top Left:</p> <p>Top Right:</p> <p>Bottom Left:</p> <p>Bottom Right:</p> 
clocks (Clocks Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides:</p> 
compass (Compass Art Border)	<p>Specifies an art border using the following images:</p> <p>Top and Bottom:</p>  <p>Left and Right:</p>  <p>Top Left, Top Right, Bottom Left, and Bottom Right:</p> 
confetti (Confetti Art Border)	<p>Specifies an art border using the following images:</p> <p>Top:</p> <p>Bottom:</p> <p>Left:</p> 






Enumeration Value	Description
	<p>Right: </p> <p>Top Left: </p> <p>Top Right: </p> <p>Bottom Left: </p> <p>Bottom Right: </p>
confettiGrays (Confetti Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
confettiOutline (Confetti Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
confettiStreamers (Confetti Streamers Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
confettiWhite (Confetti Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
cornerTriangles (Corner Triangle Art Border)	<p>Specifies an art border using the following images:</p> <p>Top, Bottom, Left, and Right: </p> <p>Top Left: </p>






Enumeration Value	Description
	<div>Top Right:</div> <div>Bottom Left:</div> <div>Bottom Right:</div>
couponCutoutDashes (Dashed Line Art Border)	<div>Specifies an art border using the following images:</div> <div>Top, Bottom, Left, and Right:</div> <div>Top Left:</div> <div>Top Right:</div> <div>Bottom Left:</div> <div>Bottom Right:</div> <div></div>
couponCutoutDots (Dotted Line Art Border)	<div>Specifies an art border using the following images:</div> <div>Top:</div> <div>Bottom:</div> <div>Left:</div> <div>Right:</div> <div>Top Left:</div>








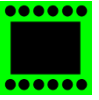
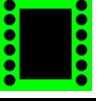

Enumeration Value	Description
	<p>Top Right: </p> <p>Bottom Left: </p> <p>Bottom Right: </p>
crazyMaze (Maze Art Border)	<p>Specifies an art border using the following images:</p> <p>Top and Bottom: </p> <p>Left and Right: </p> <p>Top Left, Top Right, Bottom Left and Bottom Right: </p>
creaturesButterfly (Butterfly Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
creaturesFish (Fish Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
creaturesInsects (Insects Art Border)	<p>Specifies an art border using the following images:</p> <p>Top: </p> <p>Bottom: </p> <p>Left and Right: </p> <p>Top Left and Top Right: </p>












Enumeration Value	Description
	Bottom Left and Bottom Right: 
creaturesLadyBug (Ladybug Art Border)	Specifies an art border using the following images: All Sides: 
crossStitch (Cross-stitch Art Border)	Specifies an art border using the following images: All Sides: 
cup (Cupid Art Border)	Specifies an art border using the following images: All Sides: 
custom (Custom Defined Art Border)	Specifies a custom art border using the parent element's attributes to reference one or more customer art border images.
dashDotStroked (Dash Dot Stroked Line Border)	Specifies a line border consisting of a line with a series of alternating thin and thick strokes around the parent object. <i>[Example:</i>  <i>end example]</i>
dashed (Dashed Line Border)	Specifies a line border consisting of a dashed line around the parent object. <i>[Example:</i>  <i>end example]</i>
dashSmallGap (Dashed Line Border)	Specifies a line border consisting of a dashed line with small gaps around the parent object. <i>[Example:</i> 













Enumeration Value	Description
	<i>end example]</i>
decoArch (Archway Art Border)	<p>Specifies an art border using the following images:</p> <p>Top and Bottom: </p> <p>Left and Right: </p> <p>Top Left and Top Right: </p> <p>Bottom Left and Bottom Right: </p>
decoArchColor (Color Archway Art Border)	<p>Specifies an art border using the following images:</p> <p>Top and Bottom: </p> <p>Left and Right: </p> <p>Top Left: </p> <p>Top Right: </p> <p>Bottom Left and Bottom Right: </p>
decoBlocks (Blocks Art Border)	<p>Specifies an art border using the following images:</p> <p>Top: </p> <p>Bottom: </p> <p>Left: </p> <p>Right: </p>





Enumeration Value	Description
	<p>Top Left: </p> <p>Top Right: </p> <p>Bottom Left: </p> <p>Bottom Right: </p>
diamondsGray (Gray Diamond Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
dotDash (Dot Dash Line Border)	<p>Specifies a line border consisting of a alternating dotted and dashed line around the parent object.</p> <p>[Example:</p> <p>-----</p> <p>end example]</p>
dotDotDash (Dot Dot Dash Line Border)	<p>Specifies a line border consisting of a alternating dotted, dotted, dashed line around the parent object.</p> <p>[Example:</p> <p>-----</p> <p>end example]</p>
dotted (Dotted Line Border)	<p>Specifies a line border consisting of a dotted line around the parent object.</p> <p>[Example:</p> <p>.....</p> <p>end example]</p>
double (Double Line Border)	<p>Specifies a line border consisting of a double line around the parent object.</p>













Enumeration Value	Description
	<p>[Example:</p>  <p>end example]</p>
doubleD (Double D Art Border)	<p>Specifies an art border using the following images:</p> <div> <div>Top:</div> <div>Bottom:</div> <div>Left:</div> <div>Right:</div> <div>Top Left:</div> <div>Top Right:</div> <div>Bottom Left:</div> <div>Bottom Right:</div> </div> 
doubleDiamonds (Diamond Art Border)	<p>Specifies an art border using the following images:</p> <div> <div>All Sides:</div> </div>  <div>  </div>
doubleWave (Double Wave Line Border)	<p>Specifies a line border consisting of a double wavy line around the parent object.</p> <p>[Example:</p>  <p>end example]</p>












Enumeration Value	Description
earth1 (Earth Art Border)	Specifies an art border using the following images: All Sides: 
earth2 (Earth Art Border)	Specifies an art border using the following images: All Sides: 
earth3 (Earth Art Border)	Specifies an art border using the following images: All sides: 
eclipsingSquares1 (Shadowed Square Art Border)	Specifies an art border using the following images: All Sides: 
eclipsingSquares2 (Shadowed Square Art Border)	Specifies an art border using the following images: All Sides: 
eggsBlack (Painted Egg Art Border)	Specifies an art border using the following images: All Sides: 
fans (Fans Art Border)	Specifies an art border using the following images: All Sides: 
film (Film Reel Art Border)	Specifies an art border using the following images: Top and Bottom:  Left and Right:  Top Left and Bottom Left: 











Enumeration Value	Description
	<p>Top Right and Bottom Right:</p> 
firecrackers (Firecracker Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides:</p> 
flowersBlockPrint (Flowers Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides:</p> 
flowersDaisies (Daisy Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides:</p> 
flowersModern1 (Flowers Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides:</p> 
flowersModern2 (Flowers Art Border)	<p>Specifies an art border using the following images:</p> <p>Top and Bottom:</p>  <p>Left and Right:</p>  <p>Top Left:</p>  <p>Top Right:</p>  <p>Bottom Left:</p>  <p>Bottom Right:</p> 
















Enumeration Value	Description
flowersPansy (Pansy Art Border)	Specifies an art border using the following images: All Sides: 
flowersRedRose (Red Rose Art Border)	Specifies an art border using the following images: All Sides: 
flowersRoses (Roses Art Border)	Specifies an art border using the following images: All Sides: 
flowersTeacup (Flowers in a Teacup Art Border)	Specifies an art border using the following images: All Sides: 
flowersTiny (Small Flower Art Border)	Specifies an art border using the following images: Top:  Bottom:  Left:  Right:  Top Left:  Top Right:  Bottom Left:  Bottom Right: 
















Enumeration Value	Description
gems (Gems Art Border)	<p>Specifies an art border using the following images:</p> <p>Top, Bottom, Left and Right</p> <p>Top Left:</p> <p>Top Right:</p> <p>Bottom Left:</p> <p>Bottom Right:</p> 
gingerbreadMan (Gingerbread Man Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides:</p> 
gradient (Triangle Gradient Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides:</p> 
handmade1 (Handmade Art Border)	<p>Specifies an art border using the following images:</p> <p>Top:</p> <p>Bottom:</p> <p>Left:</p> <p>Right:</p> <p>Top Left:</p> 







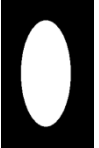



Enumeration Value	Description
	<p>Top Right: </p> <p>Bottom Left: </p> <p>Bottom Right: </p>
handmade2 (Handmade Art Border)	<p>Specifies an art border using the following images:</p> <p>Top: </p> <p>Bottom: </p> <p>Left: </p> <p>Right: </p> <p>Top Left: </p> <p>Top Right: </p> <p>Bottom Left: </p> <p>Bottom Right: </p>
heartBalloon (Heart-Shaped Balloon Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
heartGray (Gray Heart Art Border)	Specifies an art border using the following images:











Enumeration Value	Description
	<p>All Sides: </p>
hearts (Hearts Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
heebieJeebies (Pattern Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
holly (Holly Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
houseFunky (House Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
hypnotic (Circular Art Border)	<p>Specifies an art border using the following images:</p> <p>Top: </p> <p>Bottom: </p> <p>Left: </p> <p>Right: </p> <p>Top Left: </p> <p>Top Right: </p>













Enumeration Value	Description
	<p>Bottom Left: </p> <p>Bottom Right: </p>
iceCreamCones (Ice Cream Cone Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
inset (Inset Line Border)	<p>Specifies a line border consisting of an inset set of lines around the parent object.</p> <p>[Example:</p> <p></p> <p>end example]</p>
lightBulb (Light Bulb Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
lightning1 (Lightning Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
lightning2 (Lightning Art Border)	<p>Specifies an art border using the following images:</p> <p>Top: </p> <p>Bottom: </p> <p>Left and Top Left: </p> <p>Right and Top Right: </p>














Enumeration Value	Description
	<p>Bottom Left:</p>  <p>Bottom Right:</p> 
mapleLeaf (Maple Leaf Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides:</p> 
mapleMuffins (Muffin Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides:</p> 
mapPins (Map Pins Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides:</p> 
marquee (Marquee Art Border)	<p>Specifies an art border using the following images:</p> <p>Top and Bottom:</p>  <p>Left and Right:</p>  <p>Top Left, Top Right, Bottom Left, and Bottom Right:</p> 
marqueeToothed (Marquee Art Border)	<p>Specifies an art border using the following images:</p> <p>Top:</p>  <p>Bottom:</p>  <p>Left:</p>  <p>Right:</p>  <p>Top Left:</p>  <p>Top Right:</p>  <p>Bottom Left:</p> 















Enumeration Value	Description
	Bottom Right: 
moons (Moon Art Border)	Specifies an art border using the following images: Top:  Bottom:  Left:  Right:  Top Left:  Top Right:  Bottom Left:  Bottom Right: 
mosaic (Mosaic Art Border)	Specifies an art border using the following images: All Sides: 
musicNotes (Musical Note Art Border)	Specifies an art border using the following images: All Sides: 
nil (No Border)	Specifies that no border shall be applied to the current item.
none (No Border)	Specifies that no border shall be applied to the current item.
northwest (Patterned Art Border)	Specifies an art border using the following images: Top:  Bottom:  Left:  Right: 
















Enumeration Value	Description
	<p>Top Left: </p> <p>Top Right: </p> <p>Bottom Left: </p> <p>Bottom Right: </p>
outset (Outset Line Border)	<p>Specifies a line border consisting of an outset set of lines around the parent object.</p> <p>[Example:</p>  <p>end example]</p>
ovals (Oval Art Border)	<p>Specifies an art border using the following images:</p> <p>Top and Bottom: </p> <p>Right and Left: </p> <p>Top Left, Top Right, Bottom Left and Bottom Right: </p>
packages (Package Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
palmsBlack (Black Palm Tree Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>





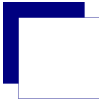





Enumeration Value	Description
palmsColor (Color Palm Tree Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
paperClips (Paper Clip Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
papyrus (Papyrus Art Border)	<p>Specifies an art using the following images:</p> <p>Top and Bottom: </p> <p>Right and Left: </p> <p>Top Left and Top Right: </p> <p>Bottom Left and Bottom Right: </p>
partyFavor (Party Favor Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
partyGlass (Party Glass Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
pencils (Pencils Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
people (Character Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
peopleHats (Character With Hat Art Border)	<p>Specifies an art border using the following images:</p>












Enumeration Value	Description
	<p>All Sides: </p>
peopleWaving (Waving Character Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
poinsettias (Poinsettia Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
postageStamp (Postage Stamp Art Border)	<p>Specifies an art border using the following images:</p> <p>Top: </p> <p>Bottom: </p> <p>Left: </p> <p>Right: </p> <p>Top Left: </p> <p>Top Right: </p> <p>Bottom Left: </p> <p>Bottom Right: </p>
pumpkin1 (Pumpkin Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>



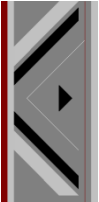
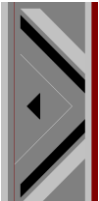





Enumeration Value	Description
pushPinNote1 (Push Pin Art Border)	<p>Specifies an art border using the following images:</p> <p>Top:</p> <p>Bottom: </p> <p>Left:</p> <p>Right: </p> <p>Top Left: </p> <p>Top Right: </p> <p>Bottom Left: </p> <p>Bottom Right: </p>
pushPinNote2 (Push Pin Art Border)	<p>Specifies an art border using the following images:</p> <p>Top: </p> <p>Bottom: </p> <p>Left: </p> <p>Right: </p> <p>Top Left: </p> <p>Top Right: </p> <p>Bottom Left: </p>
















Enumeration Value	Description
	<p>Bottom Right:</p> 
pyramids (Pyramid Art Border)	<p>Specifies an art border using the following images:</p> <p>Top:</p>  <p>Bottom:</p>  <p>Left:</p>  <p>Right:</p>  <p>Top Left, Top Right, Bottom Left, and Bottom Right:</p> 
pyramidsAbove (Pyramid Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides:</p> 
quadrants (Quadrants Art Border)	<p>Specifies an art border using the following images:</p> <p>Top and Bottom:</p>  <p>Left and Right:</p>  <p>Top Left:</p>  <p>Top Right:</p>  <p>Bottom Left:</p>  <p>Bottom Right:</p> 
rings (Rings Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides:</p> 
safari (Safari Art Border)	<p>Specifies an art border using the following images:</p>



Enumeration Value	Description
	All Sides: 
sawtooth (Saw tooth Art Border)	<p>Specifies an art border using the following images:</p> <p>Top: </p> <p>Bottom: </p> <p>Left: </p> <p>Right: </p> <p>Top Left: </p> <p>Top Right: </p> <p>Bottom Left: </p> <p>Bottom Right: </p>
sawtoothGray (Gray Saw tooth Art Border)	<p>Specifies an art border using the following images:</p> <p>Top: </p> <p>Bottom: </p> <p>Left: </p> <p>Right: </p> <p>Top Left: </p> <p>Top Right: </p>





Enumeration Value	Description
	<p>Bottom Left:</p>  <p>Bottom Right:</p> 
scaredCat (Scared Cat Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides:</p> 
seattle (Umbrella Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides:</p> 
shadowedSquares (Shadowed Squares Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides:</p> 
shapes1 (Black and White Shapes Art Border)	<p>Specifies an art border using the following images:</p> <p>Top and Bottom:</p>  <p>Right and Left:</p>  <p>Top Left, Top Right, Bottom Left and Bottom Right:</p> 
shapes2 (Black and White Art Border Two)	<p>Specifies an art border using the following images:</p> <p>Top, Bottom, Left and Right:</p>  <p>Top Left, Top Right, Bottom Left and Bottom Right:</p> 
sharksTeeth (Shark Tooth Art Border)	<p>Specifies an art border using the following images:</p>






Enumeration Value	Description
	 <p>All Sides:</p>
shorebirdTracks (Bird Tracks Art Border)	<p>Specifies an art border using the following images:</p> <p>Top: </p> <p>Bottom: </p> <p>Left: </p> <p>Right: </p> <p>Top Left, Top Right, Bottom Left and Bottom Right: </p>
single (Single Line Border)	<p>Specifies a line border consisting of a single line around the parent object.</p> <p>[Example:</p>  <p>end example]</p>
skyrocket (Rocket Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
snowflakeFancy (Snowflake Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
snowflakes (Snowflake Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
sombrero (Sombrero Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>















Enumeration Value	Description
southwest (Southwest-themed Art Border)	<p data-bbox="824 296 1425 331">Specifies an art border using the following images:</p> <p data-bbox="824 411 878 447">Top: </p> <p data-bbox="824 558 922 594">Bottom: </p> <p data-bbox="824 800 878 835">Left: </p> <p data-bbox="824 1041 894 1077">Right: </p> <p data-bbox="824 1178 932 1213">Top Left: </p> <p data-bbox="824 1314 948 1350">Top Right: </p> <p data-bbox="824 1451 976 1486">Bottom Left: </p> <p data-bbox="824 1587 992 1623">Bottom Right: </p>
stars (Stars Art Border)	<p data-bbox="824 1682 1425 1717">Specifies an art border using the following images:</p> <p data-bbox="824 1776 932 1812">All Sides: </p>










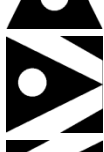




Enumeration Value	Description
stars3d (3-D Stars Art Border)	Specifies an art border using the following images: All Sides: 
starsBlack (Stars Art Border)	Specifies an art border using the following images: All Sides: 
starsShadowed (Stars With Shadows Art Border)	Specifies an art border using the following images: All Sides: 
starsTop (Stars On Top Art Border)	Specifies an art border using the following images: Top, Top Left, and Top Right:  Bottom, Bottom Left, and Bottom Right:  Left and Right: 
sun (Sun Art Border)	Specifies an art border using the following images: All Sides: 
swirligig (Whirligig Art Border)	Specifies an art border using the following images: Top:  Bottom:  Left:  Right:  Top Left:  Top Right:  Bottom Left:  Bottom Right: 





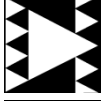

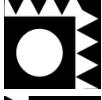

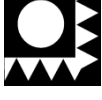


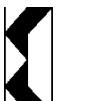

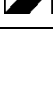
Enumeration Value	Description
	<p>Bottom Left: </p> <p>Bottom Right: </p>
thick (Single Line Border)	<p>Specifies a line border consisting of a single line around the parent object.</p> <p><i>[Example:</i></p> <hr data-bbox="824 695 1109 701"/> <p><i>end example]</i></p>
thickThinLargeGap (Thick, Thin Line Border)	<p>Specifies a line border consisting of a thick line contained within a thin line with a large sized intermediate gap around the parent object.</p> <p><i>[Example:</i></p> <hr data-bbox="824 1024 1109 1031"/> <hr data-bbox="824 1031 1109 1037"/> <p><i>end example]</i></p>
thickThinMediumGap (Thick, Thin Line Border)	<p>Specifies a line border consisting of a thick line contained within a thin line with a medium sized intermediate gap around the parent object.</p> <p><i>[Example:</i></p> <hr data-bbox="824 1360 1094 1367"/> <hr data-bbox="824 1367 1094 1373"/> <p><i>end example]</i></p>
thickThinSmallGap (Thick, Thin Line Border)	<p>Specifies a line border consisting of a thick line contained within a thin line with a small intermediate gap around the parent object.</p> <p><i>[Example:</i></p> <hr data-bbox="824 1707 1094 1713"/> <hr data-bbox="824 1713 1094 1719"/> <p><i>end example]</i></p>
thinThickLargeGap (Thin, Thick Line Border)	<p>Specifies a line border consisting of a thin line contained within a thick line contained within a thick</p>










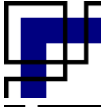
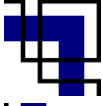
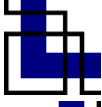
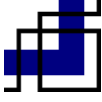
Enumeration Value	Description
	<p>thin with a large sized intermediate gap between each around the parent object.</p> <p>[Example:</p>  <p>end example]</p>
thinThickMediumGap (Thin, Thick Line Border)	<p>Specifies a line border consisting of a thin line contained within a thick line contained within a thick thin with a medium sized intermediate gap between each around the parent object.</p> <p>[Example:</p>  <p>end example]</p>
thinThickSmallGap (Thin, Thick Line Border)	<p>Specifies a line border consisting of a thin line contained within a thick line contained within a thick thin with a small intermediate gap between each around the parent object.</p> <p>[Example:</p>  <p>end example]</p>
thinThickThinLargeGap (Thin, Thick, Thin Line Border)	<p>Specifies a line border consisting of a thin line contained within a thick line, contained within a thin line with a large sized intermediate gap around the parent object.</p> <p>[Example:</p>  <p>end example]</p>
thinThickThinMediumGap (Thin, Thick, Thin Line Border)	<p>Specifies a line border consisting of a thin line contained within a thick line, contained within a thin line with a medium sized intermediate gap around the parent object.</p>









Enumeration Value	Description
	<p>[Example:</p>  <p>end example]</p>
thinThickThinSmallGap (Thin, Thick, Thin Line Border)	<p>Specifies a line border consisting of a thin line contained within a thick line, contained within a thin line with a small intermediate gap around the parent object.</p> <p>[Example:</p>  <p>end example]</p>
threeDEmboss (3D Embossed Line Border)	<p>Specifies a line border consisting of three staged gradient lines around the parent object, getting darker towards the object.</p> <p>[Example:</p>  <p>end example]</p>
threeDEngrave (3D Engraved Line Border)	<p>Specifies a line border consisting of three staged gradient lines around the parent object, getting darker away from the object.</p> <p>[Example:</p>  <p>end example]</p>
tornPaper (Torn Paper Art Border)	<p>Specifies an art border using the following images:</p> <p>Top, Top Left and Top Right</p> <p>Bottom, Bottom Left and Bottom Right:</p> <p>Left and Right:</p> <p>[Note: Image is blank. end note]</p> 













Enumeration Value	Description
tornPaperBlack (Black Torn Paper Art Border)	<p>Specifies an art border using the following images:</p> <p>Top: </p> <p>Bottom: </p> <p>Left: </p> <p>Right: </p> <p>Top Left: </p> <p>Top Right: </p> <p>Bottom Left: </p> <p>Bottom Right: </p>
trees (Tree Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
triangle1 (Triangle Art Border One)	<p>Specifies an art border using the following images:</p> <p>Top: </p> <p>Bottom: </p> <p>Left: </p> <p>Right: </p> <p>Top Left, Top Right, Bottom Left, and Bottom Right: </p>
triangle2 (Triangle Art Border Two)	<p>Specifies an art border using the following images:</p>






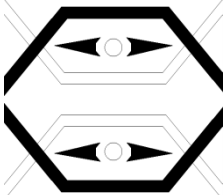
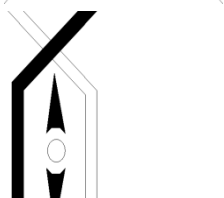


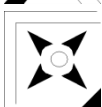

Enumeration Value	Description
	<p>Top: </p> <p>Bottom: </p> <p>Left: </p> <p>Right: </p> <p>Top Left: </p> <p>Top Right: </p> <p>Bottom Left: </p> <p>Bottom Right: </p>
triangleCircle1 (Triangle and Circle Art Border)	<p>Specifies an art border using the following images:</p> <p>Top: </p> <p>Bottom: </p> <p>Left: </p> <p>Right: </p> <p>Top Left: </p> <p>Top Right: </p> <p>Bottom Left: </p>












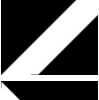

Enumeration Value	Description
	<p>Bottom Right:</p> 
triangleCircle2 (Triangle and Circle Art Border Two)	<p>Specifies an art border using the following images:</p> <p>Top:</p>  <p>Bottom:</p>  <p>Left:</p>  <p>Right:</p>  <p>Top Left:</p>  <p>Top Right:</p>  <p>Bottom Left:</p>  <p>Bottom Right:</p> 
triangleParty (Triangle Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides:</p> 
triangles (Triangles Art Border)	<p>Specifies an art border using the following images:</p> <p>Top:</p>  <p>Bottom:</p>  <p>Left:</p>  <p>Right:</p> 

Enumeration Value	Description
	<div> <div>Top Left:</div>  </div> <div> <div>Top Right:</div>  </div> <div> <div>Bottom Left:</div>  </div> <div> <div>Bottom Right:</div>  </div>
triple (Triple Line Border)	<p>Specifies a line border consisting of a triple line around the parent object.</p> <p>[Example:</p>  <p>end example]</p>
twistedLines1 (Twisted Lines Art Border)	<p>Specifies an art border using the following images:</p> <div> <div>Top:</div>  </div> <div> <div>Bottom:</div>  </div> <div> <div>Left:</div>  </div> <div> <div>Right:</div>  </div> <div> <div>Top Left:</div>  </div> <div> <div>Top Right:</div>  </div> <div> <div>Bottom Left:</div>  </div> <div> <div>Bottom Right:</div>  </div>













Enumeration Value	Description
twistedLines2 (Twisted Lines Art Border)	<p>Specifies an art border using the following images:</p> <p>Top: </p> <p>Bottom: </p> <p>Left: </p> <p>Right: </p> <p>Top Left: </p> <p>Top Right: </p> <p>Bottom Left: </p> <p>Bottom Right: </p>
vine (Vine Art Border)	<p>Specifies an art border using the following images:</p>





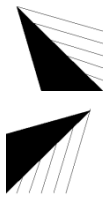









Enumeration Value	Description
	<div> <div>Top:</div>  </div> <div> <div>Bottom:</div>  </div> <div> <div>Left:</div>  </div> <div> <div>Right:</div>  </div> <div> <div>Top Left:</div>  </div> <div> <div>Top Right:</div>  </div> <div> <div>Bottom Left:</div>  </div> <div> <div>Bottom Right:</div>  </div>
wave (Wavy Line Border)	<p>Specifies a line border consisting of a wavy line around the parent object.</p> <p>[Example:</p>  <p>end example]</p>
waveline (Wavy Line Art Border)	<p>Specifies an art border using the following images:</p> <div> <div>Top:</div>  </div> <div> <div>Bottom:</div>  </div> <div> <div>Left:</div>  </div>

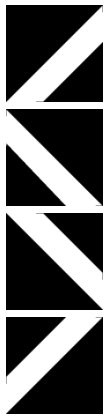
Enumeration Value	Description
	<div>Right: </div> <div>Top Left: </div> <div>Top Right: </div> <div>Bottom Left: </div> <div>Bottom Right: </div>
weavingAngles (Weaving Angles Art Border)	<div>Specifies an art border using the following images:</div> <div>Top: </div> <div>Bottom: </div> <div>Left: </div> <div>Right: </div> <div>Top Left: </div> <div>Top Right: </div>

Enumeration Value	Description
	<p>Bottom Left: </p> <p>Bottom Right: </p>
weavingBraid (Weaving Braid Art Border)	<p>Specifies an art border using the following images:</p> <p>Top: </p> <p>Bottom: </p> <p>Left: </p> <p>Right: </p> <p>Top Left, Top Right, Bottom Left, and Bottom Right: </p>
weavingRibbon (Weaving Ribbon Art Border)	<p>Specifies an art border using the following images:</p> <p>Top: </p> <p>Bottom: </p> <p>Left: </p> <p>Right: </p> <p>Top Left: </p> <p>Top Right: </p>

Enumeration Value	Description
	<div>Bottom Left:</div> <div>Bottom Right:</div>
weavingStrips (Weaving Strips Art Border)	<div>Specifies an art border using the following images:</div> <div>Top:</div> <div>Bottom:</div> <div>Left:</div> <div>Right:</div> <div>Top Left:</div> <div>Top Right:</div> <div>Bottom Left:</div> <div>Bottom Right:</div>
whiteFlowers (White Flowers Art Border)	<div>Specifies an art border using the following images:</div> <div>Top and Bottom:</div> <div>Left:</div> <div>Right:</div> <div>Top Left:</div> <div>Top Right:</div>

Enumeration Value	Description
	<p>Bottom Left: </p> <p>Bottom Right: </p>
woodwork (Woodwork Art Border)	<p>Specifies an art border using the following images:</p> <p>Top and Bottom: </p> <p>Left and Right: </p> <p>Top Left, Top Right, Bottom Left, and Bottom Right: </p>
xIllusions (Crisscross Art Border)	<p>Specifies an art border using the following images:</p> <p>All Sides: </p>
zanyTriangles (Triangle Art Border)	<p>Specifies an art border using the following images:</p> <p>Top: </p> <p>Bottom: </p> <p>Left: </p> <p>Right: </p> <p>Top Left: </p> <p>Top Right: </p>

Enumeration Value	Description
	<div>Bottom Left:</div> <div>Bottom Right:</div>
zigZag (Zigzag Art Border)	<div>Specifies an art border using the following images:</div> <div>Top:</div> <div>Bottom:</div> <div>Left:</div> <div>Right:</div> <div>Top Left:</div> <div>Top Right:</div> <div>Bottom Left:</div> <div>Bottom Right:</div>
zigZagStitch (Zigzag stitch)	<div>Specifies an art border using the following images:</div> <div>Top:</div> <div>Bottom:</div> <div>Left:</div> <div>Right:</div>

Enumeration Value	Description
	

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_Border](#)) is located in §A.1. *end note*]

17.18.3 ST_BrClear (Line Break Text Wrapping Restart Location)

This simple type specifies the set of possible restart locations which can be used as to determine the next available line when a break's type attribute has a value of `textWrapping`. This property only affects the restart location when the current run is being displayed on a line which does not span the full text extents due to the presence of a floating object (see enumeration values for details).

[*Example:* Consider a text wrapping break character which should force the restart location to the next line which spans the full width of the text extents of the page (there are no floating objects which interrupt the line).

This line break is of style `textWrapping`, since it must only advance to the next line, but the clear value must specify that this restart location must ignore all lines which are not of the full line width by specifying a value of `all`, as follows:

```
<w:br w:type="textWrapping" w:clear="all" />
```

This break must therefore not use the next available line, but rather the next available line ignoring all lines which do not span the full text width. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
all (Restart On Next Full Line)	Specifies that the text wrapping break shall advance the text to the next line in the WordprocessingML document which spans the full width of the line (i.e. the next line which is not interrupted by any floating

Enumeration Value	Description
	<p>objects when those objects are positioned on the page at display time.</p> <p>[<i>Note</i>: This setting is typically used to place a single line of text next to a floating object for use as a caption. <i>end note</i>]</p>
left (Restart In Next Text Region Unblocked on the Left)	<p>Specifies that the text wrapping break shall behave as follows when this line intersects a floating object:</p> <p>If the parent paragraph is left-to-right:</p> <ul style="list-style-type: none"> • If this is the leftmost region of text flow currently on this line, • If a floating object occurs to the left of the break, advance the text to the next available line that does not have a floating object on the left. • Otherwise, advance the text to the next position on the line where text can be displayed • Otherwise, treat this as a text wrapping break of type none. <p>If the parent paragraph is right to left:</p> <p>If the object occurs to the left of the break, advance the text to the next available line that does not have a floating object on the left.</p> <ul style="list-style-type: none"> • Otherwise, treat this as a text wrapping break of type none. <p>In either case, if this line does not intersect a floating object, then treat this break as a text wrapping break of type none.</p>
none (Restart On Next Line)	<p>Specifies that the text wrapping break shall advance the text to the next line in the WordprocessingML document, regardless of its position left to right or the presence of any floating objects which intersect with the line,</p> <p>This is the setting for a typical line break in a document.</p>
right (Restart In Next Text Region Unblocked on the Right)	<p>Specifies that the text wrapping break shall behave as follows when this line intersects a floating object:</p>

Enumeration Value	Description
	<p>If the parent paragraph is left-to-right:</p> <ul style="list-style-type: none"> • If the object occurs to the right of the break, advance the text to the next available line that does not have a floating object on the right. • Otherwise, treat this as a text wrapping break of type none. <p>If the parent paragraph is right to left:</p> <ul style="list-style-type: none"> • If this is the rightmost region of text flow currently on this line, <ul style="list-style-type: none"> • If a floating object occurs to the right of the break, advance the text to the next available line that does not have a floating object on the right. • Otherwise, advance the text to the next position on the line where text can be displayed • Otherwise, treat this as a text wrapping break of type none. <p>In either case, if this line does not intersect a floating object, then treat this break as a text wrapping break of type none.</p>

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_BrClear](#)) is located in §A.1. *end note*]

17.18.4 ST_BrType (Break Types)

This simple type specifies the possible kinds of break characters in a WordprocessingML document. The break type determines the next location where text shall be placed after this manual break is applied to the text contents (see enumeration values for details).

[*Example*: Consider a manual break which must advance the text to the next text column in the document, rather than just the next available line. This break would therefore be specified as follows:

```
<w:br w:type="column"/>
```

The type attribute specifies a value of `column`, which means that the break must force the next character in the document to be restarted on the next line in a new text column in the document. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

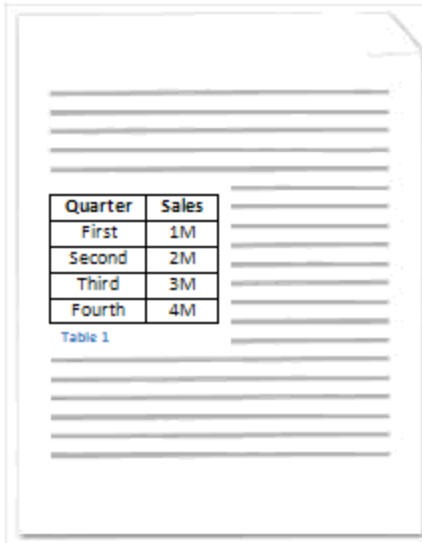
Enumeration Value	Description
column (Column Break)	<p>Specifies that the current break shall restart itself on the next column available on the current page when the document is displayed in page view.</p> <p>If the current section is not divided into columns, or the column break occurs in the last column on the current page when displayed, then the restart location for text shall be the next page in the document.</p>
page (Page Break)	<p>Specifies that the current break shall restart itself on the next page of the document when the document is displayed in page view.</p> <p>Page breaks shall be ignored when present in frames unless the showBreaksInFrames element (Part 4, §9.7.3.36) is present in the document's compatibility settings.</p>
textWrapping (Line Break)	<p>Specifies that the current break shall restart itself on the next line in the document when the document is displayed in page view.</p> <p>The determine of the next line shall be done subject to the value of the clear attribute on the specified break character.</p>

[Note: The W3C XML Schema definition of this simple type's content model ([ST_BrType](#)) is located in §A.1. *end note*]

17.18.5 ST_CaptionPos (Automatic Caption Positioning Values)

This simple type specifies the possible values can be used for the position of an automatically inserted caption on an object within this document. These values specify the position a given caption shall be take relative to the object it is used to label.

[Example: Consider a WordprocessingML document which should have all automatically inserted captions placed below the objects they are captioning, for example:



This requirement is specified using the following WordprocessingML in the document settings:

```
<w:captions>
  <w:caption w:name="Table" w:pos="below" w:numFmt="decimal" />
</w:captions>
```

The pos attribute has a value of below, specifying that the caption must be placed below the newly inserted objects. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
above (Position Caption Above Object)	Specifies that an automatically inserted caption shall be positioned above the object that it is used to label.
below (Position Caption Below Object)	Specifies that an automatically inserted caption shall be positioned below the object that it is used to label.
left (Position Caption Left Of Object)	Specifies that an automatically inserted caption shall be positioned to the left of the object that it is used to label (the position where text typed immediately before the object would appear).
right (Position Caption Right Of Object)	Specifies that an automatically inserted caption shall be positioned to the right of the object that it is used to label (the position where text typed immediately after the object would appear).

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_CaptionPos](#)) is located in §A.1. *end note*]

17.18.6 ST_ChapterSep (Chapter Separator Types)

This simple type specifies the character which shall be used to separate the chapter number from the page number for page numbers in a given section, when chapter numbers are being displayed.

[*Example:* Consider a section in a document in which the chapter must be separated from the page number using a colon character. This constraint would be specified using the following WordprocessingML:

```
<w:pgNumType w:chapSep="colon" w:chapStyle="1" />
```

The chapSep attribute declares that the chapter and page number must be separated by a colon (e.g. 1:1 for chapter one, page one). *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
colon (Colon Chapter Separator)	Specifies that a colon character shall be used to separate the chapter number from the page number when page numbers are displayed. [<i>Example:</i> 1:1 for page one, section one. <i>end example</i>]
emDash (Em Dash Chapter Separator)	Specifies that an em dash character shall be used to separate the chapter number from the page number when page numbers are displayed. [<i>Example:</i> 1—1 for page one, section one. <i>end example</i>]
enDash (En Dash Chapter Separator)	Specifies that an en dash character shall be used to separate the chapter number from the page number when page numbers are displayed. [<i>Example:</i> 1–1 for page one, section one. <i>end example</i>]
hyphen (Hyphen Chapter Separator)	Specifies that a non-breaking hyphen character shall be used to separate the chapter number from the page number when page numbers are displayed. [<i>Example:</i> 1-1 for page one, section one. <i>end example</i>]
period (Period Chapter Separator)	Specifies that a period character shall be used to separate the chapter number from the page number when page numbers are displayed. [<i>Example:</i> 1.1 for page one, section one. <i>end example</i>]

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_ChapterSep](#)) is located in §A.1. *end note*]

17.18.7 ST_CharacterSpacing (Character-Level Whitespace Compression Settings)

This simple type specifies the possible ways in which full-width characters in the current WordprocessingML document can be compressed to remove additional whitespace when the contents of this document are displayed, specifically by specifying the set(s) of characters which can be compressed to remove additional whitespace.

[*Example:* Consider the WordprocessingML below:

```
<w:characterSpacingControl w:val="doNotCompress" />
```

The characterSpacingControl element has a val attribute value of doNotCompress, which specifies that no character compression shall be applied to any character when the document is displayed. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
compressPunctuation (Compress Whitespace From Punctuation Characters)	Specifies that only whitespace characters shall have whitespace compression applied to them.
compressPunctuationAndJapaneseKana (Compress Whitespace From Both Japanese Kana And Punctuation Characters)	Specifies that whitespace and Japanese kana characters shall have whitespace compression applied to them.
doNotCompress (Do Not Compress Whitespace)	Specifies that characters shall not have whitespace compression applied to them.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_CharacterSpacing](#)) is located in §A.1. *end note*]

17.18.8 ST_CombineBrackets (Two Lines in One Enclosing Character Type)

This simple type specifies the kind of bracket character which shall be used to enclose the two lines in one text within the current run when displayed

[*Example:* Consider a paragraph with the text `two lines in one`, which must be displayed within a single logical line in the document and enclosed in curly brackets. This constraint would be specified as follows in the WordprocessingML:

```
<w:r>
  <w:rPr>
    <w:eastAsianLayout w:id="1" w:combine="on" w:combineBrackets="curly"/>
  </w:rPr>
```

```
<w:t>two lines in one</w:t>
</w:r>
```

The resulting text would be displayed on two sub lines within the other text on this line and enclosed within curly brackets when displayed. *end example*

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
angle (Angle Brackets)	Specifies that angle bracket characters shall be used to enclose the contents of the current run's two lines in one text. <i>[Example: <...> end example]</i>
curly (Curly Brackets)	Specifies that curly bracket characters shall be used to enclose the contents of the current run's two lines in one text. <i>[Example: {...} end example]</i>
none (No Enclosing Brackets)	Specifies that no characters shall be used to enclose the contents of the current run's two lines in one text.
round (Round Brackets)	Specifies that round bracket characters shall be used to enclose the contents of the current run's two lines in one text. <i>[Example: (...) end example]</i>
square (Square Brackets)	Specifies that square bracket characters shall be used to enclose the contents of the current run's two lines in one text. <i>[Example: [...] end example]</i>

[Note: The W3C XML Schema definition of this simple type's content model ([ST_CombineBrackets](#)) is located in §A.1. *end note*]

17.18.9 ST_DateTime (Standard Date and Time Storage Format)

This simple type specifies that its contents contain a date in the standard XML Schema xsd:dateTime format, whose contents are interpreted based on the context of the parent XML element.

[Example: Consider the following WordprocessingML fragment:

```
<w:date w:fullDate="01-01-2006T12:00:00Z">
```

```
...
</w:date>
```

In this case, the date in the `realDate` attribute is the full date associated with the parent date picker structured document. In every case, the value of this simple type is interpreted in the context of the parent element or attribute. *end example*

This simple type's contents are a restriction of the W3C XML Schema `dateTime` datatype.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_DateTime](#)) is located in §A.1. *end note*]

17.18.10 ST_DecimalNumber (Decimal Number Value)

This simple type specifies that its contents contain a whole decimal number (positive or negative), whose contents are interpreted based on the context of the parent XML element.

[*Example:* Consider the following WordprocessingML fragment:

```
<w:pPr>
  <w:divId w:val="1512645511" />
</w:pPr>
```

The value of the `val` attribute is the ID of the associated HTML `div`.

However, consider the following fragment:

```
<w:ilvl w:val="1">
  ...
</w:ilvl>
```

In this case, the decimal number in the `val` attribute is the ID of the associated numbering level. In each case, the value is interpreted in the context of the parent element. *end example*

This simple type's contents are a restriction of the W3C XML Schema `integer` datatype.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_DecimalNumber](#)) is located in §A.1. *end note*]

17.18.11 ST_DecimalNumberOrPercent (Percentage Measurement)

This simple type specifies that its contents will contain a percentage-based value. See the union's member types for details.

This simple type is a union of the following types:

- The `ST_Percentage` simple type (§22.9.2.9).

[Note: The W3C XML Schema definition of this simple type's content model ([ST_DecimalNumberOrPercent](#)) is located in §A.1. *end note*]

17.18.12 ST_Direction (Bidirectional Direction Types)

This simple type specifies the possible values for bidirectional settings within a WordprocessingML document.

[Example: Consider the following bidirectional setting; in this case, a bidirectional override:

```
<w:bdo w:val="rtl">
...
</w:bdo>
```

The val attribute explicitly declares that the override is applied right to left via the val attribute value of rtl. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

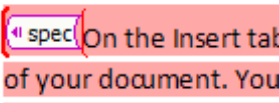
Enumeration Value	Description
ltr (Left to Right)	Specifies a left-to-right direction for the property defined by the parent XML element.
rtl (Right to Left)	Specifies a right-to-left direction for the property defined by the parent XML element.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Direction](#)) is located in §A.1. *end note*]

17.18.13 ST_DisplacedByCustomXml (Location of Custom XML Markup Displacing an Annotation)

This simple type specifies the possible values for the location of a single custom XML element's start and/or end tag relative to the location of an annotation tag in document order. This enumeration shall be used to specify that the parent annotation's placement shall be directly linked with the location of the physical presentation of a custom XML element in the document.

[Example: Consider a paragraph with block level custom XML markup and two comment anchor annotations (one before and one after the custom XML element's physical representation), as follows:



Since all three of these items are around the entire paragraph, they are stored outside of the paragraph. However, in order to ensure that their relative positions are stored correctly, any annotation which must be

displaced by the physical custom XML element specifies this information, resulting in the following WordprocessingML:

```
...
<w:commentRangeStart w:id="0" />
<w:commentRangeStart w:id="1" w:displaced byCustomXml="next" />
<w:customXml w:element="spec" ... >
  <w:p>
    ...
  </w:p>
</w:customXml>
...
```

The `displacedByCustomXml` attribute specifies that even though all three of these items are around the paragraph and is moved inside the paragraph to be represented physically, the comment with ID 0 must be inside the custom XML, but the comment with ID 1 must be displaced to stay outside of the relative location of the next custom XML element (the `spec` element). *end example*

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
next (Displaced by Next Custom XML Markup Tag)	<p>Specifies that this annotation anchor shall be displaced by the physical representation of the next element of custom XML markup in the document.</p> <p>If no custom XML markup exists in the same paragraph and after this anchor, then this setting shall be ignored.</p>
prev (Displaced by Previous Custom XML Markup Tag)	<p>Specifies that this annotation anchor shall be displaced by the physical representation of the previous element of custom XML markup in the document.</p> <p>If no custom XML markup exists in the same paragraph and directly before this anchor, then this setting shall be ignored.</p>

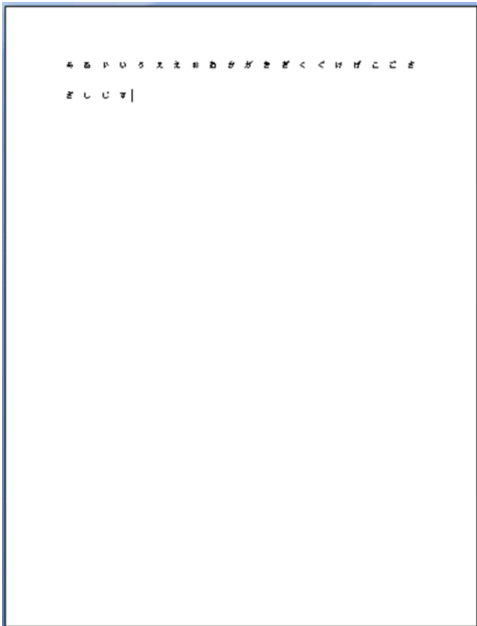
[Note: The W3C XML Schema definition of this simple type's content model ([ST_DisplacedByCustomXml](#)) is located in §A.1. *end note*]

17.18.14 ST_DocGrid (Document Grid Types)

Specifies the kind of the current document grid, which defines the grid behavior.

The grid can define a grid which snaps all East Asian characters to grid positions, but leaves Latin text with its default spacing; a grid which adds the specified character pitch to all characters on each row; or a grid which affects only the line pitch for the current section.

[*Example:* Consider the document discussed above with the document grid defined to allow 20 characters per line, and 20 lines per page by snapping characters to the grid as follows:



This document has a type attribute of type ST_DocGrid and value snapToChars, which specifies that the grid must force East Asian characters to fit 20 to a line. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
default (No Document Grid)	Specifies that no document grid shall be applied to the contents of the current section in the document.
lines (Line Grid Only)	Specifies that the parent section shall have additional line pitch added to each line within it (as specified on the docGrid element (§17.6.5)) in order to maintain the specified number of lines per page.
linesAndChars (Line and Character Grid)	Specifies that the parent section shall have both the additional line pitch and character pitch added to each line and character within it (as specified on the docGrid element (§17.6.5)) in order to maintain a specific number of lines per page and characters per line.

Enumeration Value	Description
	When this value is set, the input specified via the user interface can be allowed in exact number of line/character pitch units.
snapToChars (Character Grid Only)	<p>Specifies that the parent section shall have both the additional line pitch and character pitch added to each line and character within it (as specified on the docGrid element (§17.6.5)) in order to maintain a specific number of lines per page and characters per line.</p> <p>When this value is set, the input specified via the user interface can be restricted to the number of lines per page and characters per line, with the consumer or producer translating this information based on the current font data to get the resulting line and character pitch values</p>

[Note: The W3C XML Schema definition of this simple type's content model ([ST_DocGrid](#)) is located in §A.1. *end note*]

17.18.15 ST_DocPartBehavior (Insertion Behavior Types)

This simple type specifies the possible sets of behaviors which can be applied to the contents of a single glossary document entry (§17.12.5) when it is added to the main document story of a WordprocessingML document.

[Example: Consider the WordprocessingML fragment for a glossary document entry containing a single run, defined as follows:

```

<w:docPart>
  <w:docPartPr>
    <w:behaviors>
      <w:behavior w:val="p"/>
    </w:behaviors>
    ...
  </w:docPartPr>
  <w:docPartBody>
    <w:p>
      <w:r>
        <w:t>Sample entry.</w:t>
      </w:r>
    </w:p>
  </w:docPartBody>
</w:docPart>

```

The behavior element of type `ST_DocPartBehavior` has a value of `p`, which specifies that the contents of the parent glossary document entry must be inserted in their own paragraph when they are added to the contents of a document. *end example*

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
content (Insert Content At Specified Location)	<p>Specifies that when the glossary document entry is inserted into the main document contents of the document, it shall be inserted normally as defined above.</p> <p>This includes ensuring that the final paragraph which is included in the part is not inserted, and its run content is added to the paragraph into which the current part is being inserted.</p>
p (Ensure Entry Is In New Paragraph)	<p>Specifies that the glossary document entry shall be added into its own unique paragraph, by failing to remove the last paragraph from the entry's contents when they are added to the document.</p>
pg (Ensure Entry Is On New Page)	<p>Specifies that the glossary document entry shall be added into its own new page, by preceding the entry with a blank paragraph whose only content is a page break character.</p>

[*Note*: The W3C XML Schema definition of this simple type's content model (`ST_DocPartBehavior`) is located in §A.1. *end note*]

17.18.16 ST_DocPartGallery (Entry Gallery Types)

This simple type specifies possible settings for the predefined gallery into which a glossary document part shall be classified. This classification, although its enumeration values can be interpreted to imply semantics around the contents of the parent glossary document entry, shall only be used to classify and sort this entry (via an application or a user interface).

[*Example*: Consider the following WordprocessingML fragment for the properties of a single glossary document entry:

```

<w:docPartPr>
  <w:category>
    <w:name w:val="Internal Memo Covers" />
    <w:gallery w:val="coverPg" />
  </w:category>
  ...
</w:docPartPr>

```

The gallery element with a value of coverPg specifies that the gallery categorization applied to the current entry, for the purposes of classification or user interface sorting, puts this entry into the Cover Pages classification. *end example*

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
any (All Galleries)	Specifies that this glossary document entry shall be associated with all possible gallery classification values.
autoTxt (AutoText Gallery)	Specifies that this glossary document entry shall be associated with the AutoText gallery classification.
bib (Bibliography Gallery)	Specifies that this glossary document entry shall be associated with the Bibliography gallery classification.
coverPg (Cover Page Gallery)	Specifies that this glossary document entry shall be associated with the Cover Page gallery classification.
custAutoTxt (Custom AutoText Gallery)	Specifies that this glossary document entry shall be associated with the Custom AutoText gallery classification.
custBib (Custom Bibliography Gallery)	Specifies that this glossary document entry shall be associated with the Custom Bibliography gallery classification.
custCoverPg (Custom Cover Page Gallery)	Specifies that this glossary document entry shall be associated with the Custom Cover Page gallery classification.
custEq (Custom Equation Gallery)	Specifies that this glossary document entry shall be associated with the Custom Equation gallery classification.
custFtrs (Custom Footer Gallery)	Specifies that this glossary document entry shall be associated with the Custom Footer gallery classification.
custHdrs (Custom Header Gallery)	Specifies that this glossary document entry shall be associated with the Custom Header gallery classification.

Enumeration Value	Description
custom1 (Custom 1 Gallery)	Specifies that this glossary document entry shall be associated with the Custom 1 gallery classification.
custom2 (Custom 2 Gallery)	Specifies that this glossary document entry shall be associated with the Custom 2 gallery classification.
custom3 (Custom 3 Gallery)	Specifies that this glossary document entry shall be associated with the Custom 3 gallery classification.
custom4 (Custom 4 Gallery)	Specifies that this glossary document entry shall be associated with the Custom 4 gallery classification.
custom5 (Custom 5 Gallery)	Specifies that this glossary document entry shall be associated with the Custom 5 gallery classification.
custPgNum (Custom Page Number Gallery)	Specifies that this glossary document entry shall be associated with the Custom Page Number gallery classification.
custPgNumB (Custom Page Number At Bottom Gallery)	Specifies that this glossary document entry shall be associated with the Custom Page Number At Bottom gallery classification.
custPgNumMargins (Custom Page Number At Margins Gallery)	Specifies that this glossary document entry shall be associated with the Custom Page Number At Margins gallery classification.
custPgNumT (Custom Page Number At Top Gallery)	Specifies that this glossary document entry shall be associated with the Custom Page Number At Top gallery classification.
custQuickParts (Custom Quick Parts Gallery)	Specifies that this glossary document entry shall be associated with the Custom Quick Parts gallery classification.
custTblOfContents (Custom Table of Contents Gallery)	Specifies that this glossary document entry shall be associated with the Custom Table of Contents gallery classification.
custTbls (Custom Table Gallery)	Specifies that this glossary document entry shall be associated with the Custom Tables gallery classification.
custTextBox (Custom Text Box Gallery)	Specifies that this glossary document entry shall be associated with the Custom Text Box gallery classification.
custWatermarks (Custom Watermark Gallery)	Specifies that this glossary document entry shall be associated with the Custom Watermark gallery classification.
default (No Gallery Classification)	Specifies that this glossary document entry shall not have a gallery classification.
docParts (Document Parts Gallery)	Specifies that this glossary document entry shall be associated with the Document Parts gallery

Enumeration Value	Description
	classification.
eq (Equations Gallery)	Specifies that this glossary document entry shall be associated with the Equations gallery classification.
fters (Footers Gallery)	Specifies that this glossary document entry shall be associated with the Footers gallery classification.
hdrs (Headers Gallery)	Specifies that this glossary document entry shall be associated with the Headers gallery classification.
pgNum (Page Numbers Gallery)	Specifies that this glossary document entry shall be associated with the Page Numbers gallery classification.
pgNumB (Page Numbers At Bottom Gallery)	Specifies that this glossary document entry shall be associated with the Page Numbers At Bottom gallery classification.
pgNumMargins (Page Numbers At Margins Gallery)	Specifies that this glossary document entry shall be associated with the Page Numbers At Margins gallery classification.
pgNumT (Page Numbers At Top Gallery)	Specifies that this glossary document entry shall be associated with the Page Numbers At Top gallery classification.
placeholder (Structured Document Tag Placeholder Text Gallery)	Specifies that this glossary document entry shall be associated with the Structured Document Tag Placeholder Text gallery classification.
tblOfContents (Table of Contents Gallery)	Specifies that this glossary document entry shall be associated with the Table of Contents gallery classification.
tbls (Table Gallery)	Specifies that this glossary document entry shall be associated with the Tables gallery classification.
txtBox (Text Box Gallery)	Specifies that this glossary document entry shall be associated with the Text Box gallery classification.
watermarks (Watermark Gallery)	Specifies that this glossary document entry shall be associated with the Watermark gallery classification.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_DocPartGallery](#)) is located in §A.1. *end note*]

17.18.17 ST_DocPartType (Entry Types)

This simple type specifies the possible entry types which can be applied to the properties of a single glossary document entry (§17.12.5). Each of these entry types can, based on their values, influence the visibility and behavior of the parent glossary document entry.

[*Example:* Consider the following WordprocessingML fragment for the properties of a single glossary document entry:

```
<w:docPartPr>
  <w:types>
    <w:type w:val="bbPlcHdr" />
  </w:types>
  ...
</w:docPartPr>
```

The type element with a value of bbPlcHdr specifies that the parent glossary document entry must be treated as if it was the placeholder text for one or more structured document tags in the document. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
autoExp (Automatically Replace Name With Content)	Specifies that the type of the current glossary document entry shall allow the entry to be automatically inserted into the document whenever its name is entered into an application.
bbPlcHdr (Structured Document Tag Placeholder Text)	Specifies that the type of the current glossary document entry shall be structured document tag placeholder text.
formFld (Form Field Help Text)	Specifies that the type of the current glossary document entry shall be form field help text.
none (No Type)	Specifies no type information for the current glossary document entry.
normal (Normal)	Specifies that the type of the current glossary document entry shall be normal (i.e. a regular glossary document entry).
speller (AutoCorrect Entry)	Specifies that the type of the current glossary document entry shall be associated with the spelling and grammar tools.
toolbar (AutoText User Interface Entry)	Specifies that the type of the current glossary document entry shall be associated with a special grouping of entries associated with a single piece of user interface.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_DocPartType](#)) is located in §A.1. *end note*]

17.18.18 ST_DocProtect (Document Protection Types)

This simple type specifies the possible set of editing restrictions which can be enforced on a given WordprocessingML document.

[*Example:* Consider a WordprocessingML document that contains the following WordprocessingML specifying that hosting applications must enforce read-only protection for a given document:

```
<w:documentProtection w:edit="readOnly" w:enforcement="1" />
```

The edit attribute has a value of readOnly and an enforcement attribute with a value of 1, specifying that read-only document protection must be enforced on the given document. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
comments (Allow Editing of Comments)	Specifies that the edits made to this document shall be restricted to: <ul style="list-style-type: none"> The insertion and deletion of comments within the document The editing of regions delimited by range permissions which match the editing rights of the user account which is performing the editing.
forms (Allow Editing of Form Fields)	Specifies that the edits made to this document shall be restricted to: <ul style="list-style-type: none"> The editing of form fields in sections where the formProt element (§17.6.6) has a value of true. No restrictions in sections where the formProt element has a value of false.
none (No Editing Restrictions)	Specifies that no editing restrictions have been applied to the document.
readOnly (Allow No Editing)	Specifies that the edits made to this document shall be restricted to: <ul style="list-style-type: none"> The editing of regions delimited by range permissions which match the editing rights of the user account which is performing the editing.
trackedChanges (Allow Editing With Revision Tracking)	Specifies that the edits made to this document shall be tracked as revisions. This value shall imply the presence of the trackRevisions element (§17.15.1.89), and applications shall not allow that element's state to be changed to false.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_DocProtect](#)) is located in §A.1. *end note*]

17.18.19 ST_DocType (Document Classification Values)

This simple type specifies the possible classifications that can be used for a WordprocessingML document.

The following possible values for this type are reserved:

Value	Description
eMail (E-Mail Message)	Specifies that this document shall be classified as an e-mail message.
letter (Letter)	Specifies that this document shall be classified as a letter.
notSpecified (Default Document)	Specifies that this document shall be classified as a default document.

[*Example:* Consider a set of WordprocessingML documents which should be classified as 'letters'. This classification would be specified using the following WordprocessingML in the document settings of these documents:

```
<w:documentType w:val="letter" />
```

The documentType element's val attribute is equal to letter, specifying that the hosting application must apply the behaviors it has specified for letters to the given WordprocessingML document. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_DocType](#)) is located in §A.1. *end note*]

17.18.20 ST_DropCap (Text Frame Drop Cap Location)

This simple type specifies the location which shall be used to position a drop cap text frame when the contents of that text frame are displayed in the anchor paragraph at display time.

[*Note:* Although a drop cap is simply a text frame, the values of this simple type are used to determine how the cap should be positioned relative to the following non-frame paragraph in relative terms (see enumeration values), rather than relying on absolute sizing. *end note*]

[*Example:* Consider the following paragraph containing a text frame which should be positioned as a drop cap:

```
<w:p>
  <w:pPr>
    <w:framePr w:dropCap="margin" w:lines="3" w:hSpace="432" w:wrap="around"
    w:vAnchor="text" w:hAnchor="page" />
  </w:pPr>
</w:p>
```

```

</w:pPr>
<w:r>
  <w:t>A</w:t>
</w:r>
</w:p>

```

The dropCap attribute specifies a value of margin, so this drop cap is placed outside of the text margin before the start of the current text. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
drop (Drop Cap Inside Margin)	Specifies that the drop cap text frame shall be positioned inside the text margin on the anchor paragraph when this text frame is displayed in the document.
margin (Drop Cap Outside Margin)	Specifies that the drop cap text frame shall be positioned outside of the text margin on the anchor paragraph when this text frame is displayed in the document.
none (Not Drop Cap)	Specifies that this text frame is not a drop cap text frame.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_DropCap](#)) is located in §A.1. *end note*]

17.18.21 ST_EdGrp (Range Permission Editing Group)

This simple type specifies the set of possible aliases (or editing groups) which can be used as aliases to determine if the current user shall be allowed to edit a single range defined by a range permission within a document. This mechanism simply provides a set of predefined editing groups which can be associated with user accounts by applications in any desired manner.

[Example: Consider a range permission defined as follows:

```

<w:permStart w:id="0" w:edGrp="editors" ... />
...
<w:permEnd w:id="0" />

```

The edGrp attribute value of editors specifies that only user(s) who the current application associates with the editors group must be allowed to edit the contents between the start and end markers when document protection is being enforced. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
administrators (Administrator Group)	Specifies that users associated with the Administrators group shall be allowed to edit range permissions using this editing group when document protection is enabled.
contributors (Contributors Group)	Specifies that users associated with the Contributors group shall be allowed to edit range permissions using this editing group when document protection is enabled.
current (Current Group)	Specifies that users associated with the Current group shall be allowed to edit range permissions using this editing group when document protection is enabled.
editors (Editors Group)	Specifies that users associated with the Editors group shall be allowed to edit range permissions using this editing group when document protection is enabled.
everyone (All Users Have Editing Permissions)	Specifies that all users that open the document shall be allowed to edit range permissions using this editing group when document protection is enabled.
none (No Users Have Editing Permissions)	Specifies that none of the users that open the document shall be allowed to edit range permissions using this editing group when document protection is enabled.
owners (Owners Group)	Specifies that users associated with the Owners group shall be allowed to edit range permissions using this editing group when document protection is enabled.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_EdGrp](#)) is located in §A.1. *end note*]

17.18.22 ST_EdnPos (Endnote Positioning Location)

This simple type specifies the possible positions of endnotes in a document.

[Example: Consider a document in which endnotes must be positioned at the end of the section. The section properties for this section must be declared as follows:

```
<w:settings>
  <w:endnotePr>
    <w:pos w:val="sectEnd" />
  </w:endnotePr>
  ...
</w:settings>
```

The val attribute is sectEnd, therefore the position of endnotes is specified to be at the end of the section. *end example]*

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
docEnd (Endnotes Positioned at End of Document)	Specifies that all endnotes shall be placed at the end of the current document, regardless of which section they are referenced within.
sectEnd (Endnotes Positioned at End of Section)	Specifies that endnotes shall be placed at the end of the section in which they are referenced. An endnote which is never referenced is never displayed.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_EdnPos](#)) is located in §A.1. *end note]*

17.18.23 ST_EighthPointMeasure (Measurement in Eighths of a Point)

This simple type specifies that its contents contain a positive whole number, whose contents consist of a measurement in eighths of a point (equivalent to 1/576th of an inch).

The contents of this measurement are interpreted based on the context of the parent XML element.

[Example: Consider an attribute value of 24 whose simple type is ST_EighthPointMeasure. This attribute value specifies a size in eighths of a point (24 eighths of a point = 3 points). *end example]*

This simple type's contents are a restriction of the ST_UnsignedDecimalNumber datatype (§22.9.2.16).

[Note: The W3C XML Schema definition of this simple type's content model ([ST_EighthPointMeasure](#)) is located in §A.1. *end note]*

17.18.24 ST_Em (Emphasis Mark Type)

This simple type specifies possible types of emphasis marks which can be displayed for each non-space character in a run. This character is rendered above or below the character glyph as specified by enumeration values.

[Example: Consider a run of text which must have a dot underneath each character as an emphasis mark. This constraint is specified using the following WordprocessingML:

```
<w:rPr>
  <w:em w:val="dot"/>
</w:rPr>
```

This run explicitly declares that the emphasis mark type is dot, so the contents of this run has a dot emphasis mark above each character. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
circle (Circle Emphasis Mark Above Characters)	Specifies that the emphasis mark is a circle character which shall be rendered above each character in this run using Unicode character 0x02DA when the language of the text is not Traditional Chinese. For that language Unicode character 0x3002 shall be used instead, positioned beneath the characters.
comma (Comma Emphasis Mark Above Characters)	Specifies that the emphasis mark is a comma character which shall be rendered above each character in this run, using Unicode character 0x3001.
dot (Dot Emphasis Mark Above Characters)	Specifies that the emphasis mark is a dot character which shall be rendered above each character in this run using Unicode character 0x02D9 whenever the language of the text is not Japanese, Simplified Chinese, or Traditional Chinese. For those three languages, the emphasis mark shall be rendered as follows: <ul style="list-style-type: none"> • Japanese = Unicode character 0xFF0E (dot beneath characters) • Simplified Chinese = Unicode character 0xFF0E (dot beneath characters) • Traditional Chinese = Unicode character 0x2027
none (No Emphasis Mark)	Specifies that there shall be no emphasis mark for any character in this run.
underDot (Dot Emphasis Mark Below Characters)	Specifies that the emphasis mark is a dot character which shall be rendered below each character in this run using Unicode character 0xFF0E.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_Em](#)) is located in §A.1. *end note*]

17.18.25 ST_FFHelpTextVal (Help Text Value)

This simple type specifies the format of optional help text which can be associated with the parent form field.

[*Example:* Consider the following WordprocessingML fragment for a drop-down list form field:

```

<w:r>
  <w:fldChar w:fldCharType="begin">
    <w:ffData>
      <w:helpText w:type="text" w:val="Example help text."/>
      <w:ddList>
        ...
      </w:ddList>
    </w:ffData>
  </w:fldChar>
</w:r>
<w:r>
  <w:instrText> FORMDROPDOWN </w:instrText>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="end"/>
</w:r>

```

The `helpText` element specifies the help text for the parent form field - in this case, literal help text consisting of the string `Example help text.` *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type also specifies the following restrictions:

- This simple type's contents have a maximum length of 256 Unicode scalar values.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_FFHelpTextVal](#)) is located in §A.1. *end note*]

17.18.26 ST_FFName (Form Field Name Value)

This simple type specifies the format of the name which can be associated with the parent form field.

[*Example:* Consider the following WordprocessingML fragment for a text box form field:

```

<w:r>
  <w:fldChar w:fldCharType="begin">
    <w:ffData>
      <w:name w:val="FirstName" />
      <w:textInput>
        ...
      </w:textInput>
    </w:ffData>
  </w:fldChar>
</w:r>

```

```

<w:r>
  <w:instrText> FORMTEXT </w:instrText>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="separate"/>
</w:r>
<w:r>
  <w:t>1</w:t>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="end"/>
</w:r>

```

The name element specifies that the name of the current form field is `FirstName`. *end example*

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type also specifies the following restrictions:

- This simple type's contents have a maximum length of 65 Unicode scalar values.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_FFName](#)) is located in §A.1. *end note*]

17.18.27 ST_FFStatusTextVal (Status Text Value)

This simple type specifies the format of optional status text which can be associated with the parent form field.

[Example: Consider the following WordprocessingML fragment for a drop-down list form field:

```

<w:r>
  <w:fldChar w:fldCharType="begin">
    <w:ffData>
      <w:statusText w:type="text" w:val="Example status text."/>
      <w:ddlList>
        ...
      </w:ddlList>
    </w:ffData>
  </w:fldChar>
</w:r>
<w:r>
  <w:instrText> FORMDROPDOWN </w:instrText>
</w:r>
<w:r>
  <w:fldChar w:fldCharType="end"/>
</w:r>

```


The `statusText` element specifies the status text for the parent form field - in this case, literal text consisting of the string `Example status text`. *end example*

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type also specifies the following restrictions:

- This simple type's contents have a maximum length of 140 characters.

[*Note:* The W3C XML Schema definition of this simple type's content model (`ST_FFStatusTextVal`) is located in §A.1. *end note*]

17.18.28 ST_FFTextType (Text Box Form Field Type Values)

This simple type specifies the possible types of the contents of a text box form field.

[*Example:* Consider the following WordprocessingML fragment for the properties of a text box form field:

```
<w:ffData>
  <w:textInput>
    <w:type w:val="number" />
    <w:maxLength w:val="4" />
    <w:format w:val="0.00" />
  </w:textInput>
</w:ffData>
```

The type element specifies that the contents of this form field should be handled as a number by an application. *end example*

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
calculated (Field Calculation)	Specifies that the contents of this text box form field shall be the result of the field calculation specified by the corresponding default element (§17.16.10). This field should not be directly editable when the editing of form fields is enabled.
currentDate (Current Date Display)	Specifies that the contents of this text box form field shall be the current date when the field is updated.
currentTime (Current Time Display)	Specifies that the contents of this text box form field shall be the current time when the field is updated.
date (Date)	Specifies that the contents of this text box form field shall be treated as a date.
number (Number)	Specifies that the contents of this text box form field

Enumeration Value	Description
	shall be treated as a number value.
regular (Text Box)	Specifies that this text form field is a plain text field (no additional content restrictions).

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_FFTextType](#)) is located in §A.1. *end note*]

17.18.29 ST_FldCharType (Complex Field Character Type)

This simple type specifies the possible values for the type of a single complex field character in the document.

[*Example*: Consider the following WordprocessingML for a complex field character:

```
...
<w:fldChar w:fldCharType="separate" />
...
```

The type attribute value of `separate` specifies that this is a complex field separator character; therefore it is being used to separate the field codes from the field contents in a complex field. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
begin (Start Character)	Specifies that the character is a start character, which defines the start of a complex field.
end (End Character)	Specifies that the character is an end character, which defines the end of a complex field.
separate (Separator Character)	Specifies that the character is a separator character, which defines the end of the field codes and the start of the field result for a complex field.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_FldCharType](#)) is located in §A.1. *end note*]

17.18.30 ST_FontFamily (Font Family Value)

This simple type specifies possible values for the font family of a font.

[*Example*: Consider the following information stored for a single font:

```
<w:font w:name="Calibri">
  <w:family w:val="swiss" />
  ...
</w:font>
```

The family element specifies via its val attribute value of *swiss* that this font is part of the Swiss family. *end example*

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
auto (No Font Family)	Specifies that information about a font's font family does not exist.
decorative (Novelty Font)	Specifies the Novelty font family.
modern (Monospace Font)	Specifies a monospace font with or without serifs (monospace fonts are usually modern).
roman (Proportional Font With Serifs)	Specifies a proportional font with serifs.
script (Script Font)	Specifies a script font designed to mimic the appearance of handwriting.
swiss (Proportional Font Without Serifs)	Specifies a proportional font without serifs.

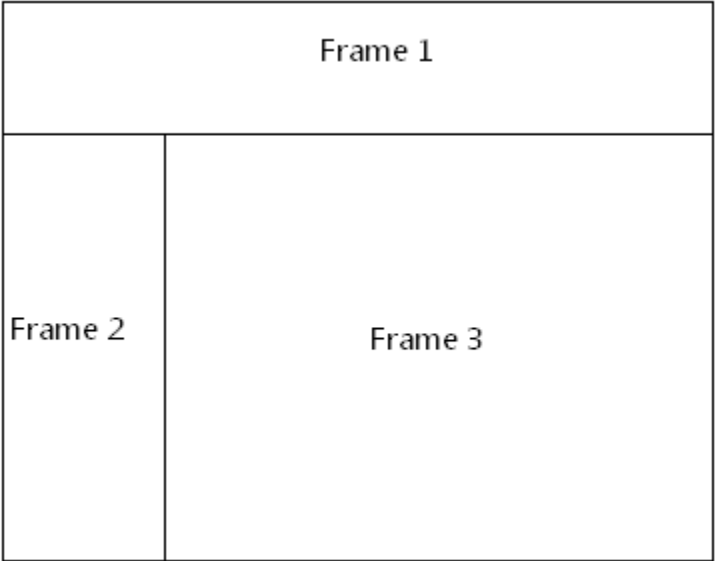
[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_FontFamily](#)) is located in §A.1. *end note*]

17.18.31 ST_FrameLayout (Frameset Layout Order)

This simple type specifies the possible order in which the frames (and nested framesets) in a frameset can be displayed. When a frameset is created, it can only contain frames which are stacked in one direction:

- Vertically (one on top of another)
- Horizontally (one next to another)

[*Example*: Consider a WordprocessingML document which serves as the frameset container for a frameset consisting of the following three frames:



The frameset properties for this document are specified by the following WordprocessingML within the web page settings:

```
<w:frameset>
  <w:frameLayout w:val="rows" />
  <w:frame>
    ...
  </w:frame>
  <w:frameset>
    <w:frameLayout w:val="cols" />
    <w:frame>
      ...
    </w:frame>
    <w:frame>
      ...
    </w:frame>
  </w:frameset>
</w:frameset>
```

The frameLayout element specifies that the outer frameset is consists of the single frame and the child frameset stacked vertically, and an inner nested frameset consisting of two frames stacked horizontally. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
cols (Stack Frames Horizontally)	Specifies that the frames in the frameset shall be

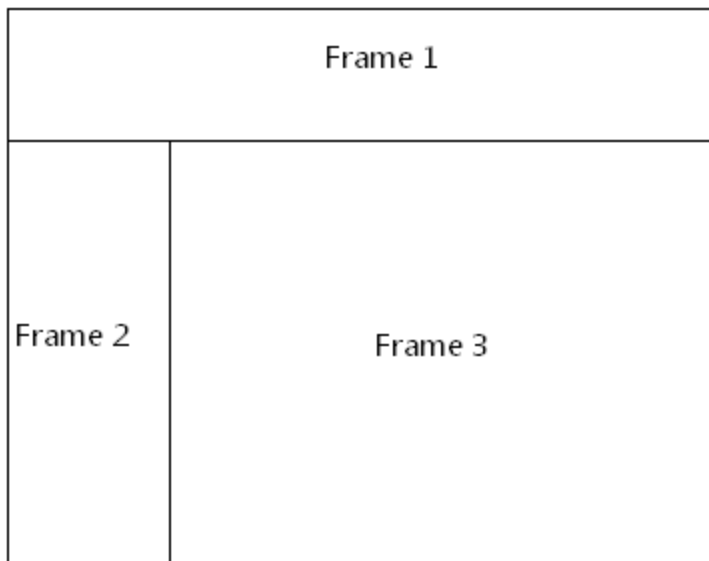
Enumeration Value	Description
	stacked horizontally next to each other in left to right order.
none (Do Not Stack Frames)	Specifies that no frames shall be shown in the frameset.
rows (Stack Frames Vertically)	Specifies that the frames in the frameset shall be stacked vertically next to each other in top to bottom order.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_FrameLayout](#)) is located in §A.1.
end note]

17.18.32 ST_FrameScrollbar (Frame Scrollbar Visibility)

This simple type specifies the possible settings for when a scrollbar shall be visible for the contents of the current frame.

[*Example:* Consider a WordprocessingML document which serves as the frameset container for a frameset consisting of the following three frames:



The frameset properties for this document are specified by the following WordprocessingML within the web page settings:

```

<w:frameset>
...
</w:frameset>

```

```
...
<w:frame>
  <w:name w:val="Frame 2" />
  <w:scrollbar w:val="auto" />
</w:frame>
...
</w:frameset>
</w:frameset>
```

The scrollbar element has a val attribute of auto, which specifies that the frame must only display a scrollbar when it is needed to display all of its content. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

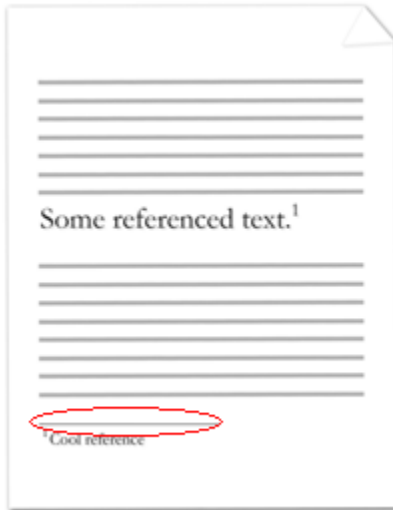
Enumeration Value	Description
auto (Automatically Show Scrollbar As Needed)	Specifies that the scrollbar for a frame shall automatically be hidden and/or displayed as needed based on the length of the contents.
off (Never Show Scrollbar)	Specifies that the scrollbar for a frame shall always be hidden.
on (Always Show Scrollbar)	Specifies that the scrollbar for a frame shall always be displayed (even when not needed).

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_FrameScrollbar](#)) is located in §A.1. *end note*]

17.18.33 ST_FtnEdn (Footnote or Endnote Type)

This simple type specifies the possible types of footnotes and endnotes which can be specified in a WordprocessingML document.

[*Example*: Consider a document with a single footnote at the bottom of the first page. This footnote must be separated from the text by the separator footnote (the footnote explicitly used to separate text from the footnote list (circled in red below):



This footnote type would be declared as follows in the WordprocessingML:

```
<w:footnote w:type="separator" w:id="0">
...
</w:footnote>
```

In this example, the footnote has an attribute value of `separator`, specifies when this footnote must be used. *end example]*

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
continuationNotice (Continuation Notice Separator)	<p>Specifies that this footnote or endnote is a continuation notice footnote or endnote.</p> <p><i>Continuation notice footnotes and endnotes</i> are used when the footnotes or endnotes exceed the length allowed on a single page. When this happens, this footnote or endnote shall be placed on the bottom of each page where the note shall continue to indicate that fact to the reader.</p>
continuationSeparator (Continuation Separator)	<p>Specifies that this footnote or endnote is a continuation separator footnote or endnote.</p> <p><i>Continuation separator footnotes and endnotes</i> are used when the footnotes or endnotes exceed the length allowed on a single page. When this happens, this footnote or endnote shall be placed between the main text contents and the continued footnotes/endnotes on all subsequent pages of the</p>

Enumeration Value	Description
	document.
normal (Normal Footnote/Endnote)	Specifies that this footnote or endnote is a normal footnote or endnote, and can be referenced by main document content.
separator (Separator)	<p>Specifies that this footnote or endnote is a separator footnote or endnote.</p> <p><i>Separator footnotes and endnotes</i> are used to indicate the separation between the main document's content and the footnotes or endnotes to indicate that fact to the reader.</p>

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_FtnEdn](#)) is located in §A.1. *end note*]

17.18.34 ST_FtnPos (Footnote Positioning Location)

This simple type specifies the position of footnotes in the document.

[*Example:* Consider a document in which footnotes must be positioned beneath their text. The footnote properties for this document must be declared as follows:

```
<w:sectPr>
  <w:footnotePr>
    <w:pos w:val="beneathText" />
  </w:footnotePr>
  ...
</w:sectPr>
```

The val attribute is beneathText, therefore the position of footnotes is specified to be beneath the page's text. *end example]*

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
beneathText (Footnotes Positioned Beneath Text)	Specifies that footnotes shall be displayed immediately after the last line of text on the page on which the note reference mark appears.
docEnd (Footnotes Positioned At End of Document)	Specifies that all footnotes shall be placed at the end of the current document, regardless of which section they are referenced within.
pageBottom (Footnotes Positioned at Page Bottom)	Specifies that footnotes shall be displayed at the

Enumeration Value	Description
	bottom margin of the page on which the note reference mark appears.
sectEnd (Footnotes Positioned At End of Section)	<p>Specifies that all footnotes shall be placed at the end of the section in which they are referenced.</p> <p>A footnote which is never referenced is never displayed.</p>

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_FtnPos](#)) is located in §A.1. *end note*]

17.18.35 ST_HAnchor (Horizontal Anchor Location)

This simple type specifies the horizontal position to which the parent object has been anchored in the document. This anchor position shall be used as the base location to determine the final horizontal position of the object in the document.

[*Example:* Consider a text frame which should be positioned one inch to the right of its column in a left-to-right document. This text frame would be specified using the following WordprocessingML:

```
<w:pPr>
  <w:framePr ... w:x="1440" w:hAnchor="margin" />
</w:pPr>
```

These frame horizontal anchor properties specify that they are relative to the anchor paragraph's margin (the text margin excluding any indents). *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
margin (Relative To Margin)	<p>Specifies that the parent object shall be horizontally anchored to the text margins.</p> <p>This shall be used to specify that any horizontal positioning values shall be calculated with respect to the location of the text margin.</p>
page (Relative to Page)	<p>Specifies that the parent object shall be horizontally anchored to the page edge.</p> <p>This shall be used to specify that any horizontal positioning values shall be calculated with respect to the location of the edge of the page.</p>

Enumeration Value	Description
text (Relative to Text Extents)	<p>Specifies that the parent object shall be horizontally anchored to the text extents.</p> <p>This shall be used to specify that any horizontal positioning values shall be calculated with respect to the location of the edge of the text in the anchor paragraph (including text indentations on that paragraph within the text margins).</p>

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_HAnchor](#)) is located in §A.1. *end note*]

17.18.36 ST_HdrFtr (Header or Footer Type)

This simple type specifies the possible types of headers and footers which can be specified for a given header or footer reference in a document. This value determines the page(s) on which the current header or footer shall be displayed.

[*Example:* Consider a WordprocessingML section which specifies the following header reference:

```
<w:headerReference r:id="rId10" w:type="first" />
```

The resulting section must use the specified header part for the first page. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
default (Default Header or Footer)	<p>Specifies that this header or footer shall appear on every page in this section which is not overridden with a specific even or first page header/footer.</p> <p>In a section with all three types specified, this header/footer type shall be used on all odd numbered pages (counting from the first page in the section, not the section numbering).</p>
even (Even Numbered Pages Only)	<p>Specifies that this header or footer shall appear on all even numbered pages in this section (counting from the first page in the section, not the section numbering).</p> <p>The appearance of this header or footer is contingent on the setting of the evenAndOddHeaders element (§17.10.1).</p>

Enumeration Value	Description
first (First Page Only)	Specifies that this header or footer shall appear on the first page in this section. The appearance of this header or footer is contingent on the setting of the titlePg element (§17.10.6).

[Note: The W3C XML Schema definition of this simple type's content model ([ST_HdrFtr](#)) is located in §A.1. *end note*]

17.18.37 ST_HeightRule (Height Rule)

This simple type specifies the logic which shall be used to calculate the height of the parent object when it is displayed in the document.

[Example: Consider the following table row:

```
<w:trPr>
  <w:trHeight w:hRule="atLeast" w:val="2189" />
</w:trPr>
```

The val attribute specifies a value of 2189 twentieths of a point, so this table row is a minimum of 2189 twentieths of a point high regardless of its contents, since its hRule value is set to atLeast. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
atLeast (Minimum Height)	Specifies that the height of the parent object shall be at least the value specified, but can be expanded to fit its content as needed.
auto (Determine Height Based On Contents)	Specifies that the height of the parent object shall be automatically determined by the size of its contents, with no predetermined minimum or maximum size.
exact (Exact Height)	Specifies that the height of the parent object shall be exactly the value specified, regardless of the size of the contents of the object. If the contents are too large for the specified height, then they shall be clipped.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_HeightRule](#)) is located in §A.1. *end note*]

17.18.38 ST_HexColor (Color Value)

This simple type specifies that its contents contain one of the following:

- A color values in RRGGBB format (ST_HexColorRGB)
- The enumeration value auto (ST_HexColorAuto)

The contents of this measurement are interpreted based on the context of the parent XML element.

[*Example*: Consider a border color with value auto, as follows:

```
<w:bottom ... w:color="auto"/>
```

This color therefore can be automatically be modified by a consumer as appropriate, for example, in order to ensure that the border can be distinguished against the page's background color. *end example*]

This simple type is a union of the following types:

- The ST_HexColorRGB simple type (§22.9.2.5).
- The ST_HexColorAuto simple type (§17.18.39).

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_HexColor](#)) is located in §A.1. *end note*]

17.18.39 ST_HexColorAuto ('Automatic' Color Value)

This simple type specifies that its contents contain the enumeration value auto. This value shall be used to specify an automatically determined color value, the meaning of which is interpreted based on the context of the parent XML element.

[*Example*: Consider a border color with value auto, as follows:

```
<w:bottom ... w:color="auto"/>
```

This color therefore can be automatically be modified by a consumer as appropriate, for example, in order to ensure that the border can be distinguished against the page's background color. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
auto (Automatically Determined Color)	Specifies that the color value can automatically be defined when this document is processed, based on the display context.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_HexColorAuto](#)) is located in §A.1. *end note*]

17.18.40 ST_HighlightColor (Text Highlight Colors)

This simple type specifies the possible values for highlighting colors which can be applied as a background behind the contents of a text run.

[*Example:* Consider a run within a paragraph which has yellow text highlighting using the highlight element. This formatting is specified using the following WordprocessingML:

```
<w:rPr>
  <w:highlight w:val="yellow" />
</w:rPr>
```

The resulting run would have yellow highlighting visible over its contents. *end example]*

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
black (Black Highlighting Color)	Specifies that the text highlighting color for this run shall be black. The hexadecimal RGB value for this setting shall be 000000.
blue (Blue Highlighting Color)	Specifies that the text highlighting color for this run shall be blue. The hexadecimal RGB value for this setting shall be 0000FF.
cyan (Cyan Highlighting Color)	Specifies that the text highlighting color for this run shall be cyan. The hexadecimal RGB value for this setting shall be 00FFFF.
darkBlue (Dark Blue Highlighting Color)	Specifies that the text highlighting color for this run shall be dark blue. The hexadecimal RGB value for this setting shall be 00008B.
darkCyan (Dark Cyan Highlighting Color)	Specifies that the text highlighting color for this run shall be dark cyan. The hexadecimal RGB value for this setting shall be 008B8B.
darkGray (Dark Gray Highlighting Color)	Specifies that the text highlighting color for this run shall be dark gray.

Enumeration Value	Description
	The hexadecimal RGB value for this setting shall be A9A9A9.
darkGreen (Dark Green Highlighting Color)	<p>Specifies that the text highlighting color for this run shall be dark green.</p> <p>The hexadecimal RGB value for this setting shall be 006400.</p>
darkMagenta (Dark Magenta Highlighting Color)	<p>Specifies that the text highlighting color for this run shall be dark magenta.</p> <p>The hexadecimal RGB value for this setting shall be 800080.</p>
darkRed (Dark Red Highlighting Color)	<p>Specifies that the text highlighting color for this run shall be dark red.</p> <p>The hexadecimal RGB value for this setting shall be 8B0000.</p>
darkYellow (Dark Yellow Highlighting Color)	<p>Specifies that the text highlighting color for this run shall be dark cyan.</p> <p>The hexadecimal RGB value for this setting shall be 808000.</p>
green (Green Highlighting Color)	<p>Specifies that the text highlighting color for this run shall be green.</p> <p>The hexadecimal RGB value for this setting shall be 00FF00.</p>
lightGray (Light Gray Highlighting Color)	<p>Specifies that the text highlighting color for this run shall be light gray.</p> <p>The hexadecimal RGB value for this setting shall be D3D3D3.</p>
magenta (Magenta Highlighting Color)	<p>Specifies that the text highlighting color for this run shall be magenta.</p> <p>The hexadecimal RGB value for this setting shall be FF00FF.</p>
none (No Text Highlighting)	Specifies that this text run shall have no text highlighting applied to its contents.
red (Red Highlighting Color)	Specifies that the text highlighting color for this run shall be red.

Enumeration Value	Description
	The hexadecimal RGB value for this setting shall be FF0000.
white (White Highlighting Color)	Specifies that the text highlighting color for this run shall be white. The hexadecimal RGB value for this setting shall be FFFFFFFF.
yellow (Yellow Highlighting Color)	Specifies that the text highlighting color for this run shall be yellow. The hexadecimal RGB value for this setting shall be FFFF00.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_HighlightColor](#)) is located in §A.1. *end note*]

17.18.41 ST_Hint (Font Type Hint)

Specifies the font type which shall be used to format any ambiguous characters in the current run.

There are certain characters which are not explicitly stored in the document, and can be mapped into multiple categories of the four mentioned above. This attribute shall be used to arbitrate that conflict, and determine how ambiguities in this run shall be handled. [*Note*: This is primarily used to handle the formatting on the paragraph mark glyph, and other characters that are not stored as text in the WordprocessingML document. *end note*]

[*Example*: Consider the run representing the paragraph mark glyph, which is not stored as a physical character. Since this could therefore be formatted with any of the fonts specified for the run, this ambiguity is resolved using the following WordprocessingML:

```
<w:pPr>
  <w:rPr>
    <w:rFonts w:hint="eastAsia" />
  </w:rPr>
</w:pPr>
```

The hint attribute specifies that the run must use the eastAsia font (theme or not, whichever is in use for East Asian text) as applied for this run. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
cs (Complex Script Font)	Specifies that the font hint for this text run shall be to use the Complex Script font defined on the run via the style hierarchy.
default (High ANSI Font)	Specifies that the font hint for this text run shall be to use the High ANSI font defined on the run via the style hierarchy.
eastAsia (East Asian Font)	Specifies that the font hint for this text run shall be to use the East Asian font defined on the run via the style hierarchy.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_Hint](#)) is located in §A.1. *end note*]

17.18.42 ST_HpsMeasure (Measurement in Half-Points)

This simple type specifies that its contents contain either:

- A positive whole number, whose contents consist of a measurement in half-points (equivalent to 1/144th of an inch), or
- A positive decimal number immediately followed by a unit identifier.

The contents of this measurement are interpreted based on the context of the parent XML element.

[*Example:* Consider an attribute value of 72 whose simple type is ST_HpsMeasure. This attribute value specifies a size of one-half of an inch or 36 points (72 halves of a point = 36 points = 0.5 inches). *end example*]

[*Example:* Consider an attribute value of 12.7mm whose type is ST_HpsMeasure. This attribute value specifies a size of 0.0127 meter or one-half of an inch or 36 points. *end example*]

This simple type is a union of the following types:

- The ST_PositiveUniversalMeasure simple type (§22.9.2.12).
- The ST_UnsignedDecimalNumber simple type (§22.9.2.16).

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_HpsMeasure](#)) is located in §A.1. *end note*]

17.18.43 ST_InfoTextType (Help or Status Text Type)

This simple type specifies the possible values for the type of help or status text which can be associated with a form field.

[*Example:* Consider the following WordprocessingML fragment for a form field:


```
<w:ffData>
  <w:helpText w:type="text" w:val="Example help text." />
</w:ffData>
```

The type attribute has a value of text, which specifies that the text in the val attribute is the literal help text for this form field. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
autoText (Glossary Document Entry)	Specifies that the value specified by the parent XML element's val attribute shall be interpreted as the name of a glossary document entry whose contents contain the help or status text.
text (Literal Text)	Specifies that the value specified by the parent XML element's val attribute shall be interpreted as the literal text for the help or status text.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_InfoTextType](#)) is located in §A.1. *end note*]

17.18.44 ST_Jc (Horizontal Alignment Type)

This simple type specifies all types of alignment which are available to be applied to objects in a WordprocessingML document.

[*Example:* Consider a paragraph which is aligned to the trailing edge of text flow. This requirement would be specified as follows in the WordprocessingML markup:

```
<w:pPr>
  <w:jc w:val="end" />
</w:pPr>
```

The val attribute's value of end specifies that the content must be right-aligned on the page for a left-to-right paragraph, and left justified for a right-to-left paragraph. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
both (Justified)	Specifies that the text shall be justified between both of the text margins in the document. The lowKashida setting shall also be applied to Arabic

Enumeration Value	Description
	<p>text when this setting is applied.</p> <p>This type of justification shall only affect the inter-word spacing on each line, and not the inter-character spacing between each word when justifying its contents.</p>
center (Align Center)	Specifies that the text shall be centered on the line between both of the text margins in the document.
distribute (Distribute All Characters Equally)	<p>Specifies that the text shall be justified between both of the text margins in the document.</p> <p>This type of justification shall equally affect the inter-word spacing on each line as well as the inter-character spacing between each word when justifying its contents - that is, an equal amount of additional character pitch shall be added to all characters on the line.</p>
end (Align to Trailing Edge)	Specifies that the text shall be aligned on the trailing text margin in the document (right for left-to-right paragraphs; left for right-to-left paragraphs).
highKashida (Widest Kashida Length)	<p>Specifies that the kashida length for text in the current paragraph shall be extended to its widest possible length.</p> <p>This setting only affects <i>kashidas</i>, which are special characters used to extend the joiner between two Arabic characters. [Note: They are typically used to improve the appearance of justified text by visually lengthening words rather than increasing the spacing between words. <i>end note</i>]</p> <p>[Example: The following example illustrates each type of kashida:</p> <p>Low: هَذَا إِمْتِيحَان</p> <p>Medium: هَذَا إِمْتِيحَان</p> <p>High: هَذَا إِمْتِيحَان</p> <p><i>end example</i>]</p>
lowKashida (Low Kashida Length)	Specifies that the kashida length for text in the current paragraph shall be extended to a slightly longer length. This setting shall also be applied to Arabic text when

Enumeration Value	Description
	<p>the both setting is applied.</p> <p>This setting only affects <i>kashidas</i>, which are special characters used to extend the joiner between two Arabic characters. [Note: They are typically used to improve the appearance of justified text by visually lengthening words rather than increasing the spacing between words. <i>end note</i>]</p> <p>[Example: The following example illustrates each type of kashida:</p> <p>Low: هذا إمتيحيان</p> <p>Medium: هذا إمتيحيان</p> <p>High: هذا إمتيحيان</p> <p><i>end example]</i></p>
mediumKashida (Medium Kashida Length)	<p>Specifies that the kashida length for text in the current paragraph shall be extended to a medium length determined by the consumer.</p> <p>This setting only affects <i>kashidas</i>, which are special characters used to extend the joiner between two Arabic characters. [Note: They are typically used to improve the appearance of justified text by visually lengthening words rather than increasing the spacing between words. <i>end note</i>]</p> <p>[Example: The following example illustrates each type of kashida:</p> <p>Low: هذا إمتيحيان</p> <p>Medium: هذا إمتيحيان</p> <p>High: هذا إمتيحيان</p> <p><i>end example]</i></p>
numTab (Align to List Tab)	<p>Specifies that the text shall be aligned to the list tab, which is the tab stop after the numbering for the current paragraph.</p> <p>If the current paragraph has no numbering, this setting has no effect.</p>

Enumeration Value	Description
	[<i>Note</i> : This justification style is used for backwards compatibility with earlier word processors, and should be avoided in favor of hanging paragraph indentation. <i>end note</i>]
start (Align To Leading Edge)	Specifies that the text shall be aligned on the leading text margin in the document (left for left-to-right paragraphs; right for right-to-left paragraphs).
thaiDistribute (Thai Language Justification)	<p>Specifies that the text shall be justified with an optimization for Thai.</p> <p>This type of justification shall affect both the inter-word spacing on each line, and the inter-character spacing between each word when justifying its contents, unlike both justification. This difference is created in that the inter-character space is increased slightly in order to ensure that the additional space created by the justification is reduced.</p> <p>[<i>Note</i>: This setting is different from justification in that the reduction in inter-character spacing would be inappropriate in Western languages. <i>end note</i>]</p>

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_Jc](#)) is located in §A.1. *end note*]

17.18.45 ST_JcTable (Table Alignment Type)

This simple type specifies all types of alignment that are available to be applied to tables in a WordprocessingML document.

[*Example*: Consider a table row that is right aligned. This requirement would be specified as follows in the WordprocessingML markup:

```
<w:trPr>
  <w:jc w:val="end" />
</w:trPr>
```

The val attribute's value of end specifies that the table is right-aligned on the page (assuming the table is aligned left-to-right. *end example*)

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
center (Align Center)	Specifies that the table shall be centered on the line between both of the text margins in the document.
end (Align to Trailing Edge)	Specifies that the table shall be aligned to the trailing edge of the text flow – the right text margin (for a left-to-right table); or the left text margin (for a right-to-left table) in the document. (See §17.4.1)
start (Align to Starting Edge)	Specifies that the table shall be aligned to the leading edge of the text flow – the left text margin (for a left-to-right table); or the right text margin (for a right-to-left table) in the document. (See §17.4.1)

[Note: The W3C XML Schema definition of this simple type's content model ([ST_JcTable](#)) is located in §A.1. *end note*]

17.18.46 ST_LevelSuffix (Content Between Numbering Symbol and Paragraph Text)

This simple type specifies the types of content which shall be possible between a given numbering level's text and the text of every numbered paragraph which references that numbering level.

[Example: Consider the numbered paragraph below:

1. Test

In this example, a space exists between the numbering symbol 1. and the numbered paragraph text Test. The space would be specified in WordprocessingML as follows:

```
<w:lvl w:ilvl="0">
...
  <w:suff w:val="space" />
...
</w:lvl>
```

The suff element with an attribute value of space specifies that the character between the numbering's level text and the paragraph text must be a space. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
nothing (Nothing Between Numbering and Text)	Specifies that no character shall be displayed between the numbering level's text and the contents of the paragraph when displaying the numbered paragraph.

Enumeration Value	Description
space (Space Between Numbering and Text)	Specifies that a space character shall be displayed between the numbering level's text and the contents of the paragraph when displaying the numbered paragraph.
tab (Tab Between Numbering and Text)	<p>Specifies that a tab character shall be displayed between the numbering level's text and the contents of the paragraph when displaying the numbered paragraph.</p> <p>This tab shall follow normal tab stop rules to determine its length.</p>

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_LevelSuffix](#)) is located in §A.1. *end note*]

17.18.47 ST_LineNumberRestart (Line Numbering Restart Position)

This simple type specifies when the line numbering in the parent section shall be reset to its restart value. The line numbering increments for each line (even if the line number itself is not displayed) until it reaches the restart point specified by this element.

[*Example*: Consider the line numbering used on each page of this document, which specifies that line numbering must restart at the top of each new page. This line numbering setting would be defined using the following WordprocessingML:

```
<w:lnNumType w:restart="newPage" ... />
```

The restart attribute is of type ST_LineNumberRestart, and a value of newPage specifies that the line numbers must restart at the top of each page to the value specified by the start attribute. In this case, newPage is the default, so this value could have been omitted entirely. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
continuous (Continue Line Numbering From Previous Section)	Specifies that line numbering for the parent section shall continue from the line numbering from the end of the previous section, if any.
newPage (Restart Line Numbering on Each Page)	Specifies that line numbering for the parent section shall restart to the starting value whenever a new page is displayed.
newSection (Restart Line Numbering for Each Section)	Specifies that line numbering for the parent section shall restart to the starting value whenever the parent

Enumeration Value	Description
	begins.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_LineNumberRestart](#)) is located in §A.1. *end note*]

17.18.48 ST_LineSpacingRule (Line Spacing Rule)

This simple type specifies the logic which shall be used to calculate the line spacing of the parent object when it is displayed in the document.

[*Example:* Consider the following WordprocessingML paragraph:

```
<w:pPr>
  <w:spacing w:line="276" w:lineRule="auto" />
</w:pPr>
```

This paragraph specifies that the spacing in each line should be automatically calculated using 1.15 times (276 divided by 240) the normal single spacing calculation. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
atLeast (Minimum Line Height)	Specifies that the height of the line shall be at least the value specified, but might be expanded to fit its content as needed.
auto (Automatically Determined Line Height)	Specifies that the line spacing of the parent object shall be automatically determined by the size of its contents, with no predetermined minimum or maximum size.
exact (Exact Line Height)	Specifies that the height of the line shall be exactly the value specified, regardless of the size of the contents of the contents. If the contents are too large for the specified height, then they shall be clipped as necessary.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_LineSpacingRule](#)) is located in §A.1. *end note*]

17.18.49 ST_Lock (Locking Types)

This simple type specifies the possible set of locking behaviors that can be applied to the contents of the nearest ancestor structured document tag when the contents of this document are edited by an application (whether through a user interface or directly).

[*Example:* Consider the following plain text structured document tag:

```
<w:sdt>
  <w:sdtPr>
    <w:lock w:val="sdtLocked"/>
    ...
    <w:text/>
  </w:sdtPr>
  ...
</w:sdt>
```

This plain text structured document tag's properties contain a lock element, specifying locking behaviors for the structured document tag. Since the locking val attribute value is sdtLocked, this locking setting must specify that the contents of the structured document tag can be edited, but the structured document tag itself must not be deleted from the document. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
contentLocked (Contents Cannot Be Edited At Runtime)	Specifies that the editing restriction applied to the nearest ancestor structured document tag shall be as follows: <ul style="list-style-type: none"> This structured document tag's contents shall not be editable This structured document tag can be deleted in its entirety (but only entirely, no sub portion of it can be deleted)
sdtContentLocked (Contents Cannot Be Edited At Runtime And SDT Cannot Be Deleted)	Specifies that the editing restriction applied to the nearest ancestor structured document tag shall be as follows: <ul style="list-style-type: none"> This structured document tag's contents shall not be editable This structured document tag shall not be deleted in its entirety
sdtLocked (SDT Cannot Be Deleted)	Specifies that the editing restriction applied to the nearest ancestor structured document tag shall be as follows: <ul style="list-style-type: none"> This structured document tag's contents shall

Enumeration Value	Description
	be editable <ul style="list-style-type: none"> This structured document tag shall not be deleted in its entirety
unlocked (No Locking)	Specifies that no special locking behaviors shall be applied to the nearest ancestor structured document tag. The default behaviors as specified on the lock element (§17.5.2.23) shall be used.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Lock](#)) is located in §A.1. *end note*]

17.18.50 ST_LongHexNumber (Eight Digit Hexadecimal Value)

This simple type specifies a number value specified as a four octet (eight digit) hexadecimal number, whose contents are interpreted based on the context of the parent XML element.

[Example: Consider the following value for a node of simple type ST_LongHexNumber: 00BE2C6C.

This value is permitted, as it contains four hexadecimal octets, each an encoding of an octet of the actual decimal number value. *end example*]

This simple type's contents are a restriction of the W3C XML Schema hexBinary datatype.

This simple type also specifies the following restrictions:

- This simple type's contents have a length of exactly 8 hexadecimal digit(s).

[Note: The W3C XML Schema definition of this simple type's content model ([ST_LongHexNumber](#)) is located in §A.1. *end note*]

17.18.51 ST_MacroName (Script Subroutine Name Value)

This simple type specifies a subroutine in a scripting language which can be executed based on the context of the parent XML element. The language and location of this subroutine can be determined using any method desired by an application.

[Example: Consider the following WordprocessingML fragment for the properties of a form field:

```
<w:ffData>
  <w:exitMacro w:val="TestExitFunction" />
</w:ffData>
```

The `exitMacro` element specifies that any application which processes this file should attempt to locate and execute a scripting subroutine called `TestExitFunction` when the contents of the form field are exited. If this subroutine cannot be located or executed, then this setting is silently ignored. *end example*

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type also specifies the following restrictions:

- This simple type's contents have a maximum length of 33 Unicode scalar values.

[*Note*: The W3C XML Schema definition of this simple type's content model (`ST_MacroName`) is located in §A.1. *end note*]

17.18.52 `ST_MailMergeDataType` (Mail Merge Data Source Type Values)

This simple type specifies the data source access mechanism used to connect to the data source for a mail merge. This setting is purely a suggestion of the data source access mechanism which shall be used, and can be ignored in favor of an alternative mechanism if one is present.

Although this any access mechanism value can be specified, the following values are reserved:

Value	Description
native (Office Data Source Object Data Source)	Specifies that a given merged WordprocessingML document has been connected to an external data source via the data stored in the Office Data Source Object (ODSO) interface (§17.14.25).
odbc (Open Database Connectivity Data Source)	Specifies that a given merged WordprocessingML document has been connected to an external data source via the Open Database Connectivity interface.
query (Query Data Source)	Specifies that a given merged WordprocessingML document has been connected to an external data source using an external query file.
soap (SOAP Data Source)	Specifies that a given WordprocessingML document has been connected to a data source using SOAP.
spreadsheet (Spreadsheet Data Source)	Specifies that a given WordprocessingML document has been connected to a spreadsheet.
textFile (Text File Data Source)	Specifies that a given WordprocessingML document has been connected to a text file.
xQuery (Text File Data Source)	Specifies that a given WordprocessingML document has been connected to an external data source via XQuery.
xmlFile (XML File Data Source)	Specifies that a given WordprocessingML document has been connected to an XML file.

[*Example*: Consider the following WordprocessingML fragment for a mail merge source or merged document:

```
<w:dataType w:val="odbc" />
```

The dataType element's val attribute is equal to odbc, specifying that the given merged WordprocessingML document has been connected to an external data source via the Open Database Connectivity interface. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_MailMergeDataType](#)) is located in §A.1. *end note*]

17.18.53 ST_MailMergeDest (Merged Document Destination Types)

This simple type specifies the possible results which can be generated when a mail merge is carried out on a given WordprocessingML source document. In other words, this element is used to specify what is to be done with the merged documents that result from populating the fields within a given merged WordprocessingML document with data from the specified external data source.

[*Example*: Consider a WordprocessingML source document containing the following WordprocessingML:

```
<w:mailMerge>
  <w:destination w:val="newDocument" />
  ...
</w:mailMerge>
```

The destination element's val attribute is set to newDocument, specifying that when the mail merge is carried out, the source document must be used to generate a specified number of new documents, which can be handled as appropriate. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
email (Send Merged Documents as E-mail Messages)	Specifies that conforming hosting applications shall generate emails using the documents that result from populating the fields within a given merged WordprocessingML document with data from the specified external data source.
fax (Send Merged Documents as Faxes)	Specifies that conforming hosting applications shall generate faxes using the documents that result from populating the fields within a given merged WordprocessingML document with data from the specified external data source.
newDocument (Send Merged Documents to New)	Specifies that conforming hosting applications shall

Enumeration Value	Description
Documents)	generate new documents by populating the fields within a given merged WordprocessingML document with data from the specified external data source.
printer (Send Merged Documents to Printer)	Specifies that conforming hosting applications shall print the documents that result from populating the fields within a given merged WordprocessingML document with external data from the specified external data source.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_MailMergeDest](#)) is located in §A.1. *end note*]

17.18.54 ST_MailMergeDocType (Source Document Types)

This simple types specifies the possible types for a given WordprocessingML source document.

[Example: Consider the WordprocessingML below:

```
<w:mailMerge>
  <w:mainDocumentType w:val="formLetters" />
  ...
</w:mailMerge>
```

In this example, the source document is of the `formLetters` type, as specified by the `mainDocumentType` element's `val` attribute being equal to `formLetters`. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
catalog (Catalog Source Document)	Specifies that the mail merge source document is of the catalog type.
email (E-Mail Source Document)	Specifies that the mail merge source document is of the e-mail message type.
envelopes (Envelope Source Document)	Specifies that the mail merge source document is of the envelope type.
fax (Fax Source Document)	Specifies that the mail merge source document is of the fax type.
formLetters (Form Letter Source Document)	Specifies that the mail merge source document is of the form letter type.
mailingLabels (Mailing Label Source Document)	Specifies that the mail merge source document is of the mailing label type.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_MailMergeDocType](#)) is located in §A.1. *end note*]

17.18.55 ST_MailMergeOdsoFMDFieldType (Merge Field Mapping Types)

This simple types specifies the possible types used to indicate if a given mail merge field has been mapped to a column in the given external data source.

[*Example:* Consider the WordprocessingML below:

```
<w:odso>
...
<w:fieldMapData>
  <w:type w:val="dbColumn" />
  <w:name w:val="Country" />
  <w:mappedName w:val="Country or Region" />
  <w:column w:val="9" />
...
</w:fieldMapData>
</w:odso>
```

In this example, the country column within the given external data source must be mapped to the mail merge field Country or Region, as specified by the type element's val attribute being equal to dbColumn. *end example*

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
dbColumn (Field Mapping to Data Source Column)	Specifies that the mail merge field has been mapped to a column in the given external data source.
null (Field Not Mapped)	Specifies that the mail merge field has not been mapped to a column in the given external data source.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_MailMergeOdsoFMDFieldType](#)) is located in §A.1. *end note*]

17.18.56 ST_MailMergeSourceType (Mail Merge ODSO Data Source Types)

This simple type specifies the type of external data source to be connected to via as part of the ODSO connection information for this mail merge. This setting is purely a suggestion of the data source type which is being used for this mail merge, and can be ignored in favor of an alternative mechanism if one is present.

[*Example:* Consider the following WordprocessingML fragment for a mail merge source or merged document:

```
<w:type w:val="database" />
```

The type element's val attribute is equal to database, specifying that the given merged WordprocessingML document has been connected to an external data source via the ODSO settings, and that the resulting data source was a database. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
addressBook (Address Book Data Source)	Specifies that a given merged WordprocessingML document has been connected to an address book of contacts.
database (Database Data Source)	Specifies that a given merged WordprocessingML document has been connected to a database.
document1 (Alternate Document Format Data Source)	Specifies that a given merged WordprocessingML document has been connected to another document format supported by the producing application. The format of this document is application-defined and outside the scope of ECMA-376.
document2 (Alternate Document Format Data Source Two)	Specifies that a given merged WordprocessingML document has been connected to another document format supported by the producing application. The format of this document is application-defined and outside the scope of ECMA-376.
email (E-Mail Program Data Source)	Specifies that a given merged WordprocessingML document has been connected to an e-mail application.
legacy (Legacy Document Format Data Source)	Specifies that a given merged WordprocessingML document has been connected to a legacy document format supported by the producing application. The format of this legacy document is application-defined and outside the scope of ECMA-376.
master (Aggregate Data Source)	Specifies that a given merged WordprocessingML document has been connected to a data source which aggregates other data sources.
native (Native Data Source)	Specifies that a given merged WordprocessingML document has been connected to another document format native to the producing application. The format of this document is application-defined and outside the scope of ECMA-376.
text (Text File Data Source)	Specifies that a given merged WordprocessingML

Enumeration Value	Description
	document has been connected to a text file.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_MailMergeSourceType](#)) is located in §A.1. *end note*]

17.18.57 ST_Merge (Merged Cell Type)

This element specifies the way in which a cell shall be included in a merged group of cells (horizontally or vertically) within the parent table.

[*Example:* Consider a table with three rows and two columns with the last column completely vertically merged:

The second cell in the first row starts a vertical merge that is completed in the last cell, resulting in the following WordprocessingML:

```
<w:tbl>
...
<w:tr>
  <w:tc>
    ...
  </w:tc>
  <w:tc>
    ...
  </w:tc>
  <w:tc>
    <w:tcPr>
      <w:vMerge w:val="restart"/>
    </w:tcPr>
    ...
  </w:tc>
</w:tr>
```

```
<w:tr>
  <w:tc>
    ...
  </w:tc>
  <w:tc>
    ...
  </w:tc>
  <w:tc>
    <w:tcPr>
      <w:vMerge w:val="continue"/>
    </w:tcPr>
    ...
  </w:tc>
</w:tr>
<w:tr>
  <w:tc>
    ...
  </w:tc>
  <w:tc>
    ...
  </w:tc>
  <w:tc>
    <w:tcPr>
      <w:vMerge w:val="continue"/>
    </w:tcPr>
    ...
  </w:tc>
</w:tr>
</w:tbl>
```

The val attribute of type ST_Merge on the vMerge element defines the cells that are vertically merged, and how each cell is merged together. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
continue (Continue Merged Region)	<p>Specifies that the current cell continues a previously existing merged group of cells in the parent table.</p> <p>If the previous cell in the document (horizontally or vertically) does not either begin or continue a set of merged cells, then this value shall be ignored (i.e. a group of merged cells shall start with a merge whose</p>

Enumeration Value	Description
	ST_Merge value is restart).
restart (Start/Restart Merged Region)	<p>Specifies that the current cell starts (or restarts) a group of merged cells in the parent table.</p> <p>After this value, all following cells which have a value of continue shall be merged into this merged cell group.</p>

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Merge](#)) is located in §A.1. *end note*]

17.18.58 ST_MultiLevelType (Numbering Definition Type)

This simple type specifies the possible types of numbering which can be defined by a given abstract numbering type. This information shall only be used by a consumer to determine user interface behaviors for this numbering definition, and shall not be used to limit the behavior of the list (i.e. a list with multiple levels marked as `singleLevel` shall not be prevented from using levels 2 through 9).

[Example: Consider the WordprocessingML below:

```
<w:abstractNum w:abstractNumId="8">
...
  <w:multiLevelType w:val="singleLevel" />
...
</w:abstractNum>
```

This abstract numbering definition is specified to be of the `singleLevel` type by the `multiLevelType` element. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
hybridMultilevel (Hybrid Multilevel Numbering Definition)	Specifies that this numbering definition defines a numbering format consisting of a multiple levels, each of a potentially different kind (bullets vs. level text).
multilevel (Multilevel Numbering Definition)	Specifies that this numbering definition defines a numbering format consisting of a multiple levels, each of the same kind (bullets vs. level text).
singleLevel (Single Level Numbering Definition)	Specifies that this numbering definition defines a numbering format consisting of a single level only.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_MultiLevelType](#)) is located in §A.1. *end note*]

17.18.59 ST_NumberFormat (Numbering Format)

This simple type specifies the numbering format which shall be used for a group of automatically numbered objects,

[*Example:* A value of lowerLetter for page numbering indicates that a consumer must use lowercase letters for each page in this section: a,b,c... *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
aiueo (AIUEO Order Half-Width Katakana)	<p>Specifies that the sequence shall consist of one or more occurrences of a single half-width Katakana character from the set listed below, in the traditional a-i-u-e-o order.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–46 and then repeats those same characters using the logic defined below to construct all other values.</p> <p>The set of characters used by this numbering format for values 1–46 is U+FF71–U+FF9C, U+FF66, and U+FF9D, respectively.</p> <p>For values greater than 46, the sequence begins again, iterating through the same 46 values, repeating this pattern as necessary.</p> <p>[<i>Example:</i> The numbering for these items should be represented by the following pattern: ア, イ, ウ, ..., ヲ, ン, ア, イ, ウ, ... <i>end example</i>]</p>
aiueoFullWidth (AIUEO Order Full-Width Katakana)	<p>Specifies that the sequence shall consist of one or more occurrences of a single full-width katakana character from the set listed below, in the traditional a-i-u-e-o order.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–46 and then repeats those same characters using the logic defined below to construct all other values.</p>

Enumeration Value	Description
	<p>The set of characters used by this numbering format for values 1–46 is U+30A2, U+30A4, U+30A6, U+30A8, U+30AA, U+30AB, U+30AD, U+30AF, U+30B1, U+30B3, U+30B5, U+30B7, U+30B9, U+30BB, U+30BD, U+30BF, U+30C1, U+30C4, U+30C6, U+30C8, U+30CA, U+30CB, U+30CC, U+30CD, U+30CE, U+30CF, U+30D2, U+30D5, U+30D8, U+30DB, U+30DE, U+30DF, U+30E0, U+30E1, U+30E2, U+30E4, U+30E6, U+30E8, U+30E9, U+30EA, U+30EB, U+30EC, U+30ED, U+30EF, U+30F0, U+30F1, U+30F2, and U+30F3, respectively.</p> <p>For values greater than 46, the sequence begins again, iterating through the same 46 values, repeating this pattern as necessary.</p> <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: ア, イ, ウ, ..., ヲ, シ, アア, イイ, ウウ, ... <i>end example</i>]</p>
arabicAbjad (Arabic Abjad Numerals)	<p>Specifies that the sequence shall consist of one or more occurrences of a single ascending Abjad numeral from the set listed below.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–28 and then repeats those same characters using the logic defined below to construct all other values.</p> <p>The set of characters used by this numbering format for values 1–28 is U+0623, U+0628, U+062C, U+062F, U+0647, U+0648, U+0632, U+062D, U+0637, U+064A, U+0643, U+0644, U+0645, U+0646, U+0633, U+0639, U+0641, U+0635, U+0642, U+0631, U+0634, U+062A, U+062B, U+062E, U+0630, U+0636, U+063A, and U+0638, respectively.</p> <p>For values greater than 28, the text displayed shall be constructed as follows:</p> <ol style="list-style-type: none"> 1. Repeatedly subtract the size of the set (28) from the value until the result is equal to or less than the size of the set. 2. The remainder determines which character to use from the set above, and that character is written once and then written once and then

Enumeration Value	Description
	<p>written once and then repeated the number of times the size of the set was subtracted from the original value.</p> <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: أ, ب, ج, ..., ظ, غ, أأ, ب ب, ج ج, ..., ظ ظ, غ غ, أأ, ب ب, ج ج, ... <i>end example</i>]</p>
arabicAlpha (Arabic Alphabet)	<p>Specifies that the sequence shall consist of one or more occurrences of a single character in the Arabic alphabet from the set listed below.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–28 and then repeats those same characters using the logic defined below to construct all other values.</p> <p>The set of characters used by this numbering format for values 1–28 is U+0623, U+0628, U+062A, U+062B, U+062C, U+062D, U+062E, U+062F, U+0630, U+0631, U+0632, U+0633, U+0634, U+0635, U+0636, U+0637, U+0638, U+0639, U+063A, U+0641, U+0642, U+0643, U+0644, U+0645, U+0646, U+0647, U+0648, and U+064A, respectively.</p> <p>For values greater than 28, the text displayed shall be constructed as follows:</p> <ol style="list-style-type: none"> 1. Repeatedly subtract the size of the set (28) from the value until the result is equal to or less than the size of the set. 2. The remainder determines which character to use from the set above, and that character is written once and then written once and then written once and then repeated the number of times the size of the set was subtracted from the original value. <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: أ, ب, ت, ..., و, ي, أ, ب, ت, ..., و, ي, أأ, ب ب, ج ج, ..., ت ت, ت ت, ... <i>end example</i>]</p>
bahtText (Thai Baht Text)	<p>Specifies that the sequence shall consist of a numeric value from the Thai counting system, with บาทถ้วน</p>

Enumeration Value	Description
	<p>appended to the result.</p> <p>The portion of the sequence which is prepended to the static text shall be the equivalent value in the thaiCounting format, defined below.</p> <p>[<i>Example</i>: The values for the items should be represented by the following pattern: หนึ่งบาทถ้วน, สองบาทถ้วน, สามบาทถ้วน. <i>end example</i>]</p>
bullet (Bullet)	<p>Specifies that the sequence shall consist of the bullet character defined by the lvlText element (§17.9.11).</p> <p>[<i>Example</i>: • <i>end example</i>]</p>
cardinalText (Cardinal Text)	<p>Specifies that the sequence shall consist of cardinal text of the run language.</p> <p>This sequence is a set of strings each of which is the textual representation, in the language of the lang element (§17.3.2.20), of a different unique position in that sequence.</p> <p>[<i>Example</i>: The numbering for the items in Spanish should be represented by the following pattern: Uno, Dos, Tres, ..., Nueve, Diez, Once, ... Diecinueve, Veinte, Veintiuno, ... <i>end example</i>]</p>
chicago (Chicago Manual of Style)	<p>Specifies that the sequence shall consist of one or more occurrences of a single character from the set listed below.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–4 and then repeats those same characters using the logic defined below to construct all other values.</p> <p>The set of characters used by this numbering format for values 1–4 is U+002A, U+2020, U+2021, and U+00A7, respectively.</p> <p>For values greater than 4, the text displayed shall be constructed as follows:</p> <ol style="list-style-type: none"> 1. Repeatedly subtract the size of the set (4) from the value until the result is equal to or less than the size of the set. 2. The remainder determines which character to

Enumeration Value	Description
	<p>use from the set above, and that character is written once and then written once and then repeated the number of times the size of the set was subtracted from the original value.</p> <p><i>[Example: The first nine items in this format are: *, †, ‡, §, **, ††, ‡‡, §§, ***. end example]</i></p>
chineseCounting (Chinese Counting System)	<p>Specifies that the sequence shall consist of one or more occurrences of a single ascending number from the Chinese counting system, from the set listed below.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–10 and then repeats those same characters using the logic defined below to construct all other values. ○ represents the number zero.</p> <p>The set of characters used by this numbering format for values 0–10 is U+25CB, U+4E00, U+4E8C, U+4E09, U+56DB, U+4E94, U+516D, U+4E03, U+516B, U+4E5D, and U+5341, respectively.</p> <p>For values greater than 10, the text displayed shall be constructed as follows:</p> <ol style="list-style-type: none"> 1. Divide the value by 10 and write the symbol that represents the remainder. If the quotient is less than 10, then write 十 to the left of the symbol, which represents the remainder. 2. Divide the quotient of the previous division by 10, and write the symbol, which represents the remainder, to the left of the existing characters. 3. Repeat step 2 until the remaining value is equal to zero. <p><i>[Example: The numbering for the items should be represented by the following pattern: 一, 二, 三, ..., 九, 十, 十一, 十二, ..., 十九, 二十, 二十一, ..., 九十九, 一〇〇, 一〇一, ... end example]</i></p>
chineseCountingThousand (Chinese Counting Thousand System)	<p>Specifies that the sequence shall consist of one or more occurrences of a single sequential number from the Chinese counting thousand system, from the set listed below.</p>

Enumeration Value	Description																				
	<p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–10, 100, 1,000, and 10,000, and then repeats those same characters using the logic defined below to construct all other values.</p> <p>The set of characters used by this numbering format is U+96F6, U+4E00, U+4E8C, U+4E09, U+56DB, U+4E94, U+516D, U+4E03, U+516B, U+4E5D, U+5341, U+767E, U+5343, and U+4E07.</p> <p>To construct a value that is beyond the set, but less than one hundred thousand, work from largest groups to smallest following these steps:</p> <ol style="list-style-type: none"> 1. Create as many groups as possible that contain ten thousand in each group. <ul style="list-style-type: none"> • Write down the symbol representing that value (1–9): <table border="1" data-bbox="964 957 1312 1461"> <thead> <tr> <th>Digit</th><th>Character</th></tr> </thead> <tbody> <tr><td>1</td><td>一 (U+4E00)</td></tr> <tr><td>2</td><td>二 (U+4E8C)</td></tr> <tr><td>3</td><td>三 (U+4E09)</td></tr> <tr><td>4</td><td>四 (U+56DB)</td></tr> <tr><td>5</td><td>五 (U+4E94)</td></tr> <tr><td>6</td><td>六 (U+516D)</td></tr> <tr><td>7</td><td>七 (U+4E03)</td></tr> <tr><td>8</td><td>八 (U+516B)</td></tr> <tr><td>9</td><td>九 (U+4E5D)</td></tr> </tbody> </table> • If no groups are formed, do not write any characters. • If groups were formed, write down the symbol representing ten thousand: 万 2. Repeat step 1 for groups of one thousand (千) using the corresponding symbol to indicate the groups (so five thousand would be 五千). <ul style="list-style-type: none"> • If the original value was between 10,000 and 100,000 and if no groups are formed (and the number is not a multiple of 	Digit	Character	1	一 (U+4E00)	2	二 (U+4E8C)	3	三 (U+4E09)	4	四 (U+56DB)	5	五 (U+4E94)	6	六 (U+516D)	7	七 (U+4E03)	8	八 (U+516B)	9	九 (U+4E5D)
Digit	Character																				
1	一 (U+4E00)																				
2	二 (U+4E8C)																				
3	三 (U+4E09)																				
4	四 (U+56DB)																				
5	五 (U+4E94)																				
6	六 (U+516D)																				
7	七 (U+4E03)																				
8	八 (U+516B)																				
9	九 (U+4E5D)																				

Enumeration Value	Description
	<p>thousand) write the symbol 零 instead (so ten thousand and five would be 一万零五)</p> <ol style="list-style-type: none"> 3. Repeat step 1 for groups of one hundred (百) using the corresponding symbol to indicate the groups (so five hundred would be 五百). <ul style="list-style-type: none"> • If the original value was between 1,000 and 10,000 and if no groups are formed (and the number is not a multiple of hundred) write the symbol 零 instead (so one thousand and five would be 一千零五) 4. Repeat step 1 for groups of ten (十) using the corresponding symbol to indicate the groups (so fifty would be 五十). <ul style="list-style-type: none"> • If the original value was between 100 and 1000 and if no groups are formed (and the number is not a multiple of ten) write the symbol 零 instead (so one hundred and five would be 一百零五) 5. Write down the symbol for the remaining number. <p>If the number is larger than one hundred thousand but less than one hundred million, perform the cycle for the numbers above one thousand, but use two characters to represent each group. So, for example, groups of one hundred thousand are represented as ten ten thousands (一十万). An additional symbol for counting groups is introduced at one hundred million (because 10 million is one thousand ten thousands).</p> <p>[Example: The numbering for the items should be represented by the following pattern: 一, 二, 三, ..., 八, 九, 一十, 一十一, 一十二, ..., 一十九, 二十, 二十一, ..., 九九, 一百, 一百一, ... end example]</p>
chineseLegalSimplified (Chinese Legal Simplified Format)	<p>Specifies that the sequence shall consist of one or more occurrences of a single sequential number from the Chinese simplified legal format, from the set listed below.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–9 and then those are combined with additional characters to represent the corresponding power of ten.</p>

Enumeration Value	Description																				
	<p>The set of characters used by this numbering format for values 1–10 is U+96F6, U+58F9, U+8D30, U+53C1, U+8086, U+4F0D, U+9646, U+67D2, U+634C, and U+7396, respectively.</p> <p>To construct a number that is less than one hundred thousand, work from largest groups to smallest following these steps:</p> <ol style="list-style-type: none"> Create as many groups as possible that contain ten thousand in each group. <ul style="list-style-type: none"> Write down the symbol representing that value (1–9): <table data-bbox="964 743 1256 1247"> <tr> <th>Digit</th><th>Character</th></tr> <tr> <td>1</td><td>壹(U+58F9)</td></tr> <tr> <td>2</td><td>貳 (U+8D30)</td></tr> <tr> <td>3</td><td>叁 (U+53C1)</td></tr> <tr> <td>4</td><td>肆(U+8086)</td></tr> <tr> <td>5</td><td>伍 (U+4F0D)</td></tr> <tr> <td>6</td><td>陆 (U+9646)</td></tr> <tr> <td>7</td><td>柒 (U+67D2)</td></tr> <tr> <td>8</td><td>捌 (U+634C)</td></tr> <tr> <td>9</td><td>玖 (U+7396)</td></tr> </table> If no groups are formed, do not write any characters. If groups were formed, write down the symbol representing ten thousand: 万 Repeat step 1 for groups of one thousand (仟) using the corresponding symbol to indicate the groups (so five thousand would be 伍仟). <ul style="list-style-type: none"> If the original value was between 10,000 and 100,000 and If no groups are formed (and the number is not a multiple of thousand) write the symbol 零 instead (so ten thousand and five would be 壹万零伍) Repeat step 1 for groups of one hundred (佰) using the corresponding symbol to indicate the groups (so five hundred would be 伍佰). <ul style="list-style-type: none"> If the original value was between 1,000 and 10,000 and if no groups are formed 	Digit	Character	1	壹(U+58F9)	2	貳 (U+8D30)	3	叁 (U+53C1)	4	肆(U+8086)	5	伍 (U+4F0D)	6	陆 (U+9646)	7	柒 (U+67D2)	8	捌 (U+634C)	9	玖 (U+7396)
Digit	Character																				
1	壹(U+58F9)																				
2	貳 (U+8D30)																				
3	叁 (U+53C1)																				
4	肆(U+8086)																				
5	伍 (U+4F0D)																				
6	陆 (U+9646)																				
7	柒 (U+67D2)																				
8	捌 (U+634C)																				
9	玖 (U+7396)																				

Enumeration Value	Description
	<p>(and the number is not a multiple of hundred) write the symbol 零 instead (so one thousand and five would be 壹仟零伍)</p> <ol style="list-style-type: none"> 4. Repeat step 1 for groups of ten (拾) using the corresponding symbol to indicate the groups (so fifty would be 伍拾). <ul style="list-style-type: none"> • If the original value was between 100 and 1000 and If no groups are formed (and the number is not a multiple of ten) write the symbol 零 instead (so one hundred and five would be 壹佰零伍) 5. Write down the symbol for the remaining number. <p>If the number is larger than one hundred thousand but less than one hundred million, perform the cycle for the numbers above one thousand but use two characters to represent each group. So, for example, groups of one million are represented as one hundred ten thousands (佰万). An additional symbol for counting groups is introduced at one hundred million (because 10 million is one thousand ten thousands).</p> <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: 壹, 貳叁, ..., 捌, 玖, 壹拾, 壹拾壹, 壹拾貳, ..., 壹拾玖, 貳拾, 貳拾壹, ..., 玖玖, 壹佰, 壹佰零壹, ... <i>end example</i>]</p>
chosung (Korean Chosung Numbering)	<p>Specifies that the sequence shall consist of one or more occurrences of a single sequential number from the Korean Chosung format, from the set listed below.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–14 and then repeats those same characters using the logic defined below to construct all other values.</p> <p>The set of characters used by this numbering format for values 1–14 is U+3131, U+3134, U+3137, U+3139, U+3141, U+3142, U+3145, U+3147, U+3148, U+314A, U+314B, U+314C, U+314D, and U+314E, respectively.</p> <p>For values greater than 14, the text displayed shall be constructed as follows:</p>

Enumeration Value	Description
	<ol style="list-style-type: none"> 1. Repeatedly subtract the size of the set (14) from the value until the result is equal to or less than the size of the set. 2. The remainder determines which character to use from the set above, and that character is written once and then repeated the number of times the size of the set was subtracted from the original value. <p>[<i>Example: The numbering for the items should be represented by the following pattern: ㄱ, ㄴ, ㄷ, ..., ㅈ, ㅊ, ㅋ, ㄴ, ㄷ, ㄷ, ... end example</i>]</p>
custom (Custom Defined Number Format)	Specifies a custom number format using the parent element's attribute to specify a number format using the mechanism defined by the XSLT format attribute.
decimal (Decimal Numbers)	<p>Specifies that the sequence shall consist of decimal numbering.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–9 and then those same characters are combined with each other and 0 (represents the number zero) to construct the remaining values.</p> <p>The set of characters used by this numbering format for values 0–9 is U+0030–U+0039, respectively.</p> <p>Continue the sequence by using the following steps:</p> <ol style="list-style-type: none"> 1. Increment the rightmost position. 2. Every time the end of the set is reached, for a given position, increment the position to the immediate left (if there is no position to the immediate left, create a new position and start the sequence of the new position at 1) and reset the current position to 0. <p>[<i>Example: The numbering for the items should be represented by the following pattern: 1, 2, 3, ..., 8, 9, 10, 11, 12, ..., 18, 19, 20, 21, ... end example</i>]</p>
decimalEnclosedCircle (Decimal Numbers Enclosed in a Circle)	Specifies that the sequence shall consist of decimal numbering enclosed in a circle, using the enclosed character.

Enumeration Value	Description
	<p>This system uses a set of characters to represent the numbers 1–20.</p> <p>The set of characters used by this numbering format for values 1–20 is U+2460–U+2473, respectively.</p> <p>For values greater than the size of the set, the items fall back to the decimal format.</p> <p><i>[Example: The numbering for the items should be represented by the following pattern: ①, ②, ③, ..., ⑱, ⑳, 21, ... end example]</i></p>
decimalEnclosedCircleChinese (Decimal Numbers Enclosed in a Circle)	Identical to decimalEnclosedCircle.
decimalEnclosedFullstop (Decimal Numbers Followed by a Period)	<p>Specifies that the sequence shall consist of decimal numbering followed by a period, using the appropriate character, as described below.</p> <p>This system uses a set of characters to represent the numbers 1–20.</p> <p>The set of characters used by this numbering format for values 1–20 is U+2488–U+249B, respectively.</p> <p>For values greater than the size of the set, the items fall back to the decimal format.</p> <p><i>[Example: The numbering for the items should be represented by the following pattern: 1., 2., 3., ..., 19., 20., 21, ... end example]</i></p>
decimalEnclosedParen (Decimal Numbers Enclosed in Parenthesis)	<p>Specifies that the sequence shall consist of decimal numbering enclosed in parentheses, using the appropriate character, as described below.</p> <p>This system uses a set of characters to represent the numbers 1–20.</p> <p>The set of characters used by this numbering format for values 1–20 is U+2474–U+2487, respectively.</p> <p>For values greater than the size of the set, the items fall back to the decimal format.</p> <p><i>[Example: The numbering for the items should be represented by the following pattern: (1), (2), (3), ..., (19), (20), 21, 22, ... end example]</i></p>

Enumeration Value	Description
decimalFullWidth (Full Width Arabic Numerals)	<p>Specifies that the sequence shall consist of full-width Arabic numbering.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–9 and then those same characters are combined with each other and 0 (represents the number zero) to construct the remaining values.</p> <p>The set of characters used by this numbering format for values 0–9 is U+FF10–U+FF19, respectively.</p> <p>For values greater than the size of the set, the number is constructed by following these steps:</p> <ol style="list-style-type: none"> 1. Divide the value by 10 and write the symbol which represents the remainder. 2. Divide the quotient of the previous division by 10 and write the symbol, which represents the remainder, to the left of the existing position. 3. Repeat step 2 until the remaining value is equal to zero. <p><i>[Example: The numbering for the items should be represented by the following pattern: 1 , 2 , 3 , ..., 8 , 9 , 1 0 , 1 1 , 1 2 , ..., 1 8 , 1 9 , 2 0 , 2 1 , ... end example]</i></p>
decimalHalfWidth (Half Width Arabic Numerals)	<p>Specifies that the sequence shall consist of half-width Arabic numbering.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–9 and then those same characters are combined with each other and 0 (represents the number zero) to construct the remaining values.</p> <p>The set of characters used by this numbering format for values 0–9 is U+0030–U+0039, respectively.</p> <p>For values greater than the size of the set, the number is constructed by following these steps:</p>

Enumeration Value	Description
	<ol style="list-style-type: none"> 1. Divide the value by 10 and write the symbol which represents the remainder. 2. Divide the quotient of the previous division by 10 and write the symbol, which represents the remainder, to the left of the existing position. 3. Repeat step 2 until the remaining value is equal to zero. <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: 1, 2, 3, ..., 8, 9, 10, 11, 12, ..., 18, 19, 20, 21, ... <i>end example</i>]</p>
decimalZero (Initial Zero Arabic Numerals)	<p>Specifies that the sequence shall consist of Arabic numbering with a zero added to numbers one through nine.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of paired characters (zero followed by an additional symbol) that represent positions 1–9 and then those same characters are combined with each other to construct the remaining values.</p> <p>The set of characters used by this numbering format for values 0–9 is U+0030–U+0039.</p> <p>For values greater than the size of the set, the number is constructed by following these steps:</p> <ol style="list-style-type: none"> 1. Divide the value by 10 and write the symbol which represents the remainder. 2. Divide the quotient of the previous division by 10 and write the symbol, which represents the remainder, to the left of the existing position. 3. Repeat step 2 until the remaining value is equal to zero. <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: 01, 02, 03, ..., 08, 09, 10, 11, 12, ..., 18, 19, 20, 21, 22, ..., 98, 99, 100, 101, ... <i>end example</i>]</p>
dollarText (Dollar Text)	<p>Specifies that the sequence shall consist of a cardinal text value of the run language, with "and 00/100" (also in the run language) appended to the result.</p>

Enumeration Value	Description
	<p>[<i>Note</i>: The latter text is fixed because values in numbering sequences are integer-based. <i>end note</i>]</p> <p>The cardinal text value which is prepended to the static text shall be the equivalent value in the cardinalText format, defined below.</p> <p>[<i>Example</i>: one and 00/100, two and 00/100, three and 00/100. <i>end example</i>]</p>
ganada (Korean Ganada Numbering)	<p>Specifies that the sequence shall consist of one or more occurrences of a single sequential number from the Korean Ganada format, from the set listed below.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–14 and then repeats those same characters using the logic defined below to construct all other values.</p> <p>The set of characters used by this numbering format for values 1–14 is U+AC00, U+B098, U+B2E4, U+B77C, U+B9C8, U+BC14, U+C0AC, U+C544, U+C790, U+CC28, U+CE74, U+D0C0, U+D30C, and U+D558, respectively.</p> <p>For values greater than 14, the text displayed shall be constructed as follows:</p> <ol style="list-style-type: none"> 1. Repeatedly subtract the size of the set (14) from the value until the result is equal to or less than the size of the set. 2. The remainder determines which character to use from the set above, and that sequence of character is repeated the number of times the size of the set was subtracted from the original value. <p>[<i>Example</i>: The numbering for the items should be represented by the following pattern: 가, 나, 다, ..., 파, 하, 가가, 나나, 다다, ... <i>end example</i>]</p>
hebrew1 (Hebrew Letters)	<p>Specifies that the sequence shall consist of Hebrew letters from the set listed below.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–9, each multiple of ten (less than</p>

Enumeration Value	Description																																						
	<p>100), each multiple of 100 (less than 1000), etc. which are then combined with each other to construct the remaining values.</p> <p>The set of characters used by this numbering format is U+05D0–U+05D9, U+05DB, U+05DC, U+05DE, U+05E0–U+05E2, U+05E4, U+05E6–U+05EA, U+05E7–U+05E9, U+05EA, U+05DA, U+05DD, U+05DF, U+05E3, and U+05E5, respectively.</p> <p>To construct the text for any value, convert it from its decimal equivalent following these steps (writing right to left):</p> <ol style="list-style-type: none"> 1. Replace the thousands digit with the appropriate symbol: <table data-bbox="922 814 1224 1327"> <tr> <th>Digit</th><th>Symbol</th></tr> <tr> <td>1</td><td>𐤀 (U+05D0)</td></tr> <tr> <td>2</td><td>𐤁 (U+05D1)</td></tr> <tr> <td>3</td><td>𐤂 (U+05D2)</td></tr> <tr> <td>4</td><td>𐤃 (U+05D3)</td></tr> <tr> <td>5</td><td>𐤄 (U+05D4)</td></tr> <tr> <td>6</td><td>𐤅 (U+05D5)</td></tr> <tr> <td>7</td><td>𐤆 (U+05D6)</td></tr> <tr> <td>8</td><td>𐤇 (U+05D7)</td></tr> <tr> <td>9</td><td>𐤈 (U+05D8)</td></tr> </table> 2. Replace the hundreds digit with the appropriate symbol: <table data-bbox="922 1434 1224 1890"> <tr> <th>Digit</th><th>Symbol</th></tr> <tr> <td>1</td><td>𐤉 (U+05E7)</td></tr> <tr> <td>2</td><td>𐤊 (U+05E8)</td></tr> <tr> <td>3</td><td>𐤋 (U+05E9)</td></tr> <tr> <td>4</td><td>𐤌 (U+05EA)</td></tr> <tr> <td>5</td><td>𐤍 (U+05DA)</td></tr> <tr> <td>6</td><td>𐤎 (U+05DD)</td></tr> <tr> <td>7</td><td>𐤏 (U+05DF)</td></tr> <tr> <td>8</td><td>𐤐 (U+05E3)</td></tr> </table> 	Digit	Symbol	1	𐤀 (U+05D0)	2	𐤁 (U+05D1)	3	𐤂 (U+05D2)	4	𐤃 (U+05D3)	5	𐤄 (U+05D4)	6	𐤅 (U+05D5)	7	𐤆 (U+05D6)	8	𐤇 (U+05D7)	9	𐤈 (U+05D8)	Digit	Symbol	1	𐤉 (U+05E7)	2	𐤊 (U+05E8)	3	𐤋 (U+05E9)	4	𐤌 (U+05EA)	5	𐤍 (U+05DA)	6	𐤎 (U+05DD)	7	𐤏 (U+05DF)	8	𐤐 (U+05E3)
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	<table border="1" data-bbox="922 247 1224 304"> <tr> <td>9</td><td>ץ (U+05E5)</td></tr> </table> <p data-bbox="873 344 1448 409">3. If the remainder is 15 or 16, replace them as follows and stop:</p> <table border="1" data-bbox="922 413 1323 562"> <tr> <th>Value</th><th>Symbols</th></tr> <tr> <td>15</td><td>טו (U+05D8, U+05D5)</td></tr> <tr> <td>16</td><td>טז (U+05D8, U+05D6)</td></tr> </table> <p data-bbox="873 602 1414 667">4. Otherwise, replace the tens digit with the appropriate symbol:</p> <table border="1" data-bbox="922 672 1224 1182"> <tr> <th>Digit</th><th>Symbol</th></tr> <tr><td>1</td><td>י (U+05d9)</td></tr> <tr><td>2</td><td>כ (U+05DB)</td></tr> <tr><td>3</td><td>ל (U+ 05DC)</td></tr> <tr><td>4</td><td>מ (U+05DE)</td></tr> <tr><td>5</td><td>נ (U+05E0)</td></tr> <tr><td>6</td><td>ס (U+05E1)</td></tr> <tr><td>7</td><td>ע (U+05E2)</td></tr> <tr><td>8</td><td>פ (U+05E4)</td></tr> <tr><td>9</td><td>צ (U+05E6)</td></tr> </table> <p data-bbox="873 1222 1437 1287">5. Replace the ones digit with the appropriate symbol:</p> <table border="1" data-bbox="922 1291 1224 1801"> <tr> <th>Digit</th><th>Symbol</th></tr> <tr><td>1</td><td>א (U+05d0)</td></tr> <tr><td>2</td><td>ב (U+05d1)</td></tr> <tr><td>3</td><td>ג (U+ 05d2)</td></tr> <tr><td>4</td><td>ד (U+05d3)</td></tr> <tr><td>5</td><td>ה (U+05d4)</td></tr> <tr><td>6</td><td>ו (U+05D5)</td></tr> <tr><td>7</td><td>ז (U+05D6)</td></tr> <tr><td>8</td><td>ח (U+05d7)</td></tr> <tr><td>9</td><td>ט (U+05D8)</td></tr> </table> <p data-bbox="873 1841 1474 1873">6. Reordering a number group will not change its</p>	9	ץ (U+05E5)	Value	Symbols	15	טו (U+05D8, U+05D5)	16	טז (U+05D8, U+05D6)	Digit	Symbol	1	י (U+05d9)	2	כ (U+05DB)	3	ל (U+ 05DC)	4	מ (U+05DE)	5	נ (U+05E0)	6	ס (U+05E1)	7	ע (U+05E2)	8	פ (U+05E4)	9	צ (U+05E6)	Digit	Symbol	1	א (U+05d0)	2	ב (U+05d1)	3	ג (U+ 05d2)	4	ד (U+05d3)	5	ה (U+05d4)	6	ו (U+05D5)	7	ז (U+05D6)	8	ח (U+05d7)	9	ט (U+05D8)
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Enumeration Value	Description
	<p>value. If a number spells out a Hebrew word with a negative or positive connotation, the number group can be rearranged.</p> <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: א, ב, ג, ... זטז, זי, חי, טי, כ, אכ, ... <i>end example</i>]</p>
hebrew2 (Hebrew Alphabet)	<p>Specifies that the sequence shall consist of the Hebrew alphabet.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–22 and then repeats those same characters using the logic defined below to construct all other values.</p> <p>The set of characters used by this numbering format for values 1–22 is U+05D0–U+05D9, U+05DB, U+05DC, U+05DE, U+05E0–U+05E2, U+05E4, and U+05E6–U+05EA, respectively.</p> <p>For values greater than the size of the set, the number is constructed by following these steps:</p> <ol style="list-style-type: none"> 1. Repeatedly subtract the size of the set (22) from the value until the result is equal to or less than the size of the set. 2. Write the symbol represented by the result value. 3. Then the ן symbol is repeated (to the right of the first symbol) for each time the size of the set was subtracted from the original value. 4. Reordering a number group does not change its value. If a number spells out a Hebrew word with a negative or positive connotation, the number group can be rearranged. <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: א, ב, ג, ..., את, בת, ... <i>end example</i>]</p>
hex (Hexadecimal Numbering)	<p>Specifies that the sequence shall consist of hexadecimal numbering.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that</p>

Enumeration Value	Description
	<p>represent positions 1–15 and then those same characters are combined with each other and 0 (represents the number zero) to construct the remaining values.</p> <p>The set of characters used by this numbering format for values 0–15 is U+0030–U+0039, and U+0041–U+0046, respectively.</p> <p>For values greater than the size of the set, the number is constructed by following these steps:</p> <ol style="list-style-type: none"> 1. Divide the value by 16 and write the symbol which represents the remainder. 2. Divide the quotient of the previous division by 16 and write the symbol, which represents the remainder, to the left of the existing position. 3. Repeat step 2 until the remaining value is equal to zero. <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: 1, 2, 3, ..., E, F, 10, 11, 12, ..., 1E, 1F, 20, 21, ... <i>end example</i>]</p>
hindiConsonants (Hindi Consonants)	<p>Specifies that the sequence shall consist of one or more occurrences of a single Hindi consonant from the set listed below.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–18 and then repeats those same characters using the logic defined below to construct all other values.</p> <p>The set of characters used by this numbering format for values 1–18 is U+0905–U+0914, U+0905 combined with U+0902, and U+0905 combined with U+0903, respectively.</p> <p>For values greater than the size of the set, the number is constructed by following these steps:</p> <ol style="list-style-type: none"> 1. Repeatedly subtract the size of the set (18) from the value until the result is equal to or less than the size of the set. 2. The result value determines which character to use, and the same character is written once

Enumeration Value	Description
	<p>and then repeated for each time the size of the set was subtracted from the original value.</p> <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: अ, आ, इ, ..., अं,अः, अअ, आआ, इइ, ..., अंअं, अःअः, अअअ, आआआ, इइइ, ... <i>end example</i>]</p>
hindiCounting (Hindi Counting System)	<p>Specifies that the sequence shall consist of sequential numbers from the Hindi counting system.</p> <p>This sequence is a set of strings each of which is the full name, in Hindi, of the next value in that sequence.</p> <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: एक, दो, तीन, चार, पाँच, छः, सात, आठ, नौ, दस, ... <i>end example</i>]</p>
hindiNumbers (Hindi Numbers)	<p>Specifies that the sequence shall consist of one or more occurrences of a single Hindi number from the set listed below.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–9 and then those same characters are combined with each other and ० (U+0966, which represents the number zero) to construct the remaining values.</p> <p>The set of characters used by this numbering format for values 1–9 is U+0967, U+0968, U+0969, U+096A, U+096B, U+096C, U+096D, U+096E, and U+096F, respectively.</p> <p>For values greater than the size of the set, the number is constructed by following these steps:</p> <ol style="list-style-type: none"> 1. Divide the value by 10 and write the symbol which represents the remainder. 2. Divide the quotient of the previous division by 10 and write the symbol, which represents the remainder, to the left of the existing position. 3. Repeat step 2 until the remaining value is equal to zero.

Enumeration Value	Description
	<p>[<i>Example</i>: The numbering for the items should be represented by the following pattern: १, २, ३, ..., ८, ९, १०, ११, १२, ..., १८, १९, २०, २१, ... <i>end example</i>]</p>
hindiVowels (Hindi Vowels)	<p>Specifies that the sequence shall consist of one or more occurrences of a single Hindi vowel from the set listed below.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–37 and then repeats those same characters using the logic defined below to construct all other values.</p> <p>The set of characters used by this numbering format for values 1–37 is U+0915–U+0939, respectively.</p> <p>For values greater than the size of the set, the number is constructed by following these steps:</p> <ol style="list-style-type: none"> 1. Repeatedly subtract the size of the set (37) from the value until the result is equal to or less than the size of the set. 2. The result value determines which character to use, and the same character is written once and then repeated for each time the size of the set was subtracted from the original value. <p>[<i>Example</i>: The numbering for the items should be represented by the following pattern: क, ख, ग, ..., स, ह, कक, खख, गग, ..., सस, हह, ककक, खखख, गगग, ... <i>end example</i>]</p>
ideographDigital (Ideographs)	<p>Specifies that the sequence shall consist of sequential numerical ideographs, using the appropriate character, as described below.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–9 and then those same characters are combined with each other and 〇 (represents the number zero) to construct the remaining values.</p> <p>The set of characters used by this numbering format</p>

Enumeration Value	Description
	<p>for values 0–9 is U+3007, U+4E00, U+4E8C, U+4E09, U+56DB, U+4E94, U+516D, U+4E03, U+516B, and U+4E5D, respectively.</p> <p>For values greater than the size of the set, the number is constructed by following these steps:</p> <ol style="list-style-type: none"> 1. Divide the value by 10 and write the symbol which represents the remainder. 2. Divide the quotient of the previous division by 10 and write the symbol, which represents the remainder, to the left of the existing position. 3. Repeat step 2 until the remaining value is equal to zero. <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: 一, 二, 三, ..., 八, 九, 一〇, 一一, 一二, ..., 一八, 一九, 二〇, 二一, ... <i>end example</i>]</p>
ideographEnclosedCircle (Ideographs Enclosed in a Circle)	<p>Specifies that the sequence shall consist of sequential numerical ideographs, using the appropriate character, as described below.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–10.</p> <p>The set of characters used by this numbering format for values 1–10 is U+3220–U+3229, respectively.</p> <p>For values greater than the size of the set, the items fall back to the decimal format.</p> <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: (一), (二), (三), ..., (九), (十), 11,12, ... <i>end example</i>]</p>
ideographLegalTraditional (Traditional Legal Ideograph Format)	<p>Specifies that the sequence shall consist of sequential numerical traditional legal ideographs.</p> <p>This system uses a set of characters to represent the numbers 1–9 and then those are combined with additional characters to represent the corresponding power of ten.</p>

Enumeration Value	Description																				
	<p>The set of characters used by this numbering format is U+58F9, U+8CB3, U+53C3, U+8086, U+4F0D, U+9678, U+67D2, U+634C, U+7396, U+62FE, U+4F70, U+4EDF, and U+842C, respectively.</p> <p>To construct a number that is less than hundred thousand, you work from largest groups to smallest following these steps:</p> <ol style="list-style-type: none"> 1. Create as many groups as possible that contain ten thousand in each group. <ul style="list-style-type: none"> • Write down the symbol representing that value (1–9): <table border="1" data-bbox="976 709 1274 1213"> <thead> <tr> <th>Digit</th><th>Character</th></tr> </thead> <tbody> <tr><td>1</td><td>壹 (U+58F9)</td></tr> <tr><td>2</td><td>貳 (U+8CB3)</td></tr> <tr><td>3</td><td>參 (U+53C3)</td></tr> <tr><td>4</td><td>肆 (U+8086)</td></tr> <tr><td>5</td><td>伍 (U+4F0D)</td></tr> <tr><td>6</td><td>陸 (U+9678)</td></tr> <tr><td>7</td><td>柒 (U+67D2)</td></tr> <tr><td>8</td><td>捌 (U+634C)</td></tr> <tr><td>9</td><td>玖 (U+7396)</td></tr> </tbody> </table> <ul style="list-style-type: none"> • If no groups are formed, do not write any characters. • If groups were formed, write down the symbol representing ten thousand (the power of ten represented by that position): 萬 2. Repeat this for groups of one thousand (仟), one hundred (佰) and ten (拾) using the corresponding symbol to indicate the groups (so five hundred would be 伍佰 and fifty would be 伍拾). 3. Write down the symbol for the remaining number. <p>If the number is larger than hundred thousand but less than one hundred million, you perform the cycle for the numbers above one thousand but use two characters to represent each group. So, for example,</p>	Digit	Character	1	壹 (U+58F9)	2	貳 (U+8CB3)	3	參 (U+53C3)	4	肆 (U+8086)	5	伍 (U+4F0D)	6	陸 (U+9678)	7	柒 (U+67D2)	8	捌 (U+634C)	9	玖 (U+7396)
Digit	Character																				
1	壹 (U+58F9)																				
2	貳 (U+8CB3)																				
3	參 (U+53C3)																				
4	肆 (U+8086)																				
5	伍 (U+4F0D)																				
6	陸 (U+9678)																				
7	柒 (U+67D2)																				
8	捌 (U+634C)																				
9	玖 (U+7396)																				

Enumeration Value	Description
	<p>groups of one million are represented as one hundred ten thousands (拾萬). An additional symbol for counting groups is introduced at one hundred million (because 10 million is one thousand ten thousands).</p> <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: 壹, 貳, 參, ..., 捌, 玖, 壹拾, 壹拾壹, 壹拾貳, ..., 壹拾玖, 貳拾, 貳拾壹, ... <i>end example</i>]</p>
ideographTraditional (Traditional Ideograph Format)	<p>Specifies that the sequence shall consist of sequential numerical traditional ideographs.</p> <p>This system uses a set of characters (elements in the Chinese Sexagenary cycle) to represent the numbers 1–10. For values greater than the size of the set, the items fall back to the decimal format.</p> <p>The set of characters used by this numbering format for values 1–10 is U+7532, U+4E59, U+4E19, U+4E01, U+620A, U+5DF1, U+5E9A, U+8F9B, U+58EC, and U+7678, respectively.</p> <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: 甲, 乙, 丙, 丁, ..., 壬, 癸, 11, 12, ... <i>end example</i>]</p>
ideographZodiac (Zodiac Ideograph Format)	<p>Specifies that the sequence shall consist of sequential zodiac ideographs.</p> <p>This system uses a set of characters (animals in the Chinese Sexagenary cycle) to represent the numbers 1–12. For values greater than the size of the set, the items fall back to the decimal format.</p> <p>The set of characters used by this numbering format for values 1–12 is U+5B50, U+4E11, U+5BC5, U+536F, U+8FB0, U+5DF3, U+5348, U+672A, U+7533, U+9149, U+620C, and U+4EA5, respectively.</p> <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: 子, 丑, 寅, ..., 戌, 亥, 13, 14, ... <i>end example</i>]</p>
ideographZodiacTraditional (Traditional Zodiac Ideograph Format)	<p>Specifies that the sequence shall consist of sequential traditional zodiac ideographs.</p>

Enumeration Value	Description
	<p>This system uses a set of character pairs (all of the element-animal combinations of the Chinese sexagenary cycle) to represent the numbers 1–60 and then those same character pairs are repeated to construct the remaining values.</p> <p>The set of character pairs used by this numbering format for values 1–60 is U+7532, U+5B50; U+4E59, U+4E11; U+4E19, U+5BC5; U+4E01, U+536F; U+620A, U+8FB0; U+5DF1, U+5DF3; U+5E9A, U+5348; U+8F9B, U+672A; U+58EC, U+7533; U+7678, U+9149; U+7532, U+620D; U+4E59, U+4EA5; U+4E19, U+5B50; U+4E01, U+4E11; U+620A, U+5BC5; U+5DF1, U+536F; U+5E9A, U+8FB0; U+8F9B, U+5DF3; U+58EC, U+5348; U+7678, U+672A; U+7532, U+7533; U+4E59, U+9149; U+4E19, U+620D; U+4E01, U+4EA5; U+620A, U+5B50; U+5DF1, U+4E11; U+5E9A, U+5BC5; U+8F9B, U+536F; U+58EC, U+8FB0; U+7678, U+5DF3; U+7532, U+5348; U+4E59, U+672A; U+4E19, U+7533; U+4E01, U+9149; U+620A, U+620D; U+5DF1, U+4EA5; U+5E9A, U+5B50; U+8F9B, U+4E11; U+58EC, U+5BC5; U+7678, U+536F; U+7532, U+8FB0; U+4E59, U+5DF3; U+4E19, U+5348; U+4E01, U+672A; U+620A, U+7533; U+5DF1, U+9149; U+5E9A, U+620D; U+8F9B, U+4EA5; U+58EC, U+5B50; U+7678, U+4E11; U+7532, U+5BC5; U+4E59, U+536F; U+4E19, U+8FB0; U+4E01, U+5DF3; U+620A, U+5348; U+5DF1, U+672A; U+5E9A, U+7533; U+8F9B, U+9149; U+58EC, U+620D; U+7678, U+4EA5, respectively.</p> <p>For values greater than the size of the set, the number is constructed by following these steps:</p> <ol style="list-style-type: none"> 1. Repeatedly subtract the size of the set (60) from the value until the result is equal to or less than the size of the set. 2. The result value determines which character pair to use. <p><i>[Example: The numbering for the items should be represented by the following pattern: 甲子, 乙丑, 丙寅, ..., 壬戌, 癸亥, 甲子, 乙丑, 丙寅, ... end example]</i></p>
iroha (Iroha Ordered Katakana)	<p>Specifies that the sequence shall consist of the iroha.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–48 and then repeats those same</p>

Enumeration Value	Description
	<p>characters using the logic defined below to construct all other values.</p> <p>The set of characters used by this numbering format for values 1–48 is U+FF72, U+FF9B, U+FF8A, U+FF86, U+FF8E, U+FF8D, U+FF84, U+FF81, U+FF98, U+FF87, U+FF99, U+FF66, U+FF9C, U+FF76, U+FF96, U+FF80, U+FF9A, U+FF7F, U+FF82, U+FF88, U+FF85, U+FF97, U+FF91, U+FF73, U+30F0, U+FF89, U+FF75, U+FF78, U+FF94, U+FF8F, U+FF79, U+FF8C, U+FF7A, U+FF74, U+FF83, U+FF71, U+FF7B, U+FF77, U+FF95, U+FF92, U+FF90, U+FF7C, U+30F1, U+FF8B, U+FF93, U+FF7E, U+FF7D, and U+FF9D, respectively.</p> <p>For values greater than the size of the set, the number is constructed by following these steps:</p> <ol style="list-style-type: none"> 1. Repeatedly subtract the size of the set (48) from the value until the result is equal to or less than the size of the set. 2. The result value determines which character to use. <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: い, ぽ, へ, ..., ん, じ, い, ぽ, へ, ... <i>end example</i>]</p>
irohaFullWidth (Full-Width Iroha Ordered Katakana)	<p>Specifies that the sequence shall consist of the full-width forms of the iroha.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–48 and then repeats those same characters using the logic defined below to construct all other values.</p> <p>The set of characters used by this numbering format for values 1–48 is U+30A4, U+30ED, U+30CF, U+30CB, U+30DB, U+30D8, U+30C8, U+30C1, U+30EA, U+30CC, U+30EB, U+30F2, U+30EF, U+30AB, U+30E8, U+30BF, U+30EC, U+30BD, U+30C4, U+30CD, U+30CA, U+30E9, U+30E0, U+30A6, U+30F0, U+30CE, U+30AA, U+30AF, U+30E4, U+30DE, U+30B1, U+30D5, U+30B3, U+30A8, U+30C6, U+30A2, U+30B5, U+30AD, U+30E6, U+30E1, U+30DF, U+30B7, U+30F1, U+30D2, U+30E2, U+30BB, U+30B9, and U+30F3, respectively.</p>

Enumeration Value	Description																		
	<p>For values greater than the size of the set, the number is constructed by following these steps:</p> <ol style="list-style-type: none"> 1. Repeatedly subtract the size of the set (48) from the value until the result is equal to or less than the size of the set. 2. The result value determines which character to use. <p>[<i>Example: The numbering for the items should be represented by the following pattern: イ, □, ハ, ..., ス, シ, イ, □, ハ, ... end example</i>]</p>																		
japaneseCounting (Japanese Counting System)	<p>Specifies that the sequence shall consist of sequential numbers from the Japanese counting system.</p> <p>This system uses a set of characters to represent the numbers 1–9 and then those are combined with additional characters to represent the corresponding power of ten.</p> <p>The set of characters used by this numbering format is U+3007, U+4E00, U+4E8C, U+4E09, U+56DB, U+4E94, U+516D, U+4E03, U+516B, U+4E5D, U+5341, U+5343, and U+767E, respectively.</p> <p>To construct a number that is less than ten thousand, you work from largest groups to smallest following these steps:</p> <ol style="list-style-type: none"> 1. Create as many groups as possible that contain one thousand in each group. <ul style="list-style-type: none"> • Write down the symbol representing that value (1–9): <table border="1" data-bbox="964 1438 1268 1892"> <thead> <tr> <th>Digit</th><th>Character</th></tr> </thead> <tbody> <tr><td>1</td><td>一 (U+4E00)</td></tr> <tr><td>2</td><td>二 (U+4E8C)</td></tr> <tr><td>3</td><td>三 (U+4E09)</td></tr> <tr><td>4</td><td>四 (U+56DB)</td></tr> <tr><td>5</td><td>五 (U+4E94)</td></tr> <tr><td>6</td><td>六 (U+516D)</td></tr> <tr><td>7</td><td>七 (U+4E03)</td></tr> <tr><td>8</td><td>八 (U+516B)</td></tr> </tbody> </table> 	Digit	Character	1	一 (U+4E00)	2	二 (U+4E8C)	3	三 (U+4E09)	4	四 (U+56DB)	5	五 (U+4E94)	6	六 (U+516D)	7	七 (U+4E03)	8	八 (U+516B)
Digit	Character																		
1	一 (U+4E00)																		
2	二 (U+4E8C)																		
3	三 (U+4E09)																		
4	四 (U+56DB)																		
5	五 (U+4E94)																		
6	六 (U+516D)																		
7	七 (U+4E03)																		
8	八 (U+516B)																		

Enumeration Value	Description		
	<table border="1" data-bbox="964 245 1268 296"> <tr> <td data-bbox="964 245 1073 296">9</td><td data-bbox="1073 245 1268 296">九 (U+4E5D)</td></tr> </table> <ul style="list-style-type: none"> If no groups are formed, do not write any characters. If groups were formed, write down the symbol representing one thousand (the power of ten represented by that position): 千 <ol style="list-style-type: none"> Repeat this for groups of one hundred (百) and ten (十) using the corresponding symbol to indicate the groups (so five hundred would be 五百 and fifty would be 五十). Write down the symbol for the remaining number. <p>If the number is larger than ten thousand but less than one hundred million, you perform the cycle for the numbers above one thousand but use two characters to represent each group. So, for example, groups of one million are represented as one hundred ten thousands (百万). An additional symbol for counting groups is introduced at one hundred million (because 10 million is one thousand ten thousands).</p> <p>[Example: The numbering for the items should be represented by the following pattern: 一, 二, 三, ..., 八, 九, 十, 十一, 十二, ..., 十八, 十九, 二十, 二十一, ... end example]</p>	9	九 (U+4E5D)
9	九 (U+4E5D)		
japaneseDigitalTenThousand (Japanese Digital Ten Thousand Counting System)	<p>Specifies that the sequence shall consist of sequential numbers from the Japanese digital ten thousand counting system.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–9 and then those same characters are combined with each other and 〇 (represents the number zero) to construct the remaining values.</p> <p>The set of characters used by this numbering format for values 0–9 is U+3007, U+4E00, U+4E8C, U+4E09, U+56DB, U+4E94, U+516D, U+4E03, U+516B, and U+4E5D, respectively.</p> <p>For values greater than the size of the set, the number is constructed by following these steps:</p>		

Enumeration Value	Description														
	<ol style="list-style-type: none"> 1. Divide the value by 10 and write the symbol which represents the remainder. 2. Divide the quotient of the previous division by 10 and write the symbol, which represents the remainder, to the left of the existing position. 3. Repeat step 2 until the remaining value is equal to zero. <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: 一, 二, 三, ..., 八, 九, 一〇, 一一, 一二, ..., 一八, 一九, 二〇, 二一, ... <i>end example</i>]</p>														
japaneseLegal (Japanese Legal Numbering)	<p>Specifies that the sequence shall consist of sequential numbers from the Japanese legal counting system.</p> <p>This system uses a set of characters to represent the numbers 1–9 and then those are combined with additional characters to represent the corresponding power of ten.</p> <p>The set of characters used by this numbering format for values is U+58F1, U+5F10, U+53C2, U+56DB, U+4F0D, U+516D, U+4E03, U+516B, U+4E5D, U+62FE, U+767E, U+842C, and U+9621, respectively.</p> <p>To construct a number that is less than hundred thousand, you work from largest groups to smallest following these steps:</p> <ol style="list-style-type: none"> 1. Create as many groups as possible that contain ten thousand in each group. <ul style="list-style-type: none"> • Write down the symbol representing that value (1–9): <table data-bbox="964 1509 1256 1860"> <tr> <th>Digit</th><th>Character</th></tr> <tr> <td>1</td><td>壱(U+58F1)</td></tr> <tr> <td>2</td><td>弍(U+5F10)</td></tr> <tr> <td>3</td><td>参(U+53C2)</td></tr> <tr> <td>4</td><td>四(U+56DB)</td></tr> <tr> <td>5</td><td>伍(U+4F0D)</td></tr> <tr> <td>6</td><td>六(U+516D)</td></tr> </table> 	Digit	Character	1	壱(U+58F1)	2	弍(U+5F10)	3	参(U+53C2)	4	四(U+56DB)	5	伍(U+4F0D)	6	六(U+516D)
Digit	Character														
1	壱(U+58F1)														
2	弍(U+5F10)														
3	参(U+53C2)														
4	四(U+56DB)														
5	伍(U+4F0D)														
6	六(U+516D)														

Enumeration Value	Description						
	<table border="1" data-bbox="966 245 1256 399"> <tr> <td>7</td><td>七(U+4E03)</td></tr> <tr> <td>8</td><td>八(U+516B)</td></tr> <tr> <td>9</td><td>九(U+4E5D)</td></tr> </table> <ul style="list-style-type: none"> If no groups are formed, do not write any characters. If groups were formed, write down the symbol representing ten thousand (the power of ten represented by that position): 萬 <ol style="list-style-type: none"> Repeat this for groups of one thousand (阡), one hundred (百) and ten (拾) using the corresponding symbol to indicate the groups (so five hundred would be 伍百 and fifty would be 伍拾). Write down the symbol for the remaining number. <p>If the number is larger than one hundred thousand but less than one hundred million, you perform the cycle for the numbers above one thousand but use two characters to represent each group. So, for example, groups of one million are represented as one hundred ten thousands (拾萬). An additional symbol for counting groups is introduced at one hundred million (because 10 million is one thousand ten thousands).</p> <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: 壹, 貳, 參, ..., 八, 九, 壹拾, 壹拾壹, 壹拾貳, ..., 壹拾八, 壹拾九, 貳拾, 貳拾壹, ... <i>end example</i>]</p>	7	七(U+4E03)	8	八(U+516B)	9	九(U+4E5D)
7	七(U+4E03)						
8	八(U+516B)						
9	九(U+4E5D)						
koreanCounting (Korean Counting System)	<p>Specifies that the sequence shall consist of sequential numbers from the Korean counting system.</p> <p>This system uses a set of characters to represent the numbers 1–9 and then those are combined with additional characters to represent the corresponding power of ten.</p> <p>The set of characters used by this numbering format is U+C77C, U+C774, U+C0BC, U+C0AC, U+C624, U+C721, U+CE60, U+D314, U+AD6C, U+C2ED, U+B9CC, U+CC9C, and U+BC31, respectively.</p> <p>To construct a number that is less than hundred</p>						

Enumeration Value	Description																				
	<p>thousand, you work from largest groups to smallest following these steps:</p> <ol style="list-style-type: none"> 1. Create as many groups as possible that contain ten thousand in each group. <ul style="list-style-type: none"> • Write down the symbol representing that value (1–9): <table data-bbox="964 495 1313 1001"> <tr> <th>Digit</th><th>Character</th></tr> <tr> <td>1</td><td>일 (U+C77C)</td></tr> <tr> <td>2</td><td>이 (U+C774)</td></tr> <tr> <td>3</td><td>삼 (U+C0BC)</td></tr> <tr> <td>4</td><td>사 (U+C0AC)</td></tr> <tr> <td>5</td><td>오 (U+C624)</td></tr> <tr> <td>6</td><td>육 (U+C721)</td></tr> <tr> <td>7</td><td>칠 (U+CE60)</td></tr> <tr> <td>8</td><td>팔 (U+D314)</td></tr> <tr> <td>9</td><td>구 (U+AD6C)</td></tr> </table> • If no groups are formed, do not write any characters. • If groups were formed, write down the symbol representing ten thousand (the power of ten represented by that position): 만 2. Repeat this for groups of one thousand (천), one hundred (백) and ten (십) using the corresponding symbol to indicate the groups (so five hundred would be 오백 and fifty would be 오십). 3. Write down the symbol for the remaining number. <p>If the number is larger than one hundred thousand but less than one hundred million, you perform the cycle for the numbers above one thousand but use two characters to represent each group. So, for example, groups of one million are represented as one hundred ten thousands 십일만. An additional symbol for counting groups is introduced at one hundred million (because 10 million is one thousand ten thousands).</p>	Digit	Character	1	일 (U+C77C)	2	이 (U+C774)	3	삼 (U+C0BC)	4	사 (U+C0AC)	5	오 (U+C624)	6	육 (U+C721)	7	칠 (U+CE60)	8	팔 (U+D314)	9	구 (U+AD6C)
Digit	Character																				
1	일 (U+C77C)																				
2	이 (U+C774)																				
3	삼 (U+C0BC)																				
4	사 (U+C0AC)																				
5	오 (U+C624)																				
6	육 (U+C721)																				
7	칠 (U+CE60)																				
8	팔 (U+D314)																				
9	구 (U+AD6C)																				

Enumeration Value	Description
	<p>[<i>Example</i>: The numbering for the items should be represented by the following pattern: 일, 이, 삼, ..., 팔, 구, 십, 십일, ... <i>end example</i>]</p>
koreanDigital (Korean Digital Counting System)	<p>Specifies that the sequence shall consist of sequential numbers from the Korean digital counting system.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–9 and then those same characters are combined with each other and 영 (represents the number zero) to construct the remaining values.</p> <p>The set of characters used by this numbering format for values 0–9 is U+C601, U+C77C, U+C774, U+C0BC, U+C0AC, U+C624, U+C721, U+CE60, U+D314, and U+AD6C, respectively.</p> <p>For values greater than the size of the set, the number is constructed by following these steps:</p> <ol style="list-style-type: none"> 1. Divide the value by 10 and write the symbol which represents the remainder. 2. Divide the quotient of the previous division by 10 and write the symbol, which represents the remainder, to the left of the existing position. 3. Repeat step 2 until the remaining value is equal to zero. <p>[<i>Example</i>: The numbering for the items should be represented by the following pattern: 일, 이, 삼, ..., 팔, 구, 일영, 일일, ... <i>end example</i>]</p>
koreanDigital2 (Korean Digital Counting System Alternate)	<p>Specifies that the sequence shall consist of sequential numbers from the Korean digital counting system.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–9 and then those same characters are combined with each other and 零 (represents the number zero) to construct the remaining values.</p> <p>The set of characters used by this numbering format for values 0–9 is U+96F6, U+4E00, U+4E8C, U+4E09,</p>

Enumeration Value	Description														
	<p>U+56DB, U+4E94, U+516D, U+4E03, U+516B, and U+4E5D, respectively.</p> <p>For values greater than the size of the set, the number is constructed by following these steps:</p> <ol style="list-style-type: none"> 1. Divide the value by 10 and write the symbol which represents the remainder. 2. Divide the quotient of the previous division by 10 and write the symbol, which represents the remainder, to the left of the existing position. 3. Repeat step 2 until the remaining value is equal to zero. <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: 一, 二, 三, ..., 八, 九, 一零, 一一, ... <i>end example</i>]</p>														
koreanLegal (Korean Legal Numbering)	<p>Specifies that the sequence shall consist of sequential numbers from the Korean legal numbering system.</p> <p>This system uses a set of characters to represent the numbers 1–9 and then those are combined with additional characters which represent the multiples of ten (less than one hundred).</p> <p>The set of characters used by this numbering format is U+D558, U+B098, U+B458, U+C14B, U+B137, U+B2E4, U+C12F, U+C5EC, U+C12F, U+C77C, U+ACF1, U+C5EC, U+B35F, U+C544, U+D649, U+C5F4, U+C2A4, U+BB3C, U+C11C, U+B978, U+B9C8, U+D754, U+C270, U+C608, U+C21C, U+C77C, U+D754, U+C5EC, U+B4E0, U+C544, and U+D754, respectively.</p> <p>They are assigned according to the following table:</p> <table data-bbox="922 1545 1352 1896"> <tr> <th>Digit</th><th>Characters</th></tr> <tr> <td>1</td><td>하나 (U+D558, U+B098)</td></tr> <tr> <td>2</td><td>둘 (U+B458)</td></tr> <tr> <td>3</td><td>셋 (U+C14B)</td></tr> <tr> <td>4</td><td>넷 (U+B137)</td></tr> <tr> <td>5</td><td>다섯 (U+B2E4, U+C12F)</td></tr> <tr> <td>6</td><td>여섯 (U+C5EC, U+C12F)</td></tr> </table>	Digit	Characters	1	하나 (U+D558, U+B098)	2	둘 (U+B458)	3	셋 (U+C14B)	4	넷 (U+B137)	5	다섯 (U+B2E4, U+C12F)	6	여섯 (U+C5EC, U+C12F)
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Enumeration Value	Description																								
	<table border="1" data-bbox="922 245 1352 856"> <tr><td>7</td><td>일곱 (U+C77C, U+ACF1)</td></tr> <tr><td>8</td><td>여덟 (U+C5EC, U+B35F)</td></tr> <tr><td>9</td><td>아홉 (U+C544, U+D649)</td></tr> <tr><td>10</td><td>열 (U+C5F4)</td></tr> <tr><td>20</td><td>스물 (U+C2A4, U+BB3C)</td></tr> <tr><td>30</td><td>서른 (U+C11C, U+B978)</td></tr> <tr><td>40</td><td>마흔 (U+B9C8, U+D754)</td></tr> <tr><td>50</td><td>쉰 (U+C270)</td></tr> <tr><td>60</td><td>예순 (U+C608, U+C21C)</td></tr> <tr><td>70</td><td>일흔 (U+C77C, U+D754)</td></tr> <tr><td>80</td><td>여든 (U+C5EC, U+B4E0)</td></tr> <tr><td>90</td><td>아흔 (U+C544, U+D754)</td></tr> </table> <p data-bbox="824 894 1479 1035">[Example: The numbering for the items should be represented by the following pattern: 하나, 둘, 셋, ..., 아홉, 열, 열하나, 열둘, ..., 스물, 스물하나, ... <i>end example</i>]</p>	7	일곱 (U+C77C, U+ACF1)	8	여덟 (U+C5EC, U+B35F)	9	아홉 (U+C544, U+D649)	10	열 (U+C5F4)	20	스물 (U+C2A4, U+BB3C)	30	서른 (U+C11C, U+B978)	40	마흔 (U+B9C8, U+D754)	50	쉰 (U+C270)	60	예순 (U+C608, U+C21C)	70	일흔 (U+C77C, U+D754)	80	여든 (U+C5EC, U+B4E0)	90	아흔 (U+C544, U+D754)
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90	아흔 (U+C544, U+D754)																								
lowerLetter (Lowercase Latin Alphabet)	<p data-bbox="824 1056 1479 1157">Specifies that the sequence shall consist of one or more occurrences of a single letter of the Latin alphabet in lower case from the set described below.</p> <p data-bbox="824 1199 1479 1335">This system uses a set of characters to represent the numbers 1 to the length of the language of the alphabet and then those same characters are combined to construct the remaining values.</p> <p data-bbox="824 1377 1479 1478">The characters used by for this numbering format is determined by using the language of the lang element (§17.3.2.20). Specifically:</p> <ul data-bbox="873 1486 1479 1801" style="list-style-type: none"> • When the script in use is derived from the Latin alphabet (a–z), that alphabet is used. [Example: For Norwegian (Nyorsk), the following Unicode characters are used by this numbering format: U+0061–U+007A, U+00E6, U+00F8, U+00E5. <i>end example</i>] • When the language in use is based on any other system, the characters U+0061–U+007A are used. <p data-bbox="824 1843 1479 1873">For values greater than the size of the set, the number</p>																								

Enumeration Value	Description
	<p>is constructed by following these steps:</p> <ol style="list-style-type: none"> 1. Repeatedly subtract the size of the set from the value until the result is equal to or less than the size of the set. 2. The result value determines which character to use and the same character is written once and then repeated for each time the size of the set was subtracted from the original value. <p>[<i>Example</i>: For English, the numbering for the items should be represented by the following pattern: a, b, c, ..., y, z, aa, bb, cc, ..., yy, zz, aaa, bbb, ccc, ... <i>end example</i>]</p>
lowerRoman (Lowercase Roman Numerals)	<p>Specifies that the sequence shall consist of lowercase roman numerals.</p> <p>This system uses a set of characters to represent the numbers 1, 5, 10, 50, 100, 500, and 1000 and then those are combined with each other to construct the remaining values.</p> <p>The set of characters used by this numbering format is U+0069, U+0076, U+0078, U+006C, U+0063, U+0064, U+006D, respectively.</p> <p>To construct a number that is outside the set, you work from largest groups to smallest following these steps:</p> <ol style="list-style-type: none"> 1. Create as many groups as possible that contain one thousand in each group. <ul style="list-style-type: none"> • The symbol representing one thousand (the power of ten represented by that position): m is repeated for the number of groups formed. If no groups are formed, do not write any symbol. 2. Repeat this for groups of nine hundred (cm), five-hundred (d), four-hundred (cd), one-hundred (c), ninety (xc), fifty (l), forty (xl), ten (x), nine (ix), five (v), four (iv) and finally one (i) using the corresponding symbol to indicate the groups (so four-hundred fifty would be cdl and forty-five would be xlv). <p>[<i>Example</i>: The numbering for the items should be</p>

Enumeration Value	Description
	represented by the following pattern: i, ii, iii, iv, ..., xviii, xix, xx, xxi, ... <i>end example</i>]
none (No Numbering)	Specifies that the sequence shall not display any numbering.
numberInDash (Number With Dashes)	<p>Specifies that the sequence shall consist of the Arabic numbering surrounded by hyphen-minus characters (U+002D).</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–9 and then those same characters are combined with each other and 0 (U+0030, which represents the number zero) to construct the remaining values.</p> <p>The set of characters used by this numbering format is U+002D (-) and, for values 1–9, U+0031–U+0039, respectively.</p> <p>For values greater than the size of the set, the number is constructed by following these steps:</p> <ol style="list-style-type: none"> 1. Divide the value by 10 and write the symbol which represents the remainder. 2. Divide the quotient of the previous division by 10 and write the symbol, which represents the remainder, to the left of the existing position. 3. Repeat step 2 until the remaining value is equal to zero. 4. Place the final number between two dashes. <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: - 1 -, - 2 -, - 3 -, ..., - 8 -, - 9 -, - 10 -, - 11 -, - 12 -, ..., - 18 -, - 19 -, - 20 -, - 21 -, ... <i>end example</i>]</p>
ordinal (Ordinal)	<p>Specifies that the sequence shall consist of ordinals of the run language.</p> <p>This sequence is a set of strings each of which is the textual representation, in the language of the lang element (§17.3.2.20), of a different unique position in that sequence.</p> <p>[<i>Example:</i> The numbering for the items in French</p>

Enumeration Value	Description
	<p>should be represented by the following pattern: 1er, 2e, 3e, ..., 9e, 10e, 11e, ... 19e, 20e, 21e, ... <i>end example</i>]</p>
ordinalText (Ordinal Text)	<p>Specifies that the sequence shall consist of ordinal text of the run language.</p> <p>This sequence is a set of strings each of which is the textual representation, in the language of the lang element (§17.3.2.20), of a different unique position in that sequence.</p> <p>[<i>Example:</i> The numbering for the items in German should be represented by the following pattern: Erste, Zweite, Dritte, ..., Neunte, Zehnte, Elfte, ..., Neunzehnte, Zwanzigste, Einundzwanzigste, ... <i>end example</i>]</p>
russianLower (Lowercase Russian Alphabet)	<p>Specifies that the sequence shall consist of one or more occurrences of a single letter of the Russian alphabet in lower case, from the set listed below.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–29 and then repeats those same characters using the logic defined below to construct all other values.</p> <p>The set of characters used by this numbering format for values 1–29 is U+0430–U+0438, U+043A–U+043F, U+0440–U+0449, U+044B, U+044D, U+044E, and U+044F, respectively.</p> <p>For values greater than the size of the set, the number is constructed by following these steps:</p> <ol style="list-style-type: none"> 1. Repeatedly subtract the size of the set (29) from the value until the result is equal to or less than the size of the set. 2. The result value determines which character to use and the same character is written once and then repeated for each time the size of the set was subtracted from the original value. <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: а, б, в, ..., ю, я, аа, бб, вв, ..., юю, яя, ааа, ббб, ввв, ... <i>end example</i>]</p>

Enumeration Value	Description
russianUpper (Uppercase Russian Alphabet)	<p>Specifies that the sequence shall consist of one or more occurrences of a single letter of the Russian alphabet in upper case, from the set listed below.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–29 and then repeats those same characters using the logic defined below to construct all other values.</p> <p>The set of characters used by this numbering format for values 1–29 is U+0410–U+0418, U+041A–U+041F, U+0420–U+0429, U+042B, U+042D, U+042E, and U+042F, respectively.</p> <p>For values greater than the size of the set, the number is constructed by following these steps:</p> <ol style="list-style-type: none"> 1. Repeatedly subtract the size of the set (29) from the value until the result is equal to or less than the size of the set. 2. The result value determines which character to use and the same character is written once and then repeated for each time the size of the set was subtracted from the original value. <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: А, Б, В, ..., Ю, Я, АА, ББ, ВВ, ..., ЮЮ, ЯЯ, ААА, БББ, ВВВ, ... <i>end example</i>]</p>
taiwaneseCounting (Taiwanese Counting System)	<p>Specifies that the sequence shall consist of sequential numbers from the Taiwanese counting system.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–9 and then those same characters are combined with each other and 〇 (U+25CB, which represents the number zero) to construct the remaining values.</p> <p>The set of characters used by this numbering format for values 1–10 is U+4E00, U+4E8C, U+4E09, U+56DB, U+4E94, U+516D, U+4E03, U+516B, U+4E5D, and U+5341, respectively.</p> <p>For values greater than the size of the set, the number</p>

Enumeration Value	Description								
	<p>is constructed by following these steps:</p> <ol style="list-style-type: none"> 1. Divide the value by 10 and write the symbol which represents the remainder. <ul style="list-style-type: none"> • If the quotient is less than 10 then write 一 to the left of the symbol, which represents the remainder. 2. Divide the quotient of the previous division by 10 and write the symbol, which represents the remainder, to the left of the existing positions. 3. Repeat step 2 until the remaining value is equal to zero. <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: 一, 二, 三, ..., 九, 十, 十一, 十二, ..., 十九, 二十, 二十一, ..., 九十九, 一〇〇, 一〇一, ... <i>end example</i>]</p>								
taiwaneseCountingThousand (Taiwanese Counting Thousand System)	<p>Specifies that the sequence shall consist of sequential numbers from the Taiwanese counting thousand system.</p> <p>This system uses a set of characters to represent the numbers 1–10 and then those are combined with additional characters to construct the remaining characters.</p> <p>The set of characters used by this numbering format is U+4E00, U+4E8C, U+4E09, U+56DB, U+4E94, U+516D, U+4E03, U+516B, U+4E5D, U+842C, U+5343, U+5341, U+767E, and U+96F6.</p> <p>To construct a number that is beyond the set but less than hundred thousand, you work from largest groups to smallest following these steps:</p> <ol style="list-style-type: none"> 1. Create as many groups as possible that contain ten thousand in each group. <ul style="list-style-type: none"> • Write down the symbol representing that value (1–9): <table border="1" data-bbox="964 1692 1289 1892"> <thead> <tr> <th>Digit</th><th>Character</th></tr> </thead> <tbody> <tr> <td>1</td><td>一 (U+4E00)</td></tr> <tr> <td>2</td><td>二 (U+4E8C)</td></tr> <tr> <td>3</td><td>三 (U+4E09)</td></tr> </tbody> </table> 	Digit	Character	1	一 (U+4E00)	2	二 (U+4E8C)	3	三 (U+4E09)
Digit	Character								
1	一 (U+4E00)								
2	二 (U+4E8C)								
3	三 (U+4E09)								

Enumeration Value	Description												
	<table border="1" data-bbox="966 241 1291 546"> <tr><td>4</td><td>四 (U+56DB)</td></tr> <tr><td>5</td><td>五 (U+4E94)</td></tr> <tr><td>6</td><td>六 (U+516D)</td></tr> <tr><td>7</td><td>七 (U+4E03)</td></tr> <tr><td>8</td><td>八 (U+516B)</td></tr> <tr><td>9</td><td>九 (U+4E5D)</td></tr> </table> <ul style="list-style-type: none"> If no groups are formed, do not write any characters. If groups were formed, write down the symbol representing ten thousand: 萬 <ol style="list-style-type: none"> Repeat step 1 this for groups of one thousand (千) using the corresponding symbol to indicate the groups (so five thousand would be 五千). If the original value was between 10,000 and 100,000 and If no groups are formed (and the number is not a multiple of ten) write the symbol 零 instead (so ten thousand and five would be 一萬零五) Repeat step 1 this for groups of one hundred (百) using the corresponding symbol to indicate the groups (so five hundred would be 五百). The value 10 uses the symbol 十. For all other groups of ten, use the corresponding symbol to indicate the groups (so fifty would be 五十). If the original value was between 100 and 1000 and If no groups are formed (and the number is not a multiple of ten) write the symbol 零 instead (so one hundred and five would be 一百零五) Write down the symbol for the remaining number. <p>If the number is larger than one hundred thousand but less than one hundred million, you perform the cycle for the numbers above one thousand but use two characters to represent each group. So, for example, groups of one million are represented as one hundred ten thousands (十萬). An additional symbol for counting groups is introduced at one hundred million (because 10 million is one thousand ten thousands).</p> <p>[Example: The numbering for the items should be</p>	4	四 (U+56DB)	5	五 (U+4E94)	6	六 (U+516D)	7	七 (U+4E03)	8	八 (U+516B)	9	九 (U+4E5D)
4	四 (U+56DB)												
5	五 (U+4E94)												
6	六 (U+516D)												
7	七 (U+4E03)												
8	八 (U+516B)												
9	九 (U+4E5D)												

Enumeration Value	Description
	represented by the following pattern: 一, 二, 三, ..., 八, 九, 一十, 十一, 十二, ..., 十九, 二十, 二十一, ..., 九九, 一百, 一百零一, ... <i>end example</i>]
taiwaneseDigital (Taiwanese Digital Counting System)	<p>Specifies that the sequence shall consist of sequential numbers from the Taiwanese digital counting system.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–9 and then those same characters are combined with each other and 〇 (represents the number zero) to construct the remaining values.</p> <p>The set of characters used by this numbering format for values 0–9 is U+25CB, U+4E00, U+4E8C, U+4E09, U+56DB, U+4E94, U+516D, U+4E03, U+516B, and U+4E5D, respectively.</p> <p>For values greater than the size of the set, the number is constructed by following these steps:</p> <ol style="list-style-type: none"> 1. Divide the value by 10 and write the symbol which represents the remainder. 2. Divide the quotient of the previous division by 10 and write the symbol, which represents the remainder, to the left of the existing position. 3. Repeat step 2 until the remaining value is equal to zero. <p>[<i>Example</i>: The numbering for the items should be represented by the following pattern: 一, 二, ..., 八, 九, 一〇, 一一, 一二, ..., 一八, 一九, 二〇, 二一, ... <i>end example</i>]</p>
thaiCounting (Thai Counting System)	<p>Specifies that the sequence shall consist of sequential numbers from the Thai counting system.</p> <p>This sequence is a set of strings each of which is the full name, in Thai, of the next value in that sequence.</p> <p>[<i>Example</i>: The numbering for the items should be represented by the following pattern: หนึ่ง, สอง, สาม, สี่, ห้า, หก, เจ็ด, แปด, เก้า, สิบ, ... <i>end example</i>]</p>
thaiLetters (Thai Letters)	Specifies that the sequence shall consist of one or more occurrences of a single Thai letter from the set

Enumeration Value	Description
	<p>listed below.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–41 and then repeats those same characters using the logic defined below to construct all other values.</p> <p>The set of characters used by this numbering format for values 1–41 is U+0E01, U+0E02, U+0E04, U+0E07–U+0E23, U+0E25, and U+0E27–U+0E2E, respectively.</p> <p>For values greater than the size of the set, the number is constructed by following these steps:</p> <ol style="list-style-type: none"> 1. Repeatedly subtract the size of the set (41) from the value until the result is equal to or less than the size of the set. 2. The result value determines which character to use and the same character is written once and then repeated for each time the size of the set was subtracted from the original value. <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: ก, ข, ค, ..., ฉ, ษ, กก, ขข, คค, ..., ฉฉ, ษษ, กกก, ขขข, คคค, ... <i>end example</i>]</p>
thaiNumbers (Thai Numerals)	<p>Specifies that the sequence shall consist of Thai numerals.</p> <p>To determine the text that is displayed for any value, this sequence specifies a set of characters that represent positions 1–9 and then those same characters are combined with each other and ๐ (represents the number zero) to construct the remaining values.</p> <p>The set of characters used by this numbering format for values 0–9 is U+0E50, U+0E51, U+0E52, U+0E53, U+0E54, U+0E55, U+0E56, U+0E57, U+0E58, and U+0E59, respectively.</p> <p>For values greater than the size of the set, the number is constructed by following these steps:</p> <ol style="list-style-type: none"> 1. Divide the value by 10 and write the symbol

Enumeration Value	Description
	<p>which represents the remainder.</p> <ol style="list-style-type: none"> 2. Divide the quotient of the previous division by 10 and write the symbol, which represents the remainder, to the left of the existing position. 3. Repeat step 2 until the remaining value is equal to zero. <p>[<i>Example:</i> The numbering for the items should be represented by the following pattern: ௧, ௨, ௩, ..., ௮, ௯, ௧௦, ௧௧, ௧௨, ..., ௧௮, ௧௯, ௨௦, ௨௧, ௨௨, ..., ௨௮, ௨௯, ... <i>end example</i>]</p>
upperLetter (Uppercase Latin Alphabet)	<p>Specifies that the sequence shall consist of one or more occurrences of a single letter of the Latin alphabet in upper case, from the set listed below.</p> <p>This system uses a set of characters to represent the numbers 1 to the length of the language of the alphabet and then those same characters are combined to construct the remaining values.</p> <p>The characters used by this numbering format is determined by using the language of the lang element (§17.3.2.20). Specifically:</p> <ul style="list-style-type: none"> • When the script in use is derived from the Latin alphabet (A–Z), that alphabet is used. [<i>Example:</i> For Norwegian (Norsk), the following Unicode characters are used by this numbering format: U+0041–U+005A, U+00C6, U+00D8, U+00C5. <i>end example</i>] • When the language in use is based on any other system, the characters U+0041–U+005A are used. <p>For values greater than the size of the set, the number is constructed by following these steps:</p> <ol style="list-style-type: none"> 1. Repeatedly subtract the size of the set from the value until the result is equal to or less than the size of the set. 2. The result value determines which character to use, and the same character is written once and then repeated for each time the size of the set was subtracted from the original value.

Enumeration Value	Description
	<p>[<i>Example</i>: For English, the numbering for the items should be represented by the following pattern: A, B, C, ..., Y, Z, AA, BB, CC, ..., YY, ZZ, AAA, BBB, CCC, ... <i>end example</i>]</p>
upperRoman (Uppercase Roman Numerals)	<p>Specifies that the sequence shall consist of uppercase roman numerals.</p> <p>This system uses a set of characters to represent the numbers 1, 5, 10, 50, 100, 500, and 1000 and then those characters are combined with each other to construct the remaining values.</p> <p>The set of characters used by this numbering format is U+0049, U+0056, U+0058, U+004C, U+0043, U+0044, U+004D, respectively.</p> <p>To construct a number that is outside the set, you work from largest groups to smallest following these steps:</p> <ol style="list-style-type: none"> 1. Create as many groups as possible that contain one thousand in each group. <ul style="list-style-type: none"> • The symbol representing one thousand (the power of ten represented by that position): M is repeated for the number of groups formed. If no groups are formed, do not write any symbol. 2. Repeat this for groups of nine hundred (CM), five-hundred (D), four-hundred (CD), one-hundred (C), ninety (XC), fifty (L), forty (XL), ten (X), nine (IX), five (V), four (IV) and finally one (I) using the corresponding symbol to indicate the groups (so four-hundred fifty would be CDL and forty-five would be XLV). <p>[<i>Example</i>: The numbering for the items should be represented by the following pattern: I, II, III, IV, ..., XVIII, XIX, XX, XXI, ... <i>end example</i>]</p>
vietnameseCounting (Vietnamese Numerals)	<p>Specifies that the sequence shall consist of Vietnamese numerals.</p> <p>This sequence is a set of strings each of which is the full name, in Vietnamese, of the next value in that sequence.</p>

Enumeration Value	Description
	[<i>Example: một, hai, ba, bốn, năm, sáu, bảy, tám, chín, mười. end example</i>]

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_NumberFormat](#)) is located in §A.1. end note*]

17.18.60 ST_ObjectDrawAspect (Embedded Object Representations)

This simple type specifies the ways in which embedded objects are displayed in the application.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
content (Snapshot)	The object's presentation is a picture of the contained document (provided by the object's server application).
icon (Icon)	The object's presentation is an icon.

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_ObjectDrawAspect](#)) is located in §A.1. end note*]

17.18.61 ST_ObjectUpdateMode (Embedded Object Update Modes)

This simple type specifies how an embedded object is updated.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
always (Server Application Update)	The object is updated whenever the object's server application indicates there is new data available.
onCall (User Update)	The object is updated when the user chooses to update it.

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_ObjectUpdateMode](#)) is located in §A.1. end note*]

17.18.62 ST_PageBorderDisplay (Page Border Display Options)

This simple type specifies the pages in the parent section on which the page border shall be printed.

[*Example:* Consider a section in a document for which the page border must only be printed on the first page. This setting is specified using the following WordprocessingML:

```
<w:pgBorders w:display="firstPage">
...
</w:pgBorders>
```

The display attribute with a value of firstPage specifies that only the first page must display the page border defined for this section. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
allPages (Display Page Border on All Pages)	Specifies that the page border shall be displayed on all pages in the parent section.
firstPage (Display Page Border on First Page)	Specifies that the page border shall be displayed on only the first page in the parent section.
notFirstPage (Display Page Border on All Pages Except First)	Specifies that the page border shall be displayed on only the first page in the parent section.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_PageBorderDisplay](#)) is located in §A.1. *end note*]

17.18.63 ST_PageBorderOffset (Page Border Positioning Base)

This simple type specifies how the relative positioning of the page borders shall be calculated.

If the value of this attribute is text, then the space attribute on each page border shall be interpreted as the distance from the text margins that shall be left before the page border.

[*Example:* Consider the following WordprocessingML fragment:

```
<w:pgBorders w:offsetFrom="page">
  <w:top w:val="dashed" w:space="24" />
  <w:left w:val="dashed" w:space="24" />
  <w:bottom w:val="dashed" w:space="24"/>
  <w:right w:val="dashed" w:space="24"/>
</w:pgBorders>
```

This fragment specifies that the page borders must be indented 24 points from the page extents.

This is distinct from the following fragment with identical space attribute values:

```

<w:pgBorders w:offsetFrom="text">
  <w:top w:val="dashed" w:space="24" />
  <w:left w:val="dashed" w:space="24" />
  <w:bottom w:val="dashed" w:space="24"/>
  <w:right w:val="dashed" w:space="24"/>
</w:pgBorders>

```

In this case, the page borders is offset by 24 points, but in this case, that offset is calculated relative to the text margins. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

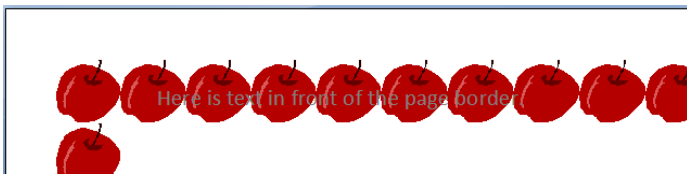
Enumeration Value	Description
page (Page Border Is Positioned Relative to Page Edges)	Specifies that the space attribute on each page border shall be interpreted as the distance from the edge of the page that shall be left before the page border.
text (Page Border Is Positioned Relative to Text Extents)	Specifies that the space attribute on each page border shall be interpreted as the distance from the edge of the text extents (text margins) that shall be left before the page border..

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_PageBorderOffset](#)) is located in §A.1. *end note*]

17.18.64 ST_PageBorderZOrder (Page Border Z-Order)

This simple type specifies whether the page border is positioned above or below intersecting texts and objects in this document.

[*Example:* Consider a document in which the page border must be displayed below any intersecting text as follows:



This setting is specified by setting the value of an attribute with `to back`, which specifies that the page border must be displayed behind all intersecting text and objects. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
back (Page Border Behind Text)	Specifies that the page border shall be rendered beneath any text or object which intersects it - effectively placing it at the lowest z-order on the page.
front (Page Border Ahead of Text)	Specifies that the page border shall be rendered above any text or object which intersects it - effectively placing it at the highest z-order on the page.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_PageBorderZOrder](#)) is located in §A.1. *end note*]

17.18.65 ST_PageOrientation (Page Orientation)

This simple type specifies the orientation of all pages in the parent section. This information is used to determine the actual paper size to use when printing the file.

[*Example*: Pages 11" wide by 8.5" long in landscape mode use 8.5"x11" paper, because the width and height are reversed for pages in this landscape section with respect to the printed page. *end example*]

[*Example*: Consider the following WordprocessingML:

```
<w:pgSz w:w="15840" w:h="12240" w:orient="landscape" />
```

Although the page width is 11", and page height is 8.5", according to the w and h attributes, because the orient attribute is set to landscape, pages in this section are printed on 8.5x11" paper in landscape mode. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
landscape (Landscape Mode)	Specifies that pages in this section shall be printed in landscape mode, which prints the page contents with a 90 degree rotation with respect to the normal page orientation.
portrait (Portrait Mode)	Specifies that pages in this section shall be printed in portrait mode.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_PageOrientation](#)) is located in §A.1. *end note*]

17.18.66 ST_Pitch (Font Pitch Value)

This simple type specifies the possible values for the font pitch of a font.

[*Example*: Consider the following information stored for a single font:

```
<w:font w:name="Courier New">
  <w:pitch w:val="fixed" />
  ...
</w:font>
```

The pitch element specifies via its val attribute value of `fixed` that this is a fixed width font. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
default (Default)	Specifies that no information is available about the pitch of a font.
fixed (Fixed Width)	Specifies that this is a fixed width font.
variable (Proportional Width)	Specifies that this is a proportional width font.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_Pitch](#)) is located in §A.1. *end note*]

17.18.67 ST_PixelsMeasure (Measurement in Pixels)

This simple type specifies that its contents contain a positive whole number, whose contents consist of a measurement in pixels.

The contents of this measurement are interpreted based on the context of the parent XML element.

[*Example*: Consider an attribute value of 96 whose simple type is `ST_PixelsMeasure`. This attribute value specifies a size of 96 pixels (one inch on a 96 pixels per inch display). *end example*]

This simple type's contents are a restriction of the `ST_UnsignedDecimalNumber` datatype (§22.9.2.16).

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_PixelsMeasure](#)) is located in §A.1. *end note*]

17.18.68 ST_PointMeasure (Measurement in Points)

This simple type specifies that its contents contain a positive whole number, whose contents consist of a measurement in points (equivalent to 1/72nd of an inch).

The contents of this measurement are interpreted based on the context of the parent XML element.

[*Example*: Consider an attribute value of 24 whose simple type is ST_PointMeasure. This attribute value specifies a size in points (24 points = 1/3 of an inch). *end example*]

This simple type's contents are a restriction of the ST_UnsignedDecimalNumber datatype (§22.9.2.16).

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_PointMeasure](#)) is located in §A.1. *end note*]

17.18.69 ST_Proof (Proofing State Values)

This simple type specifies the values which can be used to indicate the status of a given hosting application's grammar and spell checking when a given WordprocessingML document was last saved.

[*Example*: Consider a WordprocessingML document that is saved by a hosting application whose grammar checking engine had completed checking the grammar in the given WordprocessingML document, but whose spell checking engine had not completed checking the spelling in the given WordprocessingML document . In this instance, the following WordprocessingML must be written in the document settings:

```
<w:proofState w:spelling="dirty" w:grammar="clean" />
```

The proofState element's attributes spelling and grammar have the ST_Proof simple type enumeration values dirty and clean respectively, specifying that the hosting application's spell checking engine had not completed checking the spelling of the document, and that the hosting application's grammar checking engine had completed checking the grammar of the document, when the WordprocessingML document was last saved. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
clean (Check Completed)	Specifies that the given proofing engine completed checking the document when it was last saved.
dirty (Check Not Completed)	Specifies that the given proofing engine did not complete checking the document when it was last saved.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_Proof](#)) is located in §A.1. *end note*]

17.18.70 ST_ProofErr (Proofing Error Type)

This simple type specifies the possible values for the types of proofing error markers which can appear in the contents of a WordprocessingML document to indicate the last known state of any spell- and grammar-checking performed on the contents of this document.

[*Example:* Consider the following paragraph consisting of two misspelled words, where the second word has been explicitly flagged as not being a spelling error. This paragraph would consist of the following WordprocessingML markup:

```
<w:p>
  <w:proofErr w:type="spellStart"/>
  <w:r>
    <w:t>erqwt</w:t>
  </w:r>
  <w:proofErr w:type="spellEnd"/>
  <w:r>
    <w:t xml:space="preserve"> werewr</w:t>
  </w:r>
</w:p>
```

The proofErr elements with a val attribute value of spellStart and spellEnd, respectively delimit the start and end the content in this paragraph which is stored as a spelling error. Since the second word is not included in that range, it is not stored as a spelling error. *end example]*

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
gramEnd (End of Region Marked as Grammatical Error)	Specifies that this proofing error marker shall indicate the start of a region to be marked as a grammatical error in the document.
gramStart (Start of Region Marked as Grammatical Error)	Specifies that this proofing error marker shall indicate the end of a region to be marked as a grammatical error in the document.
spellEnd (End of Region Marked as Spelling Error)	Specifies that this proofing error marker shall indicate the end of a region to be marked as a spelling error in the document.
spellStart (Start of Region Marked as Spelling Error)	Specifies that this proofing error marker shall indicate the start of a region to be marked as a spelling error in the document.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_ProofErr](#)) is located in §A.1. *end note]*

17.18.71 ST_PTabAlignment (Absolute Position Tab Alignment)

This simple type specifies the alignment of an absolutely positioned tab character in a document. This alignment value determines the position on the line to which this absolute tab shall advance, as well as the alignment of the text entered after the alignment tab character position.

[*Example*: Consider a positional tab stop in a WordprocessingML document who must move to the left edge of the text margins and whose subsequent text should be left aligned. This positional tab stop would be defined as follows:

```
<w:ptab w:alignment="left" w:relativeTo="margin" ... />
```

The alignment attribute has a value of `left`, which specifies that this custom tab stop must align on the left edge of the line relative to the text margin. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
center (Center)	Specifies that the positional tab should be center aligned on the line relative to the specified base (the text margins with or without indents), and that the text at that location shall be center aligned.
left (Left)	Specifies that the positional tab should be left aligned on the line relative to the specified base (the text margins with or without indents), and that the text at that location shall be left aligned.
right (Right)	Specifies that the positional tab should be right aligned on the line relative to the specified base (the text margins with or without indents), and that the text at that location shall be right aligned.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_PTabAlignment](#)) is located in §A.1. *end note*]

17.18.72 ST_PTabLeader (Absolute Position Tab Leader Character)

This simple type specifies the characters which can be used to fill in the space created by a positional tab. This character shall be repeated as required to completely fill the tab spacing generated by the positional tab character.

[*Example*: Consider a positional tab stop which should be preceded by a sequence of underscore characters, as follows:

```
_____Text at the positional tab stop
```

This tab stop would have a leader attribute value of `underscore`, indicating that the tab stop must be preceded by underscore characters as needed to fill the tab spacing. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
dot (Dot Leader Character)	<p>Specifies that the leader character for this positional tab stop shall be a dot.</p> <p><i>[Example:</i></p> <p>..... Text at absolute tab.</p> <p><i>end example]</i></p>
hyphen (Hyphen Leader Character)	<p>Specifies that the leader character for this positional tab stop shall be a hyphen.</p> <p><i>[Example:</i></p> <p>----- Text at absolute tab.</p> <p><i>end example]</i></p>
middleDot (Centered Dot Leader Character)	<p>Specifies that the leader character for this positional tab stop shall be a centered dot.</p> <p><i>[Example:</i></p> <p>..... Text at absolute tab.</p> <p><i>end example]</i></p>
none (No Leader Character)	<p>Specifies that there shall be no leader character for this positional tab.</p> <p><i>[Example:</i></p> <p>Text at absolute tab.</p> <p><i>end example]</i></p>
underscore (Underscore Leader Character)	<p>Specifies that the leader character for this positional tab stop shall be an underscore.</p> <p><i>[Example:</i></p> <p>_____ Text at absolute tab.</p> <p><i>end example]</i></p>

[Note: The W3C XML Schema definition of this simple type's content model ([ST_PTabLeader](#)) is located in §A.1. *end note*]

17.18.73 ST_PTabRelativeTo (Absolute Position Tab Positioning Base)

Specifies the possible extents which can be used to calculate the absolute positioning of this positional tab character.

[Example: Consider a positional tab stop in a WordprocessingML document that should have a resulting position that is centered on the text margins, ignoring both any custom tab stops and any text indents on the paragraph. This positional tab stop would be defined as follows:

```
<w:ptab w:relativeTo="margin" ... />
```

The relativeTo attribute specifies that this absolute position tab stop must be relative to the margin. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
indent (Relative To Indents)	Specifies that the absolute positioning of the tab shall be relative to the indents.
margin (Relative To Text Margins)	Specifies that the absolute positioning of the tab shall be relative to the margins.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_PTabRelativeTo](#)) is located in §A.1. *end note*]

17.18.74 ST_RestartNumber (Footnote/Endnote Numbering Restart Locations)

This simple type specifies the possible values for when the automatic numbering of footnotes or endnotes shall be restarted.

[Example: Consider a WordprocessingML document where the numbering for its endnotes must be restarted after each section must be restarted after each page. This setting is represented by the following WordprocessingML:

```
<w:footnotePr>
...
  <w:numRestart w:val="eachSect" />
...
</w:footnotePr>
```

The val attribute value of eachSect specifies that numbering must be restarted after each section. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
continuous (Continue Numbering From Previous Section)	Specifies that the numbering of footnotes or endnotes shall continue from the previous section in the document.
eachPage (Restart Numbering On Each Page)	Specifies that the numbering of footnotes or endnotes shall be restarted to its starting value for each unique page in the document.
eachSect (Restart Numbering For Each Section)	Specifies that the numbering of footnotes or endnotes shall be restarted to its starting value for each unique section in the document.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_RestartNumber](#)) is located in §A.1. *end note*]

17.18.75 ST_RubyAlign (Phonetic Guide Text Alignment)

This simple type specifies the possible alignment settings which can be used to determine the placement of phonetic guide text with respect to the base text when this phonetic guide is displayed.

[Example: Consider a run of phonetic guide text which must have the ruby text positioned to the far left of the base text. This constraint is specified using the following WordprocessingML:

```
<w:rubyPr>
...
<w:rubyAlign w:val="left"/>
...
</w:rubyPr>
```

The rubyAlign property is left for the phonetic guide, so the ruby text is displayed on the left side of the base text. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
center (Center)	Specifies that the phonetic guide text shall be centered with respect to the base text in this document. [Example: <div style="text-align: center;">guide text this is a test center</div>

Enumeration Value	Description
	<i>end example]</i>
distributeLetter (Distribute All Characters)	<p>Specifies that the phonetic guide text shall be distributed with respect to the base text in this document.</p> <p>This type of justification shall equally affect the inter-word spacing on each line as well as the inter-character spacing between each word when justifying its contents - that is, an equal amount of additional character pitch shall be added to all characters on the line.</p> <p>[Example:</p> <pre>g u i d e t e x t a test distribute letter</pre> <p><i>end example]</i></p>
distributeSpace (Distribute all Characters w/ Additional Space On Either Side)	<p>Specifies that the phonetic guide text shall be distributed with respect to the base text in this document, with additional space added to the guide text to ensure it is indented with respect to the base text.</p> <p>This type of justification shall equally affect the inter-word spacing on each line as well as the inter-character spacing between each word when justifying its contents - that is, an equal amount of additional character pitch shall be added to all characters on the line. As well, an additional space is added before and after the guide text to ensure it is indented with respect to the base text.</p> <p>[Example:</p> <pre>g u i d e t e x t a test distribute space</pre> <p><i>end example]</i></p>
left (Left Aligned)	<p>Specifies that the phonetic guide text shall be left aligned with respect to the base text in this document.</p> <p>[Example:</p> <pre>guide text this is a test left</pre>

Enumeration Value	Description
	<i>end example]</i>
right (Right Aligned)	<p>Specifies that the phonetic guide text shall be right aligned with respect to the base text in this document.</p> <p>[Example:</p> <p style="text-align: right;">guide text</p> <p>this is a test right</p> <p><i>end example]</i></p>
rightVertical (Vertically Aligned to Right of Base Text)	<p>Specifies that the phonetic guide text shall be right aligned with respect to the base text in this document, and shall always be displayed vertically and to the right of the base text, regardless of the alignment of the base text.</p> <p>[Example:</p> <p style="text-align: right;">this is a test right vertical</p> <p style="text-align: right;">guide text</p> <p><i>end example]</i></p>

[Note: The W3C XML Schema definition of this simple type's content model ([ST_RubyAlign](#)) is located in §A.1.
end note]

17.18.76 ST_SdtDateMappingType (Date Storage Format Types)

This simple type specifies the possible types of translations which can be performed on the displayed date in a date picker structured document tag when the current contents are saved into the associated custom XML data via the dataBinding element (§17.5.2.6).

[Example: Consider the following date picker structured document tag:

```
<w:sdt>
  <w:sdtPr>
    <w:date w:fullDate="01-01-2006T06:30:00Z">
      <w:storeMappedDateAs w:val="text"/>
      ...
    </w:date>
  </w:sdtPr>
  <w:sdtContent>
    <w:r>
      <w:t>January 1</w:t>
    </w:r>
  </w:sdtContent>
</w:sdt>
```

The value of the storeMappedDateAs element's attribute value is text, therefore the current run contents must be sent to the mapped XML element without any translation (in this case, the value must be January 1). *end example]*

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
date (XML Schema Date Format)	Specifies that the date specified in the parent date picker structured document tag shall be converted to the xsd:date format when stored in a mapped XML element.
dateTime (XML Schema DateTime Format)	Specifies that the date specified in the parent date picker structured document tag shall be converted to the xsd:dateTime format when stored in a mapped XML element.
text (Same As Display)	Specifies that no translation shall be performed on the displayed date when stored in a mapped XML element - the mapped contents shall be the same as the displayed contents.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_SdtDateMappingType](#)) is located in §A.1. *end note]*

17.18.77 ST_SectionMark (Section Type)

Specifies the kind of the current section.

[Example: Consider a section that must start on the next page in the document. The WordprocessingML specifying this would look like:

```

<w:sectPr>
...
  <w:type w:val="nextPage"/>
</w:sectPr>

```

The nextPage value specifies that this section starts on the next page. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
continuous (Continuous Section Break)	Specifies a continuous section break, which begin the new section on the following paragraph. This means that continuous section breaks might not specify certain page-level section properties, since they are inherited from the following section. These breaks, however, can specify other section properties, such as line numbering and footnote/endnote settings. If a footnote reference (§17.11.14) occurs on the same page as a section break of this kind, the new section shall begin on the following page.
evenPage (Even Page Section Break)	Specifies an even page section break, which begins the new section on the next even-numbered page, leaving the next odd page blank if necessary.
nextColumn (Column Section Break)	Specifies a column section break, which begins the new section on the following column on the page.
nextPage (Next Page Section Break)	Specifies a next page section break, which begins the new section on the following page.
oddPage (Odd Page Section Break)	Specifies an odd page section break, which begins the new section on the next odd-numbered page, leaving the next even page blank if necessary.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_SectionMark](#)) is located in §A.1. *end note*]

[Note: A continuous section break balances the content of the previous section. *end note*]

[Example: Consider the following sample document:

Column-balancing-sample.....Section Break (Continuous).....

Text·text·text·text·text·text·text·text·text·text·text·text·text·text·text·text·text·text·
text·text·text·text·text·text·text·text·text·text·text·text·text·text·text·text·text·text·
text·text·text.....Section Break (Continuous).....

Last section.¶

The second section (“Text text text ...”) has two columns and the third section (“Last section”) has the type “continuous”. As a result, the content of the second section is balanced before the third section is laid out. *end example]*

The process of “balancing” is defined by starting the next section at the minimum section height such that all content constraints are met.

[Example:

Consider the following sample document:

Column-balancing-sample.....Section Break (Continuous).....

A.....D.....Section Break (Continuous)

B.....

C.....

Last section.

The above balancing is incorrect, as the height of the second section can be reduced such that the following minimal balancing is achieved:

Column-balancing-sample.....Section Break (Continuous)

A¶

B¶

Last-section.¶

C¶

D.....Section Break (Continuous)

end example]

[Example:

The document

Column-balancing-sample.....Section Break (Continuous)

A¶

C¶

B¶

D¶

E.....Section Break (Continuous)

Last-section.¶

has

incorrect column balancing, as the content is not laid out with respect to the implied constraints—although the section height is minimal. The correct minimal balancing looks like this:

Column-balancing-sample.....Section Break (Continuous)

A¶

D¶

B¶

E.....Section Break (Continuous)

C¶

Last-section.¶

end example]

[Example:

The following section balancing

Column-balancing-sample.....Section Break (Continuous)

A·long·long·long·long·long·long·long·long·
paragraph-with-Widow/Orphan·control·

turned·on.....Section Break (Continuous)

Last-section.¶

is incorrect, as the “Widow/Orphan” constraints are not met. The correct balancing looks like this:

Column-balancing-sample.....Section Break (Continuous)

A·long·long·long·long·long·long·long·long·
paragraph-with-Widow/Orphan·control·

turned·on.....Section Break (Continuous)

Last-section.¶

end example]

17.18.78 ST_Shd (Shading Patterns)

This simple type specifies the pattern that shall be used to lay the pattern color over the background color for shading.

This pattern consists of a mask that is applied over the background shading color to get the locations where the pattern color should be shown. Each of these possible masks is shown in the enumeration values below. In each example, an 8 pixel by 8 pixel mask is displayed where black has been used as the fill color (the parent element's fill attribute), and white has been used as the pattern color (the parent element's color attribute). When the shading is applied, the mask is tiled as necessary to match the size of the shaded area.

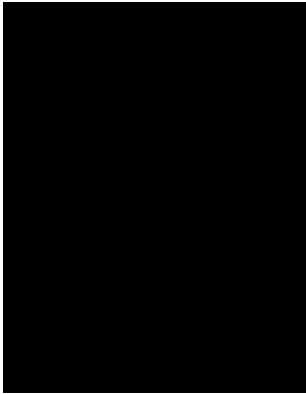
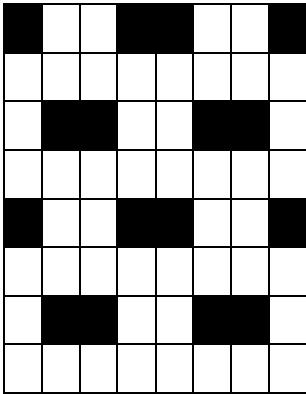
[*Example*: Consider a shaded paragraph which uses a 10 percent foreground fill, resulting in the following WordprocessingML:

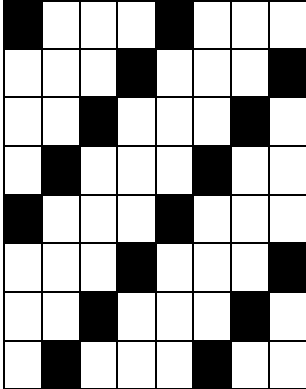
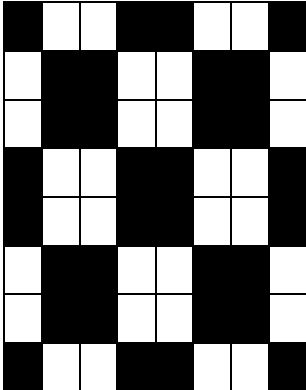
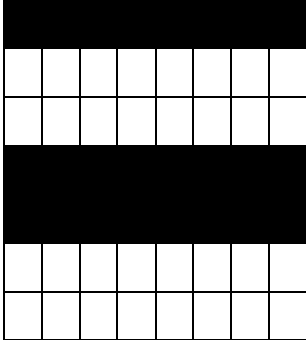
```
<w:shd w:val="pct10" .../>
```


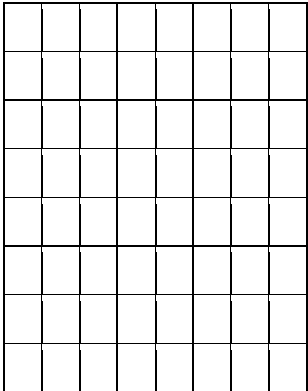
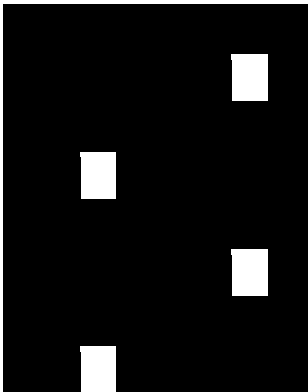
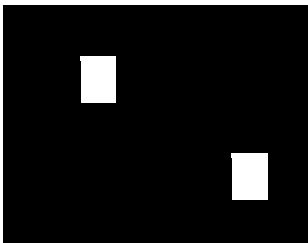
This shading val is pct10, indicating that the border style is a 10 percent foreground fill mask. *end example*]


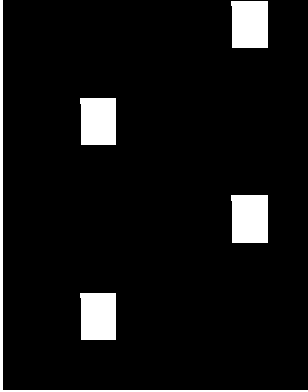
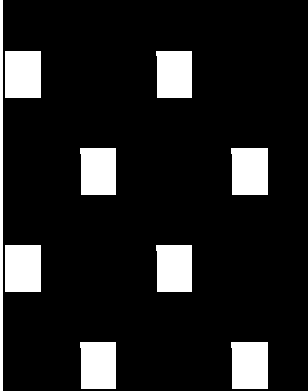
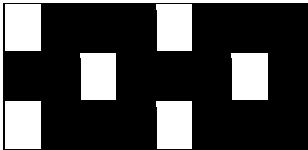
This simple type's contents are a restriction of the W3C XML Schema string datatype.

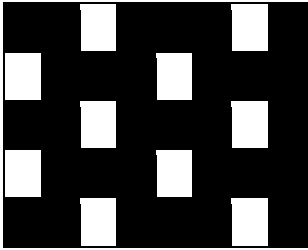
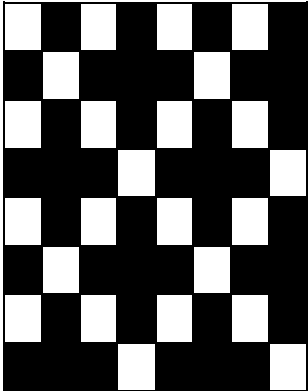
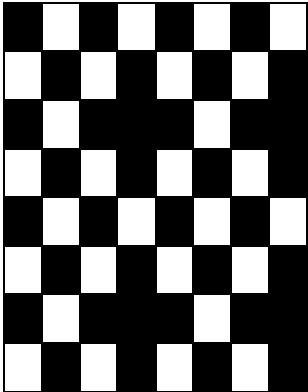

This simple type is restricted to the values listed in the following table:

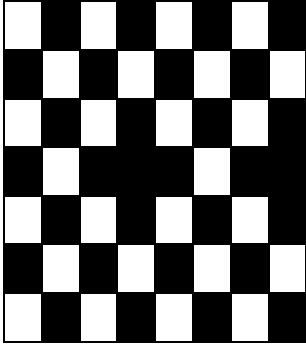
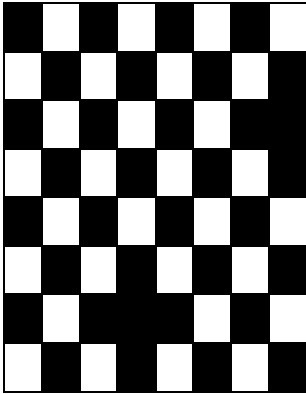
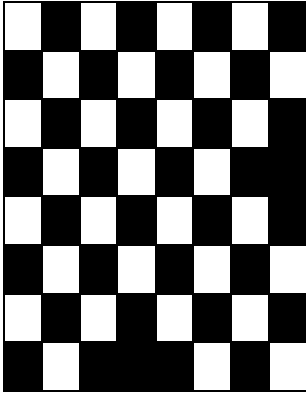
Enumeration Value	Description
clear (No Pattern)	<div>Specifies that the following mask shall be applied as the shading pattern:</div> <div></div>
diagCross (Diagonal Cross Pattern)	<div>Specifies that the following mask shall be applied as the shading pattern:</div> <div></div>

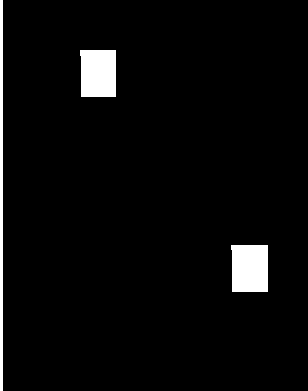
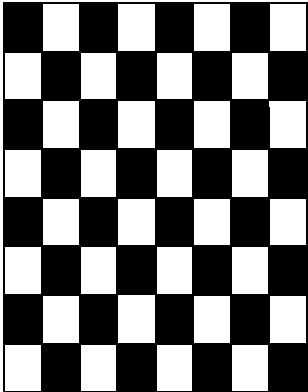
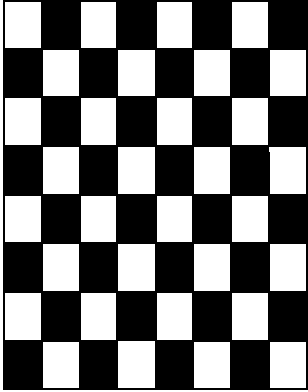
Enumeration Value	Description
diagStripe (Diagonal Stripe Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 
horzCross (Horizontal Cross Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 
horzStripe (Horizontal Stripe Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 

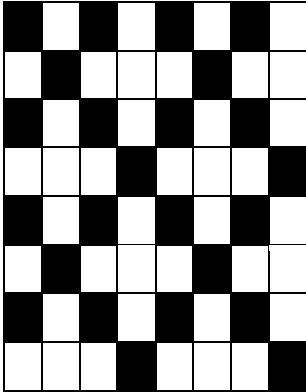
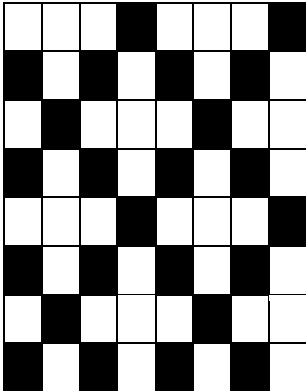
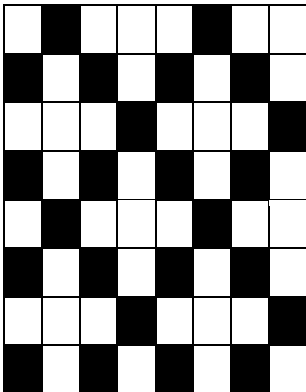
Enumeration Value	Description
	
nil (No Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 
pct10 (10% Fill Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 
pct12 (12.5% Fill Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 

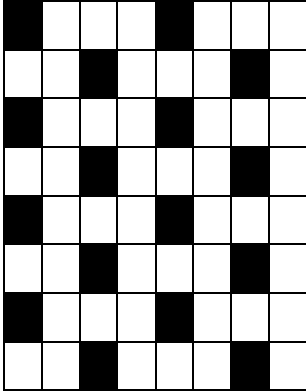
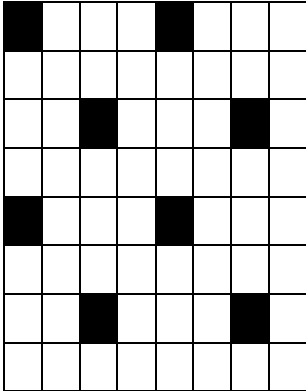
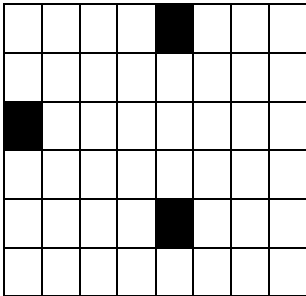
Enumeration Value	Description
	
pct15 (15% Fill Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 
pct20 (20% Fill Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 
pct25 (25% Fill Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 

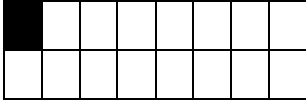
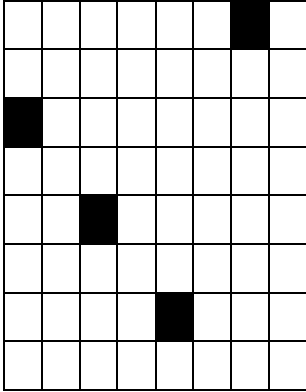
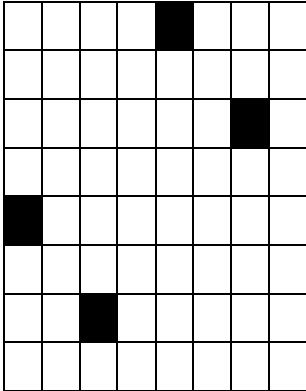
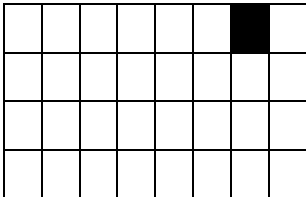
Enumeration Value	Description
	
pct30 (30% Fill Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 
pct35 (35% Fill Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 
pct37 (37.5% Fill Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 

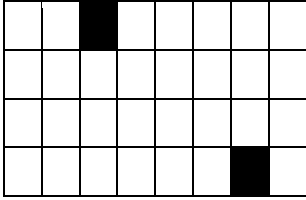
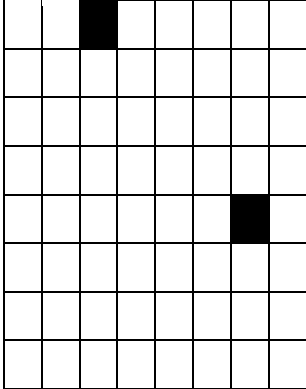
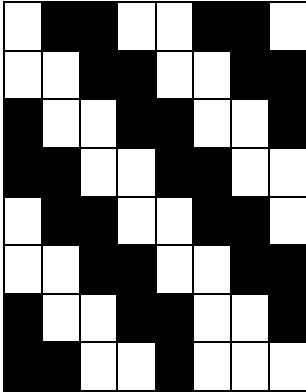
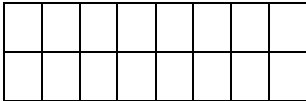
Enumeration Value	Description
	
pct40 (40% Fill Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 
pct45 (45% Fill Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 
pct5 (5% Fill Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p>

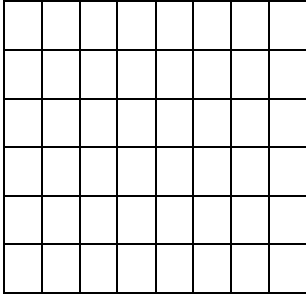
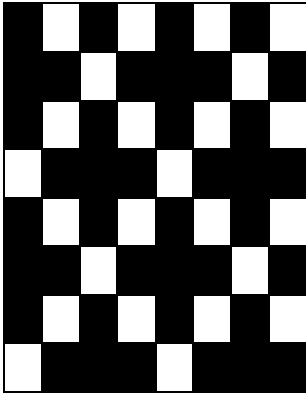
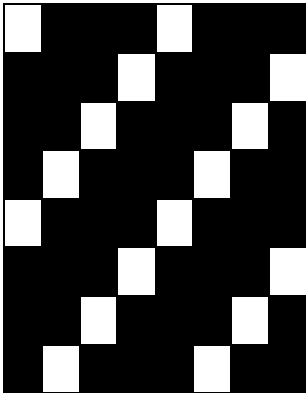
Enumeration Value	Description
	
pct50 (50% Fill Pattern)	<p data-bbox="824 753 1445 825">Specifies that the following mask shall be applied as the shading pattern:</p> 
pct55 (55% Fill Pattern)	<p data-bbox="824 1335 1445 1407">Specifies that the following mask shall be applied as the shading pattern:</p> 

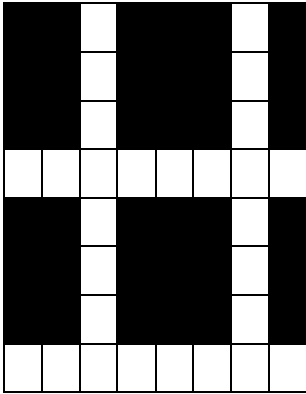
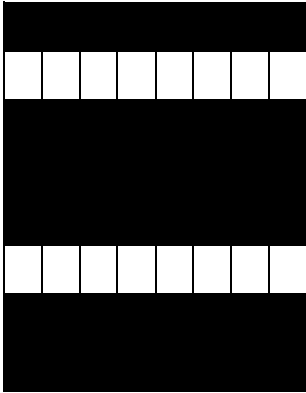
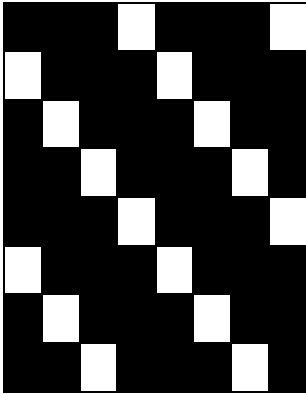
Enumeration Value	Description
pct60 (60% Fill Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 
pct62 (62.5% Fill Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 
pct65 (65% Fill Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 

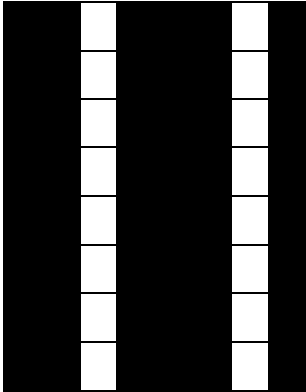
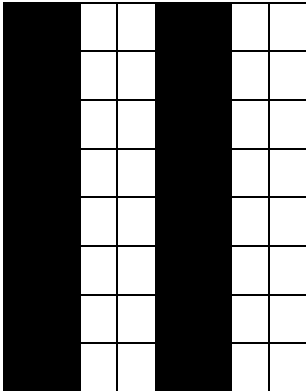
Enumeration Value	Description
pct70 (70% Fill Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 
pct75 (75% Fill Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 
pct80 (80% Fill Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 

Enumeration Value	Description
	
pct85 (85% Fill Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 
pct87 (87.5% Fill Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 
pct90 (90% Fill Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 

Enumeration Value	Description
	
pct95 (95% Fill Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 
reverseDiagStripe (Reverse Diagonal Stripe Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 
solid (100% Fill Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 

Enumeration Value	Description
	
thinDiagCross (Thin Diagonal Cross Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 
thinDiagStripe (Thin Diagonal Stripe Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 
thinHorzCross (Thin Horizontal Cross Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p>

Enumeration Value	Description
	
thinHorzStripe (Thin Horizontal Stripe Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 
thinReverseDiagStripe (Thin Reverse Diagonal Stripe Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 

Enumeration Value	Description
thinVertStripe (Thin Vertical Stripe Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 
vertStripe (Vertical Stripe Pattern)	<p>Specifies that the following mask shall be applied as the shading pattern:</p> 

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Shd](#)) is located in §A.1. *end note*]

17.18.79 ST_ShortHexNumber (Four Digit Hexadecimal Value)

This simple type specifies a number value specified as a two octet (four digit) hexadecimal number, whose contents are interpreted based on the context of the parent XML element.

[Example: Consider the following value for a node of type ST_ShortHexNumber: 2F6C.

This value is permitted, as it contains two hexadecimal octets, each an encoding of an octet of the actual decimal number value. *end example*]

This simple type's contents are a restriction of the W3C XML Schema `hexBinary` datatype.

This simple type also specifies the following restrictions:

- This simple type's contents have a length of exactly 4 hexadecimal digit(s).

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_ShortHexNumber](#)) is located in §A.1. *end note*]

17.18.80 ST_SignedHpsMeasure (Signed Measurement in Half-Points)

This simple type specifies that its contents contain either:

- A positive or negative whole number, whose contents consist of a measurement in half-points (equivalent to 1/144th of an inch).
- A positive or negative number followed immediately by a unit identifier.

The contents of this measurement are interpreted based on the context of the parent XML element.

[*Example:* Consider an attribute value of -72 whose type is `ST_SignedHpsMeasure`. This attribute value specifies a size of negative one-half of an inch or -36 points (-72 halves of a point = -36 points = -0.5 inches). *end example*]

[*Example:* Consider an attribute value of -12.7mm whose type is `ST_SignedHpsMeasure`. This attribute value specifies a size of -0.0127 meter or negative one-half of an inch or -36 points. *end example*]

This simple type is a union of the following types:

- The `ST_UniversalMeasure` simple type (§22.9.2.15).
- The W3C XML Schema integer datatype.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_SignedHpsMeasure](#)) is located in §A.1. *end note*]

17.18.81 ST_SignedTwipsMeasure (Signed Measurement in Twentieths of a Point)

This simple type specifies that its contents contain either:

- A positive or negative whole number, whose contents consist of a measurement in twentieths of a point (equivalent to 1/1440th of an inch), or
- A positive decimal number immediately following by a unit identifier.

The contents of this measurement are interpreted based on the context of the parent XML element.

[*Example:* Consider an attribute value of 720 whose simple type is `ST_SignedTwipsMeasure`. This attribute value specifies a size of one-half of an inch or 36 points (720 twentieths of a point = 36 points = 0.5 inches). *end example*]

[*Example:* Consider an attribute value of -12.7mm whose type is ST_SignedTwipsMeasure. This attribute value specifies a size of -0.0127 meter or negative one-half of an inch or -36 points. *end example*]

This simple type is a union of the following types:

- The ST_UniversalMeasure simple type (§22.9.2.15).
- The W3C XML Schema integer datatype.

[*Note:* The W3C XML Schema definition of this simple type's content model (ST_SignedTwipsMeasure) is located in §A.1. *end note*]

17.18.82 ST_StyleSort (Style Sort Settings)

This simple type specifies the ways in which the list of document styles can be ordered when they are displayed in a user interface.

[*Example:* Consider the WordprocessingML below:

```
<w:stylePaneSortMethod w:val="basedOn" />
```

The stylePaneSortMethod element has a val attribute value of basedOn, which specifies that styles are sorted by the value of their basedOn element (§17.7.4.3). *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
basedOn (Sort by Based On Style)	Specifies that styles which are visible should be sorted by the style on which they are based using the basedOn element (§17.7.4.3).
default (Sort by Default Method)	Specifies that styles which are visible should be sorted by the default sorting of the host application.
font (Sort by Font)	Specifies that styles which are visible should be sorted by the font which they apply.
name (Sort by Style Name)	Specifies that styles which are visible should be sorted by their names.
priority (Sort by Style Priority)	Specifies that styles which are visible should be sorted by their UI priority using the uiPriority element (§17.7.4.19).
type (Sort by Style Type)	Specifies that styles which are visible should be sorted by their style types (i.e. character, linked, paragraph).

[*Note:* The W3C XML Schema definition of this simple type's content model (ST_StyleSort) is located in §A.1. *end note*]

17.18.83 ST_StyleType (Style Types)

This simple type specifies the possible values for the types of style definitions defined within a WordprocessingML document. WordprocessingML supports six types of style definitions:

- Paragraph styles
- Character styles
- Table styles
- Numbering styles
- Linked styles (paragraph + character)
- Default paragraph + character properties

Each of the first four style types corresponds to a different value below, and therefore defines the style type of the current style. [Note: The last two style types are unique in that they are not simply a style type: a linked style is a pairing of a character and paragraph style via the link element (§17.7.4.6); and the document default properties are defined via the docDefaults element (§17.7.5.1). *end note*]

[Example: Consider a style defined as follows:

```
<w:style w:type="paragraph" ... >
  <w:name w:val="My Paragraph Style"/>
  <w:rPr>
    <w:b/>
  </w:rPr>
</w:style>
```

The type attribute is of simple type ST_StyleType, and its value of paragraph specifies that this style definition creates a paragraph style. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
character (Character Style)	Specifies that the parent style definition is a character style.
numbering (Numbering Style)	Specifies that the parent style definition is a numbering style.
paragraph (Paragraph Style)	Specifies that the parent style definition is a paragraph style.
table (Table Style)	Specifies that the parent style definition is a table style.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_StyleType](#)) is located in §A.1.
end note]

17.18.84 ST_TabJc (Custom Tab Stop Type)

This simple type specifies the available types of custom tab stop, which determines the behavior of the tab stop and the alignment which shall be applied to text entered at the current custom tab stop.

[*Example*: Consider a custom tab stops at 1.5" in a WordprocessingML document. This tab stop would be contained within a tab element defining the tab stop as follows:

```
<w:tab w:val="start" w:pos="2160" />
```

The val attribute specifies that this custom tab stop must align all text entered at its location to its left. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
bar (Bar Tab)	Specifies that the current tab is a bar tab. A <i>bar tab</i> is a tab which does not result in a custom tab stop in the parent paragraph (this tab stop location shall be skipped when positioning custom tab characters), but instead shall be used to draw a vertical line (or bar) at this location in the parent paragraph.
center (Centered Tab)	Specifies that the current tab stop shall result in a location in the document where all following text is centered (i.e. all text runs following this tab stop and preceding the next tab stop shall be centered around the tab stop location).
clear (No Tab Stop)	Specifies that the current tab stop is cleared and shall be removed and ignored when processing the contents of this document.
decimal (Decimal Tab)	Specifies that the current tab stop shall result in a location in the document where all following text is aligned around the first decimal character in the following text runs. All text runs before the first decimal character shall be before the tab stop, all text runs after it shall be after the tab stop location.
end (Trailing Tab)	Specifies that the current tab stop shall result in a location in the document where all following text is aligned to its trailing edge (i.e. all text runs following this tab stop and preceding the next tab stop shall be

Enumeration Value	Description
	aligned against the trailing edge with respect to the tab stop location). [<i>Example</i> : In an RTL paragraph, the trailing edge is the left edge, so text aligns to that edge, extending to the right. <i>end example</i>]
num (List Tab)	Specifies that the current tab is a list tab, which is the tab stop between the numbering and the paragraph contents in a numbered paragraph. [<i>Note</i> : This justification style is used for backwards compatibility with earlier word processors, and should be avoided in favor of hanging paragraph indentation. <i>end note</i>]
start (Leading Tab)	Specifies that the current tab stop shall result in a location in the document where all following text is aligned to its leading edge (i.e. all text runs following this tab stop and preceding the next tab stop shall be aligned against the leading edge with respect to the tab stop location).

[*Note*: The W3C XML Schema definition of this simple type's content model (`ST_TabJc`) is located in §A.1. *end note*]

17.18.85 ST_TabTlc (Custom Tab Stop Leader Character)

This simple type specifies the characters which can be used to fill in the space created by a tab which ends at this custom tab stop. The chosen character shall be repeated as required to completely fill the tab spacing generated by the tab character.

[*Example*: Consider a tab stop which should be preceded by a sequence of underscore characters, as follows:

_____Text at the tab stop

This tab stop would have a leader attribute value of underscore, indicating that the tab stop must be preceded by underscore characters as needed to fill the tab spacing. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
dot (Dotted leader line)	Specifies that the leader character for this custom tab stop shall be a dot. [<i>Example</i> :

Enumeration Value	Description
	<p>.....Text at tab stop.</p> <p><i>end example]</i></p>
heavy (Heavy solid leader line)	<p>Specifies that the leader character for this custom tab stop shall be a heavy solid line, or an underscore.</p> <p>[<i>Note:</i> This setting is used for backwards compatibility with earlier word processors, and should be avoided in favor of other leader characters. It can be displayed using underscores if desired. <i>end note]</i></p> <p>[<i>Example:</i></p> <p>_____Text at tab stop.</p> <p><i>end example]</i></p>
hyphen (Dashed tab stop leader line)	<p>Specifies that the leader character for this custom tab stop shall be a hyphen.</p> <p>[<i>Example:</i></p> <p>-----Text at tab stop.</p> <p><i>end example]</i></p>
middleDot (Middle dot leader line)	<p>Specifies that the leader character for this custom tab stop shall be a centered dot.</p> <p>[<i>Example:</i></p> <p>.....Text at tab stop.</p> <p><i>end example]</i></p>
none (No tab stop leader)	<p>Specifies that there shall be no leader character for this custom tab.</p> <p>[<i>Example:</i></p> <p>Text at tab stop.</p> <p><i>end example]</i></p>
underscore (Solid leader line)	<p>Specifies that the leader character for this custom tab stop shall be an underscore.</p> <p>[<i>Example:</i></p>

Enumeration Value	Description
	<p>_____Text at tab stop.</p> <p><i>end example]</i></p>

[Note: The W3C XML Schema definition of this simple type's content model (ST_TabTlc) is located in §A.1. *end note]*

17.18.86 ST_TargetScreenSz (Target Screen Sizes for Generated Web Pages)

This simple type specifies possible ideal minimum target screen sizes (width by height, specified in pixels) for which web pages generated can be optimized when saving this document as a web page.

[Example: Consider a WordprocessingML document which contains the following content within the web settings part:

```
<w:webSettings>
  <w:targetScreenSz w:val="1600x1200" />
</w:webSettings>
```

The targetScreenSz element's val attribute has a value of 1600x1200, which specifies that a target screen size of 1600 by 1200 pixels must be assumed when saving this document as a web page. *end example]*

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
1024x768 (Optimize for 1024x768)	Specifies that web pages produced from this document should be optimized for a screen size of 1024x768.
1152x882 (Optimize for 1152x882)	Specifies that web pages produced from this document should be optimized for a screen size of 1152x882.
1152x900 (Optimize for 1152x900)	Specifies that web pages produced from this document should be optimized for a screen size of 1152x900.
1280x1024 (Optimize for 1280x1024)	Specifies that web pages produced from this document should be optimized for a screen size of 1280x1024.
1600x1200 (Optimize for 1600x1200)	Specifies that web pages produced from this document should be optimized for a screen size of 1600x1200.
1800x1440 (Optimize for 1800x1440)	Specifies that web pages produced from this

Enumeration Value	Description
	document should be optimized for a screen size of 1800x1440.
1920x1200 (Optimize for 1920x1200)	Specifies that web pages produced from this document should be optimized for a screen size of 1920x1200.
544x376 (Optimize for 544x376)	Specifies that web pages produced from this document should be optimized for a screen size of 544x376.
640x480 (Optimize for 640x480)	Specifies that web pages produced from this document should be optimized for a screen size of 640x480.
720x512 (Optimize for 720x512)	Specifies that web pages produced from this document should be optimized for a screen size of 720x512.
800x600 (Optimize for 800x600)	Specifies that web pages produced from this document should be optimized for a screen size of 800x600.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TargetScreenSz](#)) is located in §A.1. *end note*]

17.18.87 ST_TblLayoutType (Table Layout Type)

This simple type defines the possible types of layout algorithms which can be used to lay out a table within a WordprocessingML document.

These algorithms are defined in the following paragraphs (noting, of course, that implementations are free to implement more efficient versions of each).

Fixed Width Table Layout - This method of table layout uses the preferred widths on the table items to generate the final sizing of the table, but does not change that size regardless of the contents of each table cell, hence the table is fixed width.

[Guidance: Although an application can choose to use a different process, this layout could be performed as follows:

- The table grid is used to create the set of shared columns in the table and their initial widths as defined in the tblGrid element (§17.4.48)
- The table's total width is defined based on the tblW property (§17.4.63) – if it is set to auto or nil, then the width is not yet determined and is specified using the row and cell information.
- The first table row is read and the initial number of grid units before the row starts is skipped. The width of the skipped grid columns is set using the wBefore property (§17.4.86).

- The first cell is placed on the grid, and the width of the specified grid column span set by `gridSpan` (§17.4.17) is set based on the `tcW` property (§17.4.71).
- Each additional cell is placed on the grid.
- If at any stage, the preferred width requested for the cells exceeds the preferred width of the table, then each grid column is proportionally reduced in size to fit the table width.
- If the grid is exceeded (e.g. `tblGrid` specifies three grid columns, but the second cell has a `gridSpan` of three), the grid is dynamically increased with a default width for the new grid column.
- For each subsequent row, cells are placed on the grid, and each grid column is adjusted to be the maximum value of the requested widths (if the widths do not agree) by adding width to the last cell that ends with that grid column. Again, if at any point, the space requested for the cells exceeds the width of the table, then each grid column is proportionally reduced in size to fit the table width.

end guidance]

The resulting table shall be displayed regardless of its contents to the size requested.

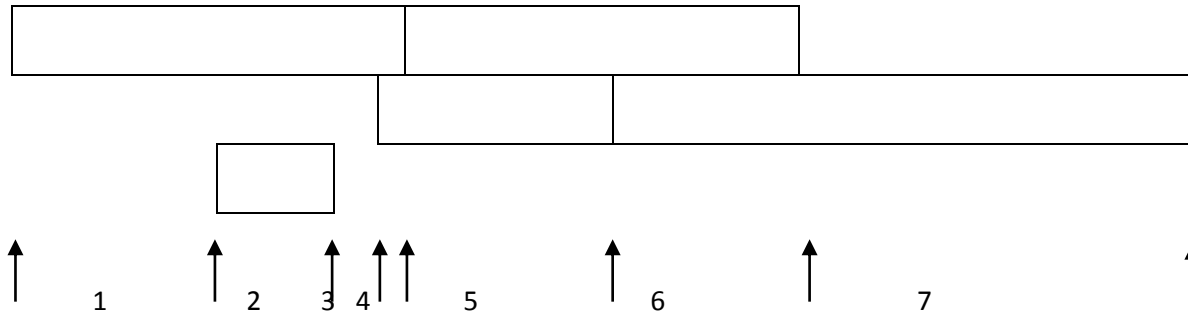
AutoFit Table Layout - This method of table layout uses the preferred widths on the table items to generate the final sizing of the table, but then uses the contents of each cell to determine final column widths.

[*Guidance*: This layout can be performed in any manner available to an application, but one algorithm as follows can be used:

- Perform the steps above to lay out the fixed width version of the table.
- Calculate the minimum content width - the width of the cell's contents including all possible line breaking locations (or the cell's width, if the width of the content is smaller), and the maximum content width - the width of the cell's contents (assuming no line breaking not generated by explicit line breaks).
- The minimum and maximum content width of all cells that span a single grid column is the minimum and maximum content width of that column.
- For cells which span multiple grid columns, enlarge all cells which it spans as needed to meet that cell's minimum width.
- If any cell in a grid column has a preferred width, the first such width overrides the maximum width of the column's contents.
- Place the text in the cells in the table, respecting the minimum content width of each cell's content. If a cell's minimum content width exceeds the cell's current width, preferences are overridden as follows:
 - First, override the column widths by making all other grid columns proportionally smaller until each it at its minimum width. This cell can then grow to any width between its own minimum and maximum width.
 - Next, override the preferred table width until the table reaches the page width.
 - Finally, force a line break in each cell's contents as needed

end guidance]

[Example: Consider the following fixed width table, which makes extensive use of resized and merged cells on what is actually just a seven-column grid. (The arrows point to each (invisible) vertical line of the grid and the numbers refer to the grid columns):



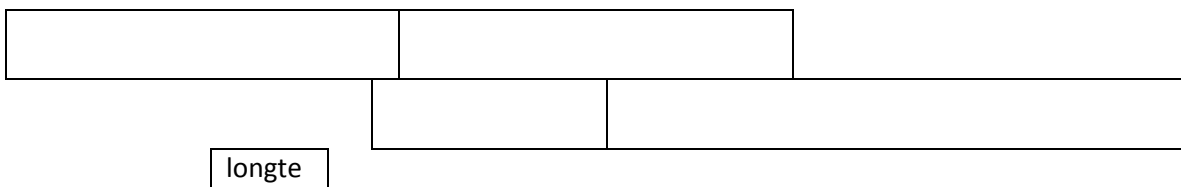
Although the table is visually complex, the standard rules apply: the first cell in the table is simply a cell which spans four grid units horizontally, as specified in the `gridSpan` element, and whose preferred width is 2952 twentieths of a point, specified in the `tcW` element:

```
<w:tc>
  <w:tcPr>
    <w:tcW w:w="2952" w:type="dxa"/>
    <w:gridSpan w:val="4"/>
  </w:tcPr>
</w:tc>
```

Similarly, all cells indented from the start and end of the grid specify that indent using the `gridBefore` and `gridAfter` elements. For example, the XML for the second row in the table shows that that row starts three grid units into the table:

```
<w:tr>
  <w:trPr>
    <w:gridBefore w:val="3"/>
    <w:wBefore w:w="2748" w:type="dxa"/>
  </w:trPr>
  ...
</w:tr>
```

If we take this fixed width table and introduce a long string into the single cell in row three, we see that the presence of this text does not affect cell widths:



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gwithn
obreak
ingcha
racters

If we now turn on the AutoFit property, we see that the algorithm for this AutoFit table causes grid column two to increase in size, proportionally decreasing the other grid columns’ size to accommodate the long non-breaking string in the last cell:

longtextstringwithnobreakingcharacters		

Each of the other grid columns was reduced, but since all columns are not at their minimum size, the table width is not increased even though the table is not yet at the page width. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
autofit (AutoFit Table Layout)	Specifies that this table shall use an AutoFit table layout algorithm.
fixed (Fixed Width Table Layout)	Specifies that this table shall use the fixed width table layout algorithm described above.

[*Note*: The W3C XML Schema definition of this simple type’s content model ([ST_TblLayoutType](#)) is located in §A.1. *end note*]

17.18.88 ST_TblOverlap (Table Overlap Setting)

This simple type contains the possible settings for a floating table which shall be used to determine if the table can overlap with other floating tables when displayed in the document.

[*Example*: Consider two floating tables in a WordprocessingML document which overlap when displayed, as follows:

If either of these tables specifies that it must not allow overlapping, using the following WordprocessingML:

```
<w:tblPr>
  <w:tblOverlap w:val="never"/>
</w:tblPr>
```

The resulting tables must not overlap, and shall be adjusted at display time to prevent any overlapping, for example:

The value of *never* specifies that the specified table cannot overlap with other floating tables in the document.
end example]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
never (Floating Table Cannot Overlap)	Specifies that the parent table, if floating, shall never be displayed in a state where it would be overlapping another floating table in the document. If two floating tables intersect and this option is set on either of them, then one or both tables shall be adjusted as needed to ensure that the table whose value is never is not overlapped when displayed.
overlap (Floating Table Can Overlap)	Specifies that the parent table, if floating, can be displayed in a state where it would be overlapping another floating table in the document.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_TblOverlap](#)) is located in §A.1. *end note*]

17.18.89 ST_TblStyleOverrideType (Conditional Table Style Formatting Types)

This simple type specifies possible values for the sections of the table to which the current conditional formatting properties shall be applied when this table style is used.

[*Example:* Consider a table style which contains conditional formatting, defined as follows:

```
<w:style w:type="table" ...>
  ...
  <w:tblStylePr w:type="lastRow">
    ...
  </w:tblStylePr>
</w:style>
```

The type attribute value of `lastRow` specifies that this set of conditional formatting properties must be applied to the last row of the table only. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
band1Horz (Banded Row Conditional Formatting)	Specifies that the table formatting applies to odd numbered groupings of rows.
band1Vert (Banded Column Conditional Formatting)	Specifies that the table formatting applies to odd numbered groupings of columns.
band2Horz (Even Row Stripe Conditional Formatting)	Specifies that the table formatting applies to even numbered groupings of rows.

Enumeration Value	Description
band2Vert (Even Column Stripe Conditional Formatting)	Specifies that the table formatting applies to even numbered groupings of columns.
firstCol (First Column Conditional Formatting)	Specifies that the table formatting applies to the first column.
firstRow (First Row Conditional Formatting)	Specifies that the table formatting applies to the first row. Any subsequent row which has the tblHeader element present (§17.4.49) shall also use this conditional format.
lastCol (Last table column formatting)	Specifies that the table formatting applies to the last column.
lastRow (Last table row formatting)	Specifies that the table formatting applies to the last row.
neCell (Top right table cell formatting)	Specifies that the table formatting applies to the top right cell.
nwCell (Top left table cell formatting)	Specifies that the table formatting applies to the top left cell.
seCell (Bottom right table cell formatting)	Specifies that the table formatting applies to the bottom right cell.
swCell (Bottom left table cell formatting)	Specifies that the table formatting applies to the bottom left cell.
wholeTable (Whole table formatting)	Specifies that the conditional formatting applies to the whole table.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TblStyleOverrideType](#)) is located in §A.1. *end note*]

17.18.90 ST_TblWidth (Table Width Units)

This simple type specifies the possible values for the units of the width property being defined by a specific table width property. These properties are used to define various properties of a table, including: cell spacing, preferred width, and table margins.

[Example: Consider a table with a table cell bottom cell spacing with a type of dxa, as follows:

```
<w:bottom ... w:type="dxa" />
```

This type must therefore be used to interpret the width specified in the w attribute as a value in twentieths of a point. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
auto (Automatically Determined Width)	<p>Specifies that the value for the measurement of the current table width property in the parent table shall be automatically determined by the table layout algorithm when the table is displayed (this width can be adjusted as appropriate).</p> <p>If this value is inappropriate for the current measurement (i.e. this measurement is not affected by that algorithm), then this width type and the associated value can be ignored.</p>
dxa (Width in Twentieths of a Point)	<p>Specifies that the value for the measurement of the current table width property in the parent table shall be interpreted as twentieths of a point (1/1440 of an inch).</p>
nil (No Width)	<p>Specifies that the current width is zero, regardless of any width value specified on the parent element.</p>
pct (Width in Percent of Table Width)	<p>Specifies that the value for the measurement of the current table width property in the parent table shall be interpreted as whole percentage point when a percent sign (U+0025) is present.</p> <p>These percentages shall be calculated relative to the extents specified by the parent XML element.</p> <p>If this value is inappropriate for the current measurement (i.e. this measurement is not part of the width of the table), then this width type and the associated value can be ignored.</p>

[Note: The W3C XML Schema definition of this simple type’s content model ([ST_TblWidth](#)) is located in §A.1. *end note*]

17.18.91 ST_TextAlignment (Vertical Text Alignment Types)

This simple type specifies the type of vertical alignment which shall be used to align the characters on each line in the parent object.

[Example: Consider a paragraph of text of different font sizes, as follows:

This is text of various sizes.

If the text on this paragraph must be aligned based on the top point of the maximum character height, that requirement would be specified as follows in the WordprocessingML:

```
<w:pPr>
  <w:textAlignment w:val="top" />
</w:pPr>
```

The resulting text would be top aligned, as follows:

This is text of **various** sizes.

The characters are all aligned to the maximum character extent on the line. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
auto (Automatically Determine Alignment)	Specifies that all text in the parent object shall be aligned automatically when displayed.
baseline (Align Text at Baseline)	Specifies that all text in the parent object shall be aligned to the baseline of each character when displayed.
bottom (Align Text at Bottom)	Specifies that all text in the parent object shall be aligned to the bottom of each character when displayed.
center (Align Text at Center)	Specifies that all text in the parent object shall be aligned to the center of each character when displayed.
top (Align Text at Top)	Specifies that all text in the parent object shall be aligned to the top of each character when displayed.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TextAlignment](#)) is located in §A.1. *end note*]

17.18.92 ST_TextboxTightWrap (Lines To Tight Wrap Within Text Box)

This simple type specifies the lines in the parent paragraph which shall allow the text to be tight wrapped to the paragraph (and not the containing text box) extents when displaying the document.

[Example: Consider a paragraph in a text box which meets the criteria specified above which must allow wrapping to the text extents on its first line only. That requirement would be specified using the following WordprocessingML:

```
<w:pPr>
  <w:textboxTightWrap w:val="firstLineOnly" />
</w:pPr>
```

The resulting paragraph would allow text to tightly wrap to the contents of its first line only. All other lines would wrap to the text box's extents. *end example*

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
allLines (Tight Wrap All Lines)	Specifies that all lines in the paragraph shall allow surrounding text to be tight wrapped to their extents and not the containing text box's extents.
firstAndLastLine (Tight Wrap First and Last Lines)	Specifies that only the first and last lines in the paragraph shall allow surrounding text to be tight wrapped to their extents and not the containing text box's extents.
firstLineOnly (Tight Wrap First Line)	Specifies that only the first line in the paragraph shall allow surrounding text to be tight wrapped to their extents and not the containing text box's extents.
lastLineOnly (Tight Wrap Last Line)	Specifies that only the last line in the paragraph shall allow surrounding text to be tight wrapped to their extents and not the containing text box's extents.
none (Do Not Tight Wrap)	Specifies that no lines in the paragraph shall allow surrounding text to be tight wrapped to their extents and not the containing text box's extents.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_TextboxTightWrap](#)) is located in §A.1. *end note*]

17.18.93 ST_TextDirection (Text Flow Direction)

This simple type specifies the direction of the text flow for the parent object.

[*Example:* Consider an object in which text must be oriented vertically, flowing from left to right horizontally on the page. This is achieved by using an `lr` value in an element of type `ST_TextDirection`. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
lr (Lines Flow From Left to Right)	Specifies that text in the parent object shall be oriented vertically, flowing from left to right

Enumeration Value	Description
	<p>horizontally on the page.</p> <p>This means that vertical lines are filled before the text expands horizontally.</p>
lrV (Lines Flow From Left to Right Rotated)	<p>Specifies that text in the parent object shall be oriented vertically, flowing from left to right horizontally on the page.</p> <p>This means that vertical lines are filled before the text expands horizontally.</p> <p>This flow is also rotated clockwise such that text which is not in an East Asian script is rotated 90 degrees when displayed on a page.</p>
rl (Lines Flow From Right to Left)	<p>Specifies that text in the parent object shall be oriented vertically, flowing from right to left horizontally on the page, as if the text were rotated 90 degrees.</p> <p>This means that vertical lines are filled before the text expands horizontally.</p>
rlV (Lines Flow From Right to Left Rotated)	<p>Specifies that text in the parent object shall be oriented vertically, flowing from right to left horizontally on the page.</p> <p>This means that vertical lines are filled before the text expands horizontally.</p> <p>This flow is also rotated such that text which is not in an East Asian script is rotated 90 degrees clockwise when displayed on a page.</p>
tb (Lines Flow From Top to Bottom)	<p>Specifies that text in the parent object shall be oriented horizontally, flowing from top to bottom vertically on the page.</p> <p>The text direction can be set to right-to-left using the <code>bidirectional</code> element (§17.3.1.6) within individual paragraphs.</p> <p>This means that horizontal lines are filled before the text expands vertically.</p>
tbV (Lines Flow From Top to Bottom Rotated)	<p>Specifies that text in the parent object shall be oriented horizontally, flowing from top to bottom vertically on the page.</p>

Enumeration Value	Description
	<p>This means that horizontal lines are filled before the text expands vertically.</p> <p>This flow is also rotated such that any characters from an East Asian script shall be rotated 270 degrees clockwise when displayed on a page.</p>

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_TextDirection](#)) is located in §A.1. *end note*]

17.18.94 ST_TextEffect (Animated Text Effects)

This simple type specifies the possible types of animated text effect which can be applied to a text run when it is displayed..

[*Example*: Consider a run of text which must have an animated text effect consisting of multiple colored flashing lights. This constraint is specified using the following WordprocessingML:

```
<w:rPr>
  <w:effect w:val="lights"/>
</w:rPr>
```

This run explicitly declares a type of text effect, using the val property, of `lights`, so the contents of this run has the animated lights text effect. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
antsBlack (Black Dashed Line Animation)	Specifies that this text shall be surrounded by an animated black dashed line border.
antsRed (Marching Red Ants)	Specifies that this text shall be surrounded by an animated red dashed line border.
blinkBackground (Blinking Background Animation)	Specifies that this text shall be surrounded by a background color which alternates between black and white.
lights (Colored Lights Animation)	Specifies that this text shall be surrounded by a border consisting of a series of colored lights, which constantly change colors in sequence.
none (No Animation)	Specifies that this text shall have no animated text effect.
shimmer (Shimmer Animation)	Specifies that this text shall be animated by alternating between normal and blurry states.

Enumeration Value	Description
sparkle (Sparkling Lights Animation)	Specifies that this text shall have a background consisting of a random pattern of colored lights, which constantly change colors in sequence.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_TextEffect](#)) is located in §A.1. *end note*]

17.18.95 ST_TextScale (Text Expansion/Compression Percentage)

This simple type specifies that the percentage by which the contents of a run shall be expanded or compressed with respect to its normal (100%) character width, with a minimum width of 1% and maximum width of 600%.

[*Example*: Consider a run of text which must be compressed by half when displaying each character within the contents of the run. This constraint is specified using the following WordprocessingML:

```
<w:rPr>
  <w:w w:val="50%" />
</w:rPr>
```

This run explicitly declares that the `w` value is 50%, so the contents of this run appear at 50% of their normal character width by compressing the width of each character. *end example*]

This simple type is a union of the following types:

- The `ST_TextScalePercent` simple type (§A.1).

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_TextScale](#)) is located in §A.1. *end note*]

17.18.96 ST_Theme (Theme Font)

This simple type specifies a theme font type which can be referenced as a theme font within the parent run properties. This theme font is a reference to one of the predefined theme fonts, located in the document's Theme part, which allows for font information to be set centrally in the document.

[*Example*: Consider a run of text which must be displayed using the `majorASCII` theme font. This requirement would be specified as follows in the resulting WordprocessingML:

```
<w:rPr>
  <w:rFonts w:asciiTheme="majorAscii" />
</w:rPr>
```

The `ascii` attribute specifies that the run must use the `majorAscii` theme font as defined in the document's themes part for all text in the appropriate range. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
majorAscii (Major ASCII Theme Font)	Specifies that the current font is a reference to the major theme font for the range of characters from U+0000–U+007F.
majorBidi (Major Complex Script Theme Font)	Specifies that the current font is a reference to the major theme font for the Complex Script range.
majorEastAsia (Major East Asian Theme Font)	Specifies that the current font is a reference to the major theme font for the East Asian range.
majorHAnsi (Major High ANSI Theme Font)	Specifies that the current font is a reference to the major theme font for the High ANSI range.
minorAscii (Minor ASCII Theme Font)	Specifies that the current font is a reference to the minor theme font for the range of characters from U+0000–U+007F.
minorBidi (Minor Complex Script Theme Font)	Specifies that the current font is a reference to the minor theme font for the Complex Script range.
minorEastAsia (Minor East Asian Theme Font)	Specifies that the current font is a reference to the minor theme font for the East Asian range.
minorHAnsi (Minor High ANSI Theme Font)	Specifies that the current font is a reference to the minor theme font for the High ANSI range.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Theme](#)) is located in §A.1. *end note*]

17.18.97 ST_ThemeColor (Theme Color)

This simple type specifies a theme color to be applied to the current object. The specified theme color is a reference to one of the predefined theme colors, located in the document's Theme part, which allows color information to be set centrally in the document.

[Example: Consider a set of borders configured to use the accent2 theme color, resulting in the following WordprocessingML markup:

```
<w:top ... w:color="FFA8A0" w:themeColor="accent2" w:themeTint="99" />
<w:bottom ... w:color="FFA8A0" w:themeColor="accent2" w:themeTint="99" />
<w:left ... w:color="FFA8A0" w:themeColor="accent2" w:themeTint="99" />
<w:right ... w:color="FFA8A0" w:themeColor="accent2" w:themeTint="99" />
```

The borders have a themeColor attribute of type ST_ThemeColor that when specified, imports the accent2 theme color specified for this document. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
accent1 (Accent 1 Theme Color)	Specifies that the color to be used shall be the theme color specified by the accent1 attribute of the clrSchemeMapping element (§17.15.1.20).
accent2 (Accent 2 Theme Color)	Specifies that the color to be used shall be the theme color specified by the accent2 attribute of the clrSchemeMapping element (§17.15.1.20).
accent3 (Accent 3 Theme Color)	Specifies that the color to be used shall be the theme color specified by the accent3 attribute of the clrSchemeMapping element (§17.15.1.20).
accent4 (Accent 4 Theme Color)	Specifies that the color to be used shall be the theme color specified by the accent4 attribute of the clrSchemeMapping element (§17.15.1.20).
accent5 (Accent 5 Theme Color)	Specifies that the color to be used shall be the theme color specified by the accent5 attribute of the clrSchemeMapping element (§17.15.1.20).
accent6 (Accent 6 Theme Color)	Specifies that the color to be used shall be the theme color specified by the accent6 attribute of the clrSchemeMapping element (§17.15.1.20).
background1 (Background 1 Theme Color)	Specifies that the color to be used shall be the theme color specified by the bg1 attribute of the clrSchemeMapping element (§17.15.1.20).
background2 (Background 2 Theme Color)	Specifies that the color to be used shall be the theme color specified by the bg2 attribute of the clrSchemeMapping element (§17.15.1.20).
dark1 (Dark 1 Theme Color)	Specifies that the color to be used shall be the theme color specified by the t1 attribute of the clrSchemeMapping element (§17.15.1.20).
dark2 (Dark 2 Theme Color)	Specifies that the color to be used shall be the theme color specified by the t2 attribute of the clrSchemeMapping element (§17.15.1.20).
followedHyperlink (Followed Hyperlink Theme Color)	Specifies that the color to be used shall be the theme color specified by the followedHyperlink attribute of the clrSchemeMapping element (§17.15.1.20).
hyperlink (Hyperlink Theme Color)	Specifies that the color to be used shall be the theme color specified by the hyperlink attribute of the clrSchemeMapping element (§17.15.1.20).
light1 (Light 1 Theme Color)	Specifies that the color to be used shall be the theme color specified by the bg1 attribute of the clrSchemeMapping element (§17.15.1.20).

Enumeration Value	Description
light2 (Light 2 Theme Color)	Specifies that the color to be used shall be the theme color specified by the bg2 attribute of the clrSchemeMapping element (§17.15.1.20).
none (No Theme Color)	Specifies that no theme color shall be applied to the current object.
text1 (Text 1 Theme Color)	Specifies that the color to be used shall be the theme color specified by the t1 attribute of the clrSchemeMapping element (§17.15.1.20).
text2 (Text 2 Theme Color)	Specifies that the color to be used shall be the theme color specified by the t2 attribute of the clrSchemeMapping element (§17.15.1.20).

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ThemeColor](#)) is located in §A.1. *end note*]

17.18.98 ST_UcharHexNumber (Two Digit Hexadecimal Value)

This simple type specifies a number value specified as a one octet (two digit) hexadecimal number, whose contents are interpreted based on the context of the parent XML element.

[Example: Consider the following value for a node of type ST_UcharHexNumber: BE.

This value is permitted, as it contains two hexadecimal digits, as an encoding of an octet of the actual decimal number value. *end example*]

This simple type's contents are a restriction of the W3C XML Schema hexBinary datatype.

This simple type also specifies the following restrictions:

- This simple type's contents have a length of exactly 2 hexadecimal digit(s).

[Note: The W3C XML Schema definition of this simple type's content model ([ST_UcharHexNumber](#)) is located in §A.1. *end note*]

17.18.99 ST_Underline (Underline Patterns)

This simple type specifies the types of patterns which can be used to create the underline applied beneath the text in a run.

[Example: Consider a run of text which must have a double underline explicitly turned on for the contents of the run. This constraint is specified using the following WordprocessingML:

```
<w:rPr>
  <w:u w:val="double"/>
</w:rPr>
```

The val of the underline on this run is double, so the style of the underline on this run must be a double line.
end example]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
dash (Dashed Underline)	Specifies an underline consisting of a dashed line beneath all characters in this run. <i>[Example:</i> <u>Underline text.</u> <i>end example]</i>
dashDotDotHeavy (Thick Dash-Dot-Dot Underline)	Specifies an underline consisting of a series of thick dash, dot, dot characters beneath all characters in this run. <i>[Example:</i> <u>Underline text.</u> <i>end example]</i>
dashDotHeavy (Thick Dash-Dot Underline)	Specifies an underline consisting of a series of thick dash, dot characters beneath all characters in this run. <i>[Example:</i> <u>Underline text.</u> <i>end example]</i>
dashedHeavy (Thick Dashed Underline)	Specifies an underline consisting of a series of thick dashes beneath all characters in this run. <i>[Example:</i> <u>Underline text.</u> <i>end example]</i>
dashLong (Long Dashed Underline)	Specifies an underline consisting of long dashed characters beneath all characters in this run. <i>[Example:</i>

Enumeration Value	Description
	<p><u>Underline text.</u></p> <p><i>end example]</i></p>
dashLongHeavy (Thick Long Dashed Underline)	<p>Specifies an underline consisting of thick long dashed characters beneath all characters in this run.</p> <p>[Example:</p> <p><u>Underline text.</u></p> <p><i>end example]</i></p>
dotDash (Dash-Dot Underline)	<p>Specifies an underline consisting of a series of dash, dot characters beneath all characters in this run.</p> <p>[Example:</p> <p><u>Underline text.</u></p> <p><i>end example]</i></p>
dotDotDash (Dash-Dot-Dot Underline)	<p>Specifies an underline consisting of a series of dash, dot, dot characters beneath all characters in this run.</p> <p>[Example:</p> <p><u>Underline text.</u></p> <p><i>end example]</i></p>
dotted (Dotted Underline)	<p>Specifies an underline consisting of a series of dot characters beneath all characters in this run.</p> <p>[Example:</p> <p><u>Underline text.</u></p> <p><i>end example]</i></p>
dottedHeavy (Thick Dotted Underline)	<p>Specifies an underline consisting of a series of thick dot characters beneath all characters in this run.</p> <p>[Example:</p> <p><u>Underline text.</u></p>

Enumeration Value	Description
	<i>end example]</i>
double (Double Underline)	<p>Specifies an underline consisting of two lines beneath all characters in this run.</p> <p>[Example:</p> <p><u><u>Underline text.</u></u></p> <p><i>end example]</i></p>
none (No Underline)	<p>Specifies no underline beneath this run.</p> <p>[Example:</p> <p>Underline text.</p> <p><i>end example]</i></p>
single (Single Underline)	<p>Specifies an underline consisting of a single line beneath all characters in this run.</p> <p>[Example:</p> <p><u>Underline text.</u></p> <p><i>end example]</i></p>
thick (Thick Underline)	<p>Specifies an underline consisting of a single thick line beneath all characters in this run.</p> <p>[Example:</p> <p><u>Underline text.</u></p> <p><i>end example]</i></p>
wave (Wave Underline)	<p>Specifies an underline consisting of a single wavy line beneath all characters in this run.</p> <p>[Example:</p> <p><u>Underline text.</u></p> <p><i>end example]</i></p>
wavyDouble (Double Wave Underline)	<p>Specifies an underline consisting of a pair of wavy lines beneath all characters in this run.</p>

Enumeration Value	Description
	<p>[Example:</p> <p><u>Underline text.</u></p> <p>end example]</p>
wavyHeavy (Heavy Wave Underline)	<p>Specifies an underline consisting of a single thick wavy line beneath all characters in this run.</p> <p>[Example:</p> <p><u>Underline text.</u></p> <p>end example]</p>
words (Underline Non-Space Characters Only)	<p>Specifies an underline consisting of a single line beneath all non-space characters in the run. There shall be no underline beneath any space character (breaking or non-breaking).</p> <p>[Example:</p> <p><u>Underline text.</u></p> <p>end example]</p>

[Note: The W3C XML Schema definition of this simple type's content model ([ST Underline](#)) is located in §A.1. end note]

17.18.100 ST_VAnchor (Vertical Anchor Location)

This simple type specifies the vertical position to which the parent object has been anchored in the document. This anchor position shall be used as the base location to determine the final vertical position of the object in the document.

[Example: Consider a text frame which should be positioned one inch to the right of its column in a left-to-right document. This text frame would be specified using the following WordprocessingML:

```
<w:pPr>
  <w:framePr ... w:y="1440" w:vAnchor="page" />
</w:pPr>
```

These frame vertical anchor properties specify that they are relative to the anchor paragraph's page. end example]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
margin (Relative To Margin)	Specifies that the parent object shall be vertically anchored to the text margins. This shall be used to specify that any vertical positioning values shall be calculated with respect to the location of the text margin.
page (Relative To Page)	Specifies that the parent object shall be vertically anchored to the page edge. This shall be used to specify that any vertical positioning values shall be calculated with respect to the location of the edge of the page.
text (Relative To Vertical Text Extents)	Specifies that the parent object shall be vertically anchored to the text extents. This shall be used to specify that any vertical positioning values shall be calculated with respect to the location of the top edge of the text in the anchor paragraph.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_VAnchor](#)) is located in §A.1. *end note*]

17.18.101 ST_VerticalJc (Vertical Alignment Type)

This simple type specifies the vertical alignment for text between the top and bottom margins of the parent container (page or table cell).

[*Example*: Consider a region where the text must be vertically centered in the parent element. This would require a val value of center, in order to specify that all justification vertically must be centered relative to the parent. For a section, this setting would be specified as follows:

```
<w:vAlign w:val="center" />
```

The val attribute of center specifies that the content is centered relative to its container . *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
both (Vertical Justification)	Specifies that the text shall be vertically justified

Enumeration Value	Description
	<p>between the top and bottom margins of the parent object, by adding additional line spacing to each paragraph as required.</p> <p>This setting is only applied for the content of the section which is displayed on full pages. If the content does not use the full page (e.g. another section begins on the same page, or the document ends mid-page), then the value shall be ignored when rendering that page (returning to the default value of top)</p> <p>This value is only permitted for page justification settings, and shall be ignored when specified on a table cell (returning to the default value of top).</p>
bottom (Align Bottom)	Specifies that the text shall be vertically aligned to the bottom margin of the parent object, by moving all text to the bottom text extent within the parent object as required.
center (Align Center)	Specifies that the text shall be vertically aligned to the center of the parent object..
top (Align Top)	Specifies that the text shall be vertically aligned to the top margin of the parent object, by moving all text to the top text extent within the parent object as required.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_VerticalJc](#)) is located in §A.1. *end note*]

17.18.102 ST_View (Document View Values)

This simple type defines the possible views which can be used to determine how WordprocessingML documents can be rendered when displayed by an application.

[Example: Consider a WordprocessingML document that must be displayed on the screen in the same form as it is printed. This requirement would be specified using the following WordprocessingML in the document settings part:

```
<w:view w:val="print" />
```

The view element's val attribute is equal to print specifying that the given WordprocessingML document must be rendered as it is printed. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
masterPages (Master Document View)	Specifies that a given WordprocessingML document shall be rendered in a view optimized for outlining or creating long documents. [<i>Note</i> : This setting can be interpreted as functionally equivalent to the <code>outline</code> setting, as it only remains separate to support legacy applications. <i>end note</i>]
none (Default View)	Specifies that a given WordprocessingML document shall be rendered in the default view of the application.
normal (Draft View)	Specifies that a given WordprocessingML document shall be rendered in a view optimized for outlining or creating long documents.
outline (Outline View)	Specifies that a given WordprocessingML document shall be rendered in a view optimized for outlining or creating long documents.
print (Print Layout View)	Specifies that this document shall be opened in a view that displays the document as it prints.
web (Web Page View)	Specifies that a given WordprocessingML document shall be rendered in a view mimicking the way this document would be displayed in a web page.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_View](#)) is located in §A.1. *end note*]

17.18.103 ST_WmlColorSchemeIndex (Theme Color Reference)

This simple type specifies the possible set of theme color stored in the document's Theme part which can be referenced by document content. This reference is used to map the use of the theme colors in the `ST_ThemeColor` enumeration to the theme colors in the theme part.

[*Example*: Consider a WordprocessingML document that must have references to the theme color `accent1` mapped to the theme color `lt1` as defined in the document's theme part. This requirement would be specified using the following WordprocessingML in the document settings:

```
<w:clrSchemeMapping w:accent1="light1" />
```

The `accent1` attribute has a value of `light1`, specifying that uses of the theme color value `accent1` must be mapped to the theme color `lt1`. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
accent1 (Accent 1 Theme Color Reference)	Specifies a reference to the accent1 theme color in the document's Theme part.
accent2 (Accent 2 Theme Color Reference)	Specifies a reference to the accent2 theme color in the document's Theme part.
accent3 (Accent 3 Theme Color Reference)	Specifies a reference to the accent3 theme color in the document's Theme part.
accent4 (Accent4 Theme Color Reference)	Specifies a reference to the accent4 theme color in the document's Theme part.
accent5 (Accent5 Theme Color Reference)	Specifies a reference to the accent5 theme color in the document's Theme part.
accent6 (Accent 6 Theme Color Reference)	Specifies a reference to the accent6 theme color in the document's Theme part.
dark1 (Dark 1 Theme Color Reference)	Specifies a reference to the dk1 theme color in the document's Theme part.
dark2 (Dark 2 Theme Color Reference)	Specifies a reference to the dk2 theme color in the document's Theme part.
followedHyperlink (Followed Hyperlink Theme Color Reference)	Specifies a reference to the folHlink theme color in the document's Theme part.
hyperlink (Hyperlink Theme Color Reference)	Specifies a reference to the hlink theme color in the document's Theme part.
light1 (Light 1 Theme Color Reference)	Specifies a reference to the lt1 theme color in the document's Theme part.
light2 (Light 2 Theme Color Reference)	Specifies a reference to the lt2 theme color in the document's Theme part.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_WmlColorSchemeIndex](#)) is located in §A.1. *end note*]

17.18.104 ST_Wrap (Text Wrapping around Text Frame Type)

This simple type specifies the type of text wrapping which shall be allowed around a text frame within a document.

[Example: Consider the following WordprocessingML fragment specifying a text frame:

```
<w:p>
  <w:pPr>
    <w:framePr w:w="2419" w:h="2189" w:hRule="atLeast" w:hSpace="187"
w:wrap="around" w:vAnchor="text" w:hAnchor="page" w:x="1643" w:y="73" />
  </w:pPr>
```

```

<w:r>
  <w:t>Text Frame Content.</w:t>
</w:r>
</w:p>

```

This wrap attribute on this text frame specifies that when the frame is rendered on the page, any non-text frame paragraphs which would normally flow onto the same lines must be allowed to wrap around it. *end example]*

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
around (Allow Text Wrapping Around Frame)	Specifies that text shall be allowed to wrap around the remaining space on each line around this text frame in the document.
auto (Default Text Wrapping Around Frame)	Specifies that text shall have the default application-defined behavior of the application displaying the WordprocessingML document with regard to the text wrapping displayed around the frame.
none (No Text Wrapping Around Frame)	Specifies that text shall not be allowed to wrap around the remaining space on each lines around this text frame. Any text content shall therefore be placed on the next line following this text frame which does not intersect with the frame's extents.
notBeside (No Text Wrapping Beside Frame)	Specifies that text shall not be allowed to wrap around the remaining space on each lines around this text frame. Any text content shall therefore be placed on the next line following this text frame which does not intersect with the frame's extents.
through (Through Text Wrapping Around Frame)	Specifies that text shall be allowed to wrap around the remaining space on each line around this text frame in the document.
tight (Tight Text Wrapping Around Frame)	Specifies that text shall be allowed to tightly wrap around the remaining space on each line around this text frame in the document.

[Note: The W3C XML Schema definition of this simple type's content model ([ST Wrap](#)) is located in §A.1. *end note]*

17.18.105 ST_Zoom (Magnification Preset Values)

This simple type specifies the type of magnification settings which can be applied to a given document on open.

[*Example*: Consider a WordprocessingML document that should be visible without any horizontal scrolling when it is displayed. This requirement would be specified using the following WordprocessingML:

```
<w:zoom w:val="bestFit" w:percent="90%" />
```

The val attribute is equal to the value bestFit specifying that an application must dynamically calculate the magnification needed such that the given document must be visible on the horizontal plane of the document with no horizontal scrolling required to see any part of the WordprocessingML document's pages. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
bestFit (Display Page Width)	Specifies that the magnification setting shall be adjusted to ensure the width of the current page matches the available window width.
fullPage (Display One Full Page)	Specifies that the magnification setting shall be adjusted to ensure that one full page can be seen at a time.
none (No Preset Magnification)	Specifies that no preset magnification is present, and the last known cached setting shall be used.
textFit (Display Text Width)	Specifies that the magnification setting shall be adjusted to ensure the width of the text extents on the current page matches the available window width.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_Zoom](#)) is located in §A.1. *end note*]

17.18.106 ST_TextScalePercent (Text Expansion/Compression Percentage)

This simple type specifies that the percentage by which the contents of a run shall be expanded or compressed with respect to its normal (100%) character width, with a minimum width of 1% and maximum width of 600%.

[*Example*: Consider a run of text that must be compressed by half when displaying each character within the contents of the run. This constraint is specified using the following WordprocessingML:

```
<w:rPr>  
  <w:w w:val="50%" />  
</w:rPr>
```

This run explicitly declares that the *w* value is 50%, so the contents of this run appear at 50% of their normal character width by compressing the width of each character. *end example*]

This simple type also specifies the following restrictions:

This simple type's contents shall match the following regular expression pattern:

`0*(600|([0-5]?[0-9]?[0-9]))%`.

[*Note*: The W3C XML Schema definition of this simple type's content model (ST_TextScalePercent) is located in §A.1. *end note*]

17.18.107 ST_MeasurementOrPercent (Measurement or Percentage Value)

This simple type specifies the possible values for a table measurement, which can be percentage-based or absolute. See the union's member types for details.

This simple type is a union of the following types:

The ST_DecimalNumberOrPercent simple type (§17.18.11).

The ST_UniversalMeasure simple type (§22.9.2.15).

[*Note*: The W3C XML Schema definition of this simple type's content model (ST_MeasurementOrPercent) is located in §A.1. *end note*]

18. SpreadsheetML Reference Material

[Note: For further information on the mapping of elements and attributes to OPC parts, see the Bibliography entry, “Information on elements, attributes, and OPC parts in ECMA-376 (OOXML)”. *end note*]

The subordinate subclauses specify the semantics for the XML markup comprising a SpreadsheetML document, as defined by §12 of this Part of ECMA-376.

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End of informative text.

18.2 Workbook

A workbook is composed of workbook-level properties and a collection of 1 or more sheets. The sheets are the central structure within a workbook, and can contain cells, which, in turn, can contain the text, numbers, dates, formulas, and other constructs of a workbook. The workbook part and corresponding properties comprise data used to set application and workbook-level operational state. The workbook also serves to bind all the sheets and child elements into an organized single file. The workbook XML attributes and elements include information about what application last saved the file, where and how the windows of the workbook were positioned, and an enumeration of the worksheets in the workbook.

It is important for the sake of simplicity to minimize the *required* set of workbook XML attributes and elements that shall be present to compose a valid SpreadsheetML workbook. Therefore this is the XML for the smallest possible (blank) workbook:

```
<workbook>
```

```
<sheets>
  <sheet name="Sheet1" sheetId="1" r:id="rId1"/>
</sheets>
</workbook>
```

Note that this workbook has a single sheet, named Sheet1. An Id for the sheet is required, and a relationship Id pointing to the location of the sheet definition is also required.

18.2.1 bookViews (Workbook Views)

This element specifies the collection of workbook views of the enclosing workbook. Each view can specify a window position, filter options, and other configurations. There is no limit on the number of workbook views that can be defined for a workbook.

[Example:

```
<bookViews>
  <workbookView showHorizontalScroll="0" showVerticalScroll="0"
    showSheetTabs="0" xWindow="120" yWindow="45" windowWidth="15135"
    windowHeight="8130" activeTab="2" autoFilterDateGrouping="0"/>
</bookViews>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT BookViews](#)) is located in §A.2. end note]

18.2.2 calcPr (Calculation Properties)

This element defines the collection of properties the application uses to record calculation status and details. Calculation is the process of computing formulas and then displaying the results as values in the cells that contain the formulas.

[Example:

```
<calcPr calcId="122211" calcMode="auto" refMode="R1C1" iterate="1"
  fullPrecision="0"/>
```

end example]

Attributes	Description
calcCompleted (Calc Completed)	<p>Specifies a boolean value that determines whether workbook data was recalculated before the workbook was saved.</p> <p>A value of 1 or true indicates recalculation was completed before save.</p> <p>A value of 0 or false indicates that recalculation was not completed before save.</p>

Attributes	Description
	<p>The default value for this attribute is true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
calcId (Calculation Id)	<p>Specifies the version of the calculation engine used to calculate values in the workbook. When you open a workbook created in the current version, the application recalculates only the formulas that depend on cells that have changed. When you open a workbook that was created in an earlier version of the application, all the formulas in the workbook— those that depend on cells that have changed and those that do not— are recalculated. This ensures that the workbook is fully optimized for the current application version.</p> <p>The value for calcID depends on the application. SpreadsheetML defaults form [version][build], where [version] refers to the version of the application, and [build] refers to the build of the application when the calculation engine changed.</p> <p>[Example:</p> <pre data-bbox="451 940 852 970"><calcPr calcId="122211"/></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
calcMode (Calculation Mode)	<p>Specifies when the application should calculate formulas in the workbook.</p> <p>The default value for this attribute is "auto."</p> <p>The possible values for this attribute are defined by the ST_CalcMode simple type (§18.18.4).</p>
calcOnSave (Calculate On Save)	<p>Specifies a boolean value that indicates whether the application recalculates values when the workbook is saved.</p> <p>A value of 1 or true indicates recalculation is performed when the workbook is saved.</p> <p>A value of 0 or false indicates recalculation is not performed when the workbook is saved.</p> <p>The default value for this attribute is true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
concurrentCalc (Concurrent	<p>Specifies a boolean value that indicates whether concurrent calculation processes are enabled for this workbook.</p>

Attributes	Description
Calculations)	<p>A value of on, 1, or true indicates concurrent calculations are enabled in this workbook.</p> <p>A value of 0 or false indicates concurrent calculations are not enabled.</p> <p>The default value for this attribute is true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
concurrentManual Count (Concurrent Thread Manual Count)	<p>Specifies the count of concurrent calculation processes manually set by the user. If omitted, the count is set automatically by the application.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
forceFullCalc (Force Full Calculation)	<p>Specifies a boolean value that indicates whether the application performs a full recalculation when one was not indicated by other calculation properties. This attribute allows the application to expose mechanisms in the user interface that give users the ability to trigger when full recalculations take place.</p> <p>A value of 1 or true indicates the application performs a full recalculation of the workbook.</p> <p>A value of 0 or false indicates the application does not perform a full recalculation of the workbook.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fullCalcOnLoad (Full Calculation On Load)	<p>Specifies a boolean value that indicates whether the application shall perform a full recalculation when the workbook is opened. After load and successful calculation, the application should set this value to false. The application should set this value to true when cell formulas or values are modified by another process while the application has the workbook opened.</p> <p>A value of 1 or true indicates the application performs a full recalculation of workbook values when the workbook is opened.</p> <p>A value of 0 or false indicates the application does not perform a full recalculation when the workbook is opened.</p> <p>[Note: If manual calcMode is true, then a full recalculation does not performed on load, even when this attribute is set. end note]</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean</p>

Attributes	Description
	datatype.
fullPrecision (Full Precision Calculation)	<p>Specifies a boolean that indicates the precision the application uses when performing calculations in the workbook. Full precision means that the application uses the entire value(s) stored in cells referenced by the formula to perform the calculation.</p> <p><i>[Example: If two cells each contain the value 10.005 and the cells are formatted to display values in currency format, the value \$10.01 is displayed in each cell. If you add the two cells together, the result is \$20.01 because the application adds the stored values 10.005 and 10.005, not the displayed values. You can change the precision of calculations so that the application uses the displayed value instead of the stored value when it recalculates formulas.</i></p> <p>For the above example, if fullPrecision is false, then the result must be \$20.02, because each cell shows \$10.01, so those are the values to be added. Furthermore, when fullPrecision is false, the calculated value as displayed must be saved to file. <i>end example</i></p> <p>A value of 1 or true indicates the application uses the stored values of the referenced cells when performing calculations.</p> <p>A value of 0 or false indicates the application uses the display values of the referenced cells when performing calculations.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
iterate (Calculation Iteration)	<p>Specifies a boolean value that indicates whether the application should attempt to calculate formulas that contain circular references. A circular reference is a formula that refers to the cell— either directly or indirectly— that contains the formula. If a formula refers back to one of its own cells, you shall determine how many times the formula should recalculate.</p> <p>A value of on, 1, or true indicates the application should attempt to calculate circular references. The calculation engine performs iterative iterateCount calculations to before stopping.</p> <p>A value of 0 or false indicates that the application should not attempt to calculate formulas with circular references. The calculation engine stops on the first iteration when it encounters a circular references.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
iterateCount (Iteration Count)	Specifies the number of iterations the calculation engine attempts when calculating a workbook with circular references, when iterate is true.

Attributes	Description
	<p>The default value for this attribute is 100.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
iterateDelta (Iterative Calculation Delta)	<p>Specifies a double that contains the maximum change for iterative calculations. The application stops calculating after iterateCount iterations or after all values in the circular reference change by less than iterateDelta between iterations, whichever comes first.</p> <p>The default value for this attribute is "0.001"</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>
refMode (Reference Mode)	<p>Specifies the reference style for this workbook. Instead of using letters for columns and numbers for rows ("A1"), this option enables using numbers for both rows and columns. Cells are then referred to in this format: R1C1.</p> <p>The default value for this attribute is "A1."</p> <p>The possible values for this attribute are defined by the ST_RefMode simple type (§18.18.64).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_CalcPr](#)) is located in §A.2. *end note*]

18.2.3 customWorkbookView (Custom Workbook View)

This element specifies a single custom workbook view. A custom workbook view consists of a set of display and print settings that you can name and apply to a workbook. You can create more than one custom workbook view of the same workbook. Custom Workbook Views are not required in order to construct a valid SpreadsheetML document, and are not necessary if the document is never displayed by a spreadsheet application, or if the spreadsheet application has a fixed display for workbooks. However, if a spreadsheet application chooses to implement configurable display modes, the customWorkbookView element should be used to persist the settings for those display modes. The settings fall into the following categories, and individual settings are detailed in the table following:

Window settings - these include size and positioning of the spreadsheet window as well as which window features should be displayed (scrollbars, sheet tabs, etc.).

Workbook content display and print settings - specifies whether features in the workbook should be included or ignored by a spreadsheet application when a custom workbook view is displayed or printed. *[Example: Whether comments in the workbook should be displayed and how objects such as images should be displayed can be controlled by a Custom Workbook View. end example]*

Persistence settings - these include settings that describe how a spreadsheet application should update persisted SpreadsheetML content if multiple spreadsheet applications are accessing a common instance of the SpreadsheetML document at the same time.

When a Custom Workbook View is present, there should also be corresponding customSheetView (§18.3.1.25) elements for each sheet (§18.2.19) in the workbook. The guid attribute of these customSheetView elements associates the customSheetView with the appropriate customWorkbookView. Attributes on the customWorkbookView element should be used to determine which settings within the Custom Sheet View should be respected by a spreadsheet application if the Custom Workbook View is displayed.

Attributes	Description
activeSheetId (Active Sheet in Book View)	<p>Specifies the sheetId of a sheet in the workbook that identifies to a consuming application the default sheet to display. Corresponds to a sheetId of a sheet in the sheets collection.</p> <p>This attribute is required.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
autoUpdate (Auto Update)	<p>Specifies a boolean value that is an instruction that if the workbook is loaded by a spreadsheet application, that spreadsheet application should automatically update changes at the interval specified by the mergeInterval attribute. This is only applicable for shared workbooks (§18.11).</p> <p>A value of 1 or true is an instruction to the spreadsheet application to update changes at the interval specified in the mergeInterval attribute.</p> <p>A value of 0 or false is an instruction to the spreadsheet application to update changes whenever the spreadsheet application generates SpreadsheetML representing the workbook.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
changesSavedWin (Changes Saved Win)	<p>Specifies a boolean value that instructs a spreadsheet application to overwrite the persisted version of the document with the updated version being persisted. This is only applicable for shared workbooks in automatic update mode.</p> <p>A value of 1 or true instructs a spreadsheet application to overwrite changes in the persisted version of a shared workbook when conflicts in data are found.</p> <p>A value of 0 or false instructs a spreadsheet application to not overwrite changes in the persisted version of a shared workbook when conflicts are found.</p> <p>The default value for this attribute is false.</p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
guid (Custom View GUID)	<p>Specifies a globally unique identifier (GUID) for this custom view</p> <p>The possible values for this attribute are defined by the ST_Guid simple type (§22.9.2.4).</p>
includeHiddenRowCol (Include Hidden Rows & Columns)	<p>Specifies a boolean value that indicates whether to include hidden rows, columns, and filter settings in this custom view.</p> <p>A value of 1 or true indicates that hidden rows, columns, and filter settings are included in this custom view.</p> <p>A value of 0 or false indicates that hidden rows, columns, and filter settings are not included.</p> <p>The default value for this attribute is true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
includePrintSettings (Include Print Settings)	<p>Specifies a boolean value that indicates whether to include print settings in this custom view.</p> <p>A value of 1 or true indicates that print settings are included in this custom view.</p> <p>A value of 0 or false indicates print settings are not included in this custom view.</p> <p>The default value for this attribute is true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
maximized (Maximized)	<p>Specifies a boolean value that indicates whether the workbook window is maximized.</p> <p>A value of 1 or true indicates the workbook window is maximized.</p> <p>A value of 0 or false indicates the workbook window is not maximized.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
mergeInterval (Merge Interval)	<p>Automatic update interval (in minutes). Only applicable for shared workbooks in automatic update mode.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt</p>

Attributes	Description
	datatype.
minimized (Minimized)	<p>Specifies a boolean value that indicates whether the workbook window is minimized.</p> <p>A value of 1 or true indicates the workbook window is minimized.</p> <p>A value of 0 or false indicates the workbook window is not minimized.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
name (Custom View Name)	<p>Specifies the name of the custom view.</p> <p>This attribute is required.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
onlySync (Only Synch)	<p>Specifies a boolean value that indicates, during automatic update, the current user's changes are not saved. The workbook is only updated with other users' changes. Only applicable for shared workbooks in automatic update mode.</p> <p>A value of 1 or true indicates the current user's changes is not saved during automatic update.</p> <p>A value of 0 or false indicates the current user's is saved during automatic update.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
personalView (Personal View)	<p>Specifies a boolean value that indicates that this custom view is a personal view for a shared workbook user. Only applicable for shared workbooks. Personal views allow each user of a shared workbook to store their individual print and filter settings.</p> <p>A value of 1 or true indicates this custom view is a personal view for a shared workbook user.</p> <p>A value of 0 or false indicates this view is not a personal view.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showComments	Specifies how comments are displayed in this custom view

Attributes	Description
(Show Comments)	<p>The possible values for this attribute are defined by the ST_Comments simple type (§18.18.14).</p>
<p>showFormulaBar (Show Formula Bar)</p>	<p>Specifies a boolean value that indicates whether to display the formula bar in the application user interface.</p> <p>A value of 1 or true indicates the formula bar is shown in the user interface.</p> <p>A value of 0 or false indicates the formula bar is not shown in the user interface.</p> <p>The default value for this attribute is true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>showHorizontalScroll (Show Horizontal Scroll)</p>	<p>Specifies a boolean value that indicates whether to display the horizontal scroll bar in the user interface.</p> <p>A value of 1 or true indicates that the horizontal scrollbar is shown.</p> <p>A value of 0 or false indicates that the horizontal scrollbar is not shown.</p> <p>The default value for this attribute is true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>showObjects (Show Objects)</p>	<p>Specifies how objects are displayed in this custom view.</p> <p>The default value for this attribute is "all."</p> <p>The possible values for this attribute are defined by the ST_Objects simple type (§18.18.48).</p>
<p>showSheetTabs (Show Sheet Tabs)</p>	<p>Specifies a boolean value that indicates whether to display the sheet tabs in the user interface.</p> <p>A value of 1 or true indicates that sheet tabs shall be shown.</p> <p>A value of 0 or false indicates that sheet tabs shall not be shown.</p> <p>The default value for this attribute is true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>showStatusbar (Show Status Bar)</p>	<p>Specifies a boolean value that indicates whether to display the status bar in the user interface.</p>

Attributes	Description
	<p>A value of 1 or true indicates that the status bar is shown.</p> <p>A value of 0 or false indicates the status bar is not shown.</p> <p>The default value for this attribute is true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showVerticalScroll (Show Vertical Scroll)	<p>Specifies a boolean value that indicates whether to display the vertical scroll bar.</p> <p>A value of 1 or true indicates the vertical scrollbar shall be shown.</p> <p>A value of 0 or false indicates the vertical scrollbar shall not be shown.</p> <p>The default value for this attribute is true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
tabRatio (Sheet Tab Ratio)	<p>Specifies the ratio between the workbook tabs bar and the horizontal scroll bar. tabRatio is assumed to be out of 1000 of the horizontal window width.</p> <p>The default value for this attribute is 600.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
windowHeight (Window Height)	<p>Specifies the height of the workbook window. The unit of measurement for this value is twips.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
windowWidth (Window Width)	<p>Specifies the width of the workbook window. The unit of measurement for this value is twips.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
xWindow (Top Left Corner (X Coordinate))	<p>Specifies the X coordinate for the upper left corner of the workbook window. The unit of measurement for this value is twips.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
yWindow (Top Left Corner (Y Coordinate))	<p>Specifies the Y coordinate for the upper left corner of the workbook window. The unit of measurement for this value is twips.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT CustomWorkbookView](#)) is located in §A.2. *end note*]

18.2.4 customWorkbookViews (Custom Workbook Views)

This element defines the collection of custom workbook views that are defined for this workbook. A customWorkbookView is similar in concept to a workbookView (§18.2.30) in that its attributes contain settings related to the way that the workbook should be displayed on a screen by a spreadsheet application.

[*Note:* Whilst a workbookView is intended to store the way the workbook window should be displayed by a spreadsheet application, customWorkbookView elements are intended to allow the user to switch between a selection of customWorkbookView items defining window and content display options. *end note*]

A customWorkbookView contains a greater number of settings (e.g., the presence of a formula bar; visibility of hidden data; whether or not to show comments) and is named.

[*Example:* A workbook which is used by two different departments might contain two customWorkbookView elements – one where the comments and hidden data are not shown, and one where they are. Users might switch between the customWorkbookView items according to the department in which they work. *end example*]

There is no limit on the number of custom views that can be contained within a SpreadsheetML instance.

[*Example:*

```
<customWorkbookViews>
  <customWorkbookView name="CustomView"
    guid="{CE6681F1-E999-414D-8446-68A031534B57}" maximized="1" xWindow="1"
    yWindow="1" windowWidth="1024" windowHeight="547" activeSheetId="1"/>
</customWorkbookViews>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT CustomWorkbookViews](#)) is located in §A.2. *end note*]

18.2.5 definedName (Defined Name)

This element defines the defined names that are defined within this workbook. Defined names are descriptive text that is used to represents a cell, range of cells, formula, or constant value. Use easy-to-understand names, such as Products, to refer to hard to understand ranges, such as Sales!C20:C30.

A defined name in a formula can make it easier to understand the purpose of the formula. [*Example:* The formula =SUM(FirstQuarterSales) might be easier to identify than =SUM(C20:C30). *end example*]

Names are available to any sheet. *[Example: If the name ProjectedSales refers to the range A20:A30 on the first worksheet in a workbook, you can use the name ProjectedSales on any other sheet in the same workbook to refer to range A20:A30 on the first worksheet. end example]*

Names can also be used to represent formulas or values that do not change (constants). *[Example: The name SalesTax can be used to represent the sales tax amount (such as 6.2 percent) applied to sales transactions. end example]*

You can also link to a defined name in another workbook, or define a name that refers to cells in another workbook. *[Example: The formula =SUM(Sales.xls!ProjectedSales) refers to the named range ProjectedSales in the workbook named Sales. end example]*

A compliant producer or consumer considers a defined name in the range A1-XFD1048576 to be an error.

All other names outside this range can be defined as names and overrides a cell reference if an ambiguity exists.

[Example: For clarification: LOG10 is always a cell reference, LOG10() is always formula, LOGO1000 can be a defined name that overrides a cell reference. end example]

Attributes	Description
comment (Comment)	Specifies the comment the user provided when the name was created. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
customMenu (Custom Menu Text)	Specifies custom menu text for the defined name. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
description (Description)	Specifies description text for the defined name. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
function (Function)	Specifies a boolean value that indicates that the defined name refers to a user-defined function. This attribute is used when there is an add-in or other code project associated with the file. A value of 1 or true indicates the name refers to a function. A value of 0 or false indicates the name does not refer to a function. The default value for this attribute is false. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
functionGroupId	Specifies the function group index if the defined name refers to a function. The function

Attributes	Description
(Function Group Id)	<p>group defines the general category for the function. This attribute is used when there is an add-in or other code project associated with the file.</p> <p>The following functionGroupIds are defined in SpreadsheetML for applications that support the association of an add-in or code project for their workbook:</p> <ul style="list-style-type: none"> • 1 Financial • 2 Date and Time • 3 Math and Trig • 4 Statistical • 5 Lookup and Reference • 6 Database • 7 Text • 8 Logical • 9 Information • 10 Commands • 11 Customizing • 12 Macro Control • 13 DDE / External • 14 User Defined • 15 Engineering • 16 Cube <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
help (Help)	<p>Specifies the help topic to display for this defined name.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
hidden (Hidden Name)	<p>Specifies a boolean value that indicates whether the defined name is hidden in the user interface.</p> <p>A value of 1 or true indicates the name is hidden.</p> <p>A value of 0 or false indicates the name is not hidden.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
localSheetId (Local Name Sheet Id)	<p>Specifies the sheet index in this workbook where data from an external reference is displayed.</p> <p>[Example: In the following example, the defined name refers to a range whose data source is an external database called "Northwind_Database":</p> <pre><definedName name="Northwind_Database"</pre>

Attributes	Description
	<p><code>localSheetId="2">Sheet5!\$A\$1:\$T\$47</definedName></code> <i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
name (Defined Name)	<p>Specifies the name that appears in the user interface for the defined name. This attribute is required. The following built-in names are defined in this SpreadsheetML specification:</p> <ul style="list-style-type: none"> • • Print <ul style="list-style-type: none"> • <code>_xlnm.Print_Area</code>: this defined name specifies the workbook's print area. • <code>_xlnm.Print_Titles</code>: this defined name specifies the row(s) or column(s) to repeat at the top of each printed page. • • Filter & Advanced Filter <ul style="list-style-type: none"> • <code>_xlnm.Criteria</code>: this defined name refers to a range containing the criteria values to be used in applying an advanced filter to a range of data. • <code>_xlnm.FilterDatabase</code>: can be one of the following <ul style="list-style-type: none"> a. this defined name refers to a range to which an advanced filter has been applied. This represents the source data range, unfiltered. b. This defined name refers to a range to which an AutoFilter has been applied. • <code>_xlnm.Extract</code>: this defined name refers to the range containing the filtered output values resulting from applying an advanced filter criteria to a source range. • • Miscellaneous <ul style="list-style-type: none"> • <code>_xlnm.Consolidate_Area</code>: the defined name refers to a consolidation area. • <code>_xlnm.Database</code>: the range specified in the defined name is from a database data source. • <code>_xlnm.Sheet_Title</code>: the defined name refers to a sheet title. • <p>Built-in names reserved by SpreadsheetML begin with "<code>_xlnm.</code>". End users shall not use this string for custom names in the user interface.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
publishToServer (Publish To Server)	<p>Specifies a boolean value that indicates whether the defined name is included in the version of the workbook that is published to or rendered on a Web or application server.</p> <p>A value of 1 or true indicates the name shall be published.</p> <p>A value of 0 or false indicates the name shall not be published.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean</p>

Attributes	Description
	datatype.
shortcutKey (Shortcut Key)	<p>Specifies the keyboard shortcut for the defined name.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
statusBar (Status Bar)	<p>Specifies text that is displayed on the application status bar when the user places focus on the defined name.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
vbProcedure (Procedure)	<p>Specifies a boolean value that indicates whether the defined name is related to an external function, command, or other executable code.</p> <p>A value of 1 or true indicates the name is related to an external function, command, or other executable code, and the loading application can optionally decide whether to load and/or execute the commands.</p> <p>A value of 0 or false indicates the name does not refer to an external function, command, or other executable code.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
workbookParameter (Workbook Parameter (Server))	<p>Specifies a boolean value that indicates that the name is used as a workbook parameter on a version of the workbook that is published to or rendered on a Web or application server.</p> <p>A value of 1 or true indicates the name is used as a workbook parameter on the application server.</p> <p>A value of 0 or false indicates the name is not used as a workbook parameter on the application server.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
xlm (External Function)	<p>Specifies a boolean value that indicates whether the defined name is related to an external function, command, or other executable code.</p> <p>A value of 1 or true indicates the name is related to an external function, command, or other executable code, and the loading application can optionally decide whether to load and/or execute the commands.</p> <p>A value of 0 or false indicates the name does not refer to an external function,</p>

Attributes	Description
	<p>command, or other executable code.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>Xml:space (Content Contains Significant Whitespace)</p> <p>Namespace: http://www.w3.org/XML/1998/namespace</p>	<p>Specifies how white space should be handled for the contents of this element using the W3C space preservation rules.</p> <p>The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_DefinedName](#)) is located in §A.2. end note]

18.2.6 definedNames (Defined Names)

This element defines the collection of defined names for this workbook. Defined names are descriptive names to represent cells, ranges of cells, formulas, or constant values. Defined names can be used to represent a range on any worksheet.

[Example:

```
<definedNames>
  <definedName name="NamedFormula"
    comment="Comment text for defined name.">SUM(Sheet3!$B$2:$B$9)</definedName>
  <definedName name="NamedRange">Sheet3!$A$1:$C$12</definedName>
  <definedName name="NamedRangeFromExternalReference" localSheetId="2"
    hidden="1">Sheet5!$A$1:$T$47</definedName>
</definedNames>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_DefinedNames](#)) is located in §A.2. end note]

18.2.7 ext (Extension)

Each extension within an extension list shall be contained within an ext element. Extensions shall be versioned by namespace, using the uri attribute, and shall be allowed to appear in any order within the extension list. Any number of extensions shall be allowed within an extension list.

When extension lists are processed, a consumer might understand some extensions, and might not understand other extensions. The preservation model for extensions is that unprocessed extensions shall always be preserved (when consuming) and written out (when producing) in whole, as long as the underlying schema extended by the extension list remains. *[Example: If a spreadsheetML sheet contains several extensions within an extension list, and through runtime processing that sheet is removed from the workbook, then the extensions associated with that sheet must not be written out when producing the resulting markup document. end example].*

Markup namespaces within extensions shall not be required to be listed in the Ignorable Compatibility-Rule attribute, nor shall these namespaces be required to be listed in the PreserveElements and PreserveAttributes Compatibility-Rule attributes. *[Note: See Part 3 for additional discussion on Application-Defined Extension Elements and processing rules. end note]*

[Example:

In this example, there are two extensions written. The first extension describes a new structure that might have been defined by a fictitious second version of ECMA-376. The second extension describes a structure that might be introduced by a private party, developed independently from ECMA-376.

```
<extLst>
  <ext uri='http://purl.oclc.org/ooxml/spreadsheetml/versionTwoExtension'>
    <v2:newContent
      xmlns:v2='http://purl.oclc.org/ooxml/spreadsheetml/versionTwoExtension'>
      ...
    </v2:newContent>
  </ext>
  <ext uri='http://www.extension.com/versionOneExtension'>
    <v2:moreContent xmlns:v2='http://www.extension.com/versionOneExtension'>
      ...
    </v2:moreContent>
  </ext>
</extLst>
```

end example]

Each extension has an uri attribute, which serves as an identifier to indicate information about the extension. *[Note: For example, the uri might state the version of a markup specification to which the content conforms, or it might state the version of a producing application that wrote the content. end note]* Upon encountering extensions, a processing consumer shall determine whether it knows how to process extensions using the value of the uri. If the consumer knows how to process such an extension, the markup contained within that extension is processed. Otherwise, the extension content shall be preserved so long as the underlying structure being extended by the extLst has not been removed.

Attributes	Description
uri (URI)	<p>A token to identify version and application information for this particular extension.</p> <p>The possible values for this attribute are defined by the W3C XML Schema token datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Extension](#)) is located in §A.2. *end note*]

18.2.8 externalReference (External Reference)

This element defines an external reference that stores data for workbook elements.

Attributes	Description
id (Relationship Id) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	<p>Specifies a unique identifier that is used to identify a relationship to another part in the file. Relationship identifiers link the element definition with the part where data for the element is stored.</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_ExternalReference](#)) is located in §A.2. *end note*]

18.2.9 externalReferences (External References)

This element defines the collection of external references for this workbook.

[Note: The W3C XML Schema definition of this element's content model ([CT_ExternalReferences](#)) is located in §A.2. *end note*]

18.2.10 extLst (Future Feature Data Storage Area)

This element provides a convention for extending spreadsheetML in defined locations within the markup specification. The locations shall be denoted with the extLst element, and are called extension lists. Extension list locations within the markup document are specified in the markup specification and can be used to store extensions to the markup specification, whether those are future version extensions of the markup specification or are private extensions implemented independently from the markup specification. Markup within an extension might not be understood by a markup consumer.

extLst elements contain ext elements, called *extensions*. See §18.2.7 for more discussion of extensions.

[*Note:* Allowing markup specification extensions and private markup extensions within an extension list does not violate interoperability because the rules articulated within §18.2.7 and Part 3, §12 describe how markup producers and consumers must generate and consume markup documents containing application defined extension elements, including how to avoid and when to generate error conditions. *end note*]

[*Note:* This element is not intended to reintroduce transitional schema into the strict conformance class. *end note*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ExtensionList](#)) is located in §A.2. *end note*]

18.2.11 fileRecoveryPr (File Recovery Properties)

This element defines properties that track the state of the workbook file, such as whether the file was saved during a crash, or whether it should be opened in auto-recover mode.

Attributes	Description
autoRecover (Auto Recover)	<p>Specifies a boolean value that indicates whether the file is mark for auto-recovery. Applications typically mark files for auto-recover following a crash.</p> <p>A value of 1 or true indicates the file is marked for auto-recover.</p> <p>A value of 0 or false indicates the file is not marked for auto-recover.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
crashSave (Crash Save)	<p>Specifies a boolean value that indicates whether the application last saved the workbook file after a crash.</p> <p>A value of 1 or true indicates the workbook was last saved after a crash.</p> <p>A value of 0 or false indicates was not last saved as part of a crash.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
dataExtractLoad (Data Extract Load)	<p>Specifies a boolean value that indicates whether the application last opened the workbook for data recovery.</p> <p>A value of 1 or true indicates the workbook was last opened for data recovery.</p> <p>A value of 0 or false indicates was not last opened for data recovery.</p>

Attributes	Description
	<p>The default value for this attribute is true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
repairLoad (Repair Load)	<p>Specifies a boolean value that indicates whether the application last opened the workbook in safe or repair mode.</p> <p>A value of 1 or true indicates the workbook was last opened in safe or repair mode.</p> <p>A value of 0 or false indicates the workbook was last opened without problems.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_FileRecoveryPr](#)) is located in §A.2. *end note*]

18.2.12 fileSharing (File Sharing)

This element tracks file sharing settings for the workbook. When a password is to be hashed and stored in this element, it shall be hashed starting from a UTF-16LE encoded string value. If there is a leading BOM character (U+FEFF) in the encoded password it is removed before hash calculation.

Attributes	Description						
algorithmName (Cryptographic Algorithm Name)	<p>Specifies the specific cryptographic hashing algorithm which shall be used along with the salt attribute and input password in order to compute the hash value.</p> <p>The following values are reserved:</p> <table> <tr> <th>Value</th><th>Algorithm</th></tr> <tr> <td>MD2</td><td> <p>Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used.</p> <p>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p> </td></tr> <tr> <td>MD4</td><td> <p>Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used.</p> <p>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p> </td></tr> </table>	Value	Algorithm	MD2	<p>Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used.</p> <p>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>	MD4	<p>Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used.</p> <p>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>
Value	Algorithm						
MD2	<p>Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used.</p> <p>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>						
MD4	<p>Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used.</p> <p>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>						

Attributes	Description																
	<table border="1"> <tr> <td data-bbox="412 247 667 472">MD5</td><td data-bbox="667 247 1484 472"> <p>Specifies that the MD5 algorithm, as defined by RFC 1321, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p> </td></tr> <tr> <td data-bbox="412 472 667 697">RIPEMD-128</td><td data-bbox="667 472 1484 697"> <p>Specifies that the RIPEMD-128 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p> </td></tr> <tr> <td data-bbox="412 697 667 779">RIPEMD-160</td><td data-bbox="667 697 1484 779"> <p>Specifies that the RIPEMD-160 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> </td></tr> <tr> <td data-bbox="412 779 667 861">SHA-1</td><td data-bbox="667 779 1484 861"> <p>Specifies that the SHA-1 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> </td></tr> <tr> <td data-bbox="412 861 667 942">SHA-256</td><td data-bbox="667 861 1484 942"> <p>Specifies that the SHA-256 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> </td></tr> <tr> <td data-bbox="412 942 667 1024">SHA-384</td><td data-bbox="667 942 1484 1024"> <p>Specifies that the SHA-384 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> </td></tr> <tr> <td data-bbox="412 1024 667 1106">SHA-512</td><td data-bbox="667 1024 1484 1106"> <p>Specifies that the SHA-512 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> </td></tr> <tr> <td data-bbox="412 1106 667 1197">WHIRLPOOL</td><td data-bbox="667 1106 1484 1197"> <p>Specifies that the WHIRLPOOL algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> </td></tr> </table> <p>[<i>Example</i>: Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre>< ... algorithmName="SHA-1" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The algorithmName attribute value of “SHA-1” specifies that the SHA-1 hashing algorithm must be used to generate a hash from the user-defined password. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>	MD5	<p>Specifies that the MD5 algorithm, as defined by RFC 1321, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>	RIPEMD-128	<p>Specifies that the RIPEMD-128 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>	RIPEMD-160	<p>Specifies that the RIPEMD-160 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>	SHA-1	<p>Specifies that the SHA-1 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>	SHA-256	<p>Specifies that the SHA-256 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>	SHA-384	<p>Specifies that the SHA-384 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>	SHA-512	<p>Specifies that the SHA-512 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>	WHIRLPOOL	<p>Specifies that the WHIRLPOOL algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>
MD5	<p>Specifies that the MD5 algorithm, as defined by RFC 1321, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>																
RIPEMD-128	<p>Specifies that the RIPEMD-128 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>																
RIPEMD-160	<p>Specifies that the RIPEMD-160 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>																
SHA-1	<p>Specifies that the SHA-1 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>																
SHA-256	<p>Specifies that the SHA-256 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>																
SHA-384	<p>Specifies that the SHA-384 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>																
SHA-512	<p>Specifies that the SHA-512 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>																
WHIRLPOOL	<p>Specifies that the WHIRLPOOL algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>																
hashValue (Password Hash Value)	<p>Specifies the hash value for the password required for editing this workbook. This value shall be compared with the resulting hash value after hashing the user-supplied password using the algorithm specified by the preceding attributes and parent XML element, and if the two values match, the protection shall no longer be enforced.</p> <p>If this value is omitted, then the reservationPassword attribute shall contain the</p>																

Attributes	Description
	<p>password hash for the workbook.</p> <p>[<i>Example:</i> Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre><... algorithmName="SHA-1" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The hashValue attribute value of 9oN7nWkCAyEZib1RomSJTjmPpCY= specifies that the user-supplied password must be hashed using the pre-processing defined by the parent element (if any) followed by the SHA-1 algorithm (specified via the cryptAlgorithmSid attribute value of 1) and that the resulting has value must be 9oN7nWkCAyEZib1RomSJTjmPpCY= for the protection to be disabled. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema base64Binary datatype.</p>
readOnlyRecommended (Read Only Recommended)	<p>Specifies a boolean value that indicates on open, whether the application alerts the user that the file be marked as read-only.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
saltValue (Salt Value for Password Verifier)	<p>Specifies the salt that was prepended to the user-supplied password before it was hashed using the hashing algorithm defined by the preceding attribute values to generate the hashValue attribute, and that shall also be prepended to the user-supplied password before attempting to generate a hash value for comparison. A <i>salt</i> is a random string which is added to a user-supplied password before it is hashed in order to prevent a malicious party from pre-calculating all possible password/hash combinations and simply using those pre-calculated values (often referred to as a "dictionary attack").</p> <p>If this attribute is omitted, then no salt shall be prepended to the user-supplied password before it is hashed for comparison with the stored hash value.</p> <p>[<i>Example:</i> Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre><... saltValue="ZUdHa+D8F/OAKP3I7ssUnQ==" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The saltValue attribute value of ZUdHa+D8F/OAKP3I7ssUnQ== specifies that the user-supplied password must have this value prepended before it is run through the specified hashing algorithm to generate a resulting hash value for comparison. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema base64Binary datatype.</p>
spinCount	Specifies the number of times the hashing function shall be iteratively run (runs using

Attributes	Description
(Iterations to Run Hashing Algorithm)	<p>each iteration's result plus a 4 byte value (0-based, little endian) containing the number of the iteration as the input for the next iteration) when attempting to compare a user-supplied password with the value stored in the hashValue attribute.</p> <p>[<i>Rationale</i>: Running the algorithm many times increases the cost of exhaustive search attacks correspondingly. Storing this value allows for the number of iterations to be increased over time to accommodate faster hardware (and hence the ability to run more iterations in less time). <i>end rationale</i>]</p> <p>[<i>Example</i>: Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre><... spinCount="100000" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The spinCount attribute value of 100000 specifies that the hashing function must be run one hundred thousand times to generate a hash value for comparison with the hashValue attribute. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
userName (User Name)	<p>Specifies the username of the person with write reservation for this workbook.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_FileSharing](#)) is located in §A.2. *end note*]

18.2.13 fileVersion (File Version)

This element defines properties that track which version of the application accessed the data and source code contained in the file.

Attributes	Description
appName (Application Name)	<p>Specifies the application name. When saving, applications can write their appName value and optionally write lastEdited and lowestEdited attributes to track the version of the application that performed those actions. When opening the workbook, applications can examine the value of appName and decide how to interpret the lastEdited, lowestEdited, and rupBuild attributes.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
codeName (Code	Specifies the GUID that identifies the code project that is associated with the workbook.

Attributes	Description
Name)	<p>[<i>Note</i>: the primary use of this attribute is to track the version of the compiled code.]</p> <p>The possible values for this attribute are defined by the ST_Guid simple type (§22.9.2.4).</p>
lastEdited (Last Edited Version)	<p>Specifies the version of the application that last saved the workbook. This attribute is application-dependent.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
lowestEdited (Lowest Edited Version)	<p>Specifies the earliest version of the application that saved the workbook. This value is reset any time an application that can read all data in the file saves the file. This attribute is application-dependent.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
rupBuild (Build Version)	<p>Specifies the incremental public release of the application. [<i>Example</i>: Betas, service packs, and versions. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_FileVersion](#)) is located in §A.2. *end note*]

18.2.14 functionGroup (Function Group)

This element represents a single function group.

Attributes	Description
name (Name)	<p>Specifies the name of the function group.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_FunctionGroup](#)) is located in §A.2. *end note*]

18.2.15 functionGroups (Function Groups)

This element defines the collection of function groups for the workbook.

Attributes	Description
builtInGroupCount	Specifies the count of built-in function groups that the application provides in this

Attributes	Description
(Built-in Function Group Count)	<p>workbook.</p> <p>The default value for this attribute is 16.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_FunctionGroups](#)) is located in §A.2. *end note*]

18.2.16 oleSize (Embedded Object Size)

This element defines the embedded object server for this workbook.

Attributes	Description
ref (Reference)	<p>Specifies the reference for the embedded object.</p> <p>The possible values for this attribute are defined by the ST_Ref simple type (§18.18.62).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_OleSize](#)) is located in §A.2. *end note*]

18.2.17 pivotCache (PivotCache)

This element represents a cache of data for pivot tables and formulas in the workbook.

Attributes	Description
cacheId (PivotCache Id)	<p>Specifies the unique identifier for the pivot cache for this workbook in the pivot cache part.</p> <p>This attribute is required.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
id (Relationship Id) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	<p>Specifies the identifier to a pivot cache definition part where cached data is stored.</p> <p>This attribute is required.</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_PivotCache](#)) is located in §A.2. *end note*]

18.2.18 pivotCaches (PivotCaches)

This element enumerates pivot cache definition parts used by pivot tables and formulas in this workbook.

[Example:

```
<pivotCaches>
  <pivotCache cacheId="4" r:id="rId8"/>
</pivotCaches>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_PivotCaches](#)) is located in §A.2. *end note*]

18.2.19 sheet (Sheet Information)

This element defines a sheet in this workbook. Sheet data is stored in a separate part.

Attributes	Description
id (Relationship Id) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the identifier of the sheet part where the definition for this sheet is stored. This attribute is required. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).
name (Sheet Name)	Specifies the name of the sheet. This name shall be unique. This attribute is required. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
sheetId (Sheet Tab Id)	Specifies the internal identifier for the sheet. This identifier shall be unique. This attribute is required. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
state (Visible State)	Specifies the visible state of this sheet. The default value for this attribute is "visible."

Attributes	Description
	The possible values for this attribute are defined by the ST_SheetState simple type (§18.18.68).

[Note: The W3C XML Schema definition of this element’s content model ([CT_Sheet](#)) is located in §A.2. *end note*]

18.2.20 sheets (Sheets)

This element represents the collection of sheets in the workbook. There are different types of sheets you can create in SpreadsheetML. The most common sheet type is a worksheet; also called a spreadsheet. A worksheet is the primary document that you use in SpreadsheetML to store and work with data. A worksheet consists of cells that are organized into columns and rows.

Some workbooks might have a modular design where there is one sheet for data and another worksheet for each specific analysis performed on that data. In a complex modular system, you might have dozens of sheets, each dedicated to a specific task.

[Example:

```
<sheets>
  <sheet name="Sheet1" sheetId="1" r:id="rId1"/>
  <sheet name="Sheet2" sheetId="2" r:id="rId2"/>
  <sheet name="Sheet5" sheetId="3" r:id="rId3"/>
  <sheet name="Chart1" sheetId="4" r:id="rId4"/>
</sheets>
```

end example]

[Note: The W3C XML Schema definition of this element’s content model ([CT_Sheets](#)) is located in §A.2. *end note*]

18.2.21 smartTagPr (Smart Tag Properties)

This element defines a collection of smart tag properties that determine smart tag behavior in the workbook.

[Example:

```
<smartTagPr embed="1" show="noIndicator"/>
```

end example]

Attributes	Description
embed (Embed SmartTags)	Specifies a boolean value that indicates whether the application saves smart tags with the workbook. Smart tag information is saved both in the workbook part and the sheet parts. A value of 1 or true indicates the application saves smart tags with the workbook.

Attributes	Description
	<p>A value of 0 or false indicates the application does not save smart tags with the workbook.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
show (Show Smart Tags)	<p>Specifies how the application displays smart tags in the user interface.</p> <p>The default value for this attribute is "all."</p> <p>The possible values for this attribute are defined by the ST_SmartTagShow simple type (§18.18.71).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_SmartTagPr](#)) is located in §A.2. *end note*]

18.2.22 smartTagType (Smart Tag Type)

This element represents a smart tag in the workbook.

Attributes	Description
name (Name)	<p>Specifies the element name used for a smart tag that is used by the application.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
namespaceUri (SmartTag Namespace URI)	<p>Specifies the namespace Uniform Resource Identifier (URI) for a smart tag used by the application.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
url (Smart Tag URL)	<p>Specifies the URL for a smart tag provided by the smart tag provider in the application.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_SmartTagType](#)) is located in §A.2. *end note*]

18.2.23 smartTagTypes (Smart Tag Types)

This element defines the collection of smart tag types in the workbook. Smart tags represent data that is recognized and labeled as a particular type.

[Example: For example, a person's name or a date can be recognized and labeled with a smart tag.

```
<smartTagTypes>
  <smartTagType namespaceUri="urn:schemas-openxmlformats-org:office:smartrags"
    name="date"/>
</smartTagTypes>
```

end example]

[Note: The W3C XML Schema definition of this element’s content model (CT SmartTagTypes) is located in §A.2.
end note]

18.2.24 webPublishing (Web Publishing Properties)

This element defines properties that relate to publishing this workbook to the Web.

Attributes	Description
allowPng (Allow PNG)	<p>Specifies a boolean value that indicates whether the application saves images in the PNG (Portable Network Graphics) graphic format.</p> <p>A value of 1 or true indicates the application supports PNG .</p> <p>A value of 0 or false indicates the application does not support PNG.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
characterSet (Character Set)	<p>Name of the character set the application uses when a Web page is saved. The values alllowed within this attribute are names and aliases listed in the IANA CHARACTER SETS listing found at http://www.iana.org/assignments/character-sets.</p> <p>If this attribute is not present then the codePage attribute can be used.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
css (Use CSS)	<p>Specifies a boolean value that indicates whether the application uses Cascading Style Sheet (CSS) for font formatting on Web pages.</p> <p>A value of 1 or true indicates the application uses CSS for font formats in Web pages.</p> <p>A value of 0 or false indicates the application does not use CSS for font formats.</p>

Attributes	Description
	<p>The default value for this attribute is true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
dpi (DPI)	<p>Specifies the DPI (defined as the number of pixels per inch) that are used to display images in Web pages. The specified DPI affects the size of graphics relative to the size of text on the screen.</p> <p>The default value for this attribute is 96.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
longFileNames (Enable Long File Names)	<p>Specifies a boolean value that indicates whether the application allows file names longer than 8 octets with a three octet extension for Web pages. File names are not case-sensitive.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
targetScreenSize (Target Screen Size)	<p>Specifies the screen size on which Web pages are displayed. The specified screen size might affect the size and layout of images on web pages.</p> <p>The default value of this attribute is "800x600."</p> <p>The possible values for this attribute are defined by the ST_TargetScreenSize simple type (§18.18.79).</p>
thicket (Thicket)	<p>Specifies a boolean value that indicates that the application stores supporting files such as bullets, background textures, and graphics in a separate folder from the Web page</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
vml (VML in Browsers)	<p>Specifies a boolean value that indicates whether the application uses VML (Vector Markup Language) to display graphics in Web browsers</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_WebPublishing](#)) is located in §A.2.
end note]

18.2.25 webPublishObject (Web Publishing Object)

This element defines a single Web publishing object for the workbook. This element tracks basic information about an object in the workbook, such as a named range, that is published to the Web.

Attributes	Description
autoRepublish (Auto Republish)	<p>Specifies a boolean value that indicates whether the object specified in sourceObject is automatically published every time the workbook is saved.</p> <p>A value of 1 or true indicates the application will publish the sourceObject when the workbook is saved.</p> <p>A value of 0 or false indicates the application will not publish the sourceObject when the workbook is saved.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
destinationFile (Destination File)	<p>Specifies the destination file name to which the sourceObject is published.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
divId (Div Id)	<p>Specifies the destination bookmark (div id) for the published object.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
id (Id)	<p>Specifies the number, in "nnnnn" format, used in generated div id, in style id's, token filenames, and other variables.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
sourceObject (Source Object)	<p>Specifies the named range to be published. If omitted, the entire workbook is published.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
title (Title)	<p>Specifies the title of the published item.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT WebPublishObject](#)) is located in §A.2. end note]

18.2.26 webPublishObjects (Web Publish Objects)

This element defines the collection of Web publishing objects in the workbook.

Attributes	Description
count (Count)	Specifies the number of items in the collection.

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_WebPublishObjects](#)) is located in §A.2. *end note*]

18.2.27 workbook (Workbook)

The workbook element is the top level element. It contains elements and attributes that encompass the data content of the workbook. The workbook's child elements each have their own subclause references, and these are shown in the child elements table below. A partial list of the workbook's structures that these elements represent are:

- **Sheets:** represents the collection of worksheets in the workbook. The sheets are the central structure within a workbook, and contain the text, numbers, dates, formulas, and other elements of a workbook.
- **Views:** SpreadsheetML defines a collection of Workbook views that define basic window dimensions and position of the workbook if it is ever displayed by a spreadsheet application. It also defines a collection of Custom Workbook Views that allows SpreadsheetML to describe one or more views of the data within a workbook.
- **Properties:** the workbook has several property collection that store basic workbook settings, such as the date system to use, file protection settings, calculation settings, and smart tag behaviors.
- **Names:** words or strings of characters that represent cells, ranges of cells, formulas, or constant values.

[*Example:*

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<workbook xmlns="http://purl.oclc.org/ooxml/spreadsheetml/main"
  xmlns:r="http://purl.oclc.org/ooxml/officeDocument/relationships">
  <fileVersion lastEdited="4" lowestEdited="4" rupBuild="4017"/>
  <workbookPr vbName="ThisWorkbook" defaultThemeVersion="123820"/>
  <bookViews>
    <workbookView xWindow="120" yWindow="45" windowWidth="15135"
      windowHeight="7650" activeTab="4"/>
  </bookViews>
  <sheets>
    <sheet name="Sheet1" sheetId="1" r:id="rId1"/>
    <sheet name="Sheet2" sheetId="2" r:id="rId2"/>
    <sheet name="Sheet5" sheetId="3" r:id="rId3"/>
    <sheet name="Chart1" sheetId="4" r:id="rId4"/>
  </sheets>
```

```
<definedNames>
  <definedName name="MyDefinedName">Sheet3!$A$1:$C$12</definedName>
</definedNames>
<calcPr calcId="122211" calcMode="autoNoTable" refMode="R1C1" iterate="1"
  fullPrecision="0"/>
<customWorkbookViews>
  <customWorkbookView name="CustomView1"
    guid="{CE6681F1-E999-414D-8446-68A031534B57}" maximized="1" xWindow="1"
    yWindow="1" windowWidth="1024" windowHeight="547" activeSheetId="1"/>
</customWorkbookViews>
<pivotCaches>
  <pivotCache cacheId="0" r:id="rId8"/>
</pivotCaches>
<smartTagPr embed="1" show="noIndicator"/>
<smartTagTypes>
  <smartTagType namespaceUri="urn:schemas-openxmlformats-org:office:smartrags"
    name="date"/>
</smartTagTypes>
<webPublishing codePage="1252"/>
</workbook>
```

end example]

Attributes	Description
conformance (Document Conformance Class)	<p>Specifies the conformance class (§2.1) to which the SpreadsheetML document conforms.</p> <p>If this attribute is omitted, its default value is <code>transitional</code>.</p> <p>[<i>Example:</i> Consider the following SpreadsheetML Workbook part markup:</p> <pre><workbook conformance="strict"> ... </workbook></pre> <p>This document has a conformance attribute value of <code>strict</code>, therefore it conforms to the SML Strict conformance class. <i>end example]</i></p> <p>The possible values for this attribute are defined by the <code>ST_ConformanceClass</code> simple type (§22.9.2.2).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Workbook](#)) is located in §A.2. *end note]*

18.2.28 workbookPr (Workbook Properties)

This element defines a collection of workbook properties.

[Example:

```
<workbookPr showObjects="none" saveExternalLinkValues="0"
  defaultThemeVersion="123820"/>
```

end example]

Attributes	Description
allowRefreshQuery (Allow Refresh Query)	<p>Specifies a boolean value that indicates whether the application will refresh query tables in this workbook.</p> <p>A value of 1 or true indicates the application will refresh query tables when the workbook is loaded.</p> <p>A value of 0 or false indicates the application will not refresh query tables.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
autoCompressPictures (Auto Compress Pictures)	<p>Specifies a boolean value that indicates the application automatically compressed pictures in the workbook.</p> <p>A value of 1 or true indicates the application automatically compresses pictures of the workbook. When a picture is compressed, the application:</p> <ul style="list-style-type: none"> • Reduces resolution (to 96 dots per inch (dpi) for Web and 200 dpi for print), and unnecessary information is discarded. • Discards extra information. [Example: When a picture has been cropped or resized, the "hidden" parts of the picture are stored in the file. end example] • Compress the picture, if possible. <p>A value of 0 or false indicates the application does not compress pictures in this workbook.</p> <p>The default value for this attribute is true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
backupFile (Create Backup File)	<p>Specifies a boolean value that indicates whether the application creates a backup of the workbook on save.</p> <p>A value of 1 or true indicates the application creates a backup of the workbook on save.</p>

Attributes	Description
	<p>A value of 0 or false indicates the application does not create a backup.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
checkCompatibility (Check Compatibility On Save)	<p>Specifies a boolean value that indicates whether the application checks for compatibility when saving this workbook to older file formats.</p> <p>A value of 1 or true indicates the application performs a compatibility check when saving to legacy binary formats.</p> <p>A value of 0 or false indicates the application does not perform a compatibility check when saving to legacy binary formats.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
codeName (Code Name)	<p>Specifies the codename of the application that created this workbook. Use this attribute to track file content in incremental releases of the application.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
date1904 (Date 1904)	<p>Value that indicates whether to use a 1900 or 1904 date system when converting serial date-times in the workbook to dates.</p> <p>A value of 1 or true indicates the workbook uses the 1904 date system.</p> <p>A value of 0 or false indicates the workbook uses the 1900 date system.</p> <p>(See §18.17.4.1 for the definition of the date systems.)</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
defaultThemeVersion (Default Theme Version)	<p>Specifies the default version of themes to apply in the workbook.</p> <p>The value for defaultThemeVersion depends on the application. SpreadsheetML defaults to the form [version][build], where [version] refers to the version of the application, and [build] refers to the build of the application when the themes in the user interface changed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt</p>

Attributes	Description
	datatype.
filterPrivacy (Filter Privacy)	<p>Specifies a boolean value that indicates whether the application has inspected the workbook for personally identifying information (PII). If this flag is set, the application warns the user any time the user performs an action that will insert PII into the document. <i>[Example: Inserting a comment might insert the user's name. end example]</i></p> <p>A value of 1 or true indicates the application will warn the user when they insert PII into the workbook.</p> <p>A value of 0 or false indicates the application will not warn the user when they insert PII into the workbook; the workbook has not been inspected for PII.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
hidePivotFieldList (Hide Pivot Field List)	<p>Specifies a boolean value that indicates whether a list of fields is shown for pivot tables in the application user interface.</p> <p>A value of 1 or true indicates a list of fields is show for pivot tables.</p> <p>A value of 0 or false indicates a list of fields is not shown for pivot tables.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
promptedSolutions (Prompted Solutions)	<p>Specifies a boolean value that indicates whether the user has received an alert to load Smart Document components.</p> <p>A value of 1 or true indicates the user received an alert to load SmartDoc.</p> <p>A value of 0 or false indicates the user did not receive an alert.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
publishItems (Publish Items)	<p>Specifies a boolean value that indicates whether the publish the workbook or workbook items to the application server.</p> <p>A value of 1 or true indicates that workbook items are published.</p> <p>A value of 0 or false indicates that the workbook is published.</p>

Attributes	Description
	<p>The default value for this attribute is <code>false</code>.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
refreshAllConnections (Refresh all Connections on Open)	<p>Specifies a boolean value that indicates whether the workbook shall refresh all the connections to data sources during load.</p> <p>The default value for this attribute is <code>false</code>.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
saveExternalLinkValues (Save External Link Values)	<p>Specifies a boolean value that indicates whether the application will cache values retrieved from other workbooks via an externally linking formula. Data is cached at save.</p> <p>A value of <code>1</code> or <code>true</code> indicates data from externally linked formulas is cached. A supporting part is written out containing a cached cell table from the external workbook.</p> <p>A value of <code>0</code> or <code>false</code> indicates data from externally linked formulas is not cached.</p> <p>The default value for this attribute is <code>true</code>.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showBorderUnselectedTables (Show Border Unselected Table)	<p>Specifies a boolean value that indicates whether a border is drawn around unselected tables in the workbook.</p> <p>A value of <code>1</code> or <code>true</code> indicates borders are drawn around unselected tables.</p> <p>A value of <code>0</code> or <code>false</code> indicates borders are not drawn around unselected tables.</p> <p>The default value for this attribute is <code>true</code>.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showInkAnnotation (Show Ink Annotations)	<p>Specifies a boolean value that indicates whether the book shows ink annotations.</p> <p>A value of <code>1</code> or <code>true</code> indicates that ink annotations are shown in the workbook.</p> <p>A value of <code>0</code> or <code>false</code> indicates that ink annotations are not shown in the workbook.</p> <p>The default value for this attribute is <code>true</code>.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

Attributes	Description
showObjects (Show Objects)	<p>Specifies how the application shows embedded objects in the workbook.</p> <p>This attribute is optional.</p> <p>The default value for this attribute is "all."</p> <p>The possible values for this attribute are defined by the ST_Objects simple type (§18.18.48).</p>
showPivotChartFilter (Show Pivot Chart Filter)	<p>Specifies a boolean value that indicates whether filtering options are shown for pivot charts in the workbook.</p> <p>A value of 1 or true indicates filtering options shall be shown for pivot charts.</p> <p>A value of 0 or false indicates filtering options shall not be shown.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
updateLinks (Update Links Behavior)	<p>Specifies how the application updates external links when the workbook is opened.</p> <p>The default value for this attribute is userSet.</p> <p>The possible values for this attribute are defined by the ST_UpdateLinks simple type (§18.18.87).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_WorkbookPr](#)) is located in §A.2. end note]

18.2.29 workbookProtection (Workbook Protection)

This element specifies options for protecting data in the workbook. Applications might use workbook protection to prevent anyone from accidentally changing, moving, or deleting important data. This protection can be ignored by applications which choose not to support this optional protection mechanism.

When a password is to be hashed and stored in this element, it shall be hashed as defined below, starting from a UTF-16LE encoded string value. If there is a leading BOM character (U+FEFF) in the encoded password it is removed before hash calculation.

[Note: Worksheet or workbook element protection should not be confused with file security. It is not meant to make your workbook safe from unintentional modification, and cannot protect it from malicious modification. end note]

Attributes	Description						
lockRevision (Lock Revisions)	<p>Specifies a boolean value that indicates whether the workbook is locked for revisions.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>						
lockStructure (Lock Structure)	<p>Specifies a boolean value that indicates whether structure of workbook is locked.</p> <p>A value of 1 or true indicates the structure of the workbook is locked. Worksheets in the workbook can't be moved, deleted, hidden, unhidden, or renamed, and new worksheets can't be inserted.</p> <p>A value of 0 or false indicates the structure of the workbook is not locked.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>						
lockWindows (Lock Windows)	<p>Specifies a boolean value that indicates whether the windows that comprise the workbook are locked.</p> <p>A value of 1 or true indicates the workbook windows are locked. Windows are the same size and position each time the workbook is opened.</p> <p>A value of 0 or false indicates the workbook windows are not locked.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>						
revisionsAlgorithm Name (Cryptographic Algorithm Name)	<p>Specifies the specific cryptographic hashing algorithm which shall be used along with the salt attribute and input password in order to compute the hash value for the revisionsHashValue attribute.</p> <p>The following values are reserved:</p> <table data-bbox="415 1457 1484 1887"> <tr> <th data-bbox="415 1457 669 1505">Value</th><th data-bbox="669 1457 1484 1505">Algorithm</th></tr> <tr> <td data-bbox="415 1505 669 1734">MD2</td><td data-bbox="669 1505 1484 1734"> <p>Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used.</p> <p>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. end note]</p> </td></tr> <tr> <td data-bbox="415 1734 669 1887">MD4</td><td data-bbox="669 1734 1484 1887"> <p>Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used.</p> <p>[Note: It is recommended that applications should avoid using</p> </td></tr> </table>	Value	Algorithm	MD2	<p>Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used.</p> <p>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. end note]</p>	MD4	<p>Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used.</p> <p>[Note: It is recommended that applications should avoid using</p>
Value	Algorithm						
MD2	<p>Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used.</p> <p>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. end note]</p>						
MD4	<p>Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used.</p> <p>[Note: It is recommended that applications should avoid using</p>						

Attributes	Description
	this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]
	MD5 Specifies that the MD5 algorithm, as defined by RFC 1321, shall be used. <i>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. end note]</i>
	RIPEMD-128 Specifies that the RIPEMD-128 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used. <i>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. end note]</i>
	RIPEMD-160 Specifies that the RIPEMD-160 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	SHA-1 Specifies that the SHA-1 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	SHA-256 Specifies that the SHA-256 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	SHA-384 Specifies that the SHA-384 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	SHA-512 Specifies that the SHA-512 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	WHIRLPOOL Specifies that the WHIRLPOOL algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	<p><i>[Example: Consider an Office Open XML document with the following information stored in one of its protection elements:</i></p> <pre>< ... revisionsAlgorithmName="SHA-1" revisionsHashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The revisionsAlgorithmName attribute value of “SHA-1” specifies that the SHA-1 hashing algorithm shall be used to generate a hash from the user-defined password. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
revisionsHashValue (Password Hash Value)	Specifies the hash value for the password stored for unlocking revisions in this workbook. This value shall be compared with the resulting hash value after hashing the user-supplied password using the algorithm specified by the preceding attributes and parent

Attributes	Description
	<p>XML element, and if the two values match, the protection shall no longer be enforced.</p> <p>If this value is omitted, then the reservationPassword attribute shall contain the password hash for the workbook.</p> <p>[<i>Example:</i> Consider a SpreadsheetML document with the following information stored in one of its protection elements:</p> <pre><... revisionsAlgorithmName="SHA-1" revisionsHashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The revisionsHashValue attribute value of 9oN7nWkCAyEZib1RomSJTjmPpCY= specifies that the user-supplied password must be hashed using the pre-processing defined by the parent element (if any) followed by the SHA-1 algorithm (specified via the revisionsAlgorithmName attribute value of SHA-1) and that the resulting has value must be 9oN7nWkCAyEZib1RomSJTjmPpCY= for the protection to be disabled. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema base64Binary datatype.</p>
revisionsSaltValue (Salt Value for Password Verifier)	<p>Specifies the salt that was prepended to the user-supplied password before it was hashed using the hashing algorithm defined by the preceding attribute values to generate the revisionsHashValue attribute, and that shall also be prepended to the user-supplied password before attempting to generate a hash value for comparison. A <i>salt</i> is a random string which is added to a user-supplied password before it is hashed in order to prevent a malicious party from pre-calculating all possible password/hash combinations and simply using those pre-calculated values (often referred to as a "dictionary attack").</p> <p>If this attribute is omitted, then no salt shall be prepended to the user-supplied password before it is hashed for comparison with the stored hash value.</p> <p>[<i>Example:</i> Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre><... revisionsSaltValue="ZUdHa+D8F/OAKP3I7ssUnQ==" revisionsHashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The revisionsSaltValue attribute value of ZUdHa+D8F/OAKP3I7ssUnQ== specifies that the user-supplied password must have this value prepended before it is run through the specified hashing algorithm to generate a resulting hash value for comparison. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema base64Binary datatype.</p>
revisionsSpinCount (Iterations to Run)	<p>Specifies the number of times the hashing function shall be iteratively run (runs using each iteration's result plus a 4 byte value (0-based, little endian) containing the number</p>

Attributes	Description								
Hashing Algorithm)	<p>of the iteration as the input for the next iteration) when attempting to compare a user-supplied password with the value stored in the revisionsHashValue attribute.</p> <p>[<i>Rationale</i>: Running the algorithm many times increases the cost of exhaustive search attacks correspondingly. Storing this value allows for the number of iterations to be increased over time to accommodate faster hardware (and hence the ability to run more iterations in less time). <i>end rationale</i>]</p> <p>[<i>Example</i>: Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre><... revisionsSpinCount="100000" revisionHashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The revisionsSpinCount attribute value of 100000 specifies that the hashing function must be run one hundred thousand times to generate a hash value for comparison with the revisionsHashValue attribute. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>								
workbookAlgorithmName (Cryptographic Algorithm Name)	<p>Specifies the specific cryptographic hashing algorithm which shall be used along with the salt attribute and input password in order to compute the hash value for the workbookHashValue attribute.</p> <p>The following values are reserved:</p> <table border="1" data-bbox="415 1144 1479 1873"> <thead> <tr> <th data-bbox="415 1144 667 1192">Value</th><th data-bbox="667 1144 1479 1192">Algorithm</th></tr> </thead> <tbody> <tr> <td data-bbox="415 1192 667 1423">MD2</td><td data-bbox="667 1192 1479 1423"> <p>Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p> </td></tr> <tr> <td data-bbox="415 1423 667 1654">MD4</td><td data-bbox="667 1423 1479 1654"> <p>Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p> </td></tr> <tr> <td data-bbox="415 1654 667 1873">MD5</td><td data-bbox="667 1654 1479 1873"> <p>Specifies that the MD5 algorithm, as defined by RFC 1321, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p> </td></tr> </tbody> </table>	Value	Algorithm	MD2	<p>Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>	MD4	<p>Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>	MD5	<p>Specifies that the MD5 algorithm, as defined by RFC 1321, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>
Value	Algorithm								
MD2	<p>Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>								
MD4	<p>Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>								
MD5	<p>Specifies that the MD5 algorithm, as defined by RFC 1321, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>								

Attributes	Description														
	<table border="1" data-bbox="415 247 1477 978"> <tr> <td data-bbox="415 247 667 474">RIPEMD-128</td><td data-bbox="667 247 1477 474"> <p>Specifies that the RIPEMD-128 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> <p><i>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. end note]</i></p> </td></tr> <tr> <td data-bbox="415 474 667 558">RIPEMD-160</td><td data-bbox="667 474 1477 558"> <p>Specifies that the RIPEMD-160 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> </td></tr> <tr> <td data-bbox="415 558 667 642">SHA-1</td><td data-bbox="667 558 1477 642"> <p>Specifies that the SHA-1 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> </td></tr> <tr> <td data-bbox="415 642 667 726">SHA-256</td><td data-bbox="667 642 1477 726"> <p>Specifies that the SHA-256 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> </td></tr> <tr> <td data-bbox="415 726 667 810">SHA-384</td><td data-bbox="667 726 1477 810"> <p>Specifies that the SHA-384 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> </td></tr> <tr> <td data-bbox="415 810 667 894">SHA-512</td><td data-bbox="667 810 1477 894"> <p>Specifies that the SHA-512 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> </td></tr> <tr> <td data-bbox="415 894 667 978">WHIRLPOOL</td><td data-bbox="667 894 1477 978"> <p>Specifies that the WHIRLPOOL algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> </td></tr> </table> <p data-bbox="415 1016 1477 1083"><i>[Example: Consider an Office Open XML document with the following information stored in one of its protection elements:</i></p> <pre data-bbox="456 1121 1305 1188">< ... workbookAlgorithmName="SHA-1" workbookHashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p data-bbox="415 1226 1477 1331">The workbookAlgorithmName attribute value of “SHA-1” specifies that the SHA-1 hashing algorithm must be used to generate a hash from the user-defined password. <i>end example]</i></p> <p data-bbox="415 1369 1477 1436">The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>	RIPEMD-128	<p>Specifies that the RIPEMD-128 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> <p><i>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. end note]</i></p>	RIPEMD-160	<p>Specifies that the RIPEMD-160 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>	SHA-1	<p>Specifies that the SHA-1 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>	SHA-256	<p>Specifies that the SHA-256 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>	SHA-384	<p>Specifies that the SHA-384 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>	SHA-512	<p>Specifies that the SHA-512 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>	WHIRLPOOL	<p>Specifies that the WHIRLPOOL algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>
RIPEMD-128	<p>Specifies that the RIPEMD-128 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> <p><i>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. end note]</i></p>														
RIPEMD-160	<p>Specifies that the RIPEMD-160 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>														
SHA-1	<p>Specifies that the SHA-1 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>														
SHA-256	<p>Specifies that the SHA-256 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>														
SHA-384	<p>Specifies that the SHA-384 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>														
SHA-512	<p>Specifies that the SHA-512 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>														
WHIRLPOOL	<p>Specifies that the WHIRLPOOL algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>														
workbookHashValue (Password Hash Value)	<p data-bbox="415 1453 1477 1596">Specifies the hash value for the password stored for unlocking this workbook. This value shall be compared with the resulting hash value after hashing the user-supplied password using the algorithm specified by the preceding attributes and parent XML element, and if the two values match, the protection shall no longer be enforced.</p> <p data-bbox="415 1633 1477 1701">If this value is omitted, then the reservationPassword attribute shall contain the password hash for the workbook.</p> <p data-bbox="415 1738 1477 1806"><i>[Example: Consider a SpreadsheetML document with the following information stored in one of its protection elements:</i></p> <pre data-bbox="456 1843 967 1875"><... workbookAlgorithmName="SHA-1"</pre>														

Attributes	Description
	<p><code>workbookHashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></code></p> <p>The <code>workbookHashValue</code> attribute value of <code>9oN7nWkCAyEZib1RomSJTjmPpCY=</code> specifies that the user-supplied password must be hashed using the pre-processing defined by the parent element (if any) followed by the SHA-1 algorithm (specified via the <code>workbookAlgorithmName</code> attribute value of SHA-1) and that the resulting has value must be <code>9oN7nWkCAyEZib1RomSJTjmPpCY=</code> for the protection to be disabled. <i>end example</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema <code>base64Binary</code> datatype.</p>
<p><code>workbookSaltValue</code> (Salt Value for Password Verifier)</p>	<p>Specifies the salt which was prepended to the user-supplied password before it was hashed using the hashing algorithm defined by the preceding attribute values to generate the <code>workbookHashValue</code> attribute, and which shall also be prepended to the user-supplied password before attempting to generate a hash value for comparison. A <i>salt</i> is a random string which is added to a user-supplied password before it is hashed in order to prevent a malicious party from pre-calculating all possible password/hash combinations and simply using those pre-calculated values (often referred to as a "dictionary attack").</p> <p>If this attribute is omitted, then no salt shall be prepended to the user-supplied password before it is hashed for comparison with the stored hash value.</p> <p>[<i>Example:</i> Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre><... workbookSaltValue="ZUdHa+D8F/OAKP3I7ssUnQ==" workbookHashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The <code>workbookSaltValue</code> attribute value of <code>ZUdHa+D8F/OAKP3I7ssUnQ==</code> specifies that the user-supplied password must have this value prepended before it is run through the specified hashing algorithm to generate a resulting hash value for comparison. <i>end example</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema <code>base64Binary</code> datatype.</p>
<p><code>workbookSpinCount</code> (Iterations to Run Hashing Algorithm)</p>	<p>Specifies the number of times the hashing function shall be iteratively run (runs using each iteration's result plus a 4 byte value (0-based, little endian) containing the number of the iteration as the input for the next iteration) when attempting to compare a user-supplied password with the value stored in the <code>workbookHashValue</code> attribute.</p> <p>[<i>Rationale:</i> Running the algorithm many times increases the cost of exhaustive search attacks correspondingly. Storing this value allows for the number of iterations to be increased over time to accommodate faster hardware (and hence the ability to run more iterations in less time). <i>end rationale</i>]</p>

Attributes	Description
	<p>[<i>Example:</i> Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre><... workbookSpinCount="100000" revisionHashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The workbookSpinCount attribute value of 100000 specifies that the hashing function must be run one hundred thousand times to generate a hash value for comparison with the workbookHashValue attribute. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_WorkbookProtection](#)) is located in §A.2. *end note*]

18.2.30 workbookView (Workbook View)

This element specifies a single Workbook view.

Units for window widths and other dimensions are expressed in twips. Twip measurements are portable between different display resolutions. The formula is (screen pixels) * (20 * 72) / (logical device dpi), where the logical device dpi can be different for x and y coordinates.

Attributes	Description
activeTab (Active Sheet Index)	<p>Specifies an unsignedInt that contains the index to the active sheet in this book view.</p> <p>The default value for this attribute is 0.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
autoFilterDateGrouping (AutoFilter Date Grouping)	<p>Specifies a boolean value that indicates whether to group dates when presenting the user with filtering options in the user interface.</p> <p>A value of 1 or true indicates that dates are grouped.</p> <p>A value of 0 or false indicates that dates are not grouped.</p> <p>The default value for this attribute is true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
firstSheet (First Sheet)	<p>Specifies the index to the first sheet in this book view.</p>

Attributes	Description
	<p>The default value for this attribute is 0.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
minimized (Minimized)	<p>Specifies a boolean value that indicates whether the workbook window is minimized.</p> <p>A value of 1 or true indicates the workbook window is minimized.</p> <p>A value of 0 or false indicates the workbook window is not minimized.</p> <p>The default value for this attribute is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showHorizontalScroll (Show Horizontal Scroll)	<p>Specifies a boolean value that indicates whether to display the horizontal scroll bar in the user interface.</p> <p>A value of 1 or true indicates that the horizontal scrollbar shall be shown.</p> <p>A value of 0 or false indicates that the horizontal scrollbar shall not be shown.</p> <p>The default value for this attribute is true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showSheetTabs (Show Sheet Tabs)	<p>Specifies a boolean value that indicates whether to display the sheet tabs in the user interface.</p> <p>A value of 1 or true indicates that sheet tabs shall be shown.</p> <p>A value of 0 or false indicates that sheet tabs shall not be shown.</p> <p>The default value for this attribute is true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showVerticalScroll (Show Vertical Scroll)	<p>Specifies a boolean value that indicates whether to display the vertical scroll bar.</p> <p>A value of 1 or true indicates the vertical scrollbar shall be shown.</p> <p>A value of 0 or false indicates the vertical scrollbar shall not be shown.</p> <p>The default value for this attribute is true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean</p>

Attributes	Description
	datatype.
tabRatio (Sheet Tab Ratio)	<p>Specifies ratio between the workbook tabs bar and the horizontal scroll bar.</p> <p>The default value for this attribute is 600.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
visibility (Visibility)	<p>Specifies visible state of the workbook window.</p> <p>The default value for this attribute is "visible."</p> <p>The possible values for this attribute are defined by the ST_Visibility simple type (§18.18.89).</p>
windowHeight (Window Height)	<p>Specifies the height of the workbook window. The unit of measurement for this value is twips.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
windowWidth (Window Width)	<p>Specifies the width of the workbook window. The unit of measurement for this value is twips.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
xWindow (Upper Left Corner (X Coordinate))	<p>Specifies the X coordinate for the upper left corner of the workbook window. The unit of measurement for this value is twips.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
yWindow (Upper Left Corner (Y Coordinate))	<p>Specifies the Y coordinate for the upper left corner of the workbook window. The unit of measurement for this value is twips.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_BookView](#)) is located in §A.2. *end note*]

18.3 Worksheets

Sheets are the central structures within a workbook, and are where the user does most of their spreadsheet work. The most common type of sheet is the worksheet, which is represented as a grid of cells. Worksheet cells can contain text, numbers, dates, and formulas. Cells can be formatted as well. Workbooks usually contain more than one sheet. To aid in the analysis of data and making informed decisions, spreadsheet applications often implement features and objects which help calculate, sort, filter, organize, and graphically display information.

Since these features are often connected very tightly with the spreadsheet grid, these are also included in the sheet definition on disk.

Other types of sheets include chart sheets and dialog sheets.

Note that sheet information is organized into three main sections:

- Top-level sheet properties (everything before sheetData)
- The cell table (sheetData)
- Supporting sheet features (everything after sheetData)

18.3.1 Worksheets

The following elements define a sheet and its contents:

18.3.1.1 [anchor \(Object Cell Anchor\)](#)

This element specifies the position of an embedded object or embedded control.

[*Example:* The following example demonstrates an embedded object whose top-left corner is at the top-left point of the cell in the first column and first row and whose bottom-right corner is offset horizontally into the cell at the fifth column and eleventh row.

```
<oleObject ... >
  <objectPr ... >
    <anchor sizeWithCells="true">
      <from>
        <col>0</col>
        <colOff>0</colOff>
        <row>0</row>
        <rowOff>0</rowOff>
      </from>
      <to>
        <col>4</col>
        <colOff>182880</colOff>
        <row>10</row>
        <rowOff>0</rowOff>
      </to>
    </anchor>
  </objectPr>
</oleObject>
```

end example]

Attributes	Description
moveWithCells	Specifies that the object moves with its underlying cells.

Attributes	Description
(Move With Cells)	<p>[Example:</p> <pre data-bbox="451 352 967 384"><anchor moveWithCells="true" ... ></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
sizeWithCells (Size With Cells)	<p>Specifies that the object resizes with its underlying cells.</p> <p>[Example:</p> <pre data-bbox="451 720 967 751"><anchor sizeWithCells="true" ... ></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
z-order (Z-Order)	<p>Specifies the Z-order index of the object. Higher numbers indicate higher Z-order. Objects with higher Z-order are rendered on top of objects with lower Z-order when they intersect or overlap.</p> <p>[Example:</p> <pre data-bbox="451 1161 854 1192"><anchor z-order="10 " ... ></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT ObjectAnchor](#)) is located in §A.2.
end note]

18.3.1.2 autoFilter (AutoFilter Settings)

AutoFilter temporarily hides rows based on a filter criteria, which is applied column by column to a table of data in the worksheet. This collection expresses AutoFilter settings.

[Example: This example expresses a filter indicating to 'show only values greater than 0.5'. The filter is being applied to the range B3:E8, and the criteria is being applied to values in the column whose colId is 1 (zero based column numbering, from left to right). Therefore any rows must be hidden if the value in that particular column is less than or equal to 0.5.

```

<autoFilter ref="B3:E8">
  <filterColumn colId="1">
    <customFilters>
      <customFilter operator="greaterThan" val="0.5"/>
    </customFilters>
  </filterColumn>
</autoFilter>

```

end example]

Attributes	Description
ref (Cell or Range Reference)	Reference to the cell range to which the AutoFilter is applied. The possible values for this attribute are defined by the ST_Ref simple type (§18.18.62).

[Note: The W3C XML Schema definition of this element's content model ([CT_AutoFilter](#)) is located in §A.2. *end note*]

18.3.1.3 brk (Break)

Individual row or column breaks

Attributes	Description
id (Id)	Zero-based row or column Id of the page break. Breaks occur above the specified row and left of the specified column. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
man (Manual Page Break)	Manual Break flag. 1 means the break is a manually inserted break. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
max (Maximum)	Zero-based index of end row or column of the break. For row breaks, specifies column index; for column breaks, specifies row index. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
min (Minimum)	Zero-based index of start row or column of the break. For row breaks, specifies column index; for column breaks, specifies row index. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

Attributes	Description
pt (Pivot-Created Page Break)	Flag indicating that a PivotTable created this break. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Break](#)) is located in §A.2. *end note*]

18.3.1.4 c (Cell)

This collection represents a cell in the worksheet. Information about the cell's location (reference), value, data type, formatting, and formula is expressed here.

[Example: This example shows the information stored for a cell whose address in the grid is C6, whose style index is '6', and whose value metadata index is '15'. The cell contains a formula as well as a calculated result of that formula.

```
<c r="C6" s="1" vm="15">
  <f>CUBEVALUE("xlext.dat9 Adventure Works",C$5,$A6)</f>
  <v>2838512.355</v>
</c>
```

end example

While a cell can have a formula element *f* and a value element *v*, when the cell's type *t* is *inlineStr* then only the element *is* is allowed as a child element.

[Example:

Here is an example of expressing a string in the cell rather than using the shared string table.

```
<row r="1" spans="1:1">
  <c r="A1" t="inlineStr">
    <is><t>This is inline string example</t></is>
  </c>
</row>
```

end example

Attributes	Description
cm (Cell Metadata Index)	The zero-based index of the cell metadata record associated with this cell. Metadata information is found in the Metadata Part. Cell metadata is extra information stored at the cell level, and is attached to the cell (travels through moves, copy / paste, clear, etc). Cell metadata is not accessible via formula reference. The possible values for this attribute are defined by the W3C XML Schema unsignedInt

Attributes	Description
	datatype.
ph (Show Phonetic)	<p>A Boolean value indicating if the spreadsheet application should show phonetic information. Phonetic information is displayed in the same cell across the top of the cell and serves as a 'hint' which indicates how the text should be pronounced. This should only be used for East Asian languages.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
r (Reference)	<p>An A1 style reference to the location of this cell</p> <p>The possible values for this attribute are defined by the ST_CellRef simple type (§18.18.7).</p>
s (Style Index)	<p>The index of this cell's style. Style records are stored in the Styles Part.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
t (Cell Data Type)	<p>An enumeration representing the cell's data type.</p> <p>The possible values for this attribute are defined by the ST_CellType simple type (§18.18.11).</p>
vm (Value Metadata Index)	<p>The zero-based index of the value metadata record associated with this cell's value. Metadata records are stored in the Metadata Part. Value metadata is extra information stored at the cell level, but associated with the value rather than the cell itself. Value metadata is accessible via formula reference.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Cell](#)) is located in §A.2. *end note*]

18.3.1.5 cellSmartTag (Cell Smart Tag)

Single smart tag associated with a cell. There can be more than one cellSmartTag for a cell.

Attributes	Description
deleted (Deleted)	<p>Boolean flag indicating that the application shouldn't display a particular smart tag in the cell. [Example: When the user has chosen to explicitly remove the Smart Tag by interacting with the application's user interface. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
type (Smart Tag Type Index)	Book-level zero-based index of the smart tag type. This index references a <smartTagType> element in the <smartTagTypes> collection in the workbook start

Attributes	Description
	<p>part.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
xmlBased (XML Based)	<p>Boolean flag indicating the Smart Tag recognition is triggered because the cell is associated with an XML map (schema-based semantic recognition), as contrasted with the more usual cell-content-based recognition of smart tags.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CellSmartTag](#)) is located in §A.2.
end note]

18.3.1.6 [cellSmartTagPr \(Smart Tag Properties\)](#)

Represents a single property of a smart tag in a cell; contains a key-value pair.

Attributes	Description
key (Key Name)	<p>Key name of a single property of a smart tag in a cell.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
val (Value)	<p>String value of a single property of a smart tag in a cell.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CellSmartTagPr](#)) is located in §A.2.
end note]

18.3.1.7 [cellSmartTags \(Cell Smart Tags\)](#)

The element is used to label the cell with a smart tag. A cell can be determined to have semantic meaning and the cell containing this data can be labeled with a smart tag. The actions which can be taken depend on the semantic meaning of the data and the actions that the application decides to associate with that type of smart tag.

[*Example:* If you recently sent mail to "Chad Rothschiller", and you type the name into a cell on the worksheet, the name is recognized and given a smart tag with actions you can take including Send Mail, Schedule a Meeting, Open Contact, or Add to Contacts.

end example]

An application can decide that the smart tag indicators appear in the cell in the worksheet.

This collection represents a collection of smart tags on a cell.

[*Example:* This example expresses a smart tag associated with cell A1. The @type is used to associate this smart tag with a workbook-level smart tag type defined in the workbook start part.

```
<cellSmartTags r="A1">
  <cellSmartTag type="0"/>
</cellSmartTags>
```

end example]

Attributes	Description
r (Reference)	Reference to the cell that contains this set of smart tags. The possible values for this attribute are defined by the ST_CellRef simple type (§18.18.7).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CellSmartTags](#)) is located in §A.2. *end note]*

18.3.1.8 cellWatch (Cell Watch Item)

The watch window is a single UI location where the application user can keep track of certain cell formulas & values which they have chosen to be in the set of watched cells. This element expresses the cell address of a cell being watched. It is always a reference to a single cell.

Attributes	Description
r (Reference)	Cell reference of the cell being watched. The possible values for this attribute are defined by the ST_CellRef simple type (§18.18.7).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CellWatch](#)) is located in §A.2. *end note]*

18.3.1.9 cellWatches (Cell Watch Items)

Collection of cells on this worksheet being watched in the 'watch window'.

[*Example:* In this example, cells B3 and B4 are being watched.

```
<cellWatches>
  <cellWatch r="B3"/>
  <cellWatch r="B4"/>
</cellWatches>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_CellWatches](#)) is located in §A.2. *end note*]

18.3.1.10 cfRule (Conditional Formatting Rule)

This collection represents a description of a conditional formatting rule.

[Example:

This example shows a conditional formatting rule highlighting cells whose values are greater than 0.5. Note that in this case the content of <formula> is a static value, but can also be a formula expression.

```
<conditionalFormatting sqref="E3:E9">
  <cfRule type="cellIs" dxflId="0" priority="1" operator="greaterThan">
    <formula>0.5</formula>
  </cfRule>
</conditionalFormatting>
```

end example]

Only rules with a type attribute value of expression support formula syntax.

Attributes	Description
aboveAverage (Above Or Below Average)	Indicates whether the rule is an "above average" rule. 1 indicates 'above average'. This attribute is ignored if type is not equal to aboveAverage. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
bottom (Bottom N)	Indicates whether a "top/bottom n" rule is a "bottom n" rule. 1 indicates 'bottom'. This attribute is ignored if type is not equal to top10. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
dxflId (Differential Formatting Id)	This is an index to a dxf element in the Styles Part indicating which cell formatting to apply when the conditional formatting rule criteria is met. The possible values for this attribute are defined by the ST_DxflId simple type (§18.18.25).

Attributes	Description
equalAverage (Equal Average)	<p>Flag indicating whether the 'aboveAverage' and 'belowAverage' criteria is inclusive of the average itself, or exclusive of that value. 1 indicates to include the average value in the criteria. This attribute is ignored if type is not equal to aboveAverage.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
operator (Operator)	<p>The operator in a "cell value is" conditional formatting rule. This attribute is ignored if type is not equal to cellIs</p> <p>The possible values for this attribute are defined by the ST_ConditionalFormattingOperator simple type (§18.18.15).</p>
percent (Top 10 Percent)	<p>Indicates whether a "top/bottom n" rule is a "top/bottom n percent" rule. This attribute is ignored if type is not equal to top10.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
priority (Priority)	<p>The priority of this conditional formatting rule. This value is used to determine which format should be evaluated and rendered. Lower numeric values are higher priority than higher numeric values, where 1 is the highest priority.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
rank (Rank)	<p>The value of "n" in a "top/bottom n" conditional formatting rule. This attribute is ignored if type is not equal to top10.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
stdDev (StdDev)	<p>The number of standard deviations to include above or below the average in the conditional formatting rule. This attribute is ignored if type is not equal to aboveAverage. If a value is present for stdDev and the rule type = aboveAverage, then this rule is automatically an "above or below N standard deviations" rule.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
stopIfTrue (Stop If True)	<p>If this flag is 1, no rules with lower priority shall be applied over this rule, when this rule evaluates to true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
text (Text)	<p>The text value in a "text contains" conditional formatting rule. This attribute is ignored if type is not equal to containsText.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

Attributes	Description
timePeriod (Time Period)	<p>The applicable time period in a "date occurring..." conditional formatting rule. This attribute is ignored if type is not equal to timePeriod.</p> <p>The possible values for this attribute are defined by the ST_TimePeriod simple type (§18.18.82).</p>
type (Type)	<p>Type of conditional formatting rule.</p> <p>The possible values for this attribute are defined by the ST_CfType simple type (§18.18.12).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_CfRule](#)) is located in §A.2. *end note*]

18.3.1.11 cfvo (Conditional Format Value Object)

Describes the values of the interpolation points in a gradient scale.

[Example: This example demonstrates a color scale conditional formatting rule, which defines a color for the minimum value in the range of cell values, a color for the midpoint value, and a color for the maximum value in the in the range of cell values. Information is given about how to define the midpoint. In this case, it is the 50 percent mark.

```
<colorScale>
  <cfvo type="min" val="0"/>
  <cfvo type="percent" val="50"/>
  <cfvo type="max" val="0"/>
  <color rgb="FFFF0000"/>
  <color rgb="FFFFFF00"/>
  <color rgb="FF00B050"/>
</colorScale>
```

The first <cfvo> element corresponds with the first <color> definition, and so on.

end example]

Attributes	Description
gte (Greater Than Or Equal)	<p>For icon sets, determines whether this threshold value uses the greater than or equal to operator. 0 indicates 'greater than' is used instead of 'greater than or equal to'.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
type (Type)	<p>The type of this conditional formatting value object. [Example: 'min' and 'max' would be used (in conjunction with @val) to express the lower and upper values to be used in a gradient. <i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_CfvoType simple type (§18.18.13).
val (Value)	The value of this conditional formatting value object. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element's content model ([CT_Cfvo](#)) is located in §A.2. *end note*]

18.3.1.12 [chartsheet \(Chart Sheet\)](#)

This is the root element of Chartsheet Parts in a SpreadsheetML document.

[Note: The W3C XML Schema definition of this element's content model ([CT_Chartsheet](#)) is located in §A.2. *end note*]

18.3.1.13 [col \(Column Width & Formatting\)](#)

Defines column width and column formatting for one or more columns of the worksheet.

[Example: This example shows that column 5 (E) has width and style information applied.

```
<col min="5" max="5" width="9.140625" style="3"/>
```

end example]

Attributes	Description
bestFit (Best Fit Column Width)	Flag indicating if the specified column(s) is set to 'best fit'. 'Best fit' is set to true under these conditions: <ul style="list-style-type: none"> • The column width has never been manually set by the user, AND • The column width is not the default width • • 'Best fit' means that when numbers are typed into a cell contained in a 'best fit' column, the column width should automatically resize to display the number. <p>[Note: In best fit cases, column width must not be made smaller, only larger. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
collapsed (Collapsed)	Flag indicating if the outlining of the affected column(s) is in the collapsed state. See description of row collapsed and outlinePr element's summaryBelow and summaryRight attributes for detailed information. <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

Attributes	Description
customWidth (Custom Width)	<p>Flag indicating that the column width for the affected column(s) is different from the default or has been manually set.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
hidden (Hidden Columns)	<p>Flag indicating if the affected column(s) are hidden on this worksheet.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
max (Maximum Column)	<p>Last column affected by this 'column info' record.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
min (Minimum Column)	<p>First column affected by this 'column info' record.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
outlineLevel (Outline Level)	<p>Outline level of affected column(s). Range is 0 to 7. See description of outlinePr element's summaryBelow and summaryRight attributes for detailed information.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedByte datatype.</p>
phonetic (Show Phonetic Information)	<p>Flag indicating if the phonetic information should be displayed by default for the affected column(s) of the worksheet.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
style (Style)	<p>Default style for the affected column(s). Affects cells not yet allocated in the column(s). In other words, this style applies to new columns.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
width (Column Width)	<p>Column width measured as the number of characters of the maximum digit width of the numbers 0, 1, 2, ..., 9 as rendered in the normal style's font. There are 4 pixels of margin padding (two on each side), plus 1 pixel padding for the gridlines.</p> $\text{width} = \text{Truncate}([\{\text{Number of Characters}\} * \{\text{Maximum Digit Width}\} + \{5 \text{ pixel padding}\}] / \{\text{Maximum Digit Width}\} * 256) / 256$ <p><i>[Example: Using the Calibri font as an example, the maximum digit width of 11 point font size is 7 pixels (at 96 dpi). In fact, each digit is the same width for this font. Therefore, if the cell width is 8 characters wide, the value of this attribute must be $\text{Truncate}([8*7+5]/7*256)/256 = 8.7109375$. end example]</i></p>

Attributes	Description
	<p>To translate the value of width in the file into the column width value at runtime (expressed in terms of pixels), use this calculation:</p> $= \text{Truncate}(((256 * \{\text{width}\} + \text{Truncate}(128/\{\text{Maximum Digit Width}\}))/256) * \{\text{Maximum Digit Width}\})$ <p>[<i>Example:</i> Using the same example as above, the calculation would be $\text{Truncate}(((256 * 8.7109375 + \text{Truncate}(128/7))/256) * 7) = 61$ pixels. <i>end example</i>]</p> <p>To translate from pixels to character width, use this calculation:</p> $= \text{Truncate}((\{\text{pixels}\} - 5) / \{\text{Maximum Digit Width}\} * 100 + 0.5) / 100$ <p>[<i>Example:</i> Using the example above, the calculation would be $\text{Truncate}((61 - 5) / 7 * 100 + 0.5) / 100 = 8$ characters. <i>end example</i>]</p> <p>[<i>Note:</i> when wide borders are applied, part of the left/right border must overlap with the 2 pixel padding on each side. Wide borders do not affect the width calculation of the column. <i>end note</i>]</p> <p>[<i>Note:</i> When the sheet is in the mode to view formulas instead of values, the pixel width of the column is doubled. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Col](#)) is located in §A.2. *end note*]

18.3.1.14 colBreaks (Vertical Page Breaks)

Vertical page break information used for print layout view, page layout view, drawing print breaks in normal view, and for printing the worksheet.

[*Example:*

In this example, a page break has been inserted at C3 (the break occurs left and above C3).

```
<colBreaks count="1" manualBreakCount="1">
  <brk id="2" max="1048575" man="1"/>
</colBreaks>
```

end example]

Attributes	Description
count (Page Break Count)	Number of breaks in the collection. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
manualBreakCount (Manual Break Count)	Number of manual breaks in the collection. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT PageBreak](#)) is located in §A.2. *end note*]

18.3.1.15 color (Data Bar Color)

One of the colors associated with the data bar or color scale.

The auto attribute shall not be used in the context of data bars.

Attributes	Description
auto (Automatic)	A boolean value indicating the color is automatic and system color dependent. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
indexed (Index)	Indexed color value. Only used for backwards compatibility. References a color in indexedColors. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
rgb (Alpha Red Green Blue Color Value)	Standard Alpha Red Green Blue color value (ARGB). The possible values for this attribute are defined by the ST_UnsignedIntHex simple type (§18.18.86).
theme (Theme Color)	A zero-based index into the <clrScheme> collection (§20.1.6.2), referencing a particular <sysClr> or <srgbClr> value expressed in the Theme part. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
tint (Tint)	Specifies the tint value applied to the color. If tint is supplied, then it is applied to the RGB value of the color to determine the final color applied. The tint value is stored as a double from -1.0 .. 1.0, where -1.0 means 100% darken and

Attributes	Description
	<p>1.0 means 100% lighten. Also, 0.0 means no change.</p> <p>In loading the RGB value, it is converted to HLS where HLS values are (0..HLSMAX), where HLSMAX is currently 255.</p> <p>[Example:</p> <p>Here are some examples of how to apply tint to color:</p> <p>If (tint < 0) $\text{Lum}' = \text{Lum} * (1.0 + \text{tint})$ <p>For example: Lum = 200; tint = -0.5; Darken 50% $\text{Lum}' = 200 * (0.5) \Rightarrow 100$ <p>For example: Lum = 200; tint = -1.0; Darken 100% (make black) $\text{Lum}' = 200 * (1.0 - 1.0) \Rightarrow 0$ <p>If (tint > 0) $\text{Lum}' = \text{Lum} * (1.0 - \text{tint}) + (\text{HLSMAX} - \text{HLSMAX} * (1.0 - \text{tint}))$ <p>For example: Lum = 100; tint = 0.75; Lighten 75% $\begin{aligned} \text{Lum}' &= 100 * (1 - .75) + (\text{HLSMAX} - \text{HLSMAX} * (1 - .75)) \\ &= 100 * .25 + (255 - 255 * .25) \\ &= 25 + (255 - 63) = 25 + 192 = 217 \end{aligned}$ <p>For example: Lum = 100; tint = 1.0; Lighten 100% (make white) $\begin{aligned} \text{Lum}' &= 100 * (1 - 1) + (\text{HLSMAX} - \text{HLSMAX} * (1 - 1)) \\ &= 100 * 0 + (255 - 255 * 0) \\ &= 0 + (255 - 0) = 255 \end{aligned}$ <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p> </p></p></p></p></p></p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Color](#)) is located in §A.2. *end note*]

18.3.1.16 colorScale (Color Scale)

Describes a gradated color scale in this conditional formatting rule.

[Example:

```
<colorScale>
  <cfvo type="min" val="0"/>
  <cfvo type="max" val="0"/>
  <color theme="5"/>
  <color rgb="FFFFFFF9C"/>
</colorScale>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ColorScale](#)) is located in §A.2. *end note*]

18.3.1.17 cols (Column Information)

Information about whole columns of the worksheet.

[*Example:*

This example shows that column 4 (D) has 'best fit' applied to it, which is also a custom width. Also, column 5 (E) is listed as having a custom width and a style applied at the column level (as opposed to the cell level).

```
<cols>
  <col min="4" max="4" width="12" bestFit="1" customWidth="1"/>
  <col min="5" max="5" width="9.140625" style="3"/>
</cols>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Cols](#)) is located in §A.2. *end note*]

18.3.1.18 conditionalFormatting (Conditional Formatting)

A Conditional Format is a format, such as cell shading or font color, that a spreadsheet application can automatically apply to cells if a specified condition is true. This collection expresses conditional formatting rules applied to a particular cell or range.

[*Example:* This example applies a 'top10' rule to the cells C3:C8. The @dxfId references the formatting (defined in the styles part) to be applied to cells that match the criteria.

```
<conditionalFormatting sqref="C3:C8">
  <cfRule type="top10" dxfId="1" priority="3" rank="2"/>
</conditionalFormatting>
```

end example]

Attributes	Description
pivot (PivotTable Conditional	Flag indicating if this is conditional formatting associated with a PivotTable.

Attributes	Description
Formatting)	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
sqref (Sequence of References)	Range over which these conditional formatting rules apply. The possible values for this attribute are defined by the ST_Sqref simple type (§18.18.76).

[Note: The W3C XML Schema definition of this element's content model ([CT_ConditionalFormatting](#)) is located in §A.2. *end note*]

18.3.1.19 control (Embedded Control)

A single embedded control.

Attributes	Description
id (Relationship Id) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	This relationship ID references an Embedded Control Data part which contains control-specific properties and state information about this particular embedded control. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).
name (Control Name)	The code name of the control. The possible values for this attribute are defined by the W3C XML Schema string datatype.
shapeId (Shape Id)	ID of the drawing shape in the DrawingML part with which this control is associated. The drawing is used to draw the control in the sheet. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Control](#)) is located in §A.2. *end note*]

18.3.1.20 controlPr (Embedded Control Properties)

This element specifies the visual, positional and cell linkage properties of an embedded control.

[Example: The following example demonstrates an non-printing embedded control linked to cell A4 that is represented as an image:

```
<controls>
  <control ... >
```

```

    <controlPr print="false" autoLine="false" linkedCell="$A$4" cf="pict"
r:id="rId5">
    <anchor sizeWithCells="true">
        <from> ... </from>
        <to> ... </to>
    </anchor>
</controlPr>
</control>
</controls>

```

end example]

Attributes	Description
altText (Alternative Text)	<p>Specifies alternative text for the object, for use by assistive technologies or applications.</p> <p>[Example:</p> <pre><controlPr altText="Alternate text" ... /></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
autoFill (Automatic Fill Flag)	<p>Specifies whether the object's fill formatting is provided automatically by the application.</p> <p>[Example:</p> <pre><controlPr autoFill="false" ... /></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
autoLine (Automatic Line Flag)	<p>Specifies whether the object's line formatting is provided automatically by the application.</p> <p>[Example:</p> <pre><controlPr autoLine="false" ... /></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
autoPict (Automatic	<p>Specifies whether the object's size is formatted automatically by the application.</p>

Attributes	Description
Size Flag)	<p>[Example:</p> <pre><controlPr autoPict="false" ... /></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
cf (Image Format)	<p>Specifies the image format used to render the object.</p> <p>[Example:</p> <pre><controlPr cf="pict" ... /></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
defaultSize (Default Size Flag)	<p>Specifies whether the object is at its default size.</p> <p>[Example:</p> <pre><controlPr defaultSize="false" ... /></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
disabled (Disabled Flag)	<p>Specifies whether the object is allowed to run an attached macro.</p> <p>[Example:</p> <pre><controlPr disabled="true" ... /></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
id (Relationship ID for Embedded Control Properties) Namespace: http://purl.oclc.or	<p>Specifies the relationship ID for the relationship which contains the properties for this embedded control. This property bag is contained in a separate part within the package.</p> <p>The relationship explicitly targeted by this attribute shall be of relationship type http://purl.oclc.org/ooxml/officeDocument/relationships/control or the document shall be considered non-conformant.</p>

Attributes	Description
g/ooxml/officeDocument/relationships	<p>If this attribute is omitted, then the embedded control shall be given no property bag when instantiated.</p> <p>[<i>Example:</i> Consider the following WordprocessingML markup for an embedded control in a document:</p> <pre><w:control r:id="rId5" w:id="CheckBox1" w:name="CheckBox1" w:shapeid="_x0000_s1027" w:class="shape" w:w="145" w:h="28" w:align="left" /></pre> <p>The id attribute in the relationship reference namespace specifies that the relationship with relationship ID rId5 must contain the property data for this embedded control. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
linkedCell (Linked Formula)	<p>Specifies the cell the control is linked to, using standard cell A1-style reference syntax as described in §18.17.2.3.1. The value in the linked cell and the index of the selected item in the object are linked together. This link is ignored if the control allows multiple selections.</p> <p>[<i>Example:</i></p> <pre><controlPr linkedCell="\$A\$4" ... /></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Formula simple type (§18.18.35).</p>
listFillRange (List Items Source Range)	<p>Specifies the range of source data cells used to populate the list box, using standard A1-style cell reference syntax as described in §18.17.2.3.1.</p> <p>[<i>Example:</i></p> <pre><controlPr listFillRange="\$A\$1:\$A\$15" ... /></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Formula simple type (§18.18.35).</p>
locked (Locked Flag)	<p>Specifies that the object is locked when the sheet is protected.</p> <p>[<i>Example:</i></p>

Attributes	Description
	<p><code><controlPr locked="false" ... /></code></p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
macro (Custom Function)	<p>Specifies the custom function associated with the object. [<i>Example:</i> A macro script, add-in function, and so on. <i>end example]</i></p> <p>[<i>Example:</i></p> <p><code><controlPr macro="Button1_Click()" ... /></code></p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Formula simple type (§18.18.35).</p>
print (Print Flag)	<p>Specifies whether the object is printed when the document is printed.</p> <p>[<i>Example:</i></p> <p><code><controlPr print="false" ... /></code></p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
recalcAlways (Recalculation Flag)	<p>Specifies whether the object is always included in recalculation. This is used by controls that reference cells in the spreadsheet to update themselves when the spreadsheet changes.</p> <p>[<i>Example:</i></p> <p><code><controlPr recalcAlways="true" ... /></code></p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
uiObject (UI Object Flag)	<p>Specifies whether the object is a UI-only object. Applications should prevent UI-only objects from being selected and edited in their user interface.</p> <p>[<i>Example:</i></p> <p><code><objectPr uiObject="true" ... /></code></p>

Attributes	Description
	<p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model (CT_ControlPr) is located in §A.2. *end note]*

18.3.1.21 controls (Embedded Controls)

Worksheets can have embedded controls embedded in them. This collection is a listing of embedded controls in this worksheet. This collection is used to reference individual Embedded Control Data part definitions, enumerate the code name of each control, and reference drawing information used to draw the control.

[*Note:* The W3C XML Schema definition of this element's content model (CT_Controls) is located in §A.2. *end note]*

18.3.1.22 customPr (Custom Property)

The custom property element provides a mechanism to store name/value pairs of arbitrary user-defined data. The name is stored in the attribute name, the arbitrary data is stored in the binary part referenced by the relationshipId.

[*Note:* There is nothing in the binary part except the arbitrary data itself.

Custom XML Data Properties provide a preferred mechanism for storing arbitrary data. The customPr supports legacy third-party document components, as well as those situations that have a stringent need for binary parts. *end note]*

Attributes	Description
id (Relationship Id)	This relationship references the binary part containing the specified custom properties.
Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).
name (Custom Property Name)	<p>Name of the custom property</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_CustomProperty](#)) is located in §A.2. *end note*]

18.3.1.23 [customProperties \(Custom Properties\)](#)

This collection is used to reference binary parts containing arbitrary user-defined data.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_CustomProperties](#)) is located in §A.2. *end note*]

18.3.1.24 [customSheetView \(Custom Chart Sheet View\)](#)

This element defines custom view properties for chart sheets. [*Note*: See [customSheetView](#) (§18.3.1.25) for an example. *end note*]

Attributes	Description
guid (GUID)	<p>Unique identifier of this custom view</p> <p>The possible values for this attribute are defined by the ST_Guid simple type (§22.9.2.4).</p>
scale (Print Scale)	<p>Print scaling, representing percent values. The values of this attribute shall be restricted to the range from 10 to 400. Horizontal & Vertical scale together.</p> <p>[<i>Example</i>:</p> <p>10 - 10%</p> <p>20 - 20%</p> <p>...</p> <p>100 - 100%</p> <p>...</p> <p>400 - 400%</p> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
state (Visible State)	<p>Visibility state of the sheet.</p> <p>The possible values for this attribute are defined by the ST_SheetState simple type (§18.18.68).</p>
zoomToFit (Zoom To Fit)	<p>Flag indicating whether chart sheet is zoom to fit window.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_CustomChartsheetView](#)) is located in §A.2. *end note*]

18.3.1.25 customSheetView (Custom Sheet View)

This collection stores information pertaining to one custom sheet view definition. A custom view is a collection of settings defining a particular view of the sheet. These views can be selected by the user for quick access to predefined views of the sheet.

[Example: This example indicates that there is both a horizontal and vertical split in the sheet view, and that the top left cell of the bottom right pane is F7. Page margin, print options, page setup, and header / footer information is also stored with this view.

```
<customSheetView guid="{F3A061A9-D5FD-4F9C-A7CD-483AD476BA25}"
  sizeWithWindow="0">
  <pane xSplit="5" ySplit="6" topLeftCell="F7"/>
  <selection/>
  <pageMargins left="0.7" right="0.7" top="0.75" bottom="0.75" header="0.3"
    footer="0.3"/>
  <printOptions gridLinesSet="0"/>
  <pageSetup paperSize="0" scale="0" orientation="portrait" printDriver="0"
    horizontalDpi="0" verticalDpi="0" copies="0"/>
  <headerFooter/>
</customSheetView>
```

end example]

Attributes	Description
colorId (Color Id)	Index to the color value for the text in row/column headings and gridlines for this custom view. This is an 'index color value' (ICV) rather than rgb value. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
filter (Filtered List)	Flag indicating whether the view contains a filtered range. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
filterUnique (Filter)	Indicates whether an advanced filter has been applied, and the option to filter out duplicate records from the data list has been selected, in this custom view. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
fitToPage (Fit To Page)	Flag indicating whether this view should be fit to page when printing this custom view. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
guid (GUID)	Unique identifier of this custom view. This is used to ensure uniqueness. It is generated when the view is created. Shall correspond to a customWorkbookView guid value in the

Attributes	Description
	<p>workbook Start Part.</p> <p>The possible values for this attribute are defined by the ST_Guid simple type (§22.9.2.4).</p>
hiddenColumns (Hidden Columns)	<p>Flag indicating that there is one or more hidden column(s) in this custom view.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
hiddenRows (Hidden Rows)	<p>Flag indicating that there is one or more hidden row(s) in this custom view.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
outlineSymbols (Show Outline Symbols)	<p>Flag indicating whether outline symbols are displayed in this custom view.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
printArea (Print Area Defined)	<p>Flag indicating whether a print area is defined as part of this custom view.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
scale (Print Scale)	<p>Print scaling for this custom view. The values of this attribute shall be restricted to the range from 10 to 400.</p> <p><i>[Example:</i> 10 - 10% 20 - 20% ... 100 - 100% ... 400 - 400% <i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
showAutoFilter (Show AutoFilter Drop Down Controls)	<p>Flag indicating whether the autofilter dropdown buttons are visible in this custom view.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showFormulas (Show Formulas)	<p>Flag indicating whether formulas are shown in this custom view.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showGridLines	<p>Flag indicating whether gridlines are shown in this custom view.</p>

Attributes	Description
(Show Grid Lines)	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
showPageBreaks (Show Page Breaks)	Flag indicating whether page breaks are shown in this custom view. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
showRowCol (Show Headers)	Flag indicating whether row and column headers are shown in this custom view. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
showRuler (Show Ruler)	Flag indicating whether to show the ruler in this custom view. Only applicable if this Custom View is in Page Layout View. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
state (Visible State)	Visibility state for this custom view. The possible values for this attribute are defined by the ST_SheetState simple type (§18.18.68).
topLeftCell (Top Left Visible Cell)	Location of the top left visible cell in the bottom right pane in this custom view (when in Left-to-Right mode). The possible values for this attribute are defined by the ST_CellRef simple type (§18.18.7).
view (View Type)	Indicates the view type for this Custom View The possible values for this attribute are defined by the ST_SheetViewType simple type (§18.18.69).
zeroValues (Show Zero Values)	Flag indicating whether the window should display 0 (zero) values in this custom view. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_CustomSheetView](#)) is located in §A.2. end note]

18.3.1.26 customSheetViews (Custom Chart Sheet Views)

Collection of custom Chart Sheet View information.

[Note: The W3C XML Schema definition of this element's content model ([CT_CustomChartsheetViews](#)) is located in §A.2. end note]

18.3.1.27 `customSheetViews` (Custom Sheet Views)

This is a collection of custom sheet views.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CustomSheetViews](#)) is located in §A.2. *end note*]

18.3.1.28 `dataBar` (Data Bar)

Describes a data bar conditional formatting rule.

[*Example:*

In this example a data bar conditional format is expressed, which spreads across all cell values in the cell range, and whose color is blue.

```
<dataBar>
  <cfvo type="min" val="0"/>
  <cfvo type="max" val="0"/>
  <color rgb="FF638EC6"/>
</dataBar>
```

end example]

The length of the data bar for any cell can be calculated as follows:

Data bar length = minLength + (cell value - minimum value in the range) / (maximum value in the range - minimum value in the range) * (maxLength - minLength),

where min and max length are a fixed percentage of the column width (by default, 10% and 90% respectively.)

The minimum difference in length (or increment amount) is 1 pixel.

Attributes	Description
maxLength (Maximum Length)	The maximum length of the data bar, as a percentage of the cell width. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
minLength (Minimum Length)	The minimum length of the data bar, as a percentage of the cell width. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
showValue (Show Values)	Indicates whether to show the values of the cells on which this data bar is applied. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_DataBar](#)) is located in §A.2. *end note*]

18.3.1.29 dataConsolidate (Data Consolidate)

Data consolidation settings. The dataRefs are the set of source ranges containing data to consolidate. The function indicates the function that shall be used to consolidate the data.

[Example:

This example demonstrates consolidating the ranges A1:C1 and A3:C3 by using the 'count' function.

```
<dataConsolidate function="count">
  <dataRefs count="2">
    <dataRef ref="A1:C1" sheet="Sheet1"/>
    <dataRef ref="A3:C3" sheet="Sheet1"/>
  </dataRefs>
</dataConsolidate>
```

end example]

Attributes	Description
function (Function Index)	Indicates which function to use when consolidating the ranges. The possible values for this attribute are defined by the ST_DataConsolidateFunction simple type (§18.18.17).
link (Link)	Create links to source data. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
startLabels (Use Starting Column Labels)	Use labels in first column. Both startLabels and topLabels can be true at the same time. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
topLabels (Labels In Top Row)	Use labels in top row. Both leftLabels and topLabels can be true at the same time. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	Specifies how white space should be handled for the contents of this element using the W3C space preservation rules. The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.

[Note: The W3C XML Schema definition of this element's content model ([CT_DataConsolidate](#)) is located in §A.2. *end note*]

18.3.1.30 dataRef (Data Consolidation Reference)

A single data consolidate reference. One dataRef shall use either name or sheet & ref, but not both on the same dataRef.

Attributes	Description
id (relationship Id) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Used only when the source range is external to this workbook. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).
name (Named Range)	Named range, either in this workbook or the external workbook referenced by r:Id. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
ref (Reference)	Cell range. The possible values for this attribute are defined by the ST_Ref simple type (§18.18.62).
sheet (Sheet Name)	Sheet name. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element's content model ([CT_DataRef](#)) is located in §A.2. *end note*]

18.3.1.31 dataRefs (Data Consolidation References)

Data consolidate reference collection.

Attributes	Description
count (Data Consolidation Reference Count)	Count of data consolidate references. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DataRefs](#)) is located in §A.2. *end note*]

18.3.1.32 dataValidation (Data Validation)

A single item of data validation defined on a range of the worksheet.

Attributes	Description
allowBlank (Allow Blank)	<p>A boolean value indicating whether the data validation allows the use of empty or blank entries. 1 means empty entries are OK and do not violate the validation constraints.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
error (Error Message)	<p>Message text of error alert.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
errorStyle (Data Validation Error Style)	<p>The style of error alert used for this data validation.</p> <p>The possible values for this attribute are defined by the ST_DataValidationErrorStyle simple type (§18.18.18).</p>
errorTitle (Error Alert Text)	<p>Title bar text of error alert.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
imeMode (IME Mode Enforced)	<p>The IME (input method editor) mode enforced by this data validation. Only applies for these languages:</p> <ul style="list-style-type: none"> • Chinese Simplified • Chinese Traditional • Japanese • Korean • • When imeMode is set, the input for the cell can be restricted to specific sets of characters, as specified by the value of imeMode. See the simple type referenced below for additional details. • <p>When imeMode is set but the application's language is not one of the languages listed above, then the default value is noControl.</p> <p>The possible values for this attribute are defined by the ST_DataValidationImeMode simple type (§18.18.19).</p>
operator (Operator)	<p>The relational operator used with this data validation.</p> <p>The possible values for this attribute are defined by the ST_DataValidationOperator simple type (§18.18.20).</p>

Attributes	Description
prompt (Input Prompt)	<p>Message text of input prompt.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
promptTitle (Prompt Title)	<p>Title bar text of input prompt.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
showDropDown (Show Drop Down)	<p>A boolean value indicating whether to display a dropdown combo box for a list type data validation.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showErrorMessage (Show Error Message)	<p>A boolean value indicating whether to display the error alert message when an invalid value has been entered, according to the criteria specified.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showInputMessage (Show Input Message)	<p>A boolean value indicating whether to display the input prompt message.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
sqref (Sequence of References)	<p>Range over which data validation is applied.</p> <p>The possible values for this attribute are defined by the ST_Sqref simple type (§18.18.76).</p>
type (Data Validation Type)	<p>The type of data validation.</p> <p>The possible values for this attribute are defined by the ST_DataValidationType simple type (§18.18.21).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_DataValidation](#)) is located in §A.2. end note]

18.3.1.33 dataValidations (Data Validations)

This collection expresses all data validation information for cells in a sheet which have data validation features applied.

Data validation is used to specify constraints on the data that can be entered into a cell. Additional UI can be provided to help the user select values (e.g., a dropdown control on the cell or hover text when the cell is active), and to help the user understand why a particular entry was disallowed (e.g., alerts and messages).

Various data types can be selected, and logical operators (e.g., greater than, less than, equal to, etc) can be used. Additionally, instead of specifying an explicit set of values that are permitted, a cell or range reference can be used.

An input message can be specified to help the user know what kind of value is expected, and a warning message (and warning type) can be specified to alert the user when they've entered data which is not permitted based on the data validations specified in the worksheet.

[Example:

```
<dataValidations count="1">
  <dataValidation type="whole" errorStyle="warning" operator="greaterThan"
    showInputMessage="1" showErrorMessage="1" errorTitle="Invalid Data"
    error="The value must be a whole number greater than 0."
    promptTitle="Whole Number"
    prompt="Please enter a whole number greater than 0." sqref="A1">
    <formula1>0</formula1>
  </dataValidation>
</dataValidations>
```

end example]

Attributes	Description
count (Data Validation Item Count)	The expected number of data validation items for this worksheet. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
disablePrompts (Disable Prompts)	A boolean value indicating whether all input prompts for the worksheet are disabled. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
xWindow (Top Left Corner (X Coodrinate))	The x-coordinate (relative to window) of top-left corner of the data validation input prompt (textbox). This is per sheet, not per cell. Units in pixels. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
yWindow (Top Left Corner (Y Coordinate))	The y-coordinate (relative to window) of top-left corner of the data validation input prompt (textbox). This is per sheet, not per cell. Units in pixels. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element’s content model ([CT_DataValidations](#)) is located in §A.2.
end note]

18.3.1.34 dialogsheet (Dialog Sheet)

This is the root element for Dialogsheet parts within a SpreadsheetML document.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Dialogsheet](#)) is located in §A.2. *end note*]

18.3.1.35 dimension (Worksheet Dimensions)

This element specifies the used range of the worksheet. It specifies the row and column bounds of used cells in the worksheet. This is optional and is not required. Used cells include cells with formulas, text content, and cell formatting. When an entire column is formatted, only the first cell in that column is considered used.

[*Example:*

```
<dimension ref="A1:C2"/>
```

end example]

Attributes	Description
ref (Reference)	The row and column bounds of all cells in this worksheet. Corresponds to the range that would contain all c elements written under sheetData. Does not support whole column or whole row reference notation. The possible values for this attribute are defined by the ST_Ref simple type (§18.18.62).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SheetDimension](#)) is located in §A.2. *end note*]

18.3.1.36 drawing (Drawing)

This element indicates that the sheet contains drawing components built on the drawingML platform. The relationship Id references the part containing the drawingML definitions.

Attributes	Description
id (Relationship id) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Relationship Id referencing a part containing drawingML definitions for this worksheet. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Drawing](#)) is located in §A.2. *end note*]

18.3.1.37 drawingHF (Drawing Reference in Header Footer)

This element specifies the usage of drawing objects rendered in the header / footer of the sheet. It specifies an explicit relationship to the part containing the DrawingML shapes used in the header / footer. It also indicates where in the header / footer each shape belongs. One drawing object can appear in each of the left side, center and right side of the header and footer.

[*Example:* This example shows a worksheet with graphics in the header. The DrawingML part referred to by rId2 contains at least two objects. The object with ID 6 is shown in the left side of the header on the first page only. The object with ID 7 is shown in the left side of the header for the other pages.

```
<worksheet ... >
...
<headerFooter differentFirst="1" ... >
...
</headerFooter>
<drawingHF r:id="rId2" lho="7" lhs="6"/>
</worksheet>
```

end example]

Attributes	Description
cfe (Center Footer for Even Pages)	<p>Specifies the DrawingML shape to be used for the center of the footer on even pages if the differentOddEven attribute of the corresponding headerFooter element (§18.3.1.46) is true.</p> <p>[<i>Example:</i></p> <pre><drawingHF ... cfe="5"/></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
cff (Center Footer for First Page)	<p>Specifies the DrawingML shape to be used for the center of the footer on the first page if the differentFirst attribute of the corresponding headerFooter element (§18.3.1.46) is true.</p> <p>[<i>Example:</i></p> <pre><drawingHF ... cff="5"/></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

Attributes	Description
cfo (Center Footer for Odd Pages)	<p>Specifies the DrawingML shape to be used for the center of the footer on odd pages if the differentOddEven attribute of the corresponding headerFooter element (§18.3.1.46) is true. If the differentOddEven attribute is false, this attribute specifies the DrawingML shape to be used for the center of the footer on both odd and even pages.</p> <p>[Example:</p> <pre data-bbox="451 499 808 531"><drawingHF ... cfo="5"/></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
che (Center Header for Even Pages)	<p>Specifies the DrawingML shape to be used for the center of the header on even pages if the differentOddEven attribute of the corresponding headerFooter element (§18.3.1.46) is true.</p> <p>[Example:</p> <pre data-bbox="451 940 808 972"><drawingHF ... che="5"/></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
chf (Center Header for First Page)	<p>Specifies the DrawingML shape to be used for the center of the header on the first page if the differentFirst attribute of the corresponding headerFooter element (§18.3.1.46) is true.</p> <p>[Example:</p> <pre data-bbox="451 1381 808 1413"><drawingHF ... chf="5"/></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
cho (Center Header for Odd Pages)	<p>Specifies the DrawingML shape to be used for the center of the header on odd pages if the differentOddEven attribute of the corresponding headerFooter element (§18.3.1.46) is true. If the differentOddEven attribute is false, this attribute specifies the DrawingML shape to be used for the center of the header on both odd and even pages.</p> <p>[Example:</p> <pre data-bbox="451 1854 808 1885"><drawingHF ... cho="5"/></pre>

Attributes	Description
	<p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
<p>id (Relationship ID for Embedded Control Properties)</p> <p>Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships</p>	<p>Specifies the relationship ID for the relationship to the DrawingML part that contains the drawing objects used in the header and footer. This DrawingML part is a separate part within the package.</p> <p>[Example:</p> <pre><drawingHF r:id="rId2" lho="7" lhf="6"/></pre> <p>The id attribute in the relationship reference namespace specifies that the relationship with relationship ID rId5 must contain the drawing objects used in the header and footer. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
<p>lfe (Left Footer for Even Pages)</p>	<p>Specifies the DrawingML shape to be used for the left side of the footer on even pages if the differentOddEven attribute of the corresponding headerFooter element (§18.3.1.46) is true.</p> <p>[Example:</p> <pre><drawingHF ... lfe="5"/></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
<p>lff (Left Footer for First Page)</p>	<p>Specifies the DrawingML shape to be used for the left side of the footer on the first page if the differentFirst attribute of the corresponding headerFooter element (§18.3.1.46) is true.</p> <p>[Example:</p> <pre><drawingHF ... lff="5"/></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
<p>lfo (Left Footer for Odd Pages)</p>	<p>Specifies the DrawingML shape to be used for the left side of the footer on odd pages if the differentOddEven attribute of the corresponding headerFooter element</p>

Attributes	Description
	<p>(§18.3.1.46) is true. If the differentOddEven attribute is false, this attribute specifies the DrawingML shape to be used for the left side of the footer on both odd and even pages.</p> <p>[Example:</p> <pre data-bbox="456 428 808 457"><drawingHF ... lfo="5"/></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
lhe (Left Header for Even Pages)	<p>Specifies the DrawingML shape to be used for the left side of the header on even pages if the differentOddEven attribute of the corresponding headerFooter element (§18.3.1.46) is true.</p> <p>[Example:</p> <pre data-bbox="456 869 808 898"><drawingHF ... lhe="5"/></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
lhf (Left Header for First Page)	<p>Specifies the DrawingML shape to be used for the left side of the header on the first page if the differentFirst attribute of the corresponding headerFooter element (§18.3.1.46) is true.</p> <p>[Example:</p> <pre data-bbox="456 1306 808 1335"><drawingHF ... lhf="5"/></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
lho (Left Header for Odd Pages)	<p>Specifies the DrawingML shape to be used for the left side of the header on odd pages if the differentOddEven attribute of the corresponding headerFooter element (§18.3.1.46) is true. If the differentOddEven attribute is false, this attribute specifies the DrawingML shape to be used for the left side of the header on both odd and even pages.</p> <p>[Example:</p> <pre data-bbox="456 1780 808 1810"><drawingHF ... lho="5"/></pre> <p>end example]</p>

Attributes	Description
	<p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
<p>rfe (Right Footer for Even Pages)</p>	<p>Specifies the DrawingML shape to be used for the right side of the footer on even pages if the differentOddEven attribute of the corresponding headerFooter element (§18.3.1.46) is true.</p> <p>[Example:</p> <pre><drawingHF ... rfe="5"/></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
<p>rff (Right Footer for First Page)</p>	<p>Specifies the DrawingML shape to be used for the right side of the footer on the first page if the differentFirst attribute of the corresponding headerFooter element (§18.3.1.46) is true.</p> <p>[Example:</p> <pre><drawingHF ... rff="5"/></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
<p>rfo (Right Footer for Odd Pages)</p>	<p>Specifies the DrawingML shape to be used for the right side of the footer on odd pages if the differentOddEven attribute of the corresponding headerFooter element (§18.3.1.46) is true. If the differentOddEven attribute is false, this attribute specifies the DrawingML shape to be used for the right side of the footer on both odd and even pages.</p> <p>[Example:</p> <pre><drawingHF ... rfo="5"/></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
<p>rhe (Right Header for Even Pages)</p>	<p>Specifies the DrawingML shape to be used for the right side of the header on even pages if the differentOddEven attribute of the corresponding headerFooter element (§18.3.1.46) is true.</p> <p>[Example:</p>

Attributes	Description
	<p data-bbox="456 285 808 317"><drawingHF ... rhe="5"/></p> <p data-bbox="415 354 574 386"><i>end example]</i></p> <p data-bbox="415 426 1453 491">The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
rhf (Right Header for First Page)	<p data-bbox="415 510 1429 611">Specifies the DrawingML shape to be used for the right side of the header on the first page if the differentFirst attribute of the corresponding headerFooter element (§18.3.1.46) is true.</p> <p data-bbox="415 651 532 682"><i>[Example:</i></p> <p data-bbox="456 722 808 753"><drawingHF ... rhf="5"/></p> <p data-bbox="415 791 574 823"><i>end example]</i></p> <p data-bbox="415 863 1453 928">The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
rho (Right Header for Odd Pages)	<p data-bbox="415 951 1479 1121">Specifies the DrawingML shape to be used for the right side of the header on odd pages if the differentOddEven attribute of the corresponding headerFooter element (§18.3.1.46) is true. If the differentOddEven attribute is false, this attribute specifies the DrawingML shape to be used for the right side of the header on both odd and even pages.</p> <p data-bbox="415 1161 532 1192"><i>[Example:</i></p> <p data-bbox="456 1232 808 1264"><drawingHF ... rho="5"/></p> <p data-bbox="415 1302 574 1333"><i>end example]</i></p> <p data-bbox="415 1373 1453 1438">The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_DrawingHF](#)) is located in §A.2. *end note]*

18.3.1.38 evenFooter (Even Page Footer)

Even page footer value. Corresponds to even printed pages. *[Example: Even page(s) in the sheet can not be printed if the print area is specified to be a range such that it falls outside an even page's scope. end example]*

If no even footer is specified, then the odd footer's value is assumed for even page footers. See the evenHeader element (§18.3.1.39) description for full discussion of value content.

The possible values for this element are defined by the ST_Xstring simple type (§22.9.2.19).

Attributes	Description
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	Specifies how white space should be handled for the contents of this element using the W3C space preservation rules. The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.

[Note: The W3C XML Schema definition of this element’s content model (ST_Xstring) is located in §A.6.9. *end note*]

18.3.1.39 **evenHeader (Even Page Header)**

Even page header value. Corresponds to even printed pages. [*Example: Even page(s) in the sheet can not be printed if the print area is specified to be a range such that it falls outside an even page's scope. end example*]

If no even header is specified, then odd header value is assumed for even page headers.

Header/Footer Formatting Syntax

There are a number of formatting codes that can be written inline with the actual header / footer text, which affect the formatting in the header or footer.

[*Example:*

This example shows the text "Center **Bold** Header" on the first line (center section), and the date on the second line (center section).

```
<headerFooter>  
  <oddHeader>&C;Center &B;"- ,Bold"Bold  
    &R;"- ,Regular"Header_x000A_&D</oddHeader>  
</headerFooter>
```

end example]

General Rules:

There is no required order in which these codes need to appear.

The first occurrence of the following codes turns the formatting ON, the second occurrence turns it OFF again:

- strikethrough
- superscript

- subscript

Superscript and subscript cannot both be ON at same time. Whichever comes first wins and the other is ignored, while the first is ON.

&L - code for "left section" (there are three header / footer locations, "left", "center", and "right"). When two or more occurrences of this section marker exist, the contents from all markers are concatenated, in the order of appearance, and placed into the left section.

&P - code for "current page #"

&N - code for "total pages"

&font size - code for "text font size", where *font size* is a font size in points.

&K - code for "text font color"

RGB Color is specified as RRGGBB

Theme Color is specified as TTSSNN where TT is the theme color Id, S is either "+" or "-" of the tint/shade value, NN is the tint/shade value.

&S - code for "text strikethrough" on / off

&X - code for "text super script" on / off

&Y - code for "text subscript" on / off

&C - code for "center section". When two or more occurrences of this section marker exist, the contents from all markers are concatenated, in the order of appearance, and placed into the center section.

&D - code for "date"

&T - code for "time"

&G - code for "picture as background"

&U - code for "text single underline"

&E - code for "double underline"

&R - code for "right section". When two or more occurrences of this section marker exist, the contents from all markers are concatenated, in the order of appearance, and placed into the right section.

&Z - code for "this workbook's file path"

&F - code for "this workbook's file name"

&A - code for "sheet tab name"

&+ - code for add to page #.

&- - code for subtract from page #.

&"*font name,font type*" - code for "text font name" and "text font type", where *font name* and *font type* are strings specifying the name and type of the font, separated by a comma. When a hyphen appears in *font name*, it means "none specified". Both of *font name* and *font type* can be localized values. Although ISO/IEC 14496-22 permits commas in font family/subfamily/full names, name and font type, the lexically first comma in the string is the one recognized as the separating comma.

&"-,Bold" - code for "bold font style"

&B - also means "bold font style".

&"-,Regular" - code for "regular font style"

&"-,Italic" - code for "italic font style"

&I - also means "italic font style"

&"-,Bold Italic" code for "bold italic font style"

&O - code for "outline style"

&H - code for "shadow style"

The possible values for this element are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element's content model ([ST_Xstring](#)) is located in §A.6.9. *end note*]

18.3.1.40 f (Formula)

Formula for the cell. The formula expression is contained in the character node of this element.

[Example:

<f>SUM(C4:E4)</f>

end example]

The possible values for the t attribute are defined by the simple type ST_CellFormulaType, and are as follows:

Value	Description
array (Array formula)	Array formula. An array formula is a single formula, applied across a range of one or more cells. An array formula can return multiple results from one single calculation, the results spanning the cells in which it is contained (§18.17.2.7).
dataTable (Table	Data table. A <i>data table</i> is a range of cells that shows how changing certain values in one

Value	Description
formula)	<p>or more formulas affects the results of those formulas. A data table provides a shortcut for calculating multiple versions in one operation, and a way to include the results of all of the different variations in a sheet.</p> <p>Both one- and two-input variable data tables can be created (see attribute dt2D).<i>[Example: A one-input variable data table might be used to calculate how different interest rates affect a monthly mortgage payment, while a two-input variable data table might be used to calculate how different interest rates and loan terms will affect the mortgage payment. end example]</i></p> <p>In a one-input variable data table, values are listed either down a column (column-oriented) or across a row (row-oriented) (see attribute dtr).</p> <p>Formulas that are used in a one-input variable data table shall refer to an input cell (see attribute r1), the cell in which each input value from a data table is substituted. Any cell on a worksheet can be the input cell. Although the input cell does not need to be part of the data table, the formulas in data tables shall refer to that input cell.</p> <p>Two-input variable data tables use only one formula with two lists of input values. The formula shall refer to two input cells (see attributes r1 and r2).</p> <p>The top-left cell in the data table is called the <i>master cell</i>.</p> <p><i>[Guidance: It is recommended that Spreadsheet applications recalculate data tables whenever a worksheet is recalculated. end guidance]</i></p>
normal (Normal formula)	Normal cell formula (§18.17).
shared (Shared formula)	Shared formula. If a cell contains the same formula as another cell, the “shared” value can be used for the t attribute and the si attribute can be used to refer to the cell containing the formula. Two formulas are considered to be the same when their respective representations in R1C1-reference notation, are the same.

Attributes	Description
aca (Always Calculate Array)	<p>Only applies to array formulas. true indicates that the entire array shall be calculated in full. If false the individual cells of the array shall be calculated as needed. The aca value shall be ignored unless the value of the corresponding t attribute is array.</p> <p><i>[Note: The primary case where an array formula must be calculated in part instead of in full is when some cells in the array depend on other cells that are semi-calculated, e.g., contains the function =RAND(). end note]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

Attributes	Description
bx (Assigns Value to Name)	<p>Specifies that this formula assigns a value to a name.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
ca (Calculate Cell)	<p>Indicates that this formula needs to be recalculated the next time calculation is performed. [<i>Example</i>: This is always set on volatile functions, like =RAND(), and circular references. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
del1 (Input 1 Deleted)	<p>Whether the first input cell for data table has been deleted. Applies to data table formula only. Written on master cell of data table formula only.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
del2 (Input 2 Deleted)	<p>Whether the second input cell for data table has been deleted. Applies to data table formula only. Written on master cell of data table formula only.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
dt2D (Data Table 2-D)	<p>Data table is two-dimensional. Only applies to the data tables function. Written on master cell of data table formula only.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
dtr (Data Table Row)	<p>true if one-dimensional data table is a row, otherwise it's a column. Only applies to the data tables function. Written on master cell of data table formula only.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
r1 (Data Table Cell 1)	<p>First input cell for data table. Only applies to the data tables array function "TABLE()". Written on master cell of data table formula only.</p> <p>The possible values for this attribute are defined by the ST_CellRef simple type (§18.18.7).</p>
r2 (Input Cell 2)	<p>Second input cell for data table when dt2D is 1. Only applies to the data tables array function "TABLE()". Written on master cell of data table formula only.</p> <p>The possible values for this attribute are defined by the ST_CellRef simple type (§18.18.7).</p>
ref (Range of Cells)	<p>Range of cells which the formula applies to. Only required for shared formula, array formula or data table. Only written on the master formula, not subsequent formulas belonging to the same shared group, array, or data table.</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_Ref simple type (§18.18.62).
si (Shared Group Index)	<p>Optional attribute to optimize load performance by sharing formulas.</p> <p>When a formula is a shared formula (t value is shared) then this value indicates the group to which this particular cell's formula belongs. The first formula in a group of shared formulas is saved in the f element. This is considered the 'master' formula cell. Subsequent cells sharing this formula need not have the formula written in their f element. Instead, the attribute si value for a particular cell is used to figure what the formula expression should be based on the cell's relative location to the master formula cell.</p> <p>A cell is shared only when si is used and t is shared. The formula expression for a cell that is specified to be part of a shared formula (and is not the master) shall be ignored, and the master formula shall override.</p> <p>If a master cell of a shared formula range specifies that a particular cell is part of the shared formula range, and that particular cell does not use the si and t attributes to indicate that it is shared, then the particular cell's formula shall override the shared master formula. If this cell occurs in the middle of a range of shared formula cells, the earlier and later formulas shall continue sharing the master formula, and the cell in question shall not share the formula of the master cell formula.</p> <p>Loading and handling of a cell and formula using an si attribute and whose t value is shared, located outside the range specified in the master cell associated with the si group, is implementation defined.</p> <p>Master cell references on the same sheet shall not overlap with each other.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
t (Formula Type)	<p>Type of formula.</p> <p>The possible values for this attribute are defined by the ST_CellFormulaType simple type (§18.18.6).</p>
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	<p>Specifies how white space should be handled for the contents of this element using the W3C space preservation rules.</p> <p>The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CellFormula](#)) is located in §A.2. *end note*]

18.3.1.41 firstFooter (First Page Footer)

First page footer content. Only used when headerFooter@differentFirst is '1'. Corresponds to first printed page. [*Example:*The first logical page in the sheet can not be printed if the print area is specified to be a range such that it falls outside the first page's scope. *end example*]

See evenHeader (§18.3.1.39) description for full discussion of value content.

The possible values for this element are defined by the ST_Xstring simple type (§22.9.2.19).

Attributes	Description
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	Specifies how white space should be handled for the contents of this element using the W3C space preservation rules. The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.

[*Note:* The W3C XML Schema definition of this element's content model ([ST_Xstring](#)) is located in §A.6.9. *end note*]

18.3.1.42 firstHeader (First Page Header)

First page header content. Only used when headerFooter@differentFirst is 1. Corresponds to first printed page. [*Example:* The first logical page in the sheet can not be printed if the print area is specified to be a range such that it falls outside the first page's scope. *end example*]

See evenHeader (§18.3.1.39) description for full discussion of value content.

The possible values for this element are defined by the ST_Xstring simple type (§22.9.2.19).

Attributes	Description
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	Specifies how white space should be handled for the contents of this element using the W3C space preservation rules. The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.

[Note: The W3C XML Schema definition of this element's content model ([ST_Xstring](#)) is located in §A.6.9. *end note*]

18.3.1.43 formula (Formula)

The content of this element is a formula whose calculated value specifies the criteria for the conditional formatting rule.

The possible values for this element are defined by the ST_Formula simple type (§18.18.35).

Attributes	Description
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	Specifies how white space should be handled for the contents of this element using the W3C space preservation rules. The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.

[Note: The W3C XML Schema definition of this element's content model ([ST_Formula](#)) is located in §A.2. *end note*]

18.3.1.44 formula1 (Formula 1)

The first formula in the Data Validation dropdown. It is used as a bounds for 'between' and 'notBetween' relational operators, and the only formula used for other relational operators (equal, notEqual, lessThan, lessThanOrEqual, greaterThan, greaterThanOrEqual), or for custom or list type data validation. The content can be a formula or a constant or a list series (comma separated values).

The possible values for this element are defined by the ST_Formula simple type (§18.18.35).

Attributes	Description
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	Specifies how white space should be handled for the contents of this element using the W3C space preservation rules. The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.

[Note: The W3C XML Schema definition of this element's content model ([ST_Formula](#)) is located in §A.2. *end note*]

18.3.1.45 formula2 (Formula 2)

The second formula in the DataValidation dropdown. It is used as a bounds for 'between' and 'notBetween' relational operators only.

The possible values for this element are defined by the ST_Formula simple type (§18.18.35).

Attributes	Description
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	Specifies how white space should be handled for the contents of this element using the W3C space preservation rules. The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.

[Note: The W3C XML Schema definition of this element's content model ([ST_Formula](#)) is located in §A.2. *end note*]

18.3.1.46 headerFooter (Header Footer Settings)

Header and footer settings.

[Example:

This example demonstrates "Header" at the top and "Footer" at the bottom of a page.


```

<headerFooter>
  <oddHeader>&CHeader</oddHeader>
  <oddFooter>&CFooter</oddFooter>
</headerFooter>

```

end example]

The tokens in the header & footer elements can be localized. An application can decide which locales are supported. Even when a locale is not supported, the header and footer text shall be loaded, and only the formatting is discarded.

Attributes	Description
alignWithMargins (Align Margins)	Align header footer margins with page margins. When true, as left/right margins grow and shrink, the header and footer edges stay aligned with the margins. When false, headers and footers are aligned on the paper edges, regardless of margins. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
differentFirst (Different First Page)	Different first page header and footer. When true then firstHeader and firstFooter specify first page header and footer values. If false and firstHeader / firstFooter are present, they are ignored. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
differentOddEven (Different Odd Even Header Footer)	Different odd and even page headers and footers. When true then oddHeader / oddFooter and evenHeader / evenFooter specify page header and footer values for odd and even pages. If false then oddHeader / oddFooter is used, even when evenHeader / evenFooter are present. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
scaleWithDoc (Scale Header & Footer With Document)	Scale header and footer with document scaling. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_HeaderFooter](#)) is located in §A.2.
end note]

18.3.1.47 [hyperlink \(Hyperlink\)](#)

A single hyperlink

Attributes	Description
display (Display)	Display string, if different from string in string table. This is a property on the hyperlink

Attributes	Description
String)	object, but does not need to appear in the spreadsheet application UI. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
id (Relationship Id) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Relationship Id in this sheet's relationships part, expressing the target location of the resource. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).
location (Location)	Location within target. If target is a workbook (or this workbook) this shall refer to a sheet and cell or a defined name. Can also be an HTML anchor if target is HTML file. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
ref (Reference)	Cell location of hyperlink on worksheet. The possible values for this attribute are defined by the ST_Ref simple type (§18.18.62).
tooltip (Tool Tip)	This is additional text to help the user understand more about the hyperlink. <i>[Example: This can be displayed as hover text when the mouse is over the link. end example]</i> The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element's content model ([CT_Hyperlink](#)) is located in §A.2. end note]

18.3.1.48 hyperlinks (Hyperlinks)

Collection of hyperlinks.

[Example:

This example shows a hyperlink in cell A11, with hover text displaying "Search Page". The relationship Id references a relationship from the sheet to the external target resource.

```
<hyperlinks>
  <hyperlink ref="A11" r:id="rId1" tooltip="Search Page"/>
</hyperlinks>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_Hyperlinks](#)) is located in §A.2. *end note*]

18.3.1.49 **iconSet (Icon Set)**

Describes an icon set conditional formatting rule.

[Example: This example demonstrates the "3Arrows" style of icons. The first icon in the set must be shown if the cell's value is less than the 33rd percentile. The second icon in the set must be shown if the cell's value is less than the 67th percentile, and greater than or equal to the 33rd percentile. The third icon in the set must be shown if the cell's value is greater than or equal to the 67th percentile.

```
<iconSet iconSet="3Arrows">
  <cfvo type="percentile" val="0"/>
  <cfvo type="percentile" val="33"/>
  <cfvo type="percentile" val="67"/>
</iconSet>
```

end example]

Attributes	Description
iconSet (Icon Set)	The icon set to display. The possible values for this attribute are defined by the ST_IconSetType simple type (§18.18.42).
percent (Percent)	Indicates whether the thresholds indicate percentile values, instead of number values. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
reverse (Reverse Icons)	If 1, reverses the default order of the icons in this icon set. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
showValue (Show Value)	Indicates whether to show the values of the cells on which this icon set is applied. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_IconSet](#)) is located in §A.2. *end note*]

18.3.1.50 **ignoredError (Ignored Error)**

A single ignored error for a range of cells.

A cell is considered to have an error condition when it meets one of the conditions specified in the attribute descriptions below. *[Example: If a cell is formatted as text but contains a numeric value, this is considered to be a potential error because the number won't be treated as a number, for example, in calculations. end example]*

This is simply a guess by the implementing application, and a recommendation to the user. Cells with the errors specified below might be deliberately defined as such. *[Example: A cell formatted as text which contains numeric Postal Codes or Order numbers. It is useful to format these cells as text so that leading zeros remain as part of the value instead of being removed. end example]*

An `<ignoreError>` element is not written in the file unless the user has specifically reviewed the error and decided to keep the cell state as it is, and no longer wishes to be alerted about it for this cell. This can be helpful for the application to decide which errors should be surfaced to the user vs kept quiet because the user doesn't want these to be surfaced (e.g., because they are legitimate cell states).

[Example: This example shows that cells A1 and B2 both contain numbers stored as text, and this error has been reviewed and specifically flagged to be no longer surfaced as an error to the user.

```
<ignoredErrors>
  <ignoreError sqref="A1 B2" numberStoredAsText="1"/>
</ignoredErrors>
```

end example]

More than one kind of error can exist on a cell. These flags are not mutually exclusive.

Attributes	Description
calculatedColumn (Calculated Column)	Ignore errors when cells contain a value different from a calculated column formula. In other words, for a calculated column, a cell in that column is considered to have an error if its formula is different from the calculated column formula, or doesn't contain a formula at all. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
emptyCellReference (Empty Cell Reference)	Ignore errors when formulas refer to empty cells. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
evalError (Evaluation Error)	Ignore errors when cells contain formulas that result in an error. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
formula (Formula)	Ignore errors when a formula in a region of your worksheet differs from other formulas in the same region. The possible values for this attribute are defined by the W3C XML Schema boolean

Attributes	Description
	datatype.
formulaRange (Formula Range)	Ignore errors when formulas omit certain cells in a region. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
listDataValidation (List Data Validation)	Ignore errors when a cell's value in a Table does not comply with the Data Validation rules specified. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
numberStoredAsText (Number Stored As Text)	Ignore errors when numbers are formatted as text or are preceded by an apostrophe. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
sqref (Sequence of References)	Reference to a range of cells that have this ignored error. The possible values for this attribute are defined by the ST_Sqref simple type (§18.18.76).
twoDigitTextYear (Two Digit Text Year)	Ignore errors when formulas contain text formatted cells with years represented as 2 digits. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
unlockedFormula (Unlocked Formula)	Ignore errors when unlocked cells contain formulas. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_IgnoredError](#)) is located in §A.2.
end note]

18.3.1.51 ignoredErrors (Ignored Errors)

A collection of ignored errors, by cell range.

[Note: The W3C XML Schema definition of this element's content model ([CT_IgnoredErrors](#)) is located in §A.2.
end note]

18.3.1.52 inputCells (Input Cells)

This collection describes each input cell for the scenario.

Attributes	Description
deleted (Deleted)	<p>Input cell was deleted. This input cell shall be present in the file format, but shall not be presented to the user as part of the scenario inputs, nor run as part of the scenario.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
numFmtId (Number Format Id)	<p>This number format Id is used only when displaying the scenario manager input UI, and is used to properly format for display the cached input values (see val attribute) for the scenario.</p> <p>The possible values for this attribute are defined by the ST_NumFmtId simple type (§18.18.47).</p>
r (Reference)	<p>Cell reference indicating the input cell address.</p> <p>The possible values for this attribute are defined by the ST_CellRef simple type (§18.18.7).</p>
undone (Undone)	<p>Cell's deletion was undone. When true the r (reference) value shall not adjust in response to the cell moving due to row / column insert or delete, or cell move.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
val (Value)	<p>Value that should be used for the cell when this scenario is run.</p> <p>val does not need a corresponding data type, the value is put into the cell when the scenario is run.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_InputCells](#)) is located in §A.2. *end note*]

18.3.1.53 [is \(Rich Text Inline\)](#)

This element allows for strings to be expressed directly in the cell definition instead of implementing the shared string table.

[Example:

```
<c r="A1">
  <is>
    <t>String</t>
  </is>
</c>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Rst](#)) is located in §A.2. *end note*]

18.3.1.54 `mergeCell` (Merged Cell)

A single merged cell

[*Note:* The W3C XML Schema definition of this element's content model ([CT_MergeCell](#)) is located in §A.2. *end note*]

18.3.1.55 `mergeCells` (Merge Cells)

This collection expresses all the merged cells in the sheet.

[*Example:*

This example shows that three ranges are merged. The formatting and content for the merged range is always stored in the top left cell.

```
<mergeCells>
  <mergeCell ref="C2:F2"/>
  <mergeCell ref="B19:C20"/>
  <mergeCell ref="E19:G19"/>
</mergeCells>
```

end example]

Attributes	Description
count (Count)	<p>A count of merged cell collections.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_MergeCells](#)) is located in §A.2. *end note*]

18.3.1.56 `objectPr` (Embedded Object Properties)

This element specifies the visual, positional and cell linkage properties of an embedded object.

[*Example:* The following example demonstrates an embedded object that does not print and that is resized when the cells underlying it are resized:

```
<oleObjects>
  <oleObject ... >
    <objectPr print="false" autoLine="false" r:id="rId5">
      <anchor sizeWithCells="true">
```

```

        <from> ... </from>
        <to> ... </to>
    </anchor>
</objectPr>
</oleObject>
</oleObjects>

```

end example]

Attributes	Description
altText (Alternative Text)	<p>Specifies alternative text for the object, for use by assistive technologies or applications.</p> <p>[Example:</p> <pre><objectPr altText="Alternate text" ... /></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
autoFill (Automatic Fill Flag)	<p>Specifies whether the object's fill formatting is provided automatically by the application.</p> <p>[Example:</p> <pre><objectPr autoFill="false" ... /></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
autoLine (Automatic Line Flag)	<p>Specifies whether the object's line formatting is provided automatically by the application.</p> <p>[Example:</p> <pre><objectPr autoLine="false" ... /></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
autoPict (Automatic Size Flag)	<p>Specifies whether the object's size is formatted automatically by the application.</p> <p>[Example:</p> <pre><objectPr autoPict="false" ... /></pre>

Attributes	Description
	<p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>dde (Dynamic Data Exchange Flag)</p>	<p>Specifies whether the object is a Dynamic Data Exchange link.</p> <p>[Example:</p> <pre><objectPr dde="true" ... /></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>defaultSize (Default Size Flag)</p>	<p>Specifies whether the object is at its default size.</p> <p>[Example:</p> <pre><objectPr defaultSize="false" ... /></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>disabled (Disabled Flag)</p>	<p>Specifies whether the object is allowed to run an attached macro.</p> <p>[Example:</p> <pre><objectPr disabled="true" ... /></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>id (Relationship ID to Embedded Object Data)</p> <p>Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships</p>	<p>Specifies the relationship ID for the relationship which targets the Embedded Object Part containing the embedded object data.</p> <p>The specified relationship shall be of type http://purl.oclc.org/ooxml/officeDocument/relationships/oleObject or the document shall be considered non-conformant.</p> <p>[Example: Consider an XML element which has the following id attribute:</p> <pre><... r:id="rId1" /></pre>

Attributes	Description
	<p>The markup specifies the associated relationship part with relationship ID rId1 targets the part containing the corresponding embedded object information. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
locked (Locked Flag)	<p>Specifies that the object is locked when the sheet is protected.</p> <p>[Example:</p> <pre><objectPr locked="false" ... /></pre> <p><i>end example</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
macro (Custom Function)	<p>Specifies the custom function associated with the object. [Example: A macro script, add-in function, and so on. <i>end example</i></p> <p>[Example:</p> <pre><objectPr macro="Button1_Click()" ... /></pre> <p><i>end example</i></p> <p>The possible values for this attribute are defined by the ST_Formula simple type (§18.18.35).</p>
print (Print Flag)	<p>Specifies whether the object is printed when the document is printed.</p> <p>[Example:</p> <pre><objectPr print="false" ... /></pre> <p><i>end example</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
uiObject (UI Object Flag)	<p>Specifies whether the object is a UI-only object. Applications should prevent UI-only objects from being selected and edited in their user interface.</p> <p>[Example:</p> <pre><objectPr uiObject="true" ... /></pre> <p><i>end example</i></p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_ObjectPr](#)) is located in §A.2. *end note*]

18.3.1.57 oddFooter (Odd Page Footer)

Odd page footer value. Corresponds to odd printed pages. [*Example*: Odd page(s) in the sheet can not be printed if the print area is specified to be a range such that it falls outside an odd page's scope. *end example*]

See evenHeader (§18.3.1.39) description for full discussion of value content.

The possible values for this element are defined by the ST_Xstring simple type (§22.9.2.19).

Attributes	Description
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	Specifies how white space should be handled for the contents of this element using the W3C space preservation rules. The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.

[Note: The W3C XML Schema definition of this element's content model ([ST_Xstring](#)) is located in §A.6.9. *end note*]

18.3.1.58 oddHeader (Odd Header)

Odd page header value. Corresponds to odd printed pages. [*Example*: Odd page(s) in the sheet can not be printed if the print area is specified to be a range such that it falls outside an odd page's scope. *end example*]

See evenHeader (§18.3.1.39) description for full discussion of value content.

The possible values for this element are defined by the ST_Xstring simple type (§22.9.2.19).

Attributes	Description
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	<p>Specifies how white space should be handled for the contents of this element using the W3C space preservation rules.</p> <p>The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.</p>

[Note: The W3C XML Schema definition of this element's content model ([ST_Xstring](#)) is located in §A.6.9. *end note*]

18.3.1.59 oleObject (Embedded Object)

Information for an individual embedded object.

Attributes	Description
autoLoad (Auto Load)	<p>Specifies whether the host application for the embedded object shall be called to load the object data automatically when the parent workbook is opened.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
dvAspect (Data or View Aspect)	<p>Specifies the desired Data or View Aspect of the object when drawing or getting data</p> <p>The possible values for this attribute are defined by the ST_DvAspect simple type (§18.18.24).</p>
id (Relationship Id) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	<p>Relationship Id of the relationship pointing to the object persistence part.</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
link (Embedded Object's Link Moniker)	<p>The embedded object's link moniker.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
oleUpdate (Linked Embedded Object Update)	<p>Indicates whether the linked object updates the cached data automatically or only when the container requests an update, only present if the embedded object is linked.</p> <p>The possible values for this attribute are defined by the ST_OleUpdate simple type (§18.18.49).</p>

Attributes	Description
progId (Embedded Object ProgId)	<p>ProgId of the embedded object.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
shapeId (Shape Id)	<p>Id of the shape this object is associated with. Corresponds with the shape @id in the drawingML part.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_OleObject](#)) is located in §A.2. *end note*]

18.3.1.60 [oleObjects \(Embedded Objects\)](#)

Embedded objects collection in this worksheet.

[Example:

This example shows two embedded objects.

```
<oleObjects>
  <oleObject progId="Word.Document.12" shapeId="1025" r:id="rId4"/>
  <oleObject progId="PowerPoint.Show.12" shapeId="1026" r:id="rId5"/>
</oleObjects>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_OleObjects](#)) is located in §A.2. *end note*]

18.3.1.61 [outlinePr \(Outline Properties\)](#)

Outline properties of the worksheet.

[Example: This example indicates that when an outline is applied to data, formatting must be applied to the outline result.

```
<sheetPr>
  <outlinePr applyStyles="1"/>
</sheetPr>
```

end example]

Attributes	Description
applyStyles (Apply Styles in Outline)	<p>Flag indicating whether to apply styles in an outline, when outline is applied. Outline styles are described in Styles (§18.8).</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showOutlineSymbols (Show Outline Symbols)	<p>Flag indicating whether the sheet has outline symbols visible. This flag shall always be overridden by the showOutlineSymbols attribute on sheetView when there is a conflict.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
summaryBelow (Summary Below)	<p>Flag indicating whether summary rows appear below detail in an outline, when applying an outline.</p> <p>When true a summary row is inserted below the detailed data being summarized and a new outline level is established on that row.</p> <p>When false a summary row is inserted above the detailed data being summarized and a new outline level is established on that row.</p> <p>Note that toggling this flag on existing outlines requires an update to cell table, specifically, putting the summary functions in the proper rows, and flagging these rows as new outline levels, and possibly resetting their collapsed state.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
summaryRight (Summary Right)	<p>Flag indicating whether summary columns appear to the right of detail in an outline, when applying an outline.</p> <p>When true a summary column is inserted to the right of the detailed data being summarized and a new outline level is established on that column.</p> <p>When false a summary column is inserted to the left of the detailed data being summarized and a new outline level is established on that column.</p> <p>Note that toggling this flag on existing outlines requires an update to cell table, specifically, putting the summary functions in the proper columns, and flagging these columns as new outline levels, and possibly resetting their collapsed state.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_OutlinePr](#)) is located in §A.2. *end note*]

18.3.1.62 `pageMargins` (Page Margins)

Page margins for a sheet or a custom sheet view.

[Example:

```
<pageMargins left="0.7" right="0.7" top="0.75" bottom="0.75" header="0.3"
  footer="0.3"/>
```

end example]

Attributes	Description
bottom (Bottom Page Margin)	Bottom Page Margin in inches. The possible values for this attribute are defined by the W3C XML Schema double datatype.
footer (Footer Page Margin)	Footer Page Margin in inches. The possible values for this attribute are defined by the W3C XML Schema double datatype.
header (Header Page Margin)	Header Page Margin in inches. The possible values for this attribute are defined by the W3C XML Schema double datatype.
left (Left Page Margin)	Left Page Margin in inches. The possible values for this attribute are defined by the W3C XML Schema double datatype.
right (Right Page Margin)	Right page margin in inches. The possible values for this attribute are defined by the W3C XML Schema double datatype.
top (Top Page Margin)	Top Page Margin in inches. The possible values for this attribute are defined by the W3C XML Schema double datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_PageMargins](#)) is located in §A.2.
end note]

18.3.1.63 `pageSetup` (Page Setup Settings)

Page setup settings for the worksheet.

[Example: The following example shows the `pageSetup` element for ISO A0 paper, printed in black and white, with graphics:

```
<pageSetup blackAndWhite="true" draft="false" paperHeight="1189mm"
paperWidth="841mm" />
```

end example]

Attributes	Description
blackAndWhite (Black And White)	Print black and white. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
cellComments (Print Cell Comments)	This attribute specifies how to print cell comments. The possible values for this attribute are defined by the ST_CellComments simple type (§18.18.5).
copies (Number Of Copies)	Number of copies to print. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
draft (Draft)	Print without graphics. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
errors (Print Error Handling)	Specifies how to print cell values for cells with errors. The possible values for this attribute are defined by the ST_PrintError simple type (§18.18.60).
firstPageNumber (First Page Number)	Page number for first printed page. If no value is specified, then 'automatic' is assumed. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
fitToHeight (Fit To Height)	Number of vertical pages to fit on. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
fitToWidth (Fit To Width)	Number of horizontal pages to fit on. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
horizontalDpi (Horizontal DPI)	Horizontal print resolution of the device. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
id (Id)	Relationship Id of the devMode printer settings part.

Attributes	Description
Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).
orientation (Orientation)	Orientation of the page. The possible values for this attribute are defined by the ST_Orientation simple type (§18.18.50).
pageOrder (Page Order)	Order of printed pages. The possible values for this attribute are defined by the ST_PageOrder simple type (§18.18.51).
paperHeight (Paper Height)	Height of custom paper as a number followed by a unit identifier. [<i>Example: 297mm, 11in end example</i>] When paperHeight and paperWidth are specified, paperSize shall be ignored. The possible values for this attribute are defined by the ST_PositiveUniversalMeasure simple type (§22.9.2.12).
paperSize (Paper Size)	Paper size 1 = Letter paper (8.5 in. by 11 in.) 2 = Letter small paper (8.5 in. by 11 in.) 3 = Tabloid paper (11 in. by 17 in.) 4 = Ledger paper (17 in. by 11 in.) 5 = Legal paper (8.5 in. by 14 in.) 6 = Statement paper (5.5 in. by 8.5 in.) 7 = Executive paper (7.25 in. by 10.5 in.) 8 = A3 paper (297 mm by 420 mm) 9 = A4 paper (210 mm by 297 mm) 10 = A4 small paper (210 mm by 297 mm) 11 = A5 paper (148 mm by 210 mm) 12 = B4 paper (250 mm by 353 mm) 13 = B5 paper (176 mm by 250 mm) 14 = Folio paper (8.5 in. by 13 in.) 15 = Quarto paper (215 mm by 275 mm) 16 = Standard paper (10 in. by 14 in.) 17 = Standard paper (11 in. by 17 in.) 18 = Note paper (8.5 in. by 11 in.) 19 = #9 envelope (3.875 in. by 8.875 in.) 20 = #10 envelope (4.125 in. by 9.5 in.) 21 = #11 envelope (4.5 in. by 10.375 in.) 22 = #12 envelope (4.75 in. by 11 in.) 23 = #14 envelope (5 in. by 11.5 in.) 24 = C paper (17 in. by 22 in.)

Attributes	Description
	<p>25 = D paper (22 in. by 34 in.)</p> <p>26 = E paper (34 in. by 44 in.)</p> <p>27 = DL envelope (110 mm by 220 mm)</p> <p>28 = C5 envelope (162 mm by 229 mm)</p> <p>29 = C3 envelope (324 mm by 458 mm)</p> <p>30 = C4 envelope (229 mm by 324 mm)</p> <p>31 = C6 envelope (114 mm by 162 mm)</p> <p>32 = C65 envelope (114 mm by 229 mm)</p> <p>33 = B4 envelope (250 mm by 353 mm)</p> <p>34 = B5 envelope (176 mm by 250 mm)</p> <p>35 = B6 envelope (176 mm by 125 mm)</p> <p>36 = Italy envelope (110 mm by 230 mm)</p> <p>37 = Monarch envelope (3.875 in. by 7.5 in.).</p> <p>38 = 6 3/4 envelope (3.625 in. by 6.5 in.)</p> <p>39 = US standard fanfold (14.875 in. by 11 in.)</p> <p>40 = German standard fanfold (8.5 in. by 12 in.)</p> <p>41 = German legal fanfold (8.5 in. by 13 in.)</p> <p>42 = ISO B4 (250 mm by 353 mm)</p> <p>43 = Japanese double postcard (200 mm by 148 mm)</p> <p>44 = Standard paper (9 in. by 11 in.)</p> <p>45 = Standard paper (10 in. by 11 in.)</p> <p>46 = Standard paper (15 in. by 11 in.)</p> <p>47 = Invite envelope (220 mm by 220 mm)</p> <p>50 = Letter extra paper (9.275 in. by 12 in.)</p> <p>51 = Legal extra paper (9.275 in. by 15 in.)</p> <p>52 = Tabloid extra paper (11.69 in. by 18 in.)</p> <p>53 = A4 extra paper (236 mm by 322 mm)</p> <p>54 = Letter transverse paper (8.275 in. by 11 in.)</p> <p>55 = A4 transverse paper (210 mm by 297 mm)</p> <p>56 = Letter extra transverse paper (9.275 in. by 12 in.)</p> <p>57 = SuperA/SuperA/A4 paper (227 mm by 356 mm)</p> <p>58 = SuperB/SuperB/A3 paper (305 mm by 487 mm)</p> <p>59 = Letter plus paper (8.5 in. by 12.69 in.)</p> <p>60 = A4 plus paper (210 mm by 330 mm)</p> <p>61 = A5 transverse paper (148 mm by 210 mm)</p> <p>62 = JIS B5 transverse paper (182 mm by 257 mm)</p> <p>63 = A3 extra paper (322 mm by 445 mm)</p> <p>64 = A5 extra paper (174 mm by 235 mm)</p> <p>65 = ISO B5 extra paper (201 mm by 276 mm)</p> <p>66 = A2 paper (420 mm by 594 mm)</p> <p>67 = A3 transverse paper (297 mm by 420 mm)</p> <p>68 = A3 extra transverse paper (322 mm by 445 mm)</p> <p>69 = Japanese Double Postcard (200 mm x 148 mm)</p> <p>70 = A6 (105 mm x 148 mm)</p> <p>71 = Japanese Envelope Kaku #2</p> <p>72 = Japanese Envelope Kaku #3</p>

Attributes	Description
	<p>73 = Japanese Envelope Chou #3 74 = Japanese Envelope Chou #4 75 = Letter Rotated (11in x 8 1/2 11 in) 76 = A3 Rotated (420 mm x 297 mm) 77 = A4 Rotated (297 mm x 210 mm) 78 = A5 Rotated (210 mm x 148 mm) 79 = B4 (JIS) Rotated (364 mm x 257 mm) 80 = B5 (JIS) Rotated (257 mm x 182 mm) 81 = Japanese Postcard Rotated (148 mm x 100 mm) 82 = Double Japanese Postcard Rotated (148 mm x 200 mm) 83 = A6 Rotated (148 mm x 105 mm) 84 = Japanese Envelope Kaku #2 Rotated 85 = Japanese Envelope Kaku #3 Rotated 86 = Japanese Envelope Chou #3 Rotated 87 = Japanese Envelope Chou #4 Rotated 88 = B6 (JIS) (128 mm x 182 mm) 89 = B6 (JIS) Rotated (182 mm x 128 mm) 90 = (12 in x 11 in) 91 = Japanese Envelope You #4 92 = Japanese Envelope You #4 Rotated 93 = PRC 16K (146 mm x 215 mm) 94 = PRC 32K (97 mm x 151 mm) 95 = PRC 32K(Big) (97 mm x 151 mm) 96 = PRC Envelope #1 (102 mm x 165 mm) 97 = PRC Envelope #2 (102 mm x 176 mm) 98 = PRC Envelope #3 (125 mm x 176 mm) 99 = PRC Envelope #4 (110 mm x 208 mm) 100 = PRC Envelope #5 (110 mm x 220 mm) 101 = PRC Envelope #6 (120 mm x 230 mm) 102 = PRC Envelope #7 (160 mm x 230 mm) 103 = PRC Envelope #8 (120 mm x 309 mm) 104 = PRC Envelope #9 (229 mm x 324 mm) 105 = PRC Envelope #10 (324 mm x 458 mm) 106 = PRC 16K Rotated 107 = PRC 32K Rotated 108 = PRC 32K(Big) Rotated 109 = PRC Envelope #1 Rotated (165 mm x 102 mm) 110 = PRC Envelope #2 Rotated (176 mm x 102 mm) 111 = PRC Envelope #3 Rotated (176 mm x 125 mm) 112 = PRC Envelope #4 Rotated (208 mm x 110 mm) 113 = PRC Envelope #5 Rotated (220 mm x 110 mm) 114 = PRC Envelope #6 Rotated (230 mm x 120 mm) 115 = PRC Envelope #7 Rotated (230 mm x 160 mm) 116 = PRC Envelope #8 Rotated (309 mm x 120 mm) 117 = PRC Envelope #9 Rotated (324 mm x 229 mm) 118 = PRC Envelope #10 Rotated (458 mm x 324 mm)</p>

Attributes	Description
	<p>When paperHeight and paperWidth are specified, paperSize should be ignored.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
paperWidth (Paper Width)	<p>Width of custom paper as a number followed by a unit identifier. <i>[Example: 21cm, 8.5in end example]</i></p> <p>When paperHeight and paperWidth are specified, paperSize shall be ignored.</p> <p>The possible values for this attribute are defined by the ST_PositiveUniversalMeasure simple type (§22.9.2.12).</p>
scale (Print Scale)	<p>Print scaling. This attribute is restricted to values ranging from 10 to 400.</p> <p><i>[Example:</i></p> <p>10 - 10%</p> <p>20 - 20%</p> <p>...</p> <p>100 - 100%</p> <p>...</p> <p>400 - 400%</p> <p><i>end example]</i></p> <p>This setting is overridden when fitToWidth and/or fitToHeight are in use.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
useFirstPageNumber (Use First Page Number)	<p>Use firstPageNumber value for first page number, and do not auto number the pages.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
usePrinterDefaults (Use Printer Defaults)	<p>Use the printer's defaults settings for page setup values and don't use the default values specified in the schema. <i>[Example: If dpi is not present or specified in the XML, the application must not assume 600dpi as specified in the schema as a default and instead must let the printer specify the default dpi. end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
verticalDpi (Vertical DPI)	<p>Vertical print resolution of the device.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_PageSetup](#)) is located in §A.2. *end note*]

18.3.1.64 pageSetup (Chart Sheet Page Setup)

This element provides page setup properties for chart sheets.

[Example: The following example shows the pageSetup element for ISO A0 paper, printed in black and white, with graphics:

```
<pageSetup blackAndWhite="true" draft="false" paperHeight="1189mm"
  paperWidth="841mm" />
```

end example]

Attributes	Description
blackAndWhite (Black And White)	Print black and white. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
copies (Number Of Copies)	Number of copies to print. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
draft (Draft)	Print draft quality. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
firstPageNumber (First Page Number)	Page number for first printed page. If no value is specified, then 'automatic' is assumed. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
horizontalDpi (Horizontal DPI)	Horizontal print resolution of the device. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
id (Id) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Relationship Id of the devMode printer settings part. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).
orientation	Orientation of the page.

Attributes	Description
(Orientation)	The possible values for this attribute are defined by the ST_Orientation simple type (§18.18.50).
paperHeight (Paper Height)	<p>Height of custom paper as a number followed by a unit identifier. [<i>Example: 297mm, 11in end example</i>]</p> <p>When paperHeight and paperWidth are specified, paperSize shall be ignored.</p> <p>The possible values for this attribute are defined by the ST_PositiveUniversalMeasure simple type (§22.9.2.12).</p>
paperSize (Paper Size)	<p>1 = Letter paper (8.5 in. by 11 in.) 2 = Letter small paper (8.5 in. by 11 in.) 3 = Tabloid paper (11 in. by 17 in.) 4 = Ledger paper (17 in. by 11 in.) 5 = Legal paper (8.5 in. by 14 in.) 6 = Statement paper (5.5 in. by 8.5 in.) 7 = Executive paper (7.25 in. by 10.5 in.) 8 = A3 paper (297 mm by 420 mm) 9 = A4 paper (210 mm by 297 mm) 10 = A4 small paper (210 mm by 297 mm) 11 = A5 paper (148 mm by 210 mm) 12 = B4 paper (250 mm by 353 mm) 13 = B5 paper (176 mm by 250 mm) 14 = Folio paper (8.5 in. by 13 in.) 15 = Quarto paper (215 mm by 275 mm) 16 = Standard paper (10 in. by 14 in.) 17 = Standard paper (11 in. by 17 in.) 18 = Note paper (8.5 in. by 11 in.) 19 = #9 envelope (3.875 in. by 8.875 in.) 20 = #10 envelope (4.125 in. by 9.5 in.) 21 = #11 envelope (4.5 in. by 10.375 in.) 22 = #12 envelope (4.75 in. by 11 in.) 23 = #14 envelope (5 in. by 11.5 in.) 24 = C paper (17 in. by 22 in.) 25 = D paper (22 in. by 34 in.) 26 = E paper (34 in. by 44 in.) 27 = DL envelope (110 mm by 220 mm) 28 = C5 envelope (162 mm by 229 mm) 29 = C3 envelope (324 mm by 458 mm) 30 = C4 envelope (229 mm by 324 mm) 31 = C6 envelope (114 mm by 162 mm) 32 = C65 envelope (114 mm by 229 mm) 33 = B4 envelope (250 mm by 353 mm) 34 = B5 envelope (176 mm by 250 mm) 35 = B6 envelope (176 mm by 125 mm)</p>

Attributes	Description
	<p>36 = Italy envelope (110 mm by 230 mm) 37 = Monarch envelope (3.875 in. by 7.5 in.). 38 = 6 3/4 envelope (3.625 in. by 6.5 in.) 39 = US standard fanfold (14.875 in. by 11 in.) 40 = German standard fanfold (8.5 in. by 12 in.) 41 = German legal fanfold (8.5 in. by 13 in.) 42 = ISO B4 (250 mm by 353 mm) 43 = Japanese double postcard (200 mm by 148 mm) 44 = Standard paper (9 in. by 11 in.) 45 = Standard paper (10 in. by 11 in.) 46 = Standard paper (15 in. by 11 in.) 47 = Invite envelope (220 mm by 220 mm) 50 = Letter extra paper (9.275 in. by 12 in.) 51 = Legal extra paper (9.275 in. by 15 in.) 52 = Tabloid extra paper (11.69 in. by 18 in.) 53 = A4 extra paper (236 mm by 322 mm) 54 = Letter transverse paper (8.275 in. by 11 in.) 55 = A4 transverse paper (210 mm by 297 mm) 56 = Letter extra transverse paper (9.275 in. by 12 in.) 57 = SuperA/SuperA/A4 paper (227 mm by 356 mm) 58 = SuperB/SuperB/A3 paper (305 mm by 487 mm) 59 = Letter plus paper (8.5 in. by 12.69 in.) 60 = A4 plus paper (210 mm by 330 mm) 61 = A5 transverse paper (148 mm by 210 mm) 62 = JIS B5 transverse paper (182 mm by 257 mm) 63 = A3 extra paper (322 mm by 445 mm) 64 = A5 extra paper (174 mm by 235 mm) 65 = ISO B5 extra paper (201 mm by 276 mm) 66 = A2 paper (420 mm by 594 mm) 67 = A3 transverse paper (297 mm by 420 mm) 68 = A3 extra transverse paper (322 mm by 445 mm)</p> <p>When paperHeight and paperWidth are specified, paperSize should be ignored.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
paperWidth (Paper Width)	<p>Width of custom paper as a number followed by a unit identifier. [<i>Example: 21cm, 8.5in end example</i>]</p> <p>When paperHeight and paperWidth are specified, paperSize shall be ignored.</p> <p>The possible values for this attribute are defined by the ST_PositiveUniversalMeasure simple type (§22.9.2.12).</p>
useFirstPageNumber (Use First Page)	<p>Use firstPageNumber value for first page number, and do not auto number the pages.</p>

Attributes	Description
Number)	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
usePrinterDefaults (Use Printer Defaults)	Use the printer's defaults settings for page setup values and don't use the default values specified in the schema. <i>[Example: If dpi is not present or specified in the XML, the application must not assume 600dpi as specified in the schema as a default and instead must let the printer specify the default dpi. end example]</i> The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
verticalDpi (Vertical DPI)	Vertical print resolution of the device. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_CsPageSetup](#)) is located in §A.2. end note]

18.3.1.65 [pageSetUpPr \(Page Setup Properties\)](#)

Page setup properties of the worksheet

Attributes	Description
autoPageBreaks (Show Auto Page Breaks)	Flag indicating whether the sheet displays Automatic Page Breaks. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
fitToPage (Fit To Page)	Flag indicating whether the Fit to Page print option is enabled. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_PageSetUpPr](#)) is located in §A.2. end note]

18.3.1.66 [pane \(View Pane\)](#)

Worksheet view pane

Attributes	Description
activePane (Active Pane)	The pane that is active. The possible values for this attribute are defined by the ST_Pane simple type (§18.18.52).

Attributes	Description
state (Split State)	Indicates whether the pane has horizontal / vertical splits, and whether those splits are frozen. The possible values for this attribute are defined by the ST_PaneState simple type (§18.18.53).
topLeftCell (Top Left Visible Cell)	Location of the top left visible cell in the bottom right pane (when in Left-To-Right mode). The possible values for this attribute are defined by the ST_CellRef simple type (§18.18.7).
xSplit (Horizontal Split Position)	Horizontal position of the split, in 1/20th of a point; 0 (zero) if none. If the pane is frozen, this value indicates the number of columns visible in the top pane. The possible values for this attribute are defined by the W3C XML Schema double datatype.
ySplit (Vertical Split Position)	Vertical position of the split, in 1/20th of a point; 0 (zero) if none. If the pane is frozen, this value indicates the number of rows visible in the left pane. The possible values for this attribute are defined by the W3C XML Schema double datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Pane](#)) is located in §A.2. *end note*]

18.3.1.67 [picture \(Background Image\)](#)

Background sheet image.

[Example:

```
<picture r:id="rId1"/>
```

end example]

Attributes	Description
id (Relationship Id) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Relationship Id pointing to the image part. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

[Note: The W3C XML Schema definition of this element's content model ([CT_SheetBackgroundPicture](#)) is located in §A.2. *end note*]

18.3.1.68 pivotArea (Pivot Area)

Rule describing a PivotTable selection.

Attributes	Description
axis (Axis)	<p>The region of the PivotTable to which this rule applies.</p> <p>The possible values for this attribute are defined by the ST_Axis simple type (§18.18.1).</p>
cacheIndex (Cache Index)	<p>Flag indicating whether any indexes refer to fields or items in the Pivot cache and not the view.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
collapsedLevelsAre Subtotals (Collapsed Levels Are Subtotals)	<p>Flag indicating if collapsed levels/dimensions are considered subtotals.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
dataOnly (Data Only)	<p>Flag indicating whether only the data values (in the data area of the view) for an item selection are selected and does not include the item labels.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
field (Field Index)	<p>Index of the field that this selection rule refers to.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
fieldPosition (Field Position)	<p>Position of the field within the axis to which this rule applies.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
grandCol (Include Column Grand Total)	<p>Flag indicating whether the column grand total is included.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
grandRow (Include Row Grand Total)	<p>Flag indicating whether the row grand total is included.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
labelOnly (Labels Only)	<p>Flag indicating whether only the item labels for an item selection are selected and does not include the data values (in the data area of the view).</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
offset (Offset Reference)	<p>A Reference that specifies a subset of the selection area. Points are relative to the top left of the selection area.</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_Ref simple type (§18.18.62).
outline (Outline)	<p>Flag indicating whether the rule refers to an area that is in outline mode.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
type (Rule Type)	<p>Indicates the type of selection rule.</p> <p>The possible values for this attribute are defined by the ST_PivotAreaType simple type (§18.18.58).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_PivotArea](#)) is located in §A.2. *end note*]

18.3.1.69 [pivotSelection \(PivotTable Selection\)](#)

A collection of PivotTable structure selections. A PivotTable structure selection is a way of specifying what cells in the PivotTable are selected. Instead of specifying cell addresses in a sqref, a particular area or structure within the PivotTable is specified. In this way there is semantic meaning regarding what is selected, rather than simply a list of cell or ranges contained in the selection. Typically fields on the row or column axis are selected.

[Example: For example, the innermost field (Product SubCategory) is selected in this PivotTable:

	A	B	C
1			
2		State	{All} ▾
3		City	{All} ▾
4			
5			Column Labels ▾
6			2001
7			3
8			July
9		Row Labels ▾	Sum of Sales Amount
10		Bikes	209652.9046
11		Mountain Bikes	64424.81
12		Mountain-100 Black, 38	3374.99
13		Mountain-100 Black, 42	3374.99
14		Mountain-100 Black, 44	13499.96
15		Mountain-100 Black, 48	3374.99
16		Mountain-100 Silver, 38	6799.98
17		Mountain-100 Silver, 42	6799.98
18		Mountain-100 Silver, 44	16999.95
19		Mountain-100 Silver, 48	10199.97
20		Road Bikes	145228.0946
21		Road-150 Red, 44	25047.89
22		Road-150 Red, 48	42939.24
23		Road-150 Red, 52	21469.62
24		Road-150 Red, 56	25047.89
25		Road-150 Red, 62	28626.16
26		Road-650 Black, 44	699.0982
27		Road-650 Black, 52	
28		Road-650 Black, 62	699.0982
29		Road-650 Red, 44	699.0982
30		Road-650 Red, 48	
31		Road-650 Red, 52	
32		Road-650 Red, 58	
33		Road-650 Red, 60	
34		Grand Total	209652.9046

The corresponding pivotSelection XML should look like this:

```
<pivotSelection pane="bottomRight" showHeader="1" axis="axisRow" dimension="2"
  activeRow="11" activeCol="1" previousRow="11" previousCol="1" click="1"
  r:id="rId1">
```

```

<pivotArea dataOnly="0" labelOnly="1" fieldPosition="0">
  <references count="1">
    <reference field="9" count="0"/>
  </references>
</pivotArea>
</pivotSelection>

```

axis indicates that this selection is on the row axis, dimension indicates the field level within the row axis that is selected (zero-based index), activeCol and activeRow respectively indicate where in the grid the selection is located, and reference field indicates to which particular field the selection corresponds.

end example]

Attributes	Description
activeCol (Active Column)	The column (zero-based) of active cell for structure selection. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
activeRow (Active Row)	The row (zero-based) of active cell for structure selection. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
axis (Axis)	Axis of the PivotTable on which this selection lies. The possible values for this attribute are defined by the ST_Axis simple type (§18.18.1).
click (Click Count)	Number of clicks for this structure selection. For some selection combinations, subsequent clicks on the same target area cycles the actual selection through some variances. Therefore number of clicks on the selection shall be recorded, if it is desirable to restore this state of the selection cycle on load. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
count (Selection Count)	Number of selections for the structure selection. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
data (Data Selection)	Flag indicating whether the structure selection is for data only. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
dimension (Dimension)	Indicates the field level within the axis that is selected (zero-based index). The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

Attributes	Description
extendable (Extendable)	<p>Flag indicating whether the structure selection can have additional selections added to it.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
id (Relationship Id) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	<p>Relationship Id pointing to the particular PivotTable Part corresponding to this selection.</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
label (Label)	<p>Flag indicating whether the structure selection is for labels only (e.g., a grand total row is selected).</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
max (Maximum)	<p>The maximum line the structure selection contains.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
min (Minimum)	<p>The minimum line the structure selection contains.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
pane (Pane)	<p>The pane to which this PivotTable structure selection belongs.</p> <p>The possible values for this attribute are defined by the ST_Pane simple type (§18.18.52).</p>
previousCol (Previous Column Selection)	<p>1-based index to the column immediately left of the structure selection.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
previousRow (Previous Row)	<p>1-based index to the row immediately above the structure selection.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
showHeader (Show Header)	<p>Flag indicating whether selection toggle from data only to header only to both is enabled. False means disabled.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
start (Start)	<p>The line the structure selection begins (zero-based). This is the line clicked to initiate the structure selection.</p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_PivotSelection](#)) is located in §A.2. end note]

18.3.1.70 [printOptions \(Print Options\)](#)

Print options for the sheet. Printer-specific settings are stored separately in the Printer Settings part as defined in §15.2.15.

Attributes	Description
gridLines (Print Grid Lines)	Used in conjunction with gridLinesSet. If both gridLines and gridLinesSet are true, then grid lines shall print. Otherwise, they shall not (i.e., one or both have false values). The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
gridLinesSet (Grid Lines Set)	Used in conjunction with gridLines. If both gridLines and gridLinesSet are true, then grid lines shall print. Otherwise, they shall not (i.e., one or both have false values). The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
headings (Print Headings)	Print row and column headings. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
horizontalCentered (Horizontal Centered)	Center on page horizontally when printing. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
verticalCentered (Vertical Centered)	Center on page vertically when printing. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_PrintOptions](#)) is located in §A.2. end note]

18.3.1.71 [protectedRange \(Protected Range\)](#)

A specified range to be protected. Ranges listed here are protected only when the sheet protection is ON and the cell is flagged as being locked. If no password is specified here, then read/write permissions are automatically given to all users, regardless of additional security descriptor information. In other words, the

security descriptor information (specific types of access) at the user level is only applied if a password for this range is specified.

When a password is to be hashed and stored in this element, it shall be hashed as defined below, starting from a UTF-16LE encoded string value. If there is a leading BOM character (U+FEFF) in the encoded password it is removed before hash calculation.

When a password is specified, then users not listed specifically as having access should be prompted with a password. If that user supplies the correct password, then they can edit the range or cell in question. This protection is optional and can be ignored by applications that choose not to support this functionality.

Attributes	Description														
algorithmName (Cryptographic Algorithm Name)	<p>Specifies the specific cryptographic hashing algorithm which shall be used along with the salt attribute and input password in order to compute the hash value.</p> <p>The following values are reserved:</p> <table data-bbox="418 793 1479 1875"> <tr> <th data-bbox="418 793 669 844">Value</th><th data-bbox="669 793 1479 844">Algorithm</th></tr> <tr> <td data-bbox="418 844 669 1066">MD2</td><td data-bbox="669 844 1479 1066"> Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used. <i>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. end note]</i> </td></tr> <tr> <td data-bbox="418 1066 669 1289">MD4</td><td data-bbox="669 1066 1479 1289"> Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used. <i>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. end note]</i> </td></tr> <tr> <td data-bbox="418 1289 669 1512">MD5</td><td data-bbox="669 1289 1479 1512"> Specifies that the MD5 algorithm, as defined by RFC 1321, shall be used. <i>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. end note]</i> </td></tr> <tr> <td data-bbox="418 1512 669 1747">RIPEMD-128</td><td data-bbox="669 1512 1479 1747"> Specifies that the RIPEMD-128 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used. <i>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. end note]</i> </td></tr> <tr> <td data-bbox="418 1747 669 1831">RIPEMD-160</td><td data-bbox="669 1747 1479 1831"> Specifies that the RIPEMD-160 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used. </td></tr> <tr> <td data-bbox="418 1831 669 1875">SHA-1</td><td data-bbox="669 1831 1479 1875"> Specifies that the SHA-1 algorithm, as defined by ISO/IEC 10118- </td></tr> </table>	Value	Algorithm	MD2	Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used. <i>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. end note]</i>	MD4	Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used. <i>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. end note]</i>	MD5	Specifies that the MD5 algorithm, as defined by RFC 1321, shall be used. <i>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. end note]</i>	RIPEMD-128	Specifies that the RIPEMD-128 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used. <i>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. end note]</i>	RIPEMD-160	Specifies that the RIPEMD-160 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.	SHA-1	Specifies that the SHA-1 algorithm, as defined by ISO/IEC 10118-
Value	Algorithm														
MD2	Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used. <i>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. end note]</i>														
MD4	Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used. <i>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. end note]</i>														
MD5	Specifies that the MD5 algorithm, as defined by RFC 1321, shall be used. <i>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. end note]</i>														
RIPEMD-128	Specifies that the RIPEMD-128 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used. <i>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. end note]</i>														
RIPEMD-160	Specifies that the RIPEMD-160 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.														
SHA-1	Specifies that the SHA-1 algorithm, as defined by ISO/IEC 10118-														

Attributes	Description										
	<table border="1" data-bbox="418 247 1477 632"> <tr> <td></td><td>3:2004 shall be used.</td></tr> <tr> <td>SHA-256</td><td>Specifies that the SHA-256 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</td></tr> <tr> <td>SHA-384</td><td>Specifies that the SHA-384 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</td></tr> <tr> <td>SHA-512</td><td>Specifies that the SHA-512 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</td></tr> <tr> <td>WHIRLPOOL</td><td>Specifies that the WHIRLPOOL algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</td></tr> </table> <p>[<i>Example:</i> Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre data-bbox="456 779 1175 842">< ... algorithmName="SHA-1" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The algorithmName attribute value of “SHA-1” specifies that the SHA-1 hashing algorithm must be used to generate a hash from the user-defined password. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>		3:2004 shall be used.	SHA-256	Specifies that the SHA-256 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.	SHA-384	Specifies that the SHA-384 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.	SHA-512	Specifies that the SHA-512 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.	WHIRLPOOL	Specifies that the WHIRLPOOL algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	3:2004 shall be used.										
SHA-256	Specifies that the SHA-256 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.										
SHA-384	Specifies that the SHA-384 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.										
SHA-512	Specifies that the SHA-512 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.										
WHIRLPOOL	Specifies that the WHIRLPOOL algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.										
hashValue (Password Hash Value)	<p>Specifies the hash value for the password required to edit this range. This value shall be compared with the resulting hash value after hashing the user-supplied password using the algorithm specified by the preceding attributes and parent XML element, and if the two values match, the protection shall no longer be enforced.</p> <p>If this value is omitted, then the reservationPassword attribute shall contain the password hash for the workbook.</p> <p>[<i>Example:</i> Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre data-bbox="456 1499 1175 1562"><... AlgorithmName="SHA-1" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The hashValue attribute value of 9oN7nWkCAyEZib1RomSJTjmPpCY= specifies that the user-supplied password must be hashed using the pre-processing defined by the parent element (if any) followed by the SHA-1 algorithm (specified via the algorithmName attribute value of SHA-1) and that the resulting has value must be 9oN7nWkCAyEZib1RomSJTjmPpCY= for the protection to be disabled. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema base64Binary datatype.</p>										

Attributes	Description
name (Name)	<p>Range title. This is used as a descriptor, not as a named range definition.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
saltValue (Salt Value for Password Verifier)	<p>Specifies the salt which was prepended to the user-supplied password before it was hashed using the hashing algorithm defined by the preceding attribute values to generate the hashValue attribute, and which shall also be prepended to the user-supplied password before attempting to generate a hash value for comparison. A <i>salt</i> is a random string which is added to a user-supplied password before it is hashed in order to prevent a malicious party from pre-calculating all possible password/hash combinations and simply using those pre-calculated values (often referred to as a "dictionary attack").</p> <p>If this attribute is omitted, then no salt shall be prepended to the user-supplied password before it is hashed for comparison with the stored hash value.</p> <p>[<i>Example</i>: Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre><... saltValue="ZUdHa+D8F/OAKP3I7ssUnQ==" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The saltValue attribute value of ZUdHa+D8F/OAKP3I7ssUnQ== specifies that the user-supplied password must have this value prepended before it is run through the specified hashing algorithm to generate a resulting hash value for comparison. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema base64Binary datatype.</p>
spinCount (Iterations to Run Hashing Algorithm)	<p>Specifies the number of times the hashing function shall be iteratively run (runs using each iteration's result plus a 4 byte value (0-based, little endian) containing the number of the iteration as the input for the next iteration) when attempting to compare a user-supplied password with the value stored in the hashValue attribute.</p> <p>[<i>Rationale</i>: Running the algorithm many times increases the cost of exhaustive search attacks correspondingly. Storing this value allows for the number of iterations to be increased over time to accommodate faster hardware (and hence the ability to run more iterations in less time). <i>end rationale</i>]</p> <p>[<i>Example</i>: Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre><... spinCount="100000" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The spinCount attribute value of 100000 specifies that the hashing function must be run one hundred thousand times to generate a hash value for comparison with the</p>

Attributes	Description
	<p>hashValue attribute. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
sqref (Sequence of References)	<p>The range to be protected.</p> <p>The possible values for this attribute are defined by the ST_Sqref simple type (§18.18.76).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_ProtectedRange](#)) is located in §A.2. *end note*]

18.3.1.72 `protectedRanges` (Protected Ranges)

This collection specifies all protected ranges on this worksheet.

[Example:

This example demonstrates that A1:C5 have been protected, with no password specified.

```
<protectedRanges>
  <protectedRange sqref="A1:C5" name="Range1"/>
</protectedRanges>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_ProtectedRanges](#)) is located in §A.2. *end note*]

18.3.1.73 `row` (Row)

The element expresses information about an entire row of a worksheet, and contains all cell definitions for a particular row in the worksheet.

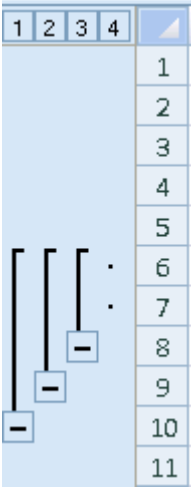
[Example:

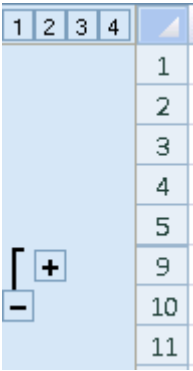

This row expresses information about row 2 in the worksheet, and contains 3 cell definitions.

```
<row r="2" spans="2:12">
  <c r="C2" s="1">
    <f>PMT(B3/12,B4,-B5)</f>
    <v>672.68336574300008</v>
  </c>
  <c r="D2">
    <v>180</v>
  </c>
```

```
<c r="E2">
  <v>360</v>
</c>
</row>
```

end example]

Attributes	Description
collapsed (Collapsed)	<p>1 if the rows 1 level of outlining deeper than the current row are in the collapsed outline state. It means that the rows which are 1 outline level deeper (numerically higher value) than the current row are currently hidden due to a collapsed outline state.</p> <p>It is possible for collapsed to be <code>false</code> and yet still have the rows in question hidden. This can be achieved by having a lower outline level collapsed, thus hiding all the child rows.</p> <p>[Example: This example shows 3 levels of outlining:</p>  <p>In the XML must be:</p> <pre><sheetData> <row r="6" outlineLevel="3"/> <row r="7" outlineLevel="3"/> <row r="8" outlineLevel="2"/> <row r="9" outlineLevel="1"/> </sheetData></pre> <p>end example]</p> <p>[Example: This example shows the same outline feature, with the middle level collapsed:</p>

Attributes	Description
	<div></div> <p>In the XML must be:</p> <pre><sheetData> <row r="6" hidden="1" outlineLevel="3"/> <row r="7" hidden="1" outlineLevel="3"/> <row r="8" hidden="1" outlineLevel="2"/> <row r="9" outlineLevel="1" collapsed="1"/> </sheetData></pre> <p><i>end example]</i></p> <p>[Example:</p> <p>This example shows the same outline feature as above, where both the middle and lowest level are collapsed:</p> <div></div> <p>In the XML must be:</p> <pre><sheetData> <row r="6" hidden="1" outlineLevel="3"/> <row r="7" hidden="1" outlineLevel="3"/> <row r="8" hidden="1" outlineLevel="2"/> <row r="9" hidden="1" outlineLevel="1" collapsed="1"/> <row r="10" collapsed="1"/> </sheetData></pre> <p>Note that in this case, if the lowest level were expanded, the middle level would remain</p>

Attributes	Description
	<p>collapsed due to collapsed being true on row 9.</p> <p><i>end example]</i></p> <p>See description of outlinePr element's summaryBelow and summaryRight attributes for detailed information.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
customFormat (Custom Format)	<p>1 if the row style should be applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
customHeight (Custom Height)	<p>1 if the row height has been manually set.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
hidden (Hidden)	<p>1 if the row is hidden, e.g., due to a collapsed outline or by manually selecting and hiding a row.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
ht (Row Height)	<p>Row height measured in point size. There is no margin padding on row height.</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>
outlineLevel (Outline Level)	<p>Outlining level of the row, when outlining is on. See description of outlinePr element's summaryBelow and summaryRight attributes for detailed information.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedByte datatype.</p>
ph (Show Phonetic)	<p>1 if the row should show phonetic.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
r (Row Index)	<p>Row index. Indicates to which row in the sheet this <row> definition corresponds.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
s (Style Index)	<p>Index to style record for the row (only applied if customFormat attribute is '1')</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

Attributes	Description
spans (Spans)	<p>Optimization only, and not required. Specifies the range of non-empty columns (in the format X:Y) for the block of rows to which the current row belongs. To achieve the optimization, span attribute values in a single block should be the same.</p> <p>There are 16 rows per block, beginning with the first row.</p> <p>[<i>Note</i>: this is an optimization, and is purely optional. Different span values within the same row block is allowed. Not writing the span value at all is also allowed. <i>end note</i>]</p> <p>Blank rows are not required to write out span values.</p> <p>[<i>Example</i>: If cells F8, E9, and D10 have data in them and the rest of the sheet is empty, then for those three rows (8,9, and 10), the spans value should each be "4:6":</p> <pre> <sheetData> <row r="8" spans="4:6"> <c r="F8"> <v>1</v> </c> </row> <row r="9" spans="4:6"> <c r="E9"> <v>2</v> </c> </row> <row r="10" spans="4:6"> <c r="D10"> <v>3</v> </c> </row> </sheetData> </pre> <p>If cells A1 and J10 have data in them and the rest of the sheet is empty, then the rows should be written like this:</p> <pre> <sheetData> <row r="1" spans="1:10"> <c r="A1"> <v>1</v> </c> </row> <row r="10" spans="1:10"> <c r="J10"> <v>2</v> </c> </row> </sheetData> </pre>

Attributes	Description
	<p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_CellSpans simple type (§18.18.9).</p>
thickBot (Thick Bottom)	<p>1 if any cell in the row has a medium or thick bottom border, or if any cell in the row directly below the current row has a thick top border. When true and customHeight is false, this flag means that the row height has been adjusted higher by .75 points of the normal style font height. This also means that if the row no longer contains these borders, then the height is automatically re-adjusted down.</p> <p>This adjustment is in addition to any adjustment of height due to thickTop.</p> <p>Medium borders are these enumeration values from the Styles Part:</p> <ul style="list-style-type: none"> • mediumDashDotDot • slantDashDot • mediumDashDot • mediumDashed • medium • • Thick borders are these enumeration values from the Styles Part: • thick • double <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
thickTop (Thick Top Border)	<p>True if the row has a medium or thick top border, or if any cell in the row directly above the current row has a thick bottom border. When true and customHeight is false, this flag means that the row height has been adjusted higher by .75 points of the normal style font height. This also means that if the row no longer contains these borders, then the height is automatically re-adjusted down.</p> <p>This adjustment is in addition to any adjustment of height due to thickBot.</p> <p>Medium borders are these enumeration values from the Styles Part:</p> <ul style="list-style-type: none"> • mediumDashDotDot • slantDashDot • mediumDashDot • mediumDashed • medium <p>Thick borders are these enumeration values from the Styles Part:</p> <ul style="list-style-type: none"> • thick • double

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Row](#)) is located in §A.2. *end note*]

18.3.1.74 rowBreaks (Horizontal Page Breaks (Row))

Horizontal page break information used for print layout view, page layout view, drawing print breaks in normal view, and for printing the worksheet.

[Example: This example shows a break inserted at cell B25:

```
<rowBreaks count="1" manualBreakCount="1">
  <brk id="24" max="16383" man="1"/>
</rowBreaks>
```

end example]

Attributes	Description
count (Page Break Count)	Number of breaks in the collection. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
manualBreakCount (Manual Break Count)	Number of manual breaks in the collection. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_PageBreak](#)) is located in §A.2. *end note*]

18.3.1.75 scenario (Scenario)

An individual scenario description. [Note: See parent element for an example. *end note*]

Attributes	Description
comment (Scenario Comment)	Comment for this scenario, rich text not supported. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
count (Changing Cell Count)	Number of input cells. The possible values for this attribute are defined by the W3C XML Schema unsignedInt

Attributes	Description
	datatype.
hidden (Hidden Scenario)	Scenario is hidden when the sheet is protected and 'edit scenarios' is not enabled in sheet protection options. If the scenario is marked as hidden but sheet protection options specify to allow editing scenarios, then the scenario shall not be hidden. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
locked (Scenario Locked)	Scenario is locked for editing when the sheet is protected. If sheet is protected and "edit scenarios" is enabled, then this setting is ignored. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
name (Scenario Name)	Scenario's name (user input). Shall be unique for the worksheet The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
user (User Name)	Name of user who last changed the scenario. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element's content model (CT_Scenario) is located in §A.2. *end note*]

18.3.1.76 scenarios (Scenarios)

A collection of Scenarios. A scenario is a named what-if model that includes variable cells linked together by one or more formulas.

[Example: For example, you might want to compare best-case and worst-case scenarios for sales in a coffee shop, based on the number of cups of coffee sold in a week.

```
<scenarios current="1" show="0" sqref="G4 G6 G7 G8">
  <scenario name="Best Case" locked="1" count="3" user="anonymous"
    comment="Created on 6/9/2006_x000a_Modified on 6/9/2006">
    <inputCells r="D5" val="151" numFmtId="37"/>
    <inputCells r="D9" val="226"/>
    <inputCells r="D13" val="126"/>
  </scenario>
```

```

<scenario name="Worst Case" locked="1" count="3" user="anonymous"
  comment="Created on 6/9/2006">
  <inputCells r="D5" val="50" numFmtId="37"/>
  <inputCells r="D9" val="40"/>
  <inputCells r="D13" val="30"/>
</scenario>
</scenarios>

```

end example]

Attributes	Description
current (Current Scenario)	Zero-based index to current scenario selected. Can correspond to selection UI. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
show (Last Shown Scenario)	Zero-based index to last shown scenario. Indicates which scenario was last selected by the user to be run/shown. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
sqref (Sequence of References)	Range or sequence of cells used for scenario results summary. The possible values for this attribute are defined by the ST_Sqref simple type (§18.18.76).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Scenarios](#)) is located in §A.2. *end note*]

18.3.1.77 securityDescriptor (Security Descriptor)

Optional setting to specify the relative security descriptor. The security descriptor defines user accounts who may edit this range without providing a password to access the range.

[*Note:* The format of a securityDescriptor is application defined; however, it is recommended that the following format be used for interoperability between implementations: `username@domain`. This format follows the form of `addr-spec` as defined in RFC 822, Standard for ARPA Internet Text Messages. *end note*]

[*Example:* This example demonstrates two user accounts in the security descriptor attribute:

```

<protectedRanges>
  <protectedRange sqref="A1:C5" name="Range1">
    <securityDescriptor>user1@iso.org</securityDescriptor>
    <securityDescriptor>user2@iso.org</securityDescriptor>
  </protectedRange>
</protectedRanges>

```

end example]

The possible values for this element are defined by the W3C XML Schema string datatype.

18.3.1.78 [selection \(Selection\)](#)

Worksheet view selection.

Attributes	Description
activeCell (Active Cell Location)	Location of the active cell. The possible values for this attribute are defined by the ST_CellRef simple type (§18.18.7).
activeCellId (Active Cell Index)	0-based index of the range reference (in the array of references listed in sqref) containing the active cell. Only used when the selection in sqref is not contiguous. Therefore, this value needs to be aware of the order in which the range references are written in sqref. When this value is out of range then activeCell can be used. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
pane (Pane)	The pane to which this selection belongs. The possible values for this attribute are defined by the ST_Pane simple type (§18.18.52).
sqref (Sequence of References)	Range of the selection. Can be non-contiguous set of ranges. The possible values for this attribute are defined by the ST_Sqref simple type (§18.18.76).

[Note: The W3C XML Schema definition of this element's content model ([CT_Selection](#)) is located in §A.2. *end note*]

18.3.1.79 [sheetCalcPr \(Sheet Calculation Properties\)](#)

This element contains calculation properties for the worksheet.

Attributes	Description
fullCalcOnLoad (Full Calculation On Load)	Indicates whether the application should do a full calculate on load due to contents on this sheet. After load and successful calc, the application shall set this value to false. Set this to true when the application should calculate the workbook on load. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_SheetCalcPr](#)) is located in §A.2. *end note*]

18.3.1.80 [sheetData \(Sheet Data\)](#)

This collection represents the cell table itself. This collection expresses information about each cell, grouped together by rows in the worksheet.

[Note: The W3C XML Schema definition of this element's content model ([CT_SheetData](#)) is located in §A.2. *end note*]

18.3.1.81 [sheetFormatPr \(Sheet Format Properties\)](#)

Sheet formatting properties.

Attributes	Description
baseColWidth (Base Column Width)	<p>Specifies the number of characters of the maximum digit width of the normal style's font. This value does not include margin padding or extra padding for gridlines. It is only the number of characters.</p> <p>See defaultColWidth description in this section for details on calculating this value.</p> <p>See the col element description, particularly the width attribute description, for more information on what is meant by "maximum digit width".</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
customHeight (Custom Height)	<p>'True' if defaultRowHeight value has been manually set, or is different from the default value.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
defaultColWidth (Default Column Width)	<p>Default column width measured as the number of characters of the maximum digit width of the normal style's font.</p> <p>If the user has not set this manually, then it can be calculated: $\text{defaultColWidth} = \text{baseColumnWidth} + \{\text{margin padding (2 pixels on each side, totalling 4 pixels)}\} + \{\text{gridline (1pixel)}\}$</p> <p>If the user has set this manually, then there is no calculation, and simply a value is specified.</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>
defaultRowHeight (Default Row Height)	<p>Default row height measured in point size. Optimization so we don't have to write the height on all rows. This can be written out if most rows have custom height, to achieve the optimization.</p>

Attributes	Description
	<p>When the row height of all rows in a sheet is the default value, then that value is written here, and customHeight is not set. If a few rows have a different height, that information is written directly on each row. However, if most or all of the rows in the sheet have the same height, but that height isn't the default height, then that height value should be written here (as an optimization), and the customHeight flag should also be set. In this case, all rows having this height do not need to express the height, only rows whose height differs from this value need to be explicitly expressed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>
outlineLevelCol (Column Outline Level)	<p>Highest number of outline levels for columns in this sheet. These values shall be in synch with the actual sheet outline levels.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedByte datatype.</p>
outlineLevelRow (Maximum Outline Row)	<p>Highest number of outline level for rows in this sheet. These values shall be in synch with the actual sheet outline levels.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedByte datatype.</p>
thickBottom (Thick Bottom Border)	<p>'True' if rows have a thick bottom border by default.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
thickTop (Thick Top Border)	<p>'True' if rows have a thick top border by default.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
zeroHeight (Hidden By Default)	<p>'True' if rows are hidden by default. This setting is an optimization used when most rows of the sheet are hidden. In this case, instead of writing out every row and specifying hidden, it is much shorter to only write out the rows that are not hidden, and specify here that rows are hidden by default, and only not hidden if specified.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_SheetFormatPr](#)) is located in §A.2. end note]

18.3.1.82 [sheetPr \(Sheet Properties\)](#)

Sheet-level properties.

Attributes	Description
codeName (Code Name)	<p>Specifies a stable name of the sheet, which should not change over time, and does not change from user input. This name should be used by code to reference a particular sheet.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
enableFormatConditionsCalculation (Enable Conditional Formatting Calculations)	<p>Flag indicating whether the conditional formatting calculations shall be evaluated. If set to <code>false</code>, then the min/max values of color scales or databars or threshold values in Top N rules shall not be updated. Essentially the conditional formatting "calc" is off.</p> <p>This is useful when conditional formats are being set programmatically at runtime, recalculation of the conditional formatting does not need to be done until the program execution has finished setting all the conditional formatting properties.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
filterMode (Filter Mode)	<p>Flag indicating whether the worksheet has one or more autofilters or advanced filters on.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
published (Published)	<p>Flag indicating whether the worksheet is published.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
syncHorizontal (Synch Horizontal)	<p>Flag indicating whether this worksheet is horizontally synced to the <code>synchRef</code> anchor point. When true and scroll location is missing from the window properties, the window view shall be scrolled to the horizontal (row) aspect of the <code>synchRef</code> value.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
synchRef (Synch Reference)	<p>Anchor point for worksheet's window.</p> <p>The possible values for this attribute are defined by the <code>ST_Ref</code> simple type (§18.18.62).</p>
syncVertical (Synch Vertical)	<p>Flag indicating whether this worksheet is vertically synced to the <code>synchRef</code> anchor point. When true and scroll location is missing from the window properties, the window view shall be scrolled to the vertical (column) aspect of the <code>synchRef</code> value.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
transitionEntry (Transition Formula Entry)	<p>Flag indicating whether the Transition Formula Entry (Lotus compatibility) option is enabled.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

Attributes	Description
transitionEvaluation (Transition Formula Evaluation)	Flag indicating whether the Transition Formula Evaluation (Lotus compatibility) option is enabled. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element’s content model ([CT_SheetPr](#)) is located in §A.2. *end note*]

18.3.1.83 [sheetPr \(Chart Sheet Properties\)](#)

This element specifies chart sheet properties.

Attributes	Description
codeName (Code Name)	Specifies a stable name of the sheet, which should not change over time, and does not change from user input. This name should be used by code to reference a particular sheet. The possible values for this attribute are defined by the W3C XML Schema string datatype.
published (Published)	Flag indicating whether the chart sheet is published. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element’s content model ([CT_ChartsheetPr](#)) is located in §A.2. *end note*]

18.3.1.84 [sheetProtection \(Chart Sheet Protection\)](#)

This collection expresses the chart sheet protection options to enforce when the chart sheet is protected.

Attributes	Description				
algorithmName (Cryptographic Algorithm Name)	Specifies the specific cryptographic hashing algorithm which shall be used along with the salt attribute and input password in order to compute the hash value. The following values are reserved: <table><tr><th>Value</th><th>Algorithm</th></tr><tr><td>MD2</td><td>Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used. [Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known</td></tr></table>	Value	Algorithm	MD2	Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used. [Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known
Value	Algorithm				
MD2	Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used. [Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known				

Attributes	Description	
		breaks. <i>end note</i>]
	MD4	Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used. [<i>Note</i> : It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]
	MD5	Specifies that the MD5 algorithm, as defined by RFC 1321, shall be used. [<i>Note</i> : It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]
	RIPEMD-128	Specifies that the RIPEMD-128 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used. [<i>Note</i> : It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]
	RIPEMD-160	Specifies that the RIPEMD-160 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	SHA-1	Specifies that the SHA-1 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	SHA-256	Specifies that the SHA-256 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	SHA-384	Specifies that the SHA-384 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	SHA-512	Specifies that the SHA-512 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	WHIRLPOOL	Specifies that the WHIRLPOOL algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
<p data-bbox="415 1518 1471 1583">[<i>Example</i>: Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre data-bbox="453 1623 1175 1688">< ... algorithmName="SHA-1" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p data-bbox="415 1728 1373 1829">The algorithmName attribute value of “SHA-1” specifies that the SHA-1 hashing algorithm must be used to generate a hash from the user-defined password. <i>end example</i>]</p>		

Attributes	Description
	The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
content (Contents)	<p>When true prevents users from making changes to items that are part of the chart, such as data series, axes, and legends. The chart continues to reflect changes made to its source data.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
hashValue (Password Hash Value)	<p>Specifies the hash value for the password required to edit this chartsheet. This value shall be compared with the resulting hash value after hashing the user-supplied password using the algorithm specified by the preceding attributes and parent XML element, and if the two values match, the protection shall no longer be enforced.</p> <p>If this value is omitted, then the reservationPassword attribute shall contain the password hash for the workbook.</p> <p>[<i>Example:</i> Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre data-bbox="456 951 1175 1016"><... algorithmName="SHA-1" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The hashValue attribute value of 9oN7nWkCAyEZib1RomSJTjmPpCY= specifies that the user-supplied password shall be hashed using the pre-processing defined by the parent element (if any) followed by the SHA-1 algorithm (specified via the algorithmName attribute value of SHA-1) and that the resulting hash value must be 9oN7nWkCAyEZib1RomSJTjmPpCY= for the protection to be disabled. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema base64Binary datatype.</p>
objects (Objects Locked)	<p>When true prevents users from making changes to graphic objects— including shapes, text boxes, and controls— unless you unlock the specific objects before you protect the chart sheet.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
saltValue (Salt Value for Password Verifier)	<p>Specifies the salt which was prepended to the user-supplied password before it was hashed using the hashing algorithm defined by the preceding attribute values to generate the hashValue attribute, and which shall also be prepended to the user-supplied password before attempting to generate a hash value for comparison. A <i>salt</i> is a random string which is added to a user-supplied password before it is hashed in order to prevent a malicious party from pre-calculating all possible password/hash combinations and simply using those pre-calculated values (often referred to as a "dictionary attack").</p> <p>If this attribute is omitted, then no salt shall be prepended to the user-supplied password</p>

Attributes	Description
	<p>before it is hashed for comparison with the stored hash value.</p> <p>[<i>Example:</i> Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre><... saltValue="ZUdHa+D8F/OAKP3I7ssUnQ==" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The saltValue attribute value of ZUdHa+D8F/OAKP3I7ssUnQ== specifies that the user-supplied password must have this value prepended before it is run through the specified hashing algorithm to generate a resulting hash value for comparison. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema base64Binary datatype.</p>
spinCount (Iterations to Run Hashing Algorithm)	<p>Specifies the number of times the hashing function shall be iteratively run (runs using each iteration's result plus a 4 byte value (0-based, little endian) containing the number of the iteration as the input for the next iteration) when attempting to compare a user-supplied password with the value stored in the hashValue attribute.</p> <p>[<i>Rationale:</i> Running the algorithm many times increases the cost of exhaustive search attacks correspondingly. Storing this value allows for the number of iterations to be increased over time to accommodate faster hardware (and hence the ability to run more iterations in less time). <i>end rationale</i>]</p> <p>[<i>Example:</i> Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre><... spinCount="100000" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The spinCount attribute value of 100000 specifies that the hashing function must be run one hundred thousand times to generate a hash value for comparison with the hashValue attribute. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ChartsheetProtection](#)) is located in §A.2. *end note*]

18.3.1.85 [sheetProtection](#) (Sheet Protection Options)

This collection expresses the sheet protection options to enforce when the sheet is protected.

[*Example:*

This example demonstrates that the sheet is protected, objects and scenarios can be edited, cell formatting is allowed, and selection of locked cells is not allowed:

```
<sheetProtection sheet="1" objects="1" scenarios="1" formatCells="0"
  selectLockedCells="1"/>
```

end example]

Attributes	Description																
algorithmName (Cryptographic Algorithm Name)	<p>Specifies the specific cryptographic hashing algorithm which shall be used along with the salt attribute and input password in order to compute the hash value.</p> <p>The following values are reserved:</p> <table> <tr> <th>Value</th><th>Algorithm</th></tr> <tr> <td>MD2</td><td> <p>Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p> </td></tr> <tr> <td>MD4</td><td> <p>Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p> </td></tr> <tr> <td>MD5</td><td> <p>Specifies that the MD5 algorithm, as defined by RFC 1321, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p> </td></tr> <tr> <td>RIPEMD-128</td><td> <p>Specifies that the RIPEMD-128 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p> </td></tr> <tr> <td>RIPEMD-160</td><td> <p>Specifies that the RIPEMD-160 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> </td></tr> <tr> <td>SHA-1</td><td> <p>Specifies that the SHA-1 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> </td></tr> <tr> <td>SHA-256</td><td> <p>Specifies that the SHA-256 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> </td></tr> </table>	Value	Algorithm	MD2	<p>Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>	MD4	<p>Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>	MD5	<p>Specifies that the MD5 algorithm, as defined by RFC 1321, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>	RIPEMD-128	<p>Specifies that the RIPEMD-128 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>	RIPEMD-160	<p>Specifies that the RIPEMD-160 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>	SHA-1	<p>Specifies that the SHA-1 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>	SHA-256	<p>Specifies that the SHA-256 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>
Value	Algorithm																
MD2	<p>Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>																
MD4	<p>Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>																
MD5	<p>Specifies that the MD5 algorithm, as defined by RFC 1321, shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>																
RIPEMD-128	<p>Specifies that the RIPEMD-128 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p> <p>[<i>Note</i>: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>																
RIPEMD-160	<p>Specifies that the RIPEMD-160 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>																
SHA-1	<p>Specifies that the SHA-1 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>																
SHA-256	<p>Specifies that the SHA-256 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.</p>																

Attributes	Description	
	SHA-384	Specifies that the SHA-384 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	SHA-512	Specifies that the SHA-512 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	WHIRLPOOL	Specifies that the WHIRLPOOL algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	<p>[<i>Example:</i> Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre>< ... algorithmName="SHA-1" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The algorithmName attribute value of “SHA-1” specifies that the SHA-1 hashing algorithm must be used to generate a hash from the user-defined password. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>	
autoFilter (AutoFilter Locked)	<p>If 1 or true then AutoFilters should not be allowed to operate when the sheet is protected.</p> <p>If 0 or false then AutoFilters should be allowed to operate when the sheet is protected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>	
deleteColumns (Delete Columns Locked)	<p>If 1 or true then deleting columns should not be allowed when the sheet is protected.</p> <p>If 0 or false then deleting columns should be allowed when the sheet is protected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>	
deleteRows (Delete Rows Locked)	<p>If 1 or true then deleting rows should not be allowed when the sheet is protected.</p> <p>If 0 or false then deleting rows should be allowed when the sheet is protected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>	
formatCells (Format Cells Locked)	<p>If 1 or true then formatting cells should not be allowed when the sheet is protected.</p> <p>If 0 or false then formatting cells should be allowed when the sheet is protected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean</p>	

Attributes	Description
	datatype.
formatColumns (Format Columns Locked)	<p>If 1 or true then formatting columns should not be allowed when the sheet is protected.</p> <p>If 0 or false then formatting columns should be allowed when the sheet is protected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
formatRows (Format Rows Locked)	<p>If 1 or true then formatting rows should not be allowed when the sheet is protected.</p> <p>If 0 or false then formatting rows should be allowed when the sheet is protected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
hashValue (Password Hash Value)	<p>Specifies the hash value for the password required to edit this worksheet. This value shall be compared with the resulting hash value after hashing the user-supplied password using the algorithm specified by the preceding attributes and parent XML element, and if the two values match, the protection shall no longer be enforced.</p> <p>If this value is omitted, then the reservationPassword attribute shall contain the password hash for the workbook.</p> <p>[<i>Example:</i> Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre data-bbox="451 1140 1175 1205"><... algorithmName="SHA-1" hashCode="9oN7nWkCAYEZib1RomSJTjmPpCY=" /></pre> <p>The hashCode attribute value of 9oN7nWkCAYEZib1RomSJTjmPpCY= specifies that the user-supplied password must be hashed using the pre-processing defined by the parent element (if any) followed by the SHA-1 algorithm (specified via the algorithmName attribute value of SHA-1) and that the resulting hash value must be 9oN7nWkCAYEZib1RomSJTjmPpCY= for the protection to be disabled. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema base64Binary datatype.</p>
insertColumns (Insert Columns Locked)	<p>If 1 or true then inserting columns should not be allowed when the sheet is protected.</p> <p>If 0 or false then inserting columns should be allowed when the sheet is protected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
insertHyperlinks (Insert Hyperlinks Locked)	<p>If 1 or true then inserting hyperlinks should not be allowed when the sheet is protected.</p>

Attributes	Description
Locked)	<p>If 0 or false then inserting hyperlinks should be allowed when the sheet is protected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
insertRows (Insert Rows Locked)	<p>If 1 or true then inserting rows should not be allowed when the sheet is protected.</p> <p>If 0 or false then inserting rows should be allowed when the sheet is protected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
objects (Objects Locked)	<p>If 1 or true then editing of objects should not be allowed when the sheet is protected.</p> <p>If 0 or false then objects are allowed to be edited when the sheet is protected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
pivotTables (Pivot Tables Locked)	<p>If 1 or true then PivotTables should not be allowed to operate when the sheet is protected.</p> <p>If 0 or false then PivotTables should be allowed to operate when the sheet is protected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
saltValue (Salt Value for Password Verifier)	<p>Specifies the salt which was prepended to the user-supplied password before it was hashed using the hashing algorithm defined by the preceding attribute values to generate the hashValue attribute, and which shall also be prepended to the user-supplied password before attempting to generate a hash value for comparison. A <i>salt</i> is a random string which is added to a user-supplied password before it is hashed in order to prevent a malicious party from pre-calculating all possible password/hash combinations and simply using those pre-calculated values (often referred to as a "dictionary attack").</p> <p>If this attribute is omitted, then no salt shall be prepended to the user-supplied password before it is hashed for comparison with the stored hash value.</p> <p>[<i>Example:</i> Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre data-bbox="451 1612 1177 1682"><... saltValue="ZUdHa+D8F/OAKP3I7ssUnQ==" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The saltValue attribute value of ZUdHa+D8F/OAKP3I7ssUnQ== specifies that the user-supplied password must have this value prepended before it is run through the specified hashing algorithm to generate a resulting hash value for comparison. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema base64Binary</p>

Attributes	Description
	datatype.
scenarios (Scenarios Locked)	<p>If 1 or true then Scenarios should not be edited when the sheet is protected.</p> <p>If 0 or false then Scenarios are allowed to be edited when the sheet is protected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
selectLockedCells (Select Locked Cells Locked)	<p>If 1 or true then selection of locked cells should not be allowed when the sheet is protected.</p> <p>If 0 or false then selection of locked cells should be allowed when the sheet is protected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
selectUnlockedCells (Select Unlocked Cells Locked)	<p>If 1 or true then selection of unlocked cells should not be allowed when the sheet is protected.</p> <p>If 0 or false then selection of unlocked cells should be allowed when the sheet is protected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
sheet (Sheet Locked)	<p>If 1 or true then the sheet is protected.</p> <p>If 0 or false then the sheet is not protected.</p> <p>The value of this attribute dictates whether the other attributes of sheetProtection should be applied. If 1 or true then the other attributes of sheetProtection should be applied. If 0 or false then the other attributes of sheetProtection should not be applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
sort (Sort Locked)	<p>If 1 or true then sorting should not be allowed when the sheet is protected.</p> <p>If 0 or false then sorting should be allowed when the sheet is protected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
spinCount (Iterations to Run Hashing Algorithm)	<p>Specifies the number of times the hashing function shall be iteratively run (runs using each iteration's result plus a 4 byte value (0-based, little endian) containing the number of the iteration as the input for the next iteration) when attempting to compare a user-supplied password with the value stored in the hashValue attribute.</p> <p>[Rationale: Running the algorithm many times increases the cost of exhaustive search</p>

Attributes	Description
	<p>attacks correspondingly. Storing this value allows for the number of iterations to be increased over time to accommodate faster hardware (and hence the ability to run more iterations in less time). <i>end rationale</i></p> <p>[<i>Example:</i> Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre><... spinCount="100000" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The spinCount attribute value of 100000 specifies that the hashing function must be run one hundred thousand times to generate a hash value for comparison with the hashValue attribute. <i>end example</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SheetProtection](#)) is located in §A.2. *end note*]

18.3.1.86 sheetView (Chart Sheet View)

This element specifies a chart sheet view. [*Note:* See sheetView (§18.3.1.87) for an example. *end note*]

Attributes	Description
tabSelected (Sheet Tab Selected)	<p>Flag indicating whether the sheet tab is selected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
workbookViewId (Workbook View Id)	<p>Zero-based index of this workbook view, pointing to a workbookView element in the bookViews collection.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
zoomScale (Window Zoom Scale)	<p>Window zoom magnification, representing percent values. This attribute is restricted to values ranging from 10 to 400. Horizontal & Vertical scale together.</p> <p>[<i>Example:</i></p> <p>10 - 10%</p> <p>20 - 20%</p> <p>...</p> <p>100 - 100%</p>

Attributes	Description
	<p>... 400 - 400%</p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
zoomToFit (Zoom To Fit)	<p>Flag indicating whether chart sheet is zoom to fit window.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_ChartsheetView](#)) is located in §A.2.
end note]

18.3.1.87 sheetView (Worksheet View)

A single sheet view definition. When more than one sheet view is defined in the file, it means that when opening the workbook, each sheet view corresponds to a separate window within the spreadsheet application, where each window is showing the particular sheet containing the same workbookViewId value, the last sheetView definition is loaded, and the others are discarded. When multiple windows are viewing the same sheet, multiple sheetView elements (with corresponding workbookView entries) are saved.

Attributes	Description
colorId (Color Id)	<p>Index to the color value for row/column text headings and gridlines. This is an 'index color value' (ICV) rather than rgb value.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
defaultGridColor (Default Grid Color)	<p>Flag indicating that the consuming application should use the default grid lines color (system dependent). Overrides any color specified in colorId.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
rightToLeft (Right To Left)	<p>Flag indicating whether the sheet is in 'right to left' display mode. When in this mode, Column A is on the far right, Column B ;is one column left of Column A, and so on. Also, information in cells is displayed in the Right to Left format.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showFormulas (Show Formulas)	<p>Flag indicating whether this sheet should display formulas.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean</p>

Attributes	Description
	datatype.
showGridLines (Show Grid Lines)	<p>Flag indicating whether this sheet should display gridlines.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showOutlineSymb ols (Show Outline Symbols)	<p>Flag indicating whether the sheet has outline symbols visible. This flag shall always override SheetPr element's outlinePr child element whose attribute is named showOutlineSymbols when there is a conflict.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showRowColHeade rs (Show Headers)	<p>Flag indicating whether the sheet should display row and column headings.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showRuler (Show Ruler)	<p>Show the ruler in Page Layout View.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showWhiteSpace (Show White Space)	<p>Flag indicating whether page layout view shall display margins. False means do not display left, right, top (header), and bottom (footer) margins (even when there is data in the header or footer).</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showZeros (Show Zero Values)	<p>Flag indicating whether the window should show 0 (zero) in cells containing zero value. When false, cells with zero value appear blank instead of showing the number zero.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
tabSelected (Sheet Tab Selected)	<p>Flag indicating whether this sheet is selected. When only 1 sheet is selected and active, this value should be in synch with the activeTab value. In case of a conflict, the Start Part setting wins and sets the active sheet tab.</p> <p>Multiple sheets can be selected, but only one sheet shall be active at one time.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
topLeftCell (Top Left Visible Cell)	<p>Location of the top left visible cell Location of the top left visible cell in the bottom right pane (when in Left-to-Right mode).</p> <p>The possible values for this attribute are defined by the ST_CellRef simple type (§18.18.7).</p>

Attributes	Description
view (View Type)	<p>Indicates the view type.</p> <p>The possible values for this attribute are defined by the ST_SheetViewType simple type (§18.18.69).</p>
windowProtection (Window Protection)	<p>Flag indicating whether the panes in the window are locked due to workbook protection. This is an option when the workbook structure is protected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
workbookViewId (Workbook View Index)	<p>Zero-based index of this workbook view, pointing to a workbookView element in the bookViews collection.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
zoomScale (Zoom Scale)	<p>Window zoom magnification for current view representing percent values. This attribute is restricted to values ranging from 10 to 400. Horizontal & Vertical scale together.</p> <p><i>[Example:</i></p> <p>10 - 10%</p> <p>20 - 20%</p> <p>...</p> <p>100 - 100%</p> <p>...</p> <p>400 - 400%</p> <p><i>end example]</i></p> <p>Current view can be Normal, Page Layout, or Page Break Preview.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
zoomScaleNormal (Zoom Scale Normal View)	<p>Zoom magnification to use when in normal view, representing percent values. This attribute is restricted to values ranging from 10 to 400. Horizontal & Vertical scale together.</p> <p><i>[Example:</i></p> <p>10 - 10%</p> <p>20 - 20%</p> <p>...</p> <p>100 - 100%</p> <p>...</p> <p>400 - 400%</p> <p><i>end example]</i></p>

Attributes	Description
	<p>Applies for worksheets only; zero implies the automatic setting.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
zoomScalePageLayoutView (Zoom Scale Page Layout View)	<p>Zoom magnification to use when in page layout view, representing percent values. This attribute is restricted to values ranging from 10 to 400. Horizontal & Vertical scale together.</p> <p><i>[Example:</i></p> <p>10 - 10%</p> <p>20 - 20%</p> <p>...</p> <p>100 - 100%</p> <p>...</p> <p>400 - 400%</p> <p><i>end example]</i></p> <p>Applies for worksheets only; zero implies the automatic setting.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
zoomScaleSheetLayoutView (Zoom Scale Page Break Preview)	<p>Zoom magnification to use when in page break preview, representing percent values. This attribute is restricted to values ranging from 10 to 400. Horizontal & Vertical scale together.</p> <p><i>[Example:</i></p> <p>10 - 10%</p> <p>20 - 20%</p> <p>...</p> <p>100 - 100%</p> <p>...</p> <p>400 - 400%</p> <p><i>end example]</i></p> <p>Applies for worksheet only; zero implies the automatic setting.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SheetView](#)) is located in §A.2. *end note*]

18.3.1.88 [sheetViews](#) (Sheet Views)

Worksheet views collection.

[*Example:*

This example shows one sheet view definition. The definition indicates that the current sheet is the active/selected sheet, and that there is a split pane applied to the view. This definition also indicates for each of the four window panes of the split which cell is the active cell for that pane.

```
<sheetViews>
  <sheetView tabSelected="1" workbookViewId="0">
    <pane xSplit="2310" ySplit="2070" topLeftCell="C1"
      activePane="bottomRight"/>
    <selection/>
    <selection pane="bottomLeft" activeCell="A6" sqref="A6"/>
    <selection pane="topRight" activeCell="C1" sqref="C1"/>
    <selection pane="bottomRight" activeCell="E13" sqref="E13"/>
  </sheetView>
</sheetViews>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SheetViews](#)) is located in §A.2. *end note*]

18.3.1.89 [sheetViews](#) (Chart Sheet Views)

This element specifies chart sheet views.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ChartsheetViews](#)) is located in §A.2. *end note*]

18.3.1.90 [smartTags](#) (Smart Tags)

This collection expresses all smart tags associated with cells on this sheet. There can be multiple smart tags associated with a particular cell, and many cells with smart tags for a given worksheet.

[*Example:*

This example shows three smart tags, each one associated with a unique cell on the worksheet.

```

<smartTags>
  <cellSmartTags r="A1">
    <cellSmartTag type="0"/>
  </cellSmartTags>
  <cellSmartTags r="B1">
    <cellSmartTag type="0"/>
  </cellSmartTags>
  <cellSmartTags r="B2">
    <cellSmartTag type="0"/>
  </cellSmartTags>
</smartTags>

```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_SmartTags](#)) is located in §A.2. *end note*]

18.3.1.91 [sortCondition \(Sort Condition\)](#)

Sort condition. When more than one sortCondition is specified, the first condition is applied first, then the second condition is applied, and so on.

Attributes	Description
customList (Custom List)	Sort by a custom list. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
descending (Descending)	Sort descending. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
dxflId (Format Id)	Format Id when sortBy=cellColor or fontColor The possible values for this attribute are defined by the ST_DxflId simple type (§18.18.25).
iconId (Icon Id)	Zero-based index of an icon in an icon set. The absence of this attribute means "no icon" The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
iconSet (Icon Set)	Icon set index when sortBy=icon. The possible values for this attribute are defined by the ST_IconSetType simple type (§18.18.42).
ref (Reference)	Column/Row that this sort condition applies to. This shall be contained within the ref in CT_SortState.

Attributes	Description
	The possible values for this attribute are defined by the ST_Ref simple type (§18.18.62).
sortBy (Sort By)	Type of sort. The possible values for this attribute are defined by the ST_SortBy simple type (§18.18.72).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SortCondition](#)) is located in §A.2.
end note]

18.3.1.92 sortState (Sort State)

This collection preserves the AutoFilter sort state.

[*Example:* This example shows a sort which is case-sensitive, descending sort. While the range of data to sort is B4:E8, the range to sort by is B4:B8.

```
<sortState caseSensitive="1" ref="B4:E8">
  <sortCondition descending="1" ref="B4:B8"/>
</sortState>
```

end example]

Attributes	Description
caseSensitive (Case Sensitive)	Flag indicating whether or not the sort is case-sensitive. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
columnSort (Sort by Columns)	Flag indicating whether or not to sort by columns. Only applies to ranges that don't have AutoFilter applied. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
ref (Sort Range)	The whole range of data to sort (not just the sort-by column). The possible values for this attribute are defined by the ST_Ref simple type (§18.18.62).
sortMethod (Sort Method)	Strokes or PinYin sort method. Applies only to these application UI languages: <ul style="list-style-type: none"> Chinese Simplified Chinese Traditional Japanese For these languages, alternate sort methods can be selected, affecting how the data is sorted.

Attributes	Description
	The possible values for this attribute are defined by the ST_SortMethod simple type (§18.18.73).

[Note: The W3C XML Schema definition of this element's content model ([CT_SortState](#)) is located in §A.2. *end note*]

18.3.1.93 tabColor (Sheet Tab Color)

Background color of the sheet tab.

Attributes	Description
auto (Automatic)	<p>A boolean value indicating the color is automatic and system color dependent.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
indexed (Index)	<p>Indexed color value. Only used for backwards compatibility. References a color in indexedColors.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
rgb (Alpha Red Green Blue Color Value)	<p>Standard Alpha Red Green Blue color value (ARGB).</p> <p>The possible values for this attribute are defined by the ST_UnsignedIntHex simple type (§18.18.86).</p>
theme (Theme Color)	<p>A zero-based index into the <clrScheme> collection (§20.1.6.2), referencing a particular <sysClr> or <srgbClr> value expressed in the Theme part.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
tint (Tint)	<p>Specifies the tint value applied to the color.</p> <p>If tint is supplied, then it is applied to the RGB value of the color to determine the final color applied.</p> <p>The tint value is stored as a double from -1.0 .. 1.0, where -1.0 means 100% darken and 1.0 means 100% lighten. Also, 0.0 means no change.</p> <p>In loading the RGB value, it is converted to HLS where HLS values are (0..HLSMAX), where HLSMAX is currently 255.</p> <p>[Example:</p>

Attributes	Description
	<p>Here are some examples of how to apply tint to color:</p> <p>If (tint < 0) $\text{Lum}' = \text{Lum} * (1.0 + \text{tint})$ <p>For example: Lum = 200; tint = -0.5; Darken 50% $\text{Lum}' = 200 * (0.5) \Rightarrow 100$ <p>For example: Lum = 200; tint = -1.0; Darken 100% (make black) $\text{Lum}' = 200 * (1.0 - 1.0) \Rightarrow 0$ <p>If (tint > 0) $\text{Lum}' = \text{Lum} * (1.0 - \text{tint}) + (\text{HLSMAX} - \text{HLSMAX} * (1.0 - \text{tint}))$ <p>For example: Lum = 100; tint = 0.75; Lighten 75% $\begin{aligned} \text{Lum}' &= 100 * (1 - .75) + (\text{HLSMAX} - \text{HLSMAX} * (1 - .75)) \\ &= 100 * .25 + (255 - 255 * .25) \\ &= 25 + (255 - 63) = 25 + 192 = 217 \end{aligned}$ <p>For example: Lum = 100; tint = 1.0; Lighten 100% (make white) $\begin{aligned} \text{Lum}' &= 100 * (1 - 1) + (\text{HLSMAX} - \text{HLSMAX} * (1 - 1)) \\ &= 100 * 0 + (255 - 255 * 0) \\ &= 0 + (255 - 0) = 255 \end{aligned}$ <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p> </p></p></p></p></p></p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Color](#)) is located in §A.2. *end note*]

18.3.1.94 [tablePart \(Table Part\)](#)

A single Table Part reference.

Attributes	Description
id (Relationship Id)	This relationship Id is used to locate a particular table definition part.
Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

[Note: The W3C XML Schema definition of this element's content model ([CT_TablePart](#)) is located in §A.2. *end note*]

18.3.1.95 [tableParts \(Table Parts\)](#)

This collection expresses a relationship Id pointing to every table on this sheet.

[Example: This example indicates that the current sheet has two tables, and their definitions can be found by locating the appropriate relationships from the sheet:

```
<tableParts count="2">
  <tablePart r:id="rId1"/>
  <tablePart r:id="rId2"/>
</tableParts>
```

end example]

Attributes	Description
count (Count)	A count of table elements in the collection. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_TableParts](#)) is located in §A.2. *end note*]

18.3.1.96 [v \(Cell Value\)](#)

This element expresses the value contained in a cell. If the cell contains a string, then this value is an index into the shared string table, pointing to the actual string value. Otherwise, the value of the cell is expressed directly in this element. Cells containing formulas express the last calculated result of the formula in this element.

For applications not wanting to implement the shared string table, an 'inline string' can be expressed in an <is> element under <c> (instead of a <v> element under <c>), in the same way a string would be expressed in the shared string table. [Note: See <is> for an example. *end note*]

[Example: In this example, cell B4 contains the number "360", cell C4 contains the local date and time 22 November 1976, 08:30, and cell C5 contains the 1900 date system serial date-time for the date-time in cell C4.

```
<c r="B4">
  <v>360</v>
</c>
<c r="C4" t="d">
  <v>1976-11-22T08:30</v>
</c>
```

```
<c r="C5">
  <f>C4</f>
  <v>28086.3541666667</v>
</c>
```

end example]

The possible values for this element are defined by the ST_Xstring simple type (§22.9.2.19).

Attributes	Description
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	Specifies how white space should be handled for the contents of this element using the W3C space preservation rules. The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.

[Note: The W3C XML Schema definition of this element's content model ([ST_Xstring](#)) is located in §A.6.9. *end note*]

18.3.1.97 webPublishItem (Web Publishing Item)

This element represents information for a single item or object which can be published to HTML.

Attributes	Description
autoRepublish (Automatically Publish)	Automatically publish this item every time the workbook is saved. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
destinationFile (Destination File Name)	Destination file name. Indicates where to save the HTML publish file. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
divId (Destination Bookmark)	Destination bookmark. Identifies a specific <div> section in the published HTML file when a subset of the workbook is published to HTML. Each item that has been published from a workbook is written to a unique <div> element in HTML. On re-publishing a particular item from the workbook, only that item's corresponding <div> content is updated. Therefore each publish item corresponds to a unique <div> element. It is possible to add new publish items to an existing published page, and it is possible to re-publish individual items without republishing the entire workbook. The possible values for this attribute are defined by the ST_Xstring simple type

Attributes	Description
	(§22.9.2.19).
id (Id)	This is a unique number "nnnnn" of the webPublishItem. This value is used to generate the divId and styleId values. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
sourceObject (Source Object Name)	Source object name (required for sourceType = pivotTable, query, or label). The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
sourceRef (Source Id)	Source range (required for sourceType = 'range'). The possible values for this attribute are defined by the ST_Ref simple type (§18.18.62).
sourceType (Web Source Type)	Type of web source (or objects to publish). The possible values for this attribute are defined by the ST_WebSourceType simple type (§18.18.92).
title (Title)	HTML title of published item. [<i>Example</i> : This value can appear in the web browser window's title bar. <i>end example</i>] The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[*Note*: The W3C XML Schema definition of this element's content model ([CT_WebPublishItem](#)) is located in §A.2. *end note*]

18.3.1.98 webPublishItems (Web Publishing Items)

This represents a listing of individual objects in this workbook that have been published (to HTML).

When one of these objects is selected to be published, just the object is published to HTML, not the entire workbook contents.

[*Example*: This example shows two items which have been previously selected for publishing. One is a range (A6:C6), the other is a chart, named "Chart 1".

```
<webPublishItems count="2">
  <webPublishItem id="11289" divId="Views_11289" sourceType="range"
    sourceRef="A6:C6" destinationFile="D:\Publish.htm" published="0"/>
  <webPublishItem id="6433" divId="Views_6433" sourceType="chart"
    sourceObject="Chart 1" destinationFile="D:\Publish.mht" published="0"/>
</webPublishItems>
```

end example]

Attributes	Description
count (Web Publishing Items Count)	Number of items. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_WebPublishItems](#)) is located in §A.2. *end note*]

18.3.1.99 **worksheet (Worksheet)**

This is the root element of Worksheet parts within a SpreadsheetML document.

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Worksheet](#)) is located in §A.2. *end note*]

18.3.2 **AutoFilter Settings**

The following subclause defines the settings which can be specified as part of an AutoFilter definition. An *AutoFilter* temporarily hides rows based on a filter criteria, which is applied column by column to a table of data in the worksheet.

18.3.2.1 **colorFilter (Color Filter Criteria)**

This element specifies the color to filter by and whether to use the cell's fill or font color in the filter criteria. If the cell's font or fill color does not match the color specified in the criteria, the rows corresponding to those cells are hidden from view.

[*Example:*

```
<filterColumn colId="1">  
  <colorFilter dxfId="0" cellColor="0"/>  
</filterColumn>
```

end example]

Attributes	Description
cellColor (Filter By Cell Color)	Flag indicating whether or not to filter by the cell's fill color. 1 indicates to filter by cell fill. 0 indicates to filter by the cell's font color. For rich text in cells, if the color specified appears in the cell at all, it shall be included in the filter. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

Attributes	Description
dxfld (Differential Format Record Id)	Id of differential format record (dxfl) in the Styles Part which expresses the color value to filter by. The possible values for this attribute are defined by the ST_Dxfl simple type (§18.18.25).

[Note: The W3C XML Schema definition of this element's content model ([CT_ColorFilter](#)) is located in §A.2. *end note*]

18.3.2.2 customFilter (Custom Filter Criteria)

A custom AutoFilter specifies an operator and a value. There can be at most two customFilters specified, and in that case the parent element specifies whether the two conditions are joined by 'and' or 'or'. For any cells whose values do not meet the specified criteria, the corresponding rows shall be hidden from view when the filter is applied.

[Example:

```
<customFilters and="1">
  <customFilter operator="greaterThanOrEqual" val="0.2"/>
  <customFilter operator="lessThanOrEqual" val="0.5"/>
</customFilters>
```

end example]

Attributes	Description
operator (Filter Comparison Operator)	Operator used by the filter comparison. The possible values for this attribute are defined by the ST_FilterOperator simple type (§18.18.31).
val (Top or Bottom Value)	Top or bottom value used in the filter criteria. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element's content model ([CT_CustomFilter](#)) is located in §A.2. *end note*]

18.3.2.3 customFilters (Custom Filters)

When there is more than one custom filter criteria to apply (an 'and' or 'or' joining two criteria), then this element groups the customFilter elements together.

Attributes	Description
and (And)	<p>Flag indicating whether the two criteria have an "and" relationship. 1 indicates "and", 0 indicates "or".</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CustomFilters](#)) is located in §A.2.
end note]

18.3.2.4 dateGroupItem (Date Grouping)

This collection is used to express a group of dates or times which are used in an AutoFilter criteria. [*Note:* See parent element for an example. *end note*] Values are always written in the calendar type of the first date encountered in the filter range, so that all subsequent dates, even when formatted or represented by other calendar types, can be correctly compared for the purposes of filtering.

Attributes	Description
dateTimeGrouping (Date Time Grouping)	<p>Grouping level.</p> <p>The possible values for this attribute are defined by the ST_DateTimeGrouping simple type (§18.18.22).</p>
day (Day)	<p>Day (1-31)</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedShort datatype.</p>
hour (Hour)	<p>Hour (0-23)</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedShort datatype.</p>
minute (Minute)	<p>Minute (0-59)</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedShort datatype.</p>
month (Month)	<p>Month (1-12)</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedShort datatype.</p>
second (Second)	<p>Second (0-59)</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedShort datatype.</p>
year (Year)	Year (4 digits)

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema unsignedShort datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT DateGroupItem](#)) is located in §A.2.
end note]

18.3.2.5 `dynamicFilter` (Dynamic Filter)

This collection specifies dynamic filter criteria. These criteria are considered dynamic because they can change, either with the data itself (e.g., "above average") or with the current system date (e.g., show values for "today"). For any cells whose values do not meet the specified criteria, the corresponding rows shall be hidden from view when the filter is applied.

[Example:

```
<filterColumn colId="0">
  <dynamicFilter type="today"/>
</filterColumn>
```

end example]

Attributes	Description
maxValIso (Max ISO Value)	<p>A maximum value for dynamic filter. maxValIso shall be required for today, yesterday, tomorrow, nextWeek, thisWeek, lastWeek, nextMonth, thisMonth, lastMonth, nextQuarter, thisQuarter, lastQuarter, nextYear, thisYear, lastYear, and yearToDate.</p> <p>The above criteria are based on a value range; that is, if today's date is September 22nd, then the range for thisWeek is the values greater than or equal to September 17 and less than September 24. In the thisWeek range, the lower value is expressed valIso. The higher value is expressed using maxValIso.</p> <p>These dynamic filters shall not require valIso or maxValIso: Q1, Q2, Q3, Q4, M1, M2, M3, M4, M5, M6, M7, M8, M9, M10, M11 and M12.</p> <p>The above criteria shall not specify the range using valIso and maxValIso because Q1 always starts from M1 to M3, and M1 is always January.</p> <p>These types of dynamic filters shall use valIso and shall not use maxValIso:</p> <ul style="list-style-type: none"> • aboveAverage and belowAverage <p>The possible values for this attribute are defined by the W3C XML Schema dateTime datatype.</p>

Attributes	Description
type (Dynamic filter type)	Dynamic filter type, e.g., “today” or “nextWeek”. The possible values for this attribute are defined by the ST_DynamicFilterType simple type (§18.18.26).
val (Value)	A minimum numeric value for dynamic filter. (See description of valIso to understand when val is required.) The possible values for this attribute are defined by the W3C XML Schema double datatype.
valIso (ISO Value)	A minimum value for dynamic filter. (See description of maxValIso to understand when <u>val</u> /valIso is required.) <u>Only these types of dynamic filters use numeric data, and therefore shall use val and shall not use valIso:</u> <ul style="list-style-type: none"> <u>aboveAverage and belowAverage</u> The possible values for this attribute are defined by the W3C XML Schema dateTime datatype.

[Note: The W3C XML Schema definition of this element’s content model ([CT_DynamicFilter](#)) is located in §A.2. *end note*]

18.3.2.6 filter (Filter)

This element expresses a filter criteria value.

[Example:

```
<filters>
  <filter val="0.316588716"/>
  <filter val="0.667439395"/>
  <filter val="0.823086999"/>
</filters>
```

end example]

Attributes	Description
val (Filter Value)	Filter value used in the criteria. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element’s content model ([CT_Filter](#)) is located in §A.2. *end note*]

18.3.2.7 filterColumn (AutoFilter Column)

The filterColumn collection identifies a particular column in the AutoFilter range and specifies filter information that has been applied to this column. If a column in the AutoFilter range has no criteria specified, then there is no corresponding filterColumn collection expressed for that column.

Attributes	Description
colId (Filter Column Data)	Zero-based index indicating the AutoFilter column to which this filter information applies. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
hiddenButton (Hidden AutoFilter Button)	Flag indicating whether the AutoFilter button for this column is hidden. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
showButton (Show Filter Button)	Flag indicating whether the filter button is visible. [<i>Example</i> : When the cell containing the filter button is merged with another cell, the filter button can be hidden, and not drawn. <i>end example</i>] The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_FilterColumn](#)) is located in §A.2.
end note]

18.3.2.8 filters (Filter Criteria)

When multiple values are chosen to filter by, or when a group of date values are chosen to filter by, this element groups those criteria together.

[*Example*:

```
<filters>
  <dateGroupItem year="2006" month="1" day="2" dateTimeGrouping="day"/>
  <dateGroupItem year="2005" month="1" day="2" dateTimeGrouping="day"/>
</filters>
```

end example]

Attributes	Description
blank (Filter by Blank)	Flag indicating whether to filter by blank. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
calendarType	Calendar type for date grouped items. Used to interpret the values in dateGroupItem.

Attributes	Description
(Calendar Type)	<p>This is the calendar type used to evaluate all dates in the filter column, even when those dates are not using the same calendar system / date formatting.</p> <p>The possible values for this attribute are defined by the ST_CalendarType simple type (§22.9.2.1).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Filters](#)) is located in §A.2. *end note*]

18.3.2.9 iconFilter (Icon Filter)

This element specifies the icon set and particular icon within that set to filter by. For any cells whose icon does not match the specified criteria, the corresponding rows shall be hidden from view when the filter is applied.

[Example:

```
<filterColumn colId="3">
  <iconFilter iconSet="3Arrows" iconId="0"/>
</filterColumn>
```

end example]

Attributes	Description
iconId (Icon Id)	<p>Zero-based index of an icon in an icon set. The absence of this attribute means "no icon"</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
iconSet (Icon Set)	<p>Specifies which icon set is used in the filter criteria.</p> <p>The possible values for this attribute are defined by the ST_IconSetType simple type (§18.18.42).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_IconFilter](#)) is located in §A.2. *end note*]

18.3.2.10 top10 (Top 10)

This element specifies the top N (percent or number of items) to filter by.

[Example: This example filters the first column by the top 10 percent of the values in that column. For all cells in the column whose value falls outside the top 10 percent of the value in that column, the rows corresponding to those cells are hidden from the view. In this example, there are 6 cells in the range, containing 1, 2, 3, 4, 5, 6 respectively.

```
<filterColumn colId="0">
  <top10 percent="1" val="5" filterVal="6"/>
</filterColumn>
```

end example]

Attributes	Description
filterVal (Filter Value)	The actual cell value in the range which is used to perform the comparison for this filter. The possible values for this attribute are defined by the W3C XML Schema double datatype.
percent (Filter by Percent)	Flag indicating whether or not to filter by percent value of the column. A false value filters by number of items. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
top (Top)	Flag indicating whether or not to filter by top order. A false value filters by bottom order. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
val (Top or Bottom Value)	Top or bottom value to use as the filter criteria. <i>[Example: "Filter by Top 10 Percent" or "Filter by Top 5 Items". end example]</i> The possible values for this attribute are defined by the W3C XML Schema double datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Top10](#)) is located in §A.2. end note]

18.4 Shared String Table

A workbook can contain thousands of cells containing string (non-numeric) data. Furthermore this data is very likely to be repeated across many rows or columns. The goal of implementing a single string table that is shared across the workbook is to improve performance in opening and saving the file by only reading and writing the repetitive information once.

[Example: Consider for example a workbook summarizing information for cities within various countries. There can be a column for the name of the country, a column for the name of each city in that country, and a column containing the data for each city. In this case the country name is repetitive, being duplicated in many cells. end example] In many cases the repetition is extensive, and significant savings are realized by making use of a shared string table when saving the workbook. When displaying text in the spreadsheet, the cell table will just contain an index into the string table as the value of a cell, instead of the full string.

The shared string table is permitted to contain all the necessary information for displaying the string: the text, formatting properties, and phonetic properties (for East Asian languages).

Most strings in a workbook have formatting applied at the cell level, that is, the entire string in the cell has the same formatting applied. In these cases, the formatting for the cell is stored in the styles part, and the string for the cell can be stored in the shared strings table. In this case, the strings stored in the shared strings table are very simple text elements.

[Example:

```
<sst xmlns="http://purl.oclc.org/ooxml/spreadsheetml/main"
  count="8" uniqueCount="4">
  <si>
    <t>United States</t>
  </si>
  <si>
    <t>Seattle</t>
  </si>
  <si>
    <t>Denver</t>
  </si>
  <si>
    <t>New York</t>
  </si>
</sst>
```

In the above example we can see that the string table is just a collection of string items that consist of simple text elements. Note that any numeric data in the workbook is not shown in the shared string table. *end example]*

Some strings in the workbook can have formatting applied at a level that is more granular than the cell level. For instance, specific characters within the string can be bolded, have coloring, italicizing, etc. In these cases, the formatting is stored along with the text in the string table, and is treated as a unique entry in the table.

[Example:

```
<sst xmlns="http://purl.oclc.org/ooxml/spreadsheetml/main"
  count="8" uniqueCount="4">
  <si>
    <r>
      <t xml:space="preserve">United </t>
    </r>
  </si>
```

```
<r>
  <rPr>
    <sz val="11"/>
    <color rgb="FFFF0000"/>
    <rFont val="Calibri"/>
    <family val="2"/>
    <scheme val="minor"/>
  </rPr>
  <t>States</t>
</r>
</si>
<si>
  <t>Seattle</t>
</si>
<si>
  <t>Denver</t>
</si>
<si>
  <t>New York</t>
</si>
</sst>
```

In the above example you can see that this time, the text "United States" has specific, colored, formatting applied to the text, "States." *end example*]

18.4.1 charset (Character Set)

This element defines the font character set of this font.

This field is used in font creation and selection if a font of the given facename is not available on the system. Although it is not required to have around when resolving font facename, the information can be stored for when needed to help resolve which font face to use of all available fonts on a system.

Charset represents the basic set of characters associated with a font (that it can display), and roughly corresponds to the ANSI codepage (8-bit or DBCS) of that character set used by a given language. Given more common use of Unicode where many fonts support more than one of the traditional charset categories, and the use of font linking, using charset to resolve font name is less and less common, but still can be useful.

These are operating-system-dependent values.

[Note: The following are some of the possible the character sets:

INT Value	Character Set
0	ANSI_CHARSET

INT Value	Character Set
1	DEFAULT_CHARSET
2	SYMBOL_CHARSET
77	MAC_CHARSET
128	SHIFTJIS_CHARSET
129	HANGUL_CHARSET
130	JOHAB_CHARSET
134	GB2312_CHARSET
136	CHINESEBIG5_CHARSET
161	GREEK_CHARSET
162	TURKISH_CHARSET
163	VIETNAMESE_CHARSET
177	HEBREW_CHARSET
178	ARABIC_CHARSET
186	BALTIC_CHARSET
204	RUSSIAN_CHARSET
222	THAI_CHARSET
238	EASTEUROPE_CHARSET
255	OEM_CHARSET

The OEM_CHARSET value specifies a character set that is operating-system dependent. *end note*

Fonts with other character sets can exist in the operating system. If an application uses a font with an unknown character set, it should not attempt to translate or interpret strings that are rendered with that font.

Attributes	Description
val (Value)	<p>The value of an integer, where each value corresponds to a different character set. This attribute is restricted to values ranging from 0 to 255.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_IntProperty](#)) is located in §A.2. *end note*]

18.4.2 outline (Outline)

This element displays only the inner and outer borders of each character. This is very similar to Bold in behavior.

Attributes	Description
val (Value)	<p>A boolean value for the property specified by the parent XML element.</p> <p>If omitted, the default value is true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_BooleanProperty](#)) is located in §A.2. end note]

18.4.3 phoneticPr (Phonetic Properties)

This element represents a collection of phonetic properties that affect the display of phonetic text for this String Item (si).

Phonetic text is used to give hints as to the pronunciation of an East Asian language, and the hints are displayed as text within the spreadsheet cells across the top portion of the cell. Since the phonetic hints are text, every phonetic hint is expressed as a phonetic run (rPh), and these properties specify how to display that phonetic run.

[Example:

```
<si>
  <t>課< 毛</t>
  <rPh sb="0" eb="1">
    <t>カ</t>
  </rPh>
  <rPh sb="4" eb="5">
    <t>ケ</t>
  </rPh>
  <phoneticPr fontId="1"/>
</si>
```

The above example shows a String Item that displays some Japanese text "課きく 毛こ." It also displays some phonetic text across the top of the cell. The phonetic text character, "カ" is displayed over the "課" character and the phonetic text "ケ" is displayed above the "毛" character, using the font record in the style sheet at index 1. end example]

Attributes	Description
alignment (Alignment)	<p>Specifies how the text for the phonetic run is aligned across the top of the cells, with respect to the main text in the body of the cell.</p> <p>The possible values for this attribute are defined by the ST_PhoneticAlignment simple</p>

Attributes	Description
	type (§18.18.56).
fontId (Font Id)	<p>An integer that is a zero-based index into the font record in the style sheet. Represents the font to be used to display this phonetic run.</p> <p>If this index is out of bounds, then the default font of the Normal style should be used in its place. This default font should be at index 0.</p> <p>The possible values for this attribute are defined by the ST_FontId simple type (§18.18.32).</p>
type (Character Type)	<p>An enumeration which specifies which East Asian character set should be used to display the phonetic run</p> <p>The possible values for this attribute are defined by the ST_PhoneticType simple type (§18.18.57).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_PhoneticPr](#)) is located in §A.2. *end note*]

18.4.4 r (Rich Text Run)

This element represents a run of rich text. A rich text run is a region of text that share a common set of properties, such as formatting properties. The properties are defined in the rPr element, and the text displayed to the user is defined in the Text (t) element.

[Note: The W3C XML Schema definition of this element's content model ([CT_RElt](#)) is located in §A.2. *end note*]

18.4.5 rFont (Font)

This element is a string representing the name of the font assigned to display this run.

Attributes	Description
val (String Value)	<p>A string representing the name of the font. If the font doesn't exist (because it isn't installed on the system), or the charset not supported by that font, then another font should be substituted.</p> <p>The string length for this attribute shall be 0 to 31 characters.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_FontName](#)) is located in §A.2. *end note*]

18.4.6 rPh (Phonetic Run)

This element represents a run of text which displays a phonetic hint for this String Item (si).

Phonetic hints are used to give information about the pronunciation of an East Asian language. The hints are displayed as text within the spreadsheet cells across the top portion of the cell.

Attributes	Description
eb (Base Text End Index)	<p>An integer used as a zero-based index representing the ending offset into the base text for this phonetic run. This represents the ending point in the base text the phonetic hint applies to.</p> <p>This value shall be between 0 and the total length of the base text. The following condition shall be true: $sb < eb$.</p> <p>It is recommended that the following condition also be satisfied: That for any two consecutive phonetic runs, $sb_1 < eb_1 \leq sb_2 < eb_2$ to avoid overlapping phonetic runs</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
sb (Base Text Start Index)	<p>An integer used as a zero-based index representing the starting offset into the base text for this phonetic run. This represents the starting point in the base text the phonetic hint applies to.</p> <p>This value shall be between 0 and the total length of the base text. The following condition shall be true: $sb < eb$.</p> <p>It is recommended that the following condition also be satisfied: That for any two consecutive phonetic runs, $sb_1 < eb_1 \leq sb_2 < eb_2$ to avoid overlapping phonetic runs.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_PhoneticRun](#)) is located in §A.2. *end note*]

18.4.7 rPr (Run Properties)

This element represents a set of properties to apply to the contents of this rich text run.

[Note: The W3C XML Schema definition of this element's content model ([CT_RPrElt](#)) is located in §A.2. *end note*]

18.4.8 si (String Item)

This element is the representation of an individual string in the Shared String table.

If the string is just a simple string with formatting applied at the cell level, then the String Item (si) should contain a single text element used to express the string. However, if the string in the cell is more complex - i.e., has formatting applied at the character level - then the string item shall consist of multiple rich text runs which collectively are used to express the string.

[Note: The W3C XML Schema definition of this element’s content model ([CT_Rst](#)) is located in §A.2. *end note*]

18.4.9 sst (Shared String Table)

This element is the root of the Shared String Table, which serves as a collection of individual String Items (si).

Attributes	Description
count (String Count)	<p>An integer representing the total count of strings in the workbook. This count does not include any numbers, it counts only the total of text strings in the workbook.</p> <p>This attribute is optional unless uniqueCount is used, in which case it is required.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
uniqueCount (Unique String Count)	<p>An integer representing the total count of unique strings in the Shared String Table. A string is unique even if it is a copy of another string, but has different formatting applied at the character level.</p> <p>[Example: World, <i>World</i>, and <i>World</i>.</p> <p>The count would be 3, and the uniqueCount would be 2. Only one entry for "World" would show in the table because it is the same string, just with different formatting applied at the cell level (i.e., applied to the entire string in the cell). The "World" string would get a separate unique entry in the shared string table because it has different formatting applied to specific characters. <i>end example</i>]</p> <p>This attribute is optional unless count is used, in which case it is required.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_Sst](#)) is located in §A.2. *end note*]

18.4.10 strike (Strike Through)

This element draws a strikethrough line through the horizontal middle of the text.

Attributes	Description
val (Value)	A boolean value for the property specified by the parent XML element.

Attributes	Description
	<p>If omitted, the default value is true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_BooleanProperty](#)) is located in §A.2. *end note*]

18.4.11 sz (Font Size)

This element represents the point size (1/72 of an inch) of the Latin and East Asian text.

Attributes	Description
val (Value)	<p>A double representing the value of a positive measurement in points (1/72 of an inch).</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_FontSize](#)) is located in §A.2. *end note*]

18.4.12 t (Text)

This element represents the text content shown as part of a string.

The possible values for this element are defined by the ST_Xstring simple type (§22.9.2.19).

Attributes	Description
<p>xml:space (Content Contains Significant Whitespace)</p> <p>Namespace: http://www.w3.org/XML/1998/namespace</p>	<p>Specifies how white space should be handled for the contents of this element using the W3C space preservation rules.</p> <p>The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.</p>

[Note: The W3C XML Schema definition of this element's content model ([ST_Xstring](#)) is located in §A.6.9. *end note*]

18.4.13 **u (Underline)**

This element represents the underline formatting style.

Attributes	Description
val (Underline Value)	<p>An enumeration representing the style of underlining that is used.</p> <p>The none style is equivalent to not using underlining at all.</p> <p>The possible values for this attribute are defined by the ST_UnderlineValues simple type (§18.18.85).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_UnderlineProperty](#)) is located in §A.2. *end note*]

18.4.14 **vertAlign (Vertical Alignment)**

This element adjusts the vertical position of the text relative to the text's default appearance for this run. It is used to get 'superscript' or 'subscript' texts, and shall reduce the font size (if a smaller size is available) accordingly.

Attributes	Description
val (Value)	<p>An enumeration representing the vertical-alignment setting.</p> <p>Setting this to either subscript or superscript shall make the font size smaller if a smaller font size is available.</p> <p>The possible values for this attribute are defined by the ST_VerticalAlignRun simple type (§22.9.2.17).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_VerticalAlignFontProperty](#)) is located in §A.2. *end note*]

18.5 **Tables**

A table helps organize and provide structure to lists of information in a worksheet. Tables have clearly labeled columns, rows, and data regions. Tables make it easier for users to sort, analyze, format, manage, add, and delete information.

If a region of data is designated as a Table, then special behaviors can be applied which help the user perform useful actions. [Example: if the user types additional data in the row adjacent to the bottom of the table, the table can expand and automatically add that data to the data region of the table. Similarly, adding a column is as easy as typing a new column heading to the right or left of the current column headings. Filter and sort abilities can automatically be surfaced to the user via the drop down arrows. Special calculated columns can be created

which summarize or calculate data in the table. These columns have the ability to expand and shrink according to size of the table, and maintain proper formula referencing. *end example*]

Tables can be created from data already present in the worksheet, from an external data query, or from mapping a collection of repeating XML elements to a worksheet range.

The sheet XML stores the numeric and textual data. The table XML records the various attributes for the particular table object.

[*Example:*

```
<table xmlns="http://purl.oclc.org/ooxml/spreadsheetml/main"
  id="1" name="MarginTable" displayName="MarginTable" ref="D3:G6"
  totalsRowShown="0">
  <autoFilter ref="D3:G6"/>
  <tableColumns count="4">
    <tableColumn id="1" name="Product"/>
    <tableColumn id="2" name="Wholesale"/>
    <tableColumn id="3" name="Retail"/>
    <tableColumn id="4" name="Margin" dataDxfId="0">
      <calculatedColumnFormula d="1">[Retail]-
        [Wholesale]</calculatedColumnFormula>
    </tableColumn>
  </tableColumns>
  <tableStyleInfo name="TableStyleMedium9" showFirstColumn="0"
    showLastColumn="0" showRowStripes="1" showColumnStripes="0"/>
</table>
```

The above xml example shows a table that spans cells D3 through G6, and has four columns: Product, Wholesale, Retail, and Margin. Margin is a column where each cell has its values calculated based on the formula (Retail - Wholesale), where those values are taken from the cells in the table columns on the corresponding row. The table has a style applied, "TableStyleMedium9", but the styles formatting isn't applied to the first column and the column striping isn't shown. Note that all the data and text values are stored in the sheet xml; the table xml just stores the properties that are specific to this table, and it is referenced by the sheet. *end example*]

18.5.1 Tables

Tables are ranges of data in the worksheet that have special behavior applied which allow users to better sort, analyze, format, manage, add, and delete data. Tables and table columns can also be referenced through formulas by the spreadsheet application using friendly names, making formula calculations that use tables much easier to understand and maintain. Tables provide a natural way for working with large sets of tabular data.

The tables described in this section are of the multi cell variety, as opposed to single cell tables created from XML mappings.

Each table gets its own xml part, and the relationship between a table part and the sheet is defined in the sheet's _rels directory. The sheet xml also references this id since there can be more than one table on a sheet. The sheet xml contains all the numeric and textual data, and the table xml records properties of the table as well as some formatting rules for data and text displayed in the table cells.

18.5.1.1 **calculatedColumnFormula (Calculated Column Formula)**

Columns in a table can have cells that are calculated, usually based on values in other cells in the table. This element stores the formula that is used to perform the calculation for each cell in this column.

It shall be understood that formulas which reference columns of this table, shall be calculated using the cells in those columns on the same row of the table as the cell that the formula resides in.

See §18.17 for details on the format required for formulas.

Attributes	Description
array (Array)	A Boolean value that indicates whether this formula is an array style formula. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	Specifies how white space should be handled for the contents of this element using the W3C space preservation rules. The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_TableFormula](#)) is located in §A.2. *end note*]

18.5.1.2 **table (Table)**

This element is the root element for a table that is not a single cell XML table.

Attributes	Description
comment (Table Comment)	A string representing a textual comment about the table. [<i>Note</i> : This can be used by the spreadsheet application in other UI. <i>end note</i>] [<i>Example</i> : There can be name UI that is used to organize defined names and function references, if tables are listed in that UI the comment can give more information about the table. <i>end example</i>] The maximum length of this string should be 32767 characters. The possible values for this attribute are defined by the ST_Xstring simple type

Attributes	Description
	(§22.9.2.19).
connectionId (Connection ID)	<p>An integer representing an ID to indicate which connection from the connections collection is used by this table.</p> <p>This shall only be used for tables that are based off of xml maps.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
dataCellStyle (Data Style Name)	<p>A string representing the name of the cell style that is applied to the data area cells of the table.</p> <p>If this string is missing or does not correspond to the name of a cell style, then the data cell style specified by the current table style should be applied.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
dataDxfId (Data Area Format Id)	<p>A zero based integer index into the differential formatting records <dxf> in the styleSheet indicating which format to apply to the data area of this table.</p> <p>The spreadsheet should fail to load if this index is out of bounds.</p> <p>The possible values for this attribute are defined by the ST_DxfId simple type (§18.18.25).</p>
displayName (Table Name)	<p>A string representing the name of the table. This is the name that shall be used in formula references, and displayed in the UI to the spreadsheet user.</p> <p>This name shall not have any spaces in it, and it shall be unique amongst all other displayNames and definedNames in the workbook. The character lengths and restrictions are the same as for definedNames. See <i>SpreadsheetML Reference - Workbook definedNames</i> section for details</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
headerRowBorderDxfId (Header Row Border Format Id)	<p>A zero based integer index into the differential formatting records <dxf> in the styleSheet indicating what border formatting to apply to the header row of this table.</p> <p>The spreadsheet should fail to load if this index is out of bounds.</p> <p>The possible values for this attribute are defined by the ST_DxfId simple type (§18.18.25).</p>
headerRowCellStyle (Header Row Style)	<p>A string representing the name of the cell style that is applied to the header row cells of the table.</p> <p>If this string is missing or does not correspond to the name of a cell style, then the header</p>

Attributes	Description
	<p>row style specified by the current table style should be applied.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
headerRowCount (Header Row Count)	<p>An integer representing the number of header rows showing at the top of the table. 0 means that the header row is not shown.</p> <p>It is up to the spreadsheet application to determine if numbers greater than 1 are allowed. Unless the spreadsheet application has a feature where there might ever be more than one header row, this number should not be higher than 1.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
headerRowDxfId (Header Row Format Id)	<p>A zero based integer index into the differential formatting records <dxf> in the styleSheet indicating which format to apply to the header row of this table.</p> <p>The spreadsheet should fail to load if this index is out of bounds.</p> <p>The possible values for this attribute are defined by the ST_DxfId simple type (§18.18.25).</p>
id (Table Id)	<p>A non zero integer representing the unique identifier for this table. Each table in the workbook shall have a unique id.</p> <p>Ids can be used to refer to the specific table in the workbook. [Note: For instance a future records bucket could refer to the table using this id. end note]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
insertRow (Insert Row Showing)	<p>A Boolean value indicating whether the insert row is showing. True when the insert row is showing, false otherwise.</p> <p>The insert row should only be shown if the table has no data.</p> <p>When a user clicks the insert row in the UI, it provides them an easy way to enter data into a table.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
insertRowShift (Insert Row Shift)	<p>A Boolean that indicates whether cells in the sheet had to be inserted when the insert row was shown for this table. True if the cells were shifted, false otherwise.</p> <p>[Note: This happens when there are values in cells immediately below the table when the table is created and the insert row is shown. In this case blank cells for the insert row are inserted, and the existing values in the sheet are shifted down by one row to make</p>

Attributes	Description
	<p>room.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
name (Name)	<p>A string representing the name of the table that is used to reference the table programmatically through the spreadsheet applications object model. This string shall be unique per table per sheet. It has the same length and character restrictions as for displayName.</p> <p>By default this should be the same as the table's displayName. This name should also be kept in synch with the displayName when the displayName is updated in the UI by the spreadsheet user.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
published (Published)	<p>A Boolean representing whether this table is marked as published for viewing by a server based spreadsheet application. True if it should be viewed by the server spreadsheet application, false otherwise.</p> <p>[Note: Such an application might only display objects from the workbook that are marked as published, thus being able to load and calculate the entire workbook but only show the specific items that are marked as published. This can allow the server spreadsheet rendering to provide a more restricted view of the workbook. end note]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
ref (Reference)	<p>The range on the relevant sheet that the table occupies expressed using A1 style referencing.</p> <p>The reference shall include the totals row if it is shown.</p> <p>The possible values for this attribute are defined by the ST_Ref simple type (§18.18.62).</p>
tableBorderDxfId (Table Border Format Id)	<p>A zero based integer index into the differential formatting records <dxfs> in the styleSheet indicating what border formatting to apply to the borders of this table.</p> <p>The spreadsheet should fail to load if this index is out of bounds.</p> <p>The possible values for this attribute are defined by the ST_DxfId simple type (§18.18.25).</p>
tableType (Table Type)	<p>An optional enumeration specifying the type or source of the table.</p> <p>Indicates whether the table is based off of an external data query, data in a worksheet, or from an xml data mapped to a worksheet.</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_TableType simple type (§18.18.78).
totalsRowBorderDxflD (Totals Row Border Format Id)	<p>A zero based integer index into the differential formatting records <dxfs> in the styleSheet indicating what border formatting to apply to the totals row of this table.</p> <p>The spreadsheet should fail to load if this index is out of bounds.</p> <p>The possible values for this attribute are defined by the ST_DxflD simple type (§18.18.25).</p>
totalsRowCellStyle (Totals Row Style)	<p>A string representing the name of the cell style that is applied to the totals row cells of the table.</p> <p>If this string is missing or does not correspond to the name of a cell style, then the totals row style specified by the current table style should be applied.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
totalsRowCount (Totals Row Count)	<p>An integer representing the number of totals rows that shall be shown at the bottom of the table.</p> <p>0 means that the totals row is not shown. It is up to the spreadsheet application to determine if numbers greater than 1 are allowed. Unless the spreadsheet application has a feature where their might ever be more than one totals row, this number should not be higher than 1.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
totalsRowDxflD (Totals Row Format Id)	<p>A zero based integer index into the differential formatting records <dxfs> in the styleSheet indicating which format to apply to the totals row of this table.</p> <p>The spreadsheet should fail to load if this index is out of bounds.</p> <p>The possible values for this attribute are defined by the ST_DxflD simple type (§18.18.25).</p>
totalsRowShown (Totals Row Shown)	<p>A Boolean indicating whether the totals row has ever been shown in the past for this table. True if the totals row has been shown, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Table](#)) is located in §A.2. end note]

18.5.1.3 `tableColumn` (Table Column)

An element representing a single column for this table.

Attributes	Description
<code>dataCellStyle</code> (Data Area Style Name)	<p>A string representing the name of the cell style that is applied to the cells in the data area of this table column.</p> <p>If this string is missing or does not correspond to the name of a cell style, then the data cell style specified by the current table style should be applied.</p> <p>This cell style should get precedence over the <code>dataCellStyle</code> defined by the table.</p> <p>The possible values for this attribute are defined by the <code>ST_Xstring</code> simple type (§22.9.2.19).</p>
<code>dataDxfId</code> (Data & Insert Row Format Id)	<p>A zero based integer index into the differential formatting records <code><dxfs></code> in the <code>styleSheet</code> indicating which format to apply to the data area of this column. This formatting shall also apply to cells on the insert row for this column.</p> <p>The spreadsheet should fail to load if this index is out of bounds.</p> <p>The possible values for this attribute are defined by the <code>ST_DxfId</code> simple type (§18.18.25).</p>
<code>headerRowCellStyle</code> (Header Row Cell Style)	<p>A string representing the name of the cell style that is applied to the header row cell of this column.</p> <p>If this string is missing or does not correspond to the name of a cell style, then header row style specified by the current table style should be applied.</p> <p>This cell style should get precedence over the <code>headerRowCellStyle</code> defined by the table.</p> <p>The possible values for this attribute are defined by the <code>ST_Xstring</code> simple type (§22.9.2.19).</p>
<code>headerRowDxfId</code> (Header Row Cell Format Id)	<p>A zero based integer index into the differential formatting records <code><dxfs></code> in the <code>styleSheet</code> indicating which format to apply to the header cell of this column.</p> <p>The possible values for this attribute are defined by the <code>ST_DxfId</code> simple type (§18.18.25).</p>
<code>id</code> (Table Field Id)	<p>An integer representing the unique identifier of this column. This shall be unique per table.</p> <p>The possible values for this attribute are defined by the W3C XML Schema <code>unsignedInt</code> datatype.</p>
<code>name</code> (Column name)	<p>A string representing the unique caption of the table column. This is what shall be displayed in the header row in the UI, and is referenced through functions. This name</p>

Attributes	Description
	<p>shall be unique per table.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
queryTableFieldId (Query Table Field Id)	<p>An integer representing the query table field ID corresponding to this table column.</p> <p>The relationship between this table and the corresponding query table is expressed in <code>_rels</code> part for this table. Each <code>queryTableField</code> has a unique <code>id</code> attribute, and this <code>id</code> is what is referenced here.</p> <p>The possible values for this attribute are defined by the W3C XML Schema <code>unsignedInt</code> datatype.</p>
totalsRowCellStyle (Totals Row Style Name)	<p>A string representing the name of the cell style that is applied to the Totals Row cell of this column.</p> <p>If this string is missing or does not correspond to the name of a cell style, then the totals row cell style specified by the current table style should be applied.</p> <p>This cell style should get precedence over the <code>totalsRowCellStyle</code> defined by the table.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
totalsRowDxfId (Totals Row Format Id)	<p>A zero based integer index into the differential formatting records <code><dxf></code> in the <code>styleSheet</code> indicating which format to apply to the totals row cell of this column.</p> <p>The spreadsheet shall not load if this index is out of bounds.</p> <p>The possible values for this attribute are defined by the ST_DxfId simple type (§18.18.25).</p>
totalsRowFunction (Totals Row Function)	<p>An enumeration indicating which type of aggregation to show in the totals row cell for this column.</p> <p>The possible values for this attribute are defined by the ST_TotalsRowFunction simple type (§18.18.83).</p>
totalsRowLabel (Totals Row Label)	<p>A String to show in the totals row cell for this column.</p> <p>This string shall be ignored unless the <code>totalsRowFunction="none"</code> for this column, in which case it is displayed in the totals row.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
uniqueName (Unique Name)	<p>An optional string representing the unique name of the table column. This string is used to bind the column to a field in a data table, so it should only be used when this table's</p>

Attributes	Description
	<p>tableType is queryTable or xml.</p> <p>This name shall be unique per table when it is used.</p> <p>For tables created from xml mappings, by default this should be the same as the name of the column, and should be kept in synch with the name of the column if that name is altered by the spreadsheet application.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TableColumn](#)) is located in §A.2.
end note]

18.5.1.4 tableColumns (Table Columns)

An element representing the collection of all table columns for this table.

Attributes	Description
count (Column Count)	<p>An integer representing the total count of how many columns there are in this Table. This count shall include both query-defined and user-defined columns.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TableColumns](#)) is located in §A.2.
end note]

18.5.1.5 tableStyleInfo (Table Style)

This element describes which style is used to display this table, and specifies which portions of the table have the style applied.

Styles define a set of formatting properties that can be easily referenced by cells or other objects in the spreadsheet application. A style can be applied to a table, but tables can define specific parts of the table that should not have the style applied independently of other table parts. For instance a table can not apply the row striping of the style, and can not show the style's formatting of the last column, but will apply the column striping and the formatting to the first column.

Attributes	Description
name (Style Name)	<p>A string representing the name of the table style to use with this table.</p> <p>If the style name does not correspond to the name of a table style then the spreadsheet</p>

Attributes	Description
	<p>application should use default style.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
showColumnStripes (Show Column Stripes)	<p>A Boolean indicating whether column stripe formatting is applied. True when style column stripe formatting is applied, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showFirstColumn (Show First Column)	<p>A Boolean indicating whether the first column in the table should have the style applied. True if the first column has the style applied, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showLastColumn (Show Last Column)	<p>A Boolean indicating whether the last column in the table should have the style applied. True if the last column has the style applied, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showRowStripes (Show Row Stripes)	<p>A Boolean indicating whether row stripe formatting is applied. True when style row stripe formatting is applied, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TableStyleInfo](#)) is located in §A.2.
end note]

18.5.1.6 totalsRowFormula (Totals Row Formula)

This element contains a custom formula for aggregating values from the column.

Each tableColumn has a totalsRowFunction that can be used for simple aggregations such as average, standard deviation, min, max, count, and others. If a more custom calculation is desired, then this element should be used, and the totalsRowFunction shall be set to "custom".

Attributes	Description
array (Array)	<p>A Boolean value that indicates whether this formula is an array style formula.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TableFormula](#)) is located in §A.2.
end note]

18.5.1.7 `xmlColumnPr` (XML Column Properties)

An element defining the XML column properties for a column. This is only used for tables created from XML mappings.

[*Example:* Here is a simple example showing a table column that has an `xmlColumnPr`.

```
<tableColumn id="1" uniqueName="SomeElement" name="SomeElement">
  <xmlColumnPr mapId="1" xpath="/xml/foo/element" xmlDataType="string"/>
</tableColumn>
```

end example]

Attributes	Description								
denormalized (Denormalized)	<p>A Boolean that indicates whether the contents of the column have been filled down due to flattening. True if it has been filled down (denormalized), false otherwise.</p> <p>This should be used when an XML mapping parent value has many children, and both the parent and child fields are mapped to their own column in the table.</p> <p>[<i>Example:</i></p> <pre><Order ID="3"> <Item>Milk</Item> <Item>Bread</Item> <Item>Cheese</Item> </Order></pre> <p>The resulting table in the spreadsheet application would have two columns, the first with the item ID, filled down for each item in the table as follows:</p> <table> <tr> <td>Item ID</td><td>Item</td></tr> <tr> <td>3</td><td>Milk</td></tr> <tr> <td>3</td><td>Bread</td></tr> <tr> <td>3</td><td>Cheese</td></tr> </table> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>	Item ID	Item	3	Milk	3	Bread	3	Cheese
Item ID	Item								
3	Milk								
3	Bread								
3	Cheese								
mapId (XML Map Id)	<p>An integer representing the ID of the XML map this table field is associated with.</p> <p>The XML map is defined in the xml maps part, and the Map element should have the corresponding id.</p>								

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
xmlDataType (XML Data Type)	<p>An enumeration indicating which XML data type is used by this column.</p> <p>The possible values for this attribute are defined by the ST_XmlDataType simple type (§18.18.93).</p>
xpath (XPath)	<p>A string representing the XML path to the element this column is associated with.</p> <p>The spreadsheet application should support XPath limited to the following</p> <ul style="list-style-type: none"> • The XPath is an absolute path to a simple-content element or attribute • <p>[Example: "/ns1:root/ns1:row/ns1:column1" is supported if 'column1' is a child-most node, but not "/ns1:root/ns1:row" for the same document since 'row' is not a child. end example]</p> <ul style="list-style-type: none"> • The XPath does not express axes, but uses the default child axes • <p>[Example: "/ns1:root/ns1:row" is supported but not "/ns1:root/child::ns1:row" end example]</p> <ul style="list-style-type: none"> • An optional filter can be expressed at the end of the xpath • <p>[Example: "/ns1:root/ns1:row/ns1:column1[@foo='abc']" is supported but not "/ns1:root/ns1:row[@foo='abc']/ns1:column1" end example]</p> <ul style="list-style-type: none"> • The filter can only contain a single expression comparing a named attribute to a specific value • • Filters are only supported on XPaths that resolve to a simple-content element (not attributes) • • The named attribute shall be defined as an attribute of the simple-content element • • The attribute name shall be preceded by the short-hand (@) symbol representing the axes 'attribute' • <p>[Example: "/ns1:root/ns1:row/ns1:column1[@foo='abc']" is supported not "/ns1:root/ns1:row/ns1:column1[attribute::foo='abc']" end example]</p>

Attributes	Description
	<ul style="list-style-type: none"> An arbitrary amount of white-space can be embedded between filter tokens <p>[Example: "/ns1:root/ns1:row/ns1:column1[@ foo='abc']" is permitted<i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_XmlColumnPr](#)) is located in §A.2.
end note]

18.5.2 Single Cell Tables

A single cell table is generated from an XML mapping. These really just look like regular cells to the spreadsheet user, but shall be implemented as Tables "under the covers."

These tables don't have the full set of properties that multi cell tables do. They only have the various XML properties, and core table properties (such as `id` and `name`) that are needed to create a table and XML mapping. For instance the formatting properties, totals row, and headers row don't exist for the single cell XML tables. The formatting for these cells is maintained in the style sheet.

18.5.2.1 singleXmlCell (Table Properties)

This element represents the table properties for a single cell XML table.

Attributes	Description
connectionId (Connection ID)	<p>An integer representing an ID to indicate which connection from the connections collection is used by this table.</p> <p>This is only used for tables that are based off of xml maps</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
id (Table Id)	<p>An integer representing the unique identifier of the table.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
r (Reference)	<p>An A1 cell style reference to the cell that the single cell xml table occupies.</p> <p>The possible values for this attribute are defined by the ST_CellRef simple type (§18.18.7).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SingleXmlCell](#)) is located in §A.2. *end note*]

18.5.2.2 [singleXmlCells \(Single Cells\)](#)

This element is a container for a collection of singleXmlCell tables.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SingleXmlCells](#)) is located in §A.2. *end note*]

18.5.2.3 [xmlCellPr \(Cell Properties\)](#)

This element stores the XML properties for the cell of a single cell xml table.

Attributes	Description
id (Table Field Id)	<p>The unique identifier of the XML properties for the cell.</p> <p>This should always be set to the value of 1 since this id is always meant to be for a single cell xml table.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
uniqueName (Unique Table Name)	<p>An optional string representing the unique name of the table column. By default this is the same as the name of the column.</p> <p>This should hold the name of the element or attribute that this cell is referring to in the XML.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_XmlCellPr](#)) is located in §A.2. *end note*]

18.5.2.4 [xmlPr \(Column XML Properties\)](#)

This element represents the column properties for single cell XML tables.

Attributes	Description
mapId (XML Map Id)	<p>An integer representing the ID of the XML map this table field is associated with.</p> <p>The XML map is defined in the xml maps part, and the Map element should have the corresponding id.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

Attributes	Description
xmlDataType (XML Data Type)	<p>An enumeration indicating which XML data type is used by this column.</p> <p>The possible values for this attribute are defined by the ST_XmlDataType simple type (§18.18.93).</p>
xpath (XPath)	<p>A string representing the XML path to the element this column is associated with.</p> <p>The spreadsheet application should support XPath limited to the following:</p> <ul style="list-style-type: none"> The XPath is an absolute path to a simple-content element or attribute <p>[Example: "/ns1:root/ns1:row/ns1:column1" is supported if 'column1' is a child-most node, but not "/ns1:root/ns1:row" for the same document since 'row' is not a child. end example]</p> <ul style="list-style-type: none"> The XPath does not express axes, but uses the default child axes <p>[Example: "/ns1:root/ns1:row" is supported but not "/ns1:root/child::ns1:row" end example]</p> <ul style="list-style-type: none"> An optional filter can be expressed at the end of the xpath <p>[Example: "/ns1:root/ns1:row/ns1:column1[@foo='abc']" is supported but not "/ns1:root/ns1:row[@foo='abc']/ns1:column1" end example]</p> <ul style="list-style-type: none"> The filter can only contain a single expression comparing a named attribute to a specific value Filters are only supported on XPaths that resolve to a simple-content element (not attributes) The named attribute shall be defined as an attribute of the simple-content element The attribute name shall be preceded by the short-hand (@) symbol representing the axes 'attribute' <p>[Example: "/ns1:root/ns1:row/ns1:column1[@foo='abc']" is supported not "/ns1:root/ns1:row/ns1:column1[attribute::foo='abc']" end example]</p> <ul style="list-style-type: none"> An arbitrary amount of white-space can be embedded between filter tokens <p>[Example:</p>

Attributes	Description
	<p>"/ns1:root/ns1:row/ns1:column1[@ foo='abc']" is permitted <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_XmlPr](#)) is located in §A.2. *end note*]

18.6 Calculation Chain

The cells in a workbook can be calculated in different orders depending on various optimizations and dependencies. The calculation chain specifies the order in which the cells in a workbook were last calculated.

The calculation chain only deals with cells that require calculation - i.e., it only deals with cells that contain formulas. It does not track or express dependencies amongst the formulas, but rather only records the order in which the cells were last calculated.

The calculation chain order can change over time. One obvious way this can happen is that new formulas can be added, formulas can be removed or updated. The spreadsheet application can also optionally implement partial calculation as an optimization. Partial calculation is when the spreadsheet only recalculates cells that have had their dependencies or values changed. This way, when a number in a cell is changed, requiring an update to a dependent formula, only the cells that are affected by the update is recalculated, as opposed to recalculating the entire workbook.

The calculation chain described in this section is not required by the spreadsheet application, but can be used if the spreadsheet application finds it useful. It can be loaded by a spreadsheet application, or the application can optionally construct it at run time in memory based on formula dependencies. Since the xml data described in this section is not strictly required, the spreadsheet application is free to ignore the order in which the calculation chain specifies calculations - i.e., even if the calculation chain is loaded, the spreadsheet application is free to perform calculations in a different order at run time.

[Example:

Consider the following workbook (the formulas shown instead of cell values):

	A	B	C	D	E
1	1	=A1	=B1+A1	=C1+B1+A1	=D1+C1+B1+A1
2					
3					
4					
5	1	=A5	=B5+A5	=C5+B5+A5	=D5+C5+B5+A5
6					
7					

There is a constant entered in A1 and A5, and next to each of those cells are a series of cells which contain formulas that depend on those cells.

After entering the cells on the first row, and then the cells on the 5th row, the calc chain xml looks like this:

```
<calcChain xmlns="http://purl.oclc.org/ooxml/spreadsheetml/main">
  <c r="E5" i="1"/>
  <c r="D5"/>
  <c r="C5"/>
  <c r="B5"/>
  <c r="E1"/>
  <c r="D1"/>
  <c r="C1"/>
  <c r="B1"/>
</calcChain>
```

It is in this order because B1 was calced first (it was the first formula entered in the workbook), followed by C1, D1, and so on. Then B5 was entered in the 5th row, followed by the other cells in the 5th row, ending with E5.

But, after a full recalculation, the spreadsheet application has realized that cells B5:E5 are on the same child chain, and cells B1:E1 are likewise on their own child chain. The xml now looks like this:

```
<calcChain xmlns="http://purl.oclc.org/ooxml/spreadsheetml/main">
  <c r="B1" i="1"/>
  <c r="C1" s="1"/>
  <c r="D1" s="1"/>
  <c r="E1" s="1"/>
  <c r="B5"/>
  <c r="C5" s="1"/>
  <c r="D5" s="1"/>
  <c r="E5" s="1"/>
</calcChain>
```

end example]

18.6.1 c (Cell)

This element represents a single cell, which shall contain a formula, in the calc chain. Cells are calculated in the same order as the c elements appear in the Calculation Chain part.

Attributes	Description
a (Array)	<p>A Boolean flag indicating whether the cell's formula is an array formula. True if this cell's formula is an array formula, false otherwise. If there is a conflict between this attribute and the t attribute of the f element (§18.3.1.40), the t attribute takes precedence.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean</p>

Attributes	Description
	datatype.
i (Sheet Id)	<p>A sheet Id of a sheet the cell belongs to. If this is omitted, it is assumed to be the same as the i value of the previous cell.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
l (New Dependency Level)	<p>A Boolean flag indicating that the cell's formula starts a new dependency level. True if the formula starts a new dependency level, false otherwise.</p> <p>Starting a new dependency level means that all concurrent calculations, and child calculations, shall be completed - and the cells have new values - before the calc chain can continue. In other words, this dependency level might depend on levels that came before it, and any later dependency levels might depend on this level; but not later dependency levels can have any calculations started until this dependency level completes.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
r (Cell Reference)	<p>An A-1 style reference to a cell.</p> <p>The possible values for this attribute are defined by the ST_CellRef simple type (§18.18.7).</p>
s (Child Chain)	<p>A Boolean flag indicating whether the cell's formula is on a child chain. True if this cell is part of a child chain, false otherwise. If this is omitted, it is assumed to be the same as the s value of the previous cell .</p> <p>A child chain is a list of calculations that occur which depend on the parent to the chain. There shall not be cross dependencies between child chains. Child chains are not the same as dependency levels - a child chain and its parent are all on the same dependency level. Child chains are series of calculations that can be independently farmed out to other threads or processors.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
t (New Thread)	<p>A Boolean flag indicating whether the cell's formula starts a new thread. True if the cell's formula starts a new thread, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model (CT_CalcCell) is located in §A.2. *end note*]

18.6.2 calcChain (Calculation Chain Info)

This element represents the root of the calculation chain.

[Note: The W3C XML Schema definition of this element's content model ([CT_CalcChain](#)) is located in §A.2. *end note*]

18.7 Comments

A comment is a rich text note that is attached to and associated with a cell, separate from other cell content. Comment content is stored separate from the cell, and is displayed in a drawing object (like a text box) that is separate from, but associated with, a cell. Comments are used as reminders, such as noting how a complex formula works, or to provide feedback to other users. Comments can also be used to explain assumptions made in a formula or to call out something special about the cell.

[Example:

```
<comments>
  <authors>
    <author>Bob</author>
    <author>CBR</author>
  </authors>
  <commentList>
    <comment ref="D4" authorId="0">
      <text>
        <r>
          <rPr>
            <b/>
            <sz val="8"/>
            <color indexed="81"/>
            <rFont val="Calibri"/>
            <charset val="1"/>
            <scheme val="minor"/>
          </rPr>
          <t>Bob:</t>
        </r>
        <r>
          <rPr>
            <sz val="8"/>
            <color indexed="81"/>
            <rFont val="Calibri"/>
            <charset val="1"/>
            <scheme val="minor"/>
          </rPr>
```

```

        <t xml:space="preserve">Why such high expense?</t>
      </r>
    </text>
  </comment>
</commentList>
</comments>

```

end example]

This xml sample displays a comment by "Bob" (bolded) that says, "Why such high expense?" (non bolded).

18.7.1 author (Author)

This element holds a string representing the name of a single author of comments. Every comment shall have an author. The maximum length of the author string is an implementation detail, but a good guideline is 255 chars.

The possible values for this element are defined by the ST_Xstring simple type (§22.9.2.19).

Attributes	Description
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	Specifies how white space should be handled for the contents of this element using the W3C space preservation rules. The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.

[Note: The W3C XML Schema definition of this element’s content model ([ST_Xstring](#)) is located in §A.6.9. *end note*]

18.7.2 authors (Authors)

This element is a container that holds a list of comment author names. There can be many comment authors per sheet, but each author name shall be unique per sheet. The information for each author is stored only once for that sheet, and comments refer to the author by zero based index.

Note that there can be multiple lists of authors per workbook since each sheet contains its own comments part, and each comments part defines a list of authors for comments on that sheet.

[Note: The W3C XML Schema definition of this element’s content model ([CT_Authors](#)) is located in §A.2. *end note*]

18.7.3 comment (Comment)

This element represents a single user entered comment. Each comment shall have an author and can optionally contain richly formatted text.

Attributes	Description
authorId (Author Id)	<p>Required. An unsigned integer which is used as the zero based index into the list of authors for this set of comments.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
guid (Unique Identifier for Comment)	<p>Unique identifier for this comment. The attribute is required and shall be unique across all comments in shared workbooks.</p> <p>The possible values for this attribute are defined by the ST_Guid simple type (§22.9.2.4).</p>
ref (Cell Reference)	<p>Required. A string that serves as the A1 style reference to the cell that the comment is associated with. Shall only reference a single cell, not a range of cells, since comments are on a per cell basis.</p> <p>The possible values for this attribute are defined by the ST_Ref simple type (§18.18.62).</p>
shapeId (Shape ID)	<p>Specifies the ID of the DrawingML shape that provides the visual representation of the comment.</p> <p>[Example:</p> <pre><comment shapeId="10 " ... ></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Comment](#)) is located in §A.2. end note]

18.7.4 commentList (List of Comments)

This element is a container that holds a list of comments for the sheet.

[Note: The W3C XML Schema definition of this element's content model ([CT_CommentList](#)) is located in §A.2. end note]

18.7.5 commentPr (Comment Properties)

This element specifies the visual and positional properties of a comment.

[Example: In the following example, the comment's visual representation resizes with the

```
<comment ... >
  <text> ... </text>
  <commentPr autoFill="false">
    <anchor moveWithCells="true" sizeWithCells="true">
      <from> ... </from>
      <to> ... </to>
    </anchor>
  </commentPr>
</comment>
```

end example]

Attributes	Description
altText (Alternative Text)	<p>Specifies alternative text for the object, for use by assistive technologies or applications.</p> <p>[Example:</p> <pre><commentPr altText="Alternate text" ... /></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
autoFill (Automatic Fill Flag)	<p>Specifies whether the object's fill formatting is provided automatically by the application.</p> <p>[Example:</p> <pre><commentPr autoFill="false" ... /></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
autoLine (Automatic Line Flag)	<p>Specifies whether the object's line formatting is provided automatically by the application.</p> <p>[Example:</p> <pre><commentPr autoLine="false" ... /></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

Attributes	Description
autoScale (Automatic Text Scaling Flag)	<p>Specifies whether the object's font is automatically scaled by the application when the object is resized.</p> <p>[Example:</p> <pre><commentPr autoScale="true" ... /></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
colHidden (Hidden Column Flag)	<p>Specifies that the column of the cell to which this comment points is hidden.</p> <p>[Example:</p> <pre><commentPr colHidden="true" ... /></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
defaultSize (Default Size Flag)	<p>Specifies whether the object is at its default size.</p> <p>[Example:</p> <pre><commentPr defaultSize="false" ... /></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
disabled (Disabled Flag)	<p>Specifies whether the object is allowed to run an attached macro.</p> <p>[Example:</p> <pre><commentPr disabled="true" ... /></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
justLastX (Far East Alignment Flag)	<p>Specifies that Far East alignment is set for the last line in the comment's text. Typically, justified text in Far East environments leaves the last line unjustified. Specifying this element also justifies the last line.</p>

Attributes	Description
	<p>[Example:</p> <pre><commentPr justLastX="true" ... /></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
locked (Locked Flag)	<p>Specifies that the object is locked when the sheet is protected.</p> <p>[Example:</p> <pre><commentPr locked="false" ... /></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
lockText (Text Lock Flag)	<p>Specifies that the object's text is locked.</p> <p>[Example:</p> <pre><commentPr lockText="true" ... /></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
print (Print Flag)	<p>Specifies whether the object is printed when the document is printed.</p> <p>[Example:</p> <pre><commentPr print="false" ... /></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
rowHidden (Hidden Row Flag)	<p>Specifies that the row of the cell to which this comment points is hidden.</p> <p>[Example:</p> <pre><commentPr rowHidden="true" ... /></pre> <p>end example]</p>

Attributes	Description
	<p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>textHAlign (Text Horizontal Alignment)</p>	<p>Specifies the horizontal alignment of the comment's text field.</p> <p>[Example:</p> <pre data-bbox="451 512 1016 541"><commentPr textHAlign="center" ... /></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the ST_TextHAlign simple type (§18.18.80).</p>
<p>textVAlign (ext Vertical Alignment)</p>	<p>Specifies the vertical alignment of the comment's text field.</p> <p>[Example:</p> <pre data-bbox="451 879 1016 909"><commentPr textVAlign="center" ... /></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the ST_TextVAlign simple type (§18.18.81).</p>
<p>uiObject (UI Object Flag)</p>	<p>Specifies whether the object is a UI Object.</p> <p>[Example:</p> <pre data-bbox="451 1247 951 1276"><commentPr uiObject="true" ... /></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_CommentPr](#)) is located in §A.2. end note]

18.7.6 comments (Comments)

This element is the root container of a set of comments and comment authors for a particular sheet. Each set of comments for a sheet is stored in a separate xml part. The relationship part for a sheet defines a link to the correct comment part for that sheet.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_Comments](#)) is located in §A.2. *end note*]

18.7.7 text (Comment Text)

This element contains rich text which represents the text of a comment. The maximum length for this text is a spreadsheet application implementation detail. A recommended guideline is 32767 chars.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_Rst](#)) is located in §A.2. *end note*]

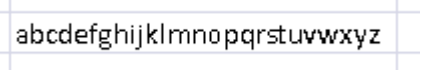
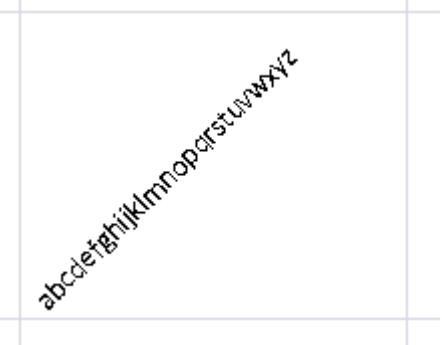
18.8 Styles

This subclause specifies the possible formatting information for the contents of the cells on a sheet in a SpreadsheetML document.

18.8.1 alignment (Alignment)

Formatting information pertaining to text alignment in cells. There are a variety of choices for how text is aligned both horizontally and vertically, as well as indentation settings, and so on.

Attributes	Description
horizontal (Horizontal Alignment)	<p>Specifies the type of horizontal alignment in cells.</p> <p>The possible values for this attribute are defined by the ST_HorizontalAlignment simple type (§18.18.40).</p>
indent (Indent)	<p>An integer value, where an increment of 1 represents 3 spaces. Indicates the number of spaces (of the normal style font) of indentation for text in a cell. The number of spaces to indent is calculated as following:</p> <p>Number of spaces to indent = indent value * 3</p> <p>[<i>Example</i>:For example, an indent value of 1 means that the text begins 3 space widths (of the normal style font) from the edge of the cell. <i>end example</i>]</p> <p>[<i>Note</i>: The width of one space character is defined by the font. <i>end note</i>]</p> <p>Only left, right, and distributed horizontal alignments are supported.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
justifyLastLine (Justify Last Line)	<p>A boolean value indicating if the cells justified or distributed alignment should be used on the last line of text. (This is typical for East Asian alignments but not typical in other contexts.)</p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
readingOrder (Reading Order)	<p>An integer value indicating whether the reading order (bidirectionality) of the cell is left-to-right, right-to-left, or context dependent.</p> <p>0 - Context Dependent - reading order is determined by scanning the text for the first non-whitespace character: if it is a strong right-to-left character, the reading order is right-to-left; otherwise, the reading order left-to-right.</p> <p>1 - Left-to-Right- reading order is left-to-right in the cell, as in English.</p> <p>2 - Right-to-Left - reading order is right-to-left in the cell, as in Hebrew.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
relativeIndent (Relative Indent)	<p>An integer value (used only in a dxf element) to indicate the additional number of spaces of indentation to adjust for text in a cell.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
shrinkToFit (Shrink To Fit)	<p>A boolean value indicating if the displayed text in the cell should be shrunk to fit the cell width. Not applicable when a cell contains multiple lines of text.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
textRotation (Text Rotation)	<p>Text rotation in cells. Expressed in degrees. Values are in the range 0 to 180. The first letter of the text is considered the center-point of the arc.</p> <p>For 0 - 90, the value represents degrees above horizon. For 91-180 the degrees below the horizon is calculated as:</p> <p>[degrees below horizon] = 90 - textRotation.</p> <p>0</p>  <p>45</p> 

Attributes	Description
	<div><div>90</div><div><div></div><div>abcdefghijklmnopqrstuvwxyz</div></div></div> <div><div>135</div><div><div></div><div>abcdefghijklmnopqrstuvwxyz</div></div></div> <div><div>180</div><div><div></div><div>abcdefghijklmnopqrstuvwxyz</div></div></div> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
vertical (Vertical Alignment)	Vertical alignment in cells.

Attributes	Description
	The possible values for this attribute are defined by the ST_VerticalAlignment simple type (§18.18.88).
wrapText (Wrap Text)	A boolean value indicating if the text in a cell should be line-wrapped within the cell. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_CellAlignment](#)) is located in §A.2. end note]

18.8.2 **b (Bold)**

Displays characters in bold face font style.

Attributes	Description
val (Value)	A boolean value for the property specified by the parent XML element. If omitted, the default value is true. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_BooleanProperty](#)) is located in §A.2. end note]

18.8.3 **bgColor (Background Color)**

Background color of the cell fill pattern. Cell fill patterns operate with two colors: a background color and a foreground color. These combine together to make a patterned cell fill.

Attributes	Description
auto (Automatic)	A boolean value indicating the color is automatic and system color dependent. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
indexed (Index)	Indexed color value. Only used for backwards compatibility. References a color in indexedColors. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
rgb (Alpha Red Green Blue Color)	Standard Alpha Red Green Blue color value (ARGB).



Attributes	Description
Value)	The possible values for this attribute are defined by the ST_UnsignedIntHex simple type (§18.18.86).
theme (Theme Color)	<p>A zero-based index into the <clrScheme> collection (§20.1.6.2), referencing a particular <sysClr> or <srgbClr> value expressed in the Theme part.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
tint (Tint)	<p>Specifies the tint value applied to the color.</p> <p>If tint is supplied, then it is applied to the RGB value of the color to determine the final color applied.</p> <p>The tint value is stored as a double from -1.0 .. 1.0, where -1.0 means 100% darken and 1.0 means 100% lighten. Also, 0.0 means no change.</p> <p>In loading the RGB value, it is converted to HLS where HLS values are (0..HLSMAX), where HLSMAX is currently 255.</p> <p>[Example:</p> <p>Here are some examples of how to apply tint to color:</p> <p>If (tint < 0) $\text{Lum}' = \text{Lum} * (1.0 + \text{tint})$ <p>For example: Lum = 200; tint = -0.5; Darken 50% $\text{Lum}' = 200 * (0.5) \Rightarrow 100$ <p>For example: Lum = 200; tint = -1.0; Darken 100% (make black) $\text{Lum}' = 200 * (1.0 - 1.0) \Rightarrow 0$ <p>If (tint > 0) $\text{Lum}' = \text{Lum} * (1.0 - \text{tint}) + (\text{HLSMAX} - \text{HLSMAX} * (1.0 - \text{tint}))$ <p>For example: Lum = 100; tint = 0.75; Lighten 75% $\begin{aligned} \text{Lum}' &= 100 * (1 - .75) + (\text{HLSMAX} - \text{HLSMAX} * (1 - .75)) \\ &= 100 * .25 + (255 - 255 * .25) \\ &= 25 + (255 - 63) = 25 + 192 = 217 \end{aligned}$ <p>For example: Lum = 100; tint = 1.0; Lighten 100% (make white) $\begin{aligned} \text{Lum}' &= 100 * (1 - 1) + (\text{HLSMAX} - \text{HLSMAX} * (1 - 1)) \\ &= 100 * 0 + (255 - 255 * 0) \\ &= 0 + (255 - 0) = 255 \end{aligned}$ <p><i>end example]</i></p> </p></p></p></p></p></p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema double datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Color](#)) is located in §A.2. *end note*]

18.8.4 border (Border)

Expresses a single set of cell border formats (left, right, top, bottom, diagonal). Color is optional. When missing, 'automatic' is implied.

Attributes	Description
diagonalDown (Diagonal Down)	<p>A boolean value indicating if the cell's diagonal border includes a diagonal line, starting at the top left corner of the cell and moving down to the bottom right corner of the cell.</p> <p>[Example:</p> <p>This example shows a thin diagonal down line:</p>  <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
diagonalUp (Diagonal Up)	<p>A boolean value indicating if the cell's diagonal border includes a diagonal line, starting at the bottom left corner of the cell and moving up to the top right corner of the cell.</p> <p>[Example:</p> <p>This example shows a thin diagonal up line:</p>  <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
outline (Outline)	<p>A boolean value indicating if left, right, top, and bottom borders should be applied only to outside borders of a cell range.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Border](#)) is located in §A.2. *end note*]

18.8.5 borders (Borders)

This element contains borders formatting information, specifying all border definitions for all cells in the workbook.

[*Example:* In this example the first border definition specifies that there are no borders, the second definition specifies that there is a thin bottom border and medium right border, and the third definition specifies that there is a double top border.

```
<borders count="3">
  <border>
    <begin/>
    <end/>
    <top/>
    <bottom/>
    <diagonal/>
  </border>
  <border>
    <begin/>
    <end style="medium">
      <color indexed="64"/>
    </end>
    <top/>
    <bottom style="thin">
      <color indexed="64"/>
    </bottom>
    <diagonal/>
  </border>
  <border>
    <begin/>
    <end/>
    <top style="double">
      <color auto="1"/>
    </top>
    <bottom/>
    <diagonal/>
  </border>
</borders>
```

end example]

Attributes	Description
count (Border Count)	Count of border elements. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Borders](#)) is located in §A.2. *end note*]

18.8.6 bottom (Bottom Border)

This element specifies the color and line style for the bottom border of a cell.

Attributes	Description
style (Line Style)	The line style for this border. The possible values for this attribute are defined by the ST_BorderStyle simple type (§18.18.3).

[Note: The W3C XML Schema definition of this element's content model ([CT_BorderPr](#)) is located in §A.2. *end note*]

18.8.7 cellStyle (Cell Style)

This element represents the name and related formatting records for a named cell style in this workbook.

Annex G contains a listing of cellStyles whose corresponding formatting records are implied rather than explicitly saved in the file. In this case, a builtinId attribute is written on the cellStyle record, but no corresponding formatting records are written.

For all built-in cell styles, the builtinId determines the style, not the name. For all cell styles, Normal is applied by default.

Attributes	Description
builtinId (Built-In Style Id)	The index of a built-in cell style: The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
customBuiltin (Custom Built In)	True indicates that this built-in cell style has been customized. By default built-in styles are not persisted when not in use. This flag indicates that a built-in style has been modified, and therefore should be saved with the workbook, even if not currently in use.

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
hidden (Hidden Style)	If 'true' do not show this style in the application UI. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
iLevel (Outline Style)	Indicates that this formatting is for an outline style . When styles are applied to outline levels (using the outline feature), this value is set and the formatting specified on this cell style is applied to the corresponding level of the outline. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
name (User Defined Cell Style)	The name of the cell style. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
xfId (Format Id)	Zero-based index referencing an xf record in the cellStyleXfs collection. This is used to determine the formatting defined for this named cell style. The possible values for this attribute are defined by the ST_CellStyleXfId simple type (§18.18.10).

[Note: The W3C XML Schema definition of this element's content model ([CT_CellStyle](#)) is located in §A.2. *end note*]

18.8.8 cellStyles (Cell Styles)

This element contains the named cell styles, consisting of a sequence of named style records. A named cell style is a collection of direct or themed formatting (e.g., cell border, cell fill, and font type/size/style) grouped together into a single named style, and can be applied to a cell.

[Example: For example, "Normal", "Heading 1", "Title", and "20% Accent1" are named cell styles expressed below. They have builtInId's associated with them, and use xfId to reference the specific formatting elements pertaining to the particular style. The xfId is a zero-based index, referencing an xf record in the cellStyleXfs collection.

```
<cellStyles count="4">
  <cellStyle name="20% - Accent1" xfId="3" builtinId="30"/>
  <cellStyle name="Heading 1" xfId="2" builtinId="16"/>
  <cellStyle name="Normal" xfId="0" builtinId="0"/>
  <cellStyle name="Title" xfId="1" builtinId="15"/>
</cellStyles>
```


end example]

Attributes	Description
count (Style Count)	Count of style elements. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_CellStyles](#)) is located in §A.2. *end note*]

18.8.9 cellStyleXfs (Formatting Records)

This element contains the master formatting records (xf's) which define the formatting for all named cell styles in this workbook. Master formatting records reference individual elements of formatting (e.g., number format, font definitions, cell fills, etc) by specifying a zero-based index into those collections. Master formatting records also specify whether to apply or ignore particular aspects of formatting. [*Example: Whether to apply a border or not. end example*]

A cell can have both direct formatting (e.g., bold) and a cell style (e.g., Explanatory) applied to it. Therefore, both the cell style xf records and cell xf records shall be read to understand the full set of formatting applied to a cell.

[*Example: This example shows 4 master formatting records, each defining formatting for a named cell style (expressed in the cellStyles collection). Note that 0th record does not express any "apply" attributes, while the other records do express "apply" attribute values. For example, the last record specifies that number format, alignment, and protection formatting will not be applied to the cell, even when that information is specified in related formatting records.*

```
<cellStyleXfs count="4">
  <xf numFmtId="0" fontId="0" fillId="0" borderId="0"/>
  <xf numFmtId="0" fontId="2" fillId="0" borderId="0" applyNumberFormat="0"
    applyFill="0" applyBorder="0" applyAlignment="0" applyProtection="0"/>
  <xf numFmtId="0" fontId="3" fillId="0" borderId="1" applyNumberFormat="0"
    applyFill="0" applyAlignment="0" applyProtection="0"/>
  <xf numFmtId="0" fontId="4" fillId="2" borderId="2" applyNumberFormat="0"
    applyAlignment="0" applyProtection="0"/>
</cellStyleXfs>
```

end example]

Attributes	Description
count (Style Count)	Count of cell style (xf) elements. The possible values for this attribute are defined by the W3C XML Schema unsignedInt

Attributes	Description
	datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_CellStyleXfs](#)) is located in §A.2. *end note*]

18.8.10 cellXfs (Cell Formats)

This element contains the master formatting records (xf) which define the formatting applied to cells in this workbook. These records are the starting point for determining the formatting for a cell. Cells in the Sheet Part reference the xf records by zero-based index.

A cell can have both direct formatting (e.g., bold) and a cell style (e.g., Explanatory) applied to it. Therefore, both the cell style xf records and cell xf records shall be read to understand the full set of formatting applied to a cell.

Attributes	Description
count (Format Count)	Count of xf elements. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_CellXfs](#)) is located in §A.2. *end note*]

18.8.11 colors (Colors)

Color information associated with this stylesheet. This collection is written whenever the legacy color palette has been modified (backwards compatibility settings) or a custom color has been selected while using this workbook.

When the color palette is modified, the indexedColors collection is written. When a custom color has been selected, the mruColors collection is written.

[Note: The W3C XML Schema definition of this element's content model ([CT_Colors](#)) is located in §A.2. *end note*]

18.8.12 condense (Condense)

Macintosh compatibility setting. Represents special word/character rendering on Macintosh, when this flag is set. The effect is to condense the text (squeeze it together). SpreadsheetML applications are not required to render according to this flag.

Attributes	Description
val (Value)	A boolean value for the property specified by the parent XML element. If omitted, the default value is true.

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_BooleanProperty](#)) is located in §A.2. *end note*]

18.8.13 diagonal (Diagonal)

This element specifies the color and line style for the diagonal border(s) of a cell, possibly including diagonally up and diagonally down. The line style for diagonal up and diagonal down lines shall be the same.

Attributes	Description
style (Line Style)	The line style for this border. The possible values for this attribute are defined by the ST_BorderStyle simple type (§18.18.3).

[Note: The W3C XML Schema definition of this element's content model ([CT_BorderPr](#)) is located in §A.2. *end note*]

18.8.14 dxf (Formatting)

A single dxf record, expressing incremental formatting to be applied.

[Note: The W3C XML Schema definition of this element's content model ([CT_Dxf](#)) is located in §A.2. *end note*]

18.8.15 dxfs (Formats)

This element contains the master differential formatting records (dxf's) which define formatting for all non-cell formatting in this workbook. Whereas xf records fully specify a particular aspect of formatting (e.g., cell borders) by referencing those formatting definitions elsewhere in the Styles part, dxf records specify incremental (or differential) aspects of formatting directly inline within the dxf element. The dxf formatting is to be applied on top of or in addition to any formatting already present on the object using the dxf record.

Attributes	Description
count (Format Count)	Count of dxf elements. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Dxfs](#)) is located in §A.2. *end note*]

18.8.16 **end (Trailing Edge Border)**

This element specifies the color and line style for the trailing edge border of a cell (i.e., the right border for left-to-right cells and the left border for right-to-left cells)..

Attributes	Description
style (Line Style)	<p>The line style for this border.</p> <p>The possible values for this attribute are defined by the ST_BorderStyle simple type (§18.18.3).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_BorderPr](#)) is located in §A.2. *end note*]

18.8.17 **extend (Extend)**

This element specifies a compatibility setting used for previous spreadsheet applications, resulting in special word/character rendering on those legacy applications, when this flag is set. The effect extends or stretches out the text. SpreadsheetML applications are not required to render according to this flag.

Attributes	Description
val (Value)	<p>A boolean value for the property specified by the parent XML element.</p> <p>If omitted, the default value is true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_BooleanProperty](#)) is located in §A.2. *end note*]

18.8.18 **family (Font Family)**

The font family this font belongs to. The font name overrides when there are conflicting values.

Attributes	Description
val (Value)	<p>The font family this font belongs to.</p> <p>The possible values for this attribute are defined by the ST_FontFamily simple type (§18.18.94).</p>

[*Note*: The W3C XML Schema definition of this element's content model (ST_FontFamily) is located in §A.2. *end note*]

18.8.19 fgColor (Foreground Color)

Foreground color of the cell fill pattern. Cell fill patterns operate with two colors: a background color and a foreground color. These combine together to make a patterned cell fill.

Attributes	Description
auto (Automatic)	<p>A boolean value indicating the color is automatic and system color dependent.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
indexed (Index)	<p>Indexed color value. Only used for backwards compatibility. References a color in indexedColors.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
rgb (Alpha Red Green Blue Color Value)	<p>Standard Alpha Red Green Blue color value (ARGB).</p> <p>The possible values for this attribute are defined by the ST_UnsignedIntHex simple type (§18.18.86).</p>
theme (Theme Color)	<p>A zero-based index into the <clrScheme> collection (§20.1.6.2), referencing a particular <sysClr> or <srgbClr> value expressed in the Theme part.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
tint (Tint)	<p>Specifies the tint value applied to the color.</p> <p>If tint is supplied, then it is applied to the RGB value of the color to determine the final color applied.</p> <p>The tint value is stored as a double from -1.0 .. 1.0, where -1.0 means 100% darken and 1.0 means 100% lighten. Also, 0.0 means no change.</p> <p>In loading the RGB value, it is converted to HLS where HLS values are (0..HLSMAX), where HLSMAX is currently 255.</p> <p>[Example:</p> <p>Here are some examples of how to apply tint to color:</p> <p>If (tint < 0) $\text{Lum}' = \text{Lum} * (1.0 + \text{tint})$ <p>For example: Lum = 200; tint = -0.5; Darken 50% $\text{Lum}' = 200 * (0.5) \Rightarrow 100$ <p>For example: Lum = 200; tint = -1.0; Darken 100% (make black)</p> </p></p>

Attributes	Description
	$\text{Lum}' = 200 * (1.0 - 1.0) \Rightarrow 0$ <p>If (tint > 0)</p> $\text{Lum}' = \text{Lum} * (1.0 - \text{tint}) + (\text{HLSMAX} - \text{HLSMAX} * (1.0 - \text{tint}))$ <p>For example: Lum = 100; tint = 0.75; Lighten 75%</p> $\begin{aligned} \text{Lum}' &= 100 * (1 - .75) + (\text{HLSMAX} - \text{HLSMAX} * (1 - .75)) \\ &= 100 * .25 + (255 - 255 * .25) \\ &= 25 + (255 - 63) = 25 + 192 = 217 \end{aligned}$ <p>For example: Lum = 100; tint = 1.0; Lighten 100% (make white)</p> $\begin{aligned} \text{Lum}' &= 100 * (1 - 1) + (\text{HLSMAX} - \text{HLSMAX} * (1 - 1)) \\ &= 100 * 0 + (255 - 255 * 0) \\ &= 0 + (255 - 0) = 255 \end{aligned}$ <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Color](#)) is located in §A.2. *end note*]

18.8.20 fill (Fill)

This element specifies fill formatting.

[Note: The W3C XML Schema definition of this element's content model ([CT_Fill](#)) is located in §A.2. *end note*]

18.8.21 fills (Fills)

This element defines the cell fills portion of the Styles part, consisting of a sequence of fill records. A cell fill consists of a background color, foreground color, and pattern to be applied across the cell.

[Example: This cell has a yellow fill:



This is the corresponding XML:

```
<fill>
  <patternFill patternType="solid">
    <fgColor rgb="FFFFFF00"/>
    <bgColor indexed="64"/>
  </patternFill>
</fill>
```

This cell has a yellow fill with a thin horizontal crosshatch pattern applied (patternType = lightGrid):



This is the corresponding XML:

```
<fill>
  <patternFill patternType="lightGrid">
    <bgColor rgb="FFFFFF00"/>
  </patternFill>
</fill>
```

end example]

Attributes	Description
count (Fill Count)	Count of fill elements. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element’s content model ([CT_Fills](#)) is located in §A.2. *end note*]

18.8.22 font (Font)

This element defines the properties for one of the fonts used in this workbook.

[Note: The W3C XML Schema definition of this element’s content model ([CT_Font](#)) is located in §A.2. *end note*]

18.8.23 fonts (Fonts)

This element contains all font definitions for this workbook.

[Example: This example expresses two fonts in the workbook. A Calibri family font, with font size of 11, and an Arial family font, with font size 12. The second font has strikethrough applied.

```
<fonts count="2">
  <font>
    <sz val="11"/>
    <color theme="1"/>
    <name val="Calibri"/>
    <family val="2"/>
    <scheme val="minor"/>
  </font>
```

```
<font>
  <strike/>
  <sz val="12"/>
  <color theme="1"/>
  <name val="Arial"/>
  <family val="2"/>
</font>
</fonts>
```

end example]

Attributes	Description
count (Font Count)	Count of font elements. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element’s content model ([CT_Fonts](#)) is located in §A.2. *end note*]

18.8.24 gradientFill (Gradient)

This element defines a gradient-style cell fill. Gradient cell fills can use one or two colors as the end points of color interpolation.

[Example:

This example shows a gradient cell fill, with color green at the top transitioning into blue at the bottom.



This is the XML:



```
<fill>
  <gradientFill degree="90">
    <stop position="0">
      <color rgb="FF92D050"/>
    </stop>
    <stop position="1">
      <color rgb="FF0070C0"/>
    </stop>
  </gradientFill>
</fill>
```




This example shows a gradient cell fill, from the center. Note the left, right, top, and bottom values (and see explanation in the attribute section):



```
<fill>
  <gradientFill type="path" left="0.2" right="0.8" top="0.2" bottom="0.8">
    <stop position="0">
      <color theme="0"/>
    </stop>
    <stop position="1">
      <color theme="4"/>
    </stop>
  </gradientFill>
</fill>
```

end example]

Attributes	Description
bottom (Bottom Convergence)	<p>This attribute is restricted to values ranging from 0 to 1. Specifies in percentage format (from the top to the bottom) the position of the bottom edge of the inner rectangle (color 1). For bottom, 0 means the bottom edge of the inner rectangle is on the top edge of the cell, and 1 means it is on the bottom edge of the cell.</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>
degree (Linear Gradient Degree)	<p>Angle of the linear gradient - vertical, horizontal, diagonal.</p> <p>[Example: In these examples, color 1 is white and color 2 is blue.</p> <p>90 = Horizontal & color 1 to color 2</p>  <p>270 = Horizontal & color 1 to color 2</p>  <p>0 = Vertical & color 1 to color 2</p>

Attributes	Description
	 <p>180 = Vertical & color 1 to color 2</p>  <p>45 = Diagonal Up & top to bottom (color 1 to color 2)</p> <p>225 = Diagonal Up & bottom to top (color 1 to color 2)</p> <p>135 = Diagonal Down & top to bottom (color 1 to color 2)</p> <p>315 = Diagonal Down & bottom to top (color 1 to color 2)</p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>
left (Left Convergence)	<p>This attribute is restricted to values ranging from 0 to 1. Specifies in percentage format (from the left to the right) the position of the left edge of the inner rectangle (color 1). For left, 0 means the left edge of the inner rectangle is on the left edge of the cell, and 1 means it is on the right edge of the cell. (applies to From Corner and From Center gradients).</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>
right (Right Convergence)	<p>This attribute is restricted to values ranging from 0 to 1. Specifies in percentage format (from the left to the right) the position of the right edge of the inner rectangle (color 1). For right, 0 means the right edge of the inner rectangle is on the left edge of the cell, and 1 means it is on the right edge of the cell. (applies to From Corner and From Center gradients).</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>
top (Top Gradient Convergence)	<p>This attribute is restricted to values ranging from 0 to 1. Specifies in percentage format (from the top to the bottom) the position of the top edge of the inner rectangle (color 1). For top, 0 means the top edge of the inner rectangle is on the top edge of the cell, and 1 means it is on the bottom edge of the cell. (applies to From Corner and From Center gradients).</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>
type (Gradient Fill)	Type of this gradient fill.

Attributes	Description
Type)	The possible values for this attribute are defined by the ST_GradientType simple type (§18.18.37).

[Note: The W3C XML Schema definition of this element's content model ([CT_GradientFill](#)) is located in §A.2. *end note*]

18.8.25 horizontal (Horizontal Inner Borders)

This element specifies the color and line style for the horizontal inner border(s) of a range of cells. Used in the context of dxf elements only. [Example: see the borders definitions for **TableStyleMedium28**. *end example*]

Attributes	Description
style (Line Style)	The line style for this border. The possible values for this attribute are defined by the ST_BorderStyle simple type (§18.18.3).

[Note: The W3C XML Schema definition of this element's content model ([CT_BorderPr](#)) is located in §A.2. *end note*]

18.8.26 i (Italic)

Displays characters in italic font style. The italic style is defined by the font at a system level and is not specified by ECMA-376.

Attributes	Description
val (Value)	A boolean value for the property specified by the parent XML element. If omitted, the default value is true. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_BooleanProperty](#)) is located in §A.2. *end note*]


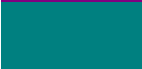


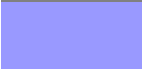

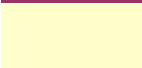
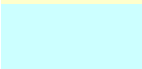











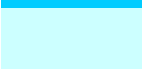
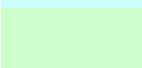
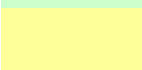
18.8.27 indexedColors (Color Indexes)





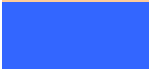
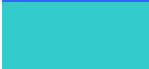






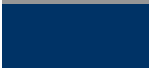


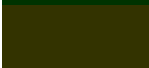




A legacy indexing scheme for colors that is still required for some records, and for backwards compatibility with legacy formats.

This element contains a sequence of RGB color values that correspond to color indexes (zero-based). When using the default indexed color palette, the values are not written out, but instead are implied. When the color palette has been modified from default, then the entire color palette is written out.

Here is the table of default mappings from indexed color value to ARGB value. Note that 0-7 are redundant of 8-15 to preserve backwards compatibility.

Color Index	ARGB Value	[Example:
indexed="0"	00000000	
indexed="1"	00FFFFFF	
indexed="2"	00FF0000	
indexed="3"	0000FF00	
indexed="4"	000000FF	
indexed="5"	00FFFF00	
indexed="6"	00FF00FF	
indexed="7"	0000FFFF	
(none)	(none)	
indexed="8"	00000000	
indexed="9"	00FFFFFF	
indexed="10"	00FF0000	
indexed="11"	0000FF00	
indexed="12"	000000FF	
indexed="13"	00FFFF00	
indexed="14"	00FF00FF	
indexed="15"	0000FFFF	
indexed="16"	00800000	
indexed="17"	00008000	
indexed="18"	00000080	

indexed="19"	00808000	
indexed="20"	00800080	
indexed="21"	00008080	
indexed="22"	00C0C0C0	
indexed="23"	00808080	
indexed="24"	009999FF	
indexed="25"	00993366	
indexed="26"	00FFFFCC	
indexed="27"	00CCFFFF	
indexed="28"	00660066	
indexed="29"	00FF8080	
indexed="30"	000066CC	
indexed="31"	00CCCCFF	
indexed="32"	00000080	
indexed="33"	00FF00FF	
indexed="34"	00FFFF00	
indexed="35"	0000FFFF	
indexed="36"	00800080	
indexed="37"	00800000	
indexed="38"	00008080	
indexed="39"	000000FF	
indexed="40"	0000CCFF	
indexed="41"	00CCFFFF	
indexed="42"	00CCFFCC	
indexed="43"	00FFFF99	

indexed="44"	0099CCFF	
indexed="45"	00FF99CC	
indexed="46"	00CC99FF	
indexed="47"	00FFCC99	
indexed="48"	003366FF	
indexed="49"	0033CCCC	
indexed="50"	0099CC00	
indexed="51"	00FFCC00	
indexed="52"	00FF9900	
indexed="53"	00FF6600	
indexed="54"	00666699	
indexed="55"	00969696	
indexed="56"	00003366	
indexed="57"	00339966	
indexed="58"	00003300	
indexed="59"	00333300	
indexed="60"	00993300	
indexed="61"	00993366	
indexed="62"	00333399	
indexed="63"	00333333	
indexed="64"	System Foreground	n/a
indexed="65"	System Background	n/a

[Note: The W3C XML Schema definition of this element’s content model ([CT_IndexedColors](#)) is located in §A.2.
end note]

18.8.28 mruColors (MRU Colors)

This element contains sequence of RGB values that correspond to custom colors selected by the user for this workbook.

[Note: The W3C XML Schema definition of this element's content model ([CT_MRUColors](#)) is located in §A.2. *end note*]

18.8.29 name (Font Name)

This element specifies the face name of this font.

Attributes	Description
val (String Value)	<p>A string representing the name of the font. If the font doesn't exist (because it isn't installed on the system), or the charset not supported by that font, then another font should be substituted.</p> <p>The string length for this attribute shall be 0 to 31 Unicode scalar values.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_FontName](#)) is located in §A.2. *end note*]

18.8.30 numFmt (Number Format)

This element specifies number format properties which indicate how to format and render the numeric value of a cell.

Following is a listing of number formats whose formatCode value is implied rather than explicitly saved in the file. In this case a numFmtId value is written on the xf record, but no corresponding numFmt element is written. Some of these Ids can be interpreted differently, depending on the UI language of the implementing application.

Ids not specified in the listing, such as 5, 6, 7, and 8, shall follow the number format specified by the formatCode attribute.

All Languages

ID	formatCode
0	General
1	0
2	0.00
3	#,##0

ID	formatCode
4	#,##0.00
9	0%
10	0.00%
11	0.00E+00
12	# ?/?
13	# ??/??
14	mm-dd-yy
15	d-mmm-yy
16	d-mmm
17	mmm-yy
18	h:mm AM/PM
19	h:mm:ss AM/PM
20	h:mm
21	h:mm:ss
22	m/d/yy h:mm
37	#,##0 ;(#,##0)
38	#,##0 ;[Red](#,##0)
39	#,##0.00;(#,##0.00)
40	#,##0.00;[Red](#,##0.00)
45	mm:ss
46	[h]:mm:ss
47	mmss.0
48	##0.0E+0
49	@

"General" Format

Some additional comments about the "General" number format are appropriate.

The primary goal when a cell is using "General" formatting is to render the cell content without user-specified guidance to the best ability of the application.

Alignment

(Specified for Left-to-Right mode)

- Strings: left aligned
- Boolean/error values: centered
- Numbers: right aligned
- Dates: do not follow the "General" format, instead automatically convert to date formatting.

Numbers

The application shall attempt to display the full number up to 11 digits (inc. decimal point). If the number is too large, the application shall attempt to show exponential format. If the number has too many significant digits, the display shall be truncated. The optimal method of display is based on the available cell width. If the number cannot be displayed using any of these formats in the available width, the application shall show "#" across the width of the cell.

Conditions for switching to exponential format:

3. The cell value shall have at least five digits for xE-xx
4. If the exponent is bigger than the size allowed, a floating point number cannot fit, so try exponential notation.
5. Similarly, for negative exponents, check if there is space for even one (non-zero) digit in floating point format.
6. Finally, if there isn't room for all of the significant digits in floating point format (for a negative exponent), exponential format shall display more digits if the exponent is less than -3. (The 3 is because E-xx takes 4 characters, and the leading 0 in floating point takes only 1 character. Thus, for an exponent less than -3, there is more than 3 additional leading 0's, more than enough to compensate for the size of the E-xx.)

Floating point rule:

For general formatting in cells, max overall length for cell display is 11, not including negative sign, but includes leading zeros and decimal separator.

zh-tw and zh-cn

ID	zh-tw formatCode	zh-cn formatCode
27	[\$-404]e/m/d	yyyy"年"m"月"
28	[\$-404]e"年"m"月"d"日"	m"月"d"日"
29	[\$-404]e"年"m"月"d"日"	m"月"d"日"
30	m/d/yy	m-d-yy
31	yyyy"年"m"月"d"日"	yyyy"年"m"月"d"日"
32	hh"時"mm"分"	h"时"mm"分"

ID	zh-tw formatCode	zh-cn formatCode
33	hh"時"mm"分"ss"秒"	h"时"mm"分"ss"秒"
34	上午/下午 hh"時"mm"分"	上午/下午 h"时"mm"分"
35	上午/下午 hh"時"mm"分"ss"秒"	上午/下午 h"时"mm"分"ss"秒"
36	[\$-404]e/m/d	yyyy"年"m"月"
50	[\$-404]e/m/d	yyyy"年"m"月"
51	[\$-404]e"年"m"月"d"日"	m"月"d"日"
52	上午/下午 hh"時"mm"分"	yyyy"年"m"月"
53	上午/下午 hh"時"mm"分"ss"秒"	m"月"d"日"
54	[\$-404]e"年"m"月"d"日"	m"月"d"日"
55	上午/下午 hh"時"mm"分"	上午/下午 h"时"mm"分"
56	上午/下午 hh"時"mm"分"ss"秒"	上午/下午 h"时"mm"分"ss"秒"
57	[\$-404]e/m/d	yyyy"年"m"月"
58	[\$-404]e"年"m"月"d"日"	m"月"d"日"

zh-tw and zh-cn (with unicode values provided for language glyphs where they occur)

ID	zh-tw formatCode	zh-cn formatCode
27	[\$-404]e/m/d	yyyy"5E74"m"6708"
28	[\$-404]e"5E74"m"6708"d"65E5"	m"6708"d"65E5"
29	[\$-404]e"5E74"m"6708"d"65E5"	m"6708"d"65E5"
30	m/d/yy	m-d-yy
31	yyyy"5E74"m"6708"d"65E5"	yyyy"5E74"m"6708"d"65E5"
32	hh"6642"mm"5206"	h"65F6"mm"5206"
33	hh"6642"mm"5206"ss"79D2"	h"65F6"mm"5206"ss"79D2"
34	4E0A5348/4E0B5348hh"6642"mm"5206"	4E0A5348/4E0B5348h"65F6"mm"5206"
35	4E0A5348/4E0B5348hh"6642"mm"5206"ss"79D2"	4E0A5348/4E0B5348h"65F6"mm"5206"ss"79D2"
36	[\$-404]e/m/d	yyyy"5E74"m"6708"
50	[\$-404]e/m/d	yyyy"5E74"m"6708"
51	[\$-404]e"5E74"m"6708"d"65E5"	m"6708"d"65E5"

ID	zh-tw formatCode	zh-cn formatCode
52	4E0A5348/4E0B5348hh"6642"mm"5206"	yyyy"5E74"m"6708"
53	4E0A5348/4E0B5348hh"6642"mm"5206"ss"79D2"	m"6708"d"65E5"
54	[\$-404]e"5E74"m"6708"d"65E5"	m"6708"d"65E5"
55	4E0A5348/4E0B5348hh"6642"mm"5206"	4E0A5348/4E0B5348h"65F6"mm"5206"
56	4E0A5348/4E0B5348hh"6642"mm"5206"ss"79D2"	4E0A5348/4E0B5348h"65F6"mm"5206"ss"79D2"
57	[\$-404]e/m/d	yyyy"5E74"m"6708"
58	[\$-404]e"5E74"m"6708"d"65E5"	m"6708"d"65E5"

ja-jp and ko-kr

ID	ja-jp formatCode	ko-kr formatCode
27	[\$-411]ge.m.d	yyyy"年" mm"月" dd"日"
28	[\$-411]ggge"年"m"月"d"日"	mm-dd
29	[\$-411]ggge"年"m"月"d"日"	mm-dd
30	m/d/yy	mm-dd-yy
31	yyyy"年"m"月"d"日"	yyyy"년" mm"월" dd"일"
32	h"時"mm"分"	h"시" mm"분"
33	h"時"mm"分"ss"秒"	h"시" mm"분" ss"초"
34	yyyy"年"m"月"	yyyy-mm-dd
35	m"月"d"日"	yyyy-mm-dd
36	[\$-411]ge.m.d	yyyy"年" mm"月" dd"日"
50	[\$-411]ge.m.d	yyyy"年" mm"月" dd"日"
51	[\$-411]ggge"年"m"月"d"日"	mm-dd
52	yyyy"年"m"月"	yyyy-mm-dd
53	m"月"d"日"	yyyy-mm-dd
54	[\$-411]ggge"年"m"月"d"日"	mm-dd
55	yyyy"年"m"月"	yyyy-mm-dd
56	m"月"d"日"	yyyy-mm-dd
57	[\$-411]ge.m.d	yyyy"年" mm"月" dd"日"
58	[\$-411]ggge"年"m"月"d"日"	mm-dd

ja-jp and ko-kr (with unicode values provided for language glyphs where they occur)

ID	ja-jp formatCode	ko-kr formatCode
27	[\$-411]ge.m.d	yyyy"5E74" mm"6708" dd"65E5"
28	[\$-411]ggge"5E74"m"6708"d"65E5"	mm-dd
29	[\$-411]ggge"5E74"m"6708"d"65E5"	mm-dd
30	m/d/yy	mm-dd-yy
31	yyyy"5E74"m"6708"d"65E5"	yyyy"B144" mm"C6D4" dd"C77C"
32	h"6642"mm"5206"	h"C2DC" mm"BD84"
33	h"6642"mm"5206"ss"79D2"	h"C2DC" mm"BD84" ss"CD08"
34	yyyy"5E74"m"6708"	yyyy-mm-dd
35	m"6708"d"65E5"	yyyy-mm-dd
36	[\$-411]ge.m.d	yyyy"5E74" mm"6708" dd"65E5"
50	[\$-411]ge.m.d	yyyy"5E74" mm"6708" dd"65E5"
51	[\$-411]ggge"5E74"m"6708"d"65E5"	mm-dd
52	yyyy"5E74"m"6708"	yyyy-mm-dd
53	m"6708"d"65E5"	yyyy-mm-dd
54	[\$-411]ggge"5E74"m"6708"d"65E5"	mm-dd
55	yyyy"5E74"m"6708"	yyyy-mm-dd
56	m"6708"d"65E5"	yyyy-mm-dd
57	[\$-411]ge.m.d	yyyy"5E74" mm"6708" dd"65E5"
58	[\$-411]ggge"5E74"m"6708"d"65E5"	mm-dd

th-th

ID	th-th formatCode
59	t0
60	t0.00
61	t#,##0
62	t#,##0.00
67	t0%
68	t0.00%
69	t# ?/?

ID	th-th formatCode
70	t# ??/??
71	ว/ด/ปปปป
72	ว-ดดด-ปป
73	ว-ดดด
74	ดดด-ปป
75	ช:นน
76	ช:นน:ทท
77	ว/ด/ปปปป ช:นน
78	นน:ทท
79	[ช]:นน:ทท
80	นน:ทท.0
81	d/m/bb

th-th (with unicode values provided for language glyphs where they occur)

ID	th-th formatCode
59	t0
60	t0.00
61	t#,##0
62	t#,##0.00
67	t0%
68	t0.00%
69	t# ?/?
70	t# ??/??
71	0E27/0E14/0E1B0E1B0E1B0E1B
72	0E27-0E140E140E14-0E1B0E1B
73	0E27-0E140E140E14
74	0E140E140E14-0E1B0E1B
75	0E0A:0E190E19
76	0E0A:0E190E19:0E170E17
77	0E27/0E14/0E1B0E1B0E1B0E1B 0E0A:0E190E19

ID	th-th formatCode
78	0E190E19:0E170E17
79	[0E0A]:0E190E19:0E170E17
80	0E190E19:0E170E17.0
81	d/m/bb

Attributes	Description
formatCode (Number Format Code)	The number format code for this number format. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
numFmtId (Number Format Id)	Id used by the master style records (xf's) to reference this number format. The possible values for this attribute are defined by the ST_NumFmtId simple type (§18.18.47).

[Note: The W3C XML Schema definition of this element's content model ([CT_NumFmt](#)) is located in §A.2. *end note*]

18.8.31 numFmts (Number Formats)

This element defines the number formats in this workbook, consisting of a sequence of numFmt records, where each numFmt record defines a particular number format, indicating how to format and render the numeric value of a cell.

[Example:

This cell is formatting as US currency:

\$1.23

The XML expressing this format shows that the formatId is "166" and the decoded formatCode is \$#,##0.00

```
<numFmts count="1">
  <numFmt numFmtId="166" formatCode="&quot;$&quot;;#,##0.00"/>
</numFmts>
```

end example]

Number Format Codes

Up to four sections of format codes can be specified. The format codes, separated by semicolons, define the formats for positive numbers, negative numbers, zero values, and text, in that order. If only two sections are specified, the first is used for positive numbers and zeros, and the second is used for negative numbers. If only one section is specified, it is used for all numbers. To skip a section, the ending semicolon for that section shall be written.

`#,###.00_);[Red](#,###.00);0.00;"sales"@`
 Format for positive numbers Format for zeros
 Format for negative numbers Format for text

The first section, "Format for positive numbers", is the format code that applies to the cell when the cell value contains a positive number.

The second section, "Format for negative numbers", is the format code that applies to the cell when the cell value contains a negative number.

The third section, "Format for zeros", is the format code that applies to the cell when the cell value is zero.

The fourth, and last, section, "Format for text", is the format code that applies to the cell when the cell value is text.

The & (ampersand) text operator is used to join, or concatenate, two values.

The following table describes the different symbols that are available for use in custom number formats.

Format symbol	Description and result
0	Digit placeholder. [Example: If the value 8.9 is to be displayed as 8.90, use the format #.00 end example]
#	Digit placeholder. This symbol follows the same rules as the 0 symbol. However, the application shall not display extra zeros when the number typed has fewer digits on either side of the decimal than there are # symbols in the format. [Example: If the custom format is #.##, and 8.9 is in the cell, the number 8.9 is displayed. end example]
?	Digit placeholder. This symbol follows the same rules as the 0 symbol. However, the application shall put a space for insignificant zeros on either side of the decimal point so that decimal points are aligned in the column. [Example: The custom format 0.0? aligns the decimal points for the numbers 8.9 and 88.99 in a column. end example]
. (period)	Decimal point.
%	Percentage. If the cell contains a number between 0 and 1, and the custom format 0% is used, the application shall multiply the number by 100 and add the percentage symbol in the cell.
, (comma)	Thousands separator. The application shall separate thousands by commas if the format contains a comma that is enclosed by number signs (#) or by zeros. A comma that follows a placeholder scales the number by one thousand. [Example: If the format is #.0,, and the cell value is 12,200,000 then the number 12.2 is displayed. end example]

Format symbol	Description and result
E- E+ e- e+	Scientific format. The application shall display a number to the right of the "E" symbol that corresponds to the number of places that the decimal point was moved. [<i>Example</i> : If the format is 0.00E+00, and the value 12,200,000 is in the cell, the number 1.22E+07 is displayed. If the number format is #0.0E+0, then the number 12.2E+6 is displayed. <i>end example</i>]
\$-+():space	Displays the symbol. If it is desired to display a character that differs from one of these symbols, precede the character with a backslash (\). Alternatively, enclose the character in quotation marks. [<i>Example</i> : If the number format is (000), and the value 12 is in the cell, the number (012) is displayed. <i>end example</i>]
/	If this symbol is preceded and followed by a number symbol (0, #, and ?), it is interpreted as the fraction format symbol and will display the number in the format of a fraction. Otherwise, it is interpreted as the forward slash character and is displayed as such.
\	Displays the next character in the format. The application shall not display the backslash. [<i>Example</i> : If the number format is 0\!, and the value 3 is in the cell, the value 3! is displayed. <i>end example</i>]
*	Repeats the next character in the format enough times to fill the column to its current width. There shall not be more than one asterisk in one section of the format. If more than one asterisk appears in one section of the format, all but the last asterisk shall be ignored. [<i>Example</i> : if the number format is 0*x, and the value 3 is in the cell, the value 3xxxxxx is displayed. The number of x characters that are displayed in the cell varies based on the width of the column. <i>end example</i>]
_ (underline)	Skips the width of the next character. This is useful for lining up negative and positive values in different cells of the same column. [<i>Example</i> : The number format _(0.0_);(0.0) aligns the numbers 2.3 and -4.5 in the column even though the negative number is enclosed by parentheses. <i>end example</i>]
"text"	Displays whatever text is inside the quotation marks. [<i>Example</i> : The format 0.00 "dollars" displays 1.23 dollars when the value 1.23 is in the cell. <i>end example</i>]
@	Text placeholder. If text is typed in the cell, the text from the cell is placed in the format where the at symbol (@) appears. [<i>Example</i> : If the number format is "Bob "@ Smith" (including quotation marks), and the value "John" is in the cell, the value Bob John Smith is displayed. <i>end example</i>]

Text and spacing

Display both text and numbers

To display both text and numbers in a cell, enclose the text characters in double quotation marks (" ") or precede a single character with a backslash (\). Single quotation marks shall not be used to denote text. Characters inside double quotes, or immediately following backslash shall never be interpreted as part of the format code lexicon; instead they shall always be treated as literal strings. Remember to include the characters

in the appropriate section of the format codes. [Example: Use the format "\$0.00" Surplus";\$-0.00" Shortage" to display a positive amount as "\$125.74 Surplus" and a negative amount as "\$-125.74 Shortage." end example]

The following characters are displayed without the use of quotation marks.

\$	Dollar sign			-	Minus sign
+	Plus sign			/	Slash mark
(Left parenthesis)	Right parenthesis
:	Colon			!	Exclamation point
^	Circumflex accent (caret)			&	Ampersand
'	Apostrophe			~	Tilde
{	Left curly bracket			}	Right curly bracket
<	Less-than sign			>	Greater-than sign
=	Equal sign				Space character

Include a section for text entry

If included, a text section shall be the last section in the number format. Include an "at" sign (@) in the section, precisely where the cell's text value should be displayed. If the @ character is omitted from the text section, text typed in the cell will not be displayed. To always display specific text characters with the typed text, enclose the additional text in double quotation marks (" "). [Example: If "June" is typed into the cell, and the text format is "gross receipts for "@ , then the cell will display "gross receipts for June". end example]

If the format does not include a text section, text entered in a cell is not affected by the format code.

Add spaces

To create a space that is the width of a character in a number format, include an underscore, followed by the character. [Example: When an underscore is followed with a right parenthesis, such as _), positive numbers line up correctly with negative numbers that are enclosed in parentheses because positive numbers are displayed with a blank space after them exactly the width of the right parenthesis character. end example]

Repeat characters

To repeat the next character in the format to fill the column width, include an asterisk (*) in the number format. [Example: Use 0*- to include enough dashes after a number to fill the cell, or use *0 before any format to include leading zeros. end example]

Decimal places, spaces, colors, and conditions

Include decimal places and significant digits

To format fractions or numbers with decimal points, include the following digit placeholders in a section. If a number has more digits to the right of the decimal point than there are placeholders in the format, the number rounds to as many decimal places as there are placeholders. If there are more digits to the left of the decimal

point than there are placeholders, the extra digits are displayed. If the format contains only number signs (#) to the left of the decimal point, numbers less than 1 begin with a decimal point.

(number sign) displays only significant digits and does not display insignificant zeros.

0 (zero) displays insignificant zeros if a number has fewer digits than there are zeros in the format.

? (question mark) adds spaces for insignificant zeros on either side of the decimal point so that decimal points align when they are formatted with a fixed-width font, such as Courier New. ? can also be used for fractions that have varying numbers of digits.

To display	As	Use this code
1234.59	1234.6	####.#
8.9	8.900	#.000
.631	0.6	0.#
12 1234.568	12.0 1234.57	#.0#
44.398 102.65 2.8	44.398 102.65 2.8 (with aligned decimals)	???.???
5.25 5.3	5 1/4 5 3/10 (with aligned fractions)	# ???/???

Display a thousands separator

To display a comma as a thousands separator or to scale a number by a multiple of 1,000, include a comma in the number format.

To display	As	Use this code
12000	12,000	#,###
12000	12	#,
12200000	12.2	0.0,,

Specify colors

To set the text color for a section of the format, use the name of one of the following eight colors in square brackets in the section. The color code shall be the first item in the section.

[Black]			[Blue]			[Cyan]
---------	--	--	--------	--	--	--------

[Green]		[Magenta]		[Red]
[White]		[Yellow]		

Instead of using the name of the color, the color index can be used, like this [Color3] for Red. Numeric indexes for color are restricted to the range from 1 to 56, which reference by index to the legacy color palette.

[*Note:* the default legacy color palette values are listed in §18.8.27. In the format codes, [Color1] refers to the color associated with indexed="8", or black (by default), [Color2] refers to the color associated with indexed="9", or white (by default), and so on up to [Color56] referring to the color associated with indexed="63". If the color palette has been customized from default values, then the colors associated with these indexes will reflect those customizations.

Specify conditions

To set number formats that are applied only if a number meets a specified condition, enclose the condition in square brackets. The condition consists of a comparison operator and a value. Comparison operators include: = Equal to; > Greater than; < Less than; >= Greater than or equal to, <= Less than or equal to, and <> Not equal to. [*Example:* The following format displays numbers that are less than or equal to 100 in a red font and numbers that are greater than 100 in a blue font.

[Red][<=100];[Blue][>100]

end example]

If the cell value does not meet any of the criteria, then pound signs ("#") are displayed across the width of the cell.

Currency, percentages, and scientific notation

Include currency symbols

To include currency symbols, place the currency symbol in the location it should when displayed.

Display percentages

To display numbers as a percentage of 100 — [*Example:* To display .08 as 8% or 2.8 as 280% *end example]*— include the percent sign (%) in the number format.

Display scientific notations

To display numbers in scientific format, use exponent codes in a section — [*Example:* E-, E+, e-, or e+. *end example]*

If a format contains a zero (0) or number sign (#) to the right of an exponent code, the application displays the number in scientific format and inserts an "E" or "e". The number of zeros or number signs to the right of a code

determines the number of digits in the exponent. "E-" or "e-" places a minus sign by negative exponents. "E+" or "e+" places a minus sign by negative exponents and a plus sign by positive exponents.

Dates and times

Display days, months, and years

To display	As	Use this code
Months	1–12	m
Months	01–12	mm
Months	Jan–Dec	mmm
Months	January–December	mmmm
Months	J–D	mmmmm
Days	1–31	d
Days	01–31	dd
Days	Sun–Sat	ddd
Days	Sunday–Saturday	dddd
Years	00–99	yy
Years	date-base minimum value –9999	yyyy

See §18.17.4.1 for details on possible date systems.

Month versus minutes

If "m" or "mm" code is used immediately after the "h" or "hh" code (for hours) or immediately before the "ss" code (for seconds), the application shall display minutes instead of the month.

Display hours, minutes, and seconds

To display	As	Use this code
Hours	0–23	h

Hours	00–23	hh
Minutes	0–59	m
Minutes	00–59	mm
Seconds	0–59	s
Seconds	00–59	ss
Time	4 AM	h AM/PM
Time	4:36 PM	h:mm AM/PM
Time	4:36:03 P	h:mm:ss A/P
Time	4:36:03.75	h:mm:ss.00
Elapsed time (hours and minutes)	1:02	[h]:mm
Elapsed time (minutes and seconds)	62:16	[mm]:ss
Elapsed time (seconds and hundredths)	3735.80	[ss].00

Minutes versus month

The "m" or "mm" code shall appear immediately after the "h" or "hh" code or immediately before the "ss" code; otherwise, these will display as the month instead of minutes.

AM and PM

If the format contains AM or PM, the hour is based on the 12-hour clock, where "AM" or "A" indicates times from midnight until noon and "PM" or "P" indicates times from noon until midnight. Otherwise, the hour is based on the 24-hour clock.

Illegal date and time values

Cells formatted with a date or time format and which contain date or time values which do not meet the requirements specified shall show the pound sign ("#") across the width of the cell.

International Considerations

Format Code	Description
r	ja-jp/zh-tw only. When loading in ja-jp locale, code becomes "ee". When loading in zh-tw locale, code becomes "e".
rr	ja-jp/zh-tw only. When loading in ja-jp locale, code becomes "gggee". When loading in zh-tw locale, code becomes "e".
g	When loading in ja-jp locale: Single Roman character emperor reign When loading in zh-tw (Taiwan only) locale: treat same as "gg".
gg	When loading in ja-jp locale: Single Kanji character emperor reign When loading in zh-tw locale: Last era short name (since 1911)
ggg	When loading in ja-jp locale: Tow Kanji character emperor reign When loading in zh-tw locale: Last era long name (since 1911)
e	When loading in ja-jp locale: Era year When lading in zh-tw (Taiwan only) locale: Era year since 1912. If preceded by "g", "gg", or "ggg" then year of 1912, and years before 1912 are special, otherwise years before 1912 are Gregorian. OTHER locales: becomes "yyyy"
ee	When loading in ja-jp locale: Era year w/ leading zero When loading in zh-tw (Taiwan only) locale: Era year since 1911 OTHER locales: becomes "yy"
b2	Hijri calander
b1	Gregorian calendar
[\$USD-409]	Specifies currency and locale/date system/number system information. Syntax is [\$<Currency String>-<language info>]. Currency string is a string to use as a currency symbol. Language info is a 32-bit value entered in hexadecimal format. Language info format (byte 3 is most significant byte): Bytes 0,1: 16-bit Language ID (LID). Byte 2: Calendar type. High bit indicates that input is parsed using specified calendar. Byte 3: Number system type. High bit indicates that input is parsed using specified number system.

Format Code	Description
	Special language info values: 0xf800: System long date format 0xf400: System time format

Attributes	Description
count (Number Format Count)	Count of number format elements. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_NumFmts](#)) is located in §A.2. *end note*]

18.8.32 patternFill (Pattern)

This element is used to specify cell fill information for pattern and solid color cell fills. For solid cell fills (no pattern), fgColor is used. For cell fills with patterns specified, then the cell fill color is specified by the bgColor element.

Attributes	Description
patternType (Pattern Type)	Specifies the fill pattern type (including solid and none) Default is none, when missing. The possible values for this attribute are defined by the ST_PatternType simple type (§18.18.55).

[Note: The W3C XML Schema definition of this element's content model ([CT_PatternFill](#)) is located in §A.2. *end note*]

18.8.33 protection (Protection Properties)

Contains protection properties associated with the cell. Each cell has protection properties that can be set. The cell protection properties do not take effect unless the sheet has been protected.

Attributes	Description
hidden (Hidden Cell)	A boolean value indicating if the cell is hidden. When the cell is hidden and the sheet on which the cell resides is protected, then the cell value is displayed in the cell grid location, but the contents of the cell will not be displayed in the formula bar. This is true for all types of cell content, including formula, text, or numbers. Therefore the cell A4 can contain a formula "=SUM(A1:A3)", but if the cell protection

Attributes	Description
	<p>property of A4 is marked as hidden, and the sheet is protected, then the cell should display the calculated result [<i>Example: "6" end example</i>], but will not display the formula used to calculate the result.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
locked (Cell Locked)	<p>A boolean value indicating if the cell is locked. When cells are marked as "locked" and the sheet is protected, then the options specified in the Sheet Part's sheetProtection element (§18.3.1.85) are prohibited for these cells.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note: The W3C XML Schema definition of this element's content model ([CT_CellProtection](#)) is located in §A.2. end note*]

18.8.34 rgbColor (RGB Color)

A single ARGB entry for the corresponding color index.

Attributes	Description
rgb (Alpha Red Green Blue)	<p>Color value expressed in Alpha Red Green Blue format (ARGB).</p> <p>The possible values for this attribute are defined by the ST_UnsignedIntHex simple type (§18.18.86).</p>

[*Note: The W3C XML Schema definition of this element's content model ([CT_RgbColor](#)) is located in §A.2. end note*]

18.8.35 scheme (Scheme)

Defines the font scheme, if any, to which this font belongs. When a font definition is part of a theme definition, then the font is categorized as either a major or minor font scheme component. When a new theme is chosen, every font that is part of a theme definition is updated to use the new major or minor font definition for that theme. Usually major fonts are used for styles like headings, and minor fonts are used for body and paragraph text.

Attributes	Description
val (Font Scheme)	<p>Sets font scheme property.</p> <p>The possible values for this attribute are defined by the ST_FontScheme simple type (§18.18.33).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FontScheme](#)) is located in §A.2. *end note*]

18.8.36 shadow (Shadow)

Macintosh compatibility setting. Represents special word/character rendering on Macintosh, when this flag is set. The effect is to render a shadow behind, beneath and to the right of the text. SpreadsheetML applications are not required to render according to this flag.

Attributes	Description
val (Value)	<p>A boolean value for the property specified by the parent XML element.</p> <p>If omitted, the default value is true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_BooleanProperty](#)) is located in §A.2. *end note*]

18.8.37 start (Leading Edge Border)

This element specifies the color and line style for the leading edge border of a cell (i.e., the left border for left-to-right cells and the right border for right-to-left cells).

Attributes	Description
style (Line Style)	<p>The line style for this border.</p> <p>The possible values for this attribute are defined by the ST_BorderStyle simple type (§18.18.3).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_BorderPr](#)) is located in §A.2. *end note*]

18.8.38 stop (Gradient Stop)

One of a sequence of two or more gradient stops, constituting this gradient fill.

Attributes	Description
position (Gradient Stop Position)	<p>Position information for this gradient stop. Interpreted exactly like gradientFill left, right, bottom, top. The position indicated here indicates the point where the color is pure. Before and after this position the color can be in transition (or pure, depending on if this is the last stop or not).</p> <p>The possible values for this attribute are defined by the W3C XML Schema double</p>

Attributes	Description
	datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_GradientStop](#)) is located in §A.2. *end note*]

18.8.39 styleSheet (Style Sheet)

This is the root element of the Styles part.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Stylesheet](#)) is located in §A.2. *end note*]

18.8.40 tableStyle (Table Style)

This element represents a single table style definition that indicates how a spreadsheet application should format and display a table.

Each of the tableStyle elements contains a collection of tableStyleElement elements that define formatting for a particular region of the table.

Annex G contains a listing of table styles whose tableStyleElement elements are implied rather than explicitly saved in the file. In this case, a name attribute is written on the tableStyle record, but no corresponding tableStyleElement elements are written.

All of the built-in, named table styles defined in Annex D shall be supported by applications that implement table styles.

[*Note:* Each of the table styles is made up of a collection of formatting definitions, each of which corresponds to a particular structured region of the table. An application can decide to support these built-in types, and can also decide to define more styles, each with their own definitions. An application can also decide whether the user is allowed to customize or further define additional table styles. *end note*]

Attributes	Description
count (Table Style Count)	Count of table style elements defined for this table style. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
name (Table Style Name)	Name of this table style. The possible values for this attribute are defined by the W3C XML Schema string datatype.
pivot (Pivot Style)	'True' if this table style should be shown as an available pivot table style. Not mutually exclusive with table - both can be true.

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
table (Table)	<p>True if this table style should be shown as an available table style.</p> <p>Not mutually exclusive with pivot - both can be true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TableStyle](#)) is located in §A.2. *end note*]

18.8.41 tableStyleElement (Table Style)

This element specifies formatting for one area of a table or PivotTable. Together the sequence of these elements makes up one entire Table style or PivotTable style definition.

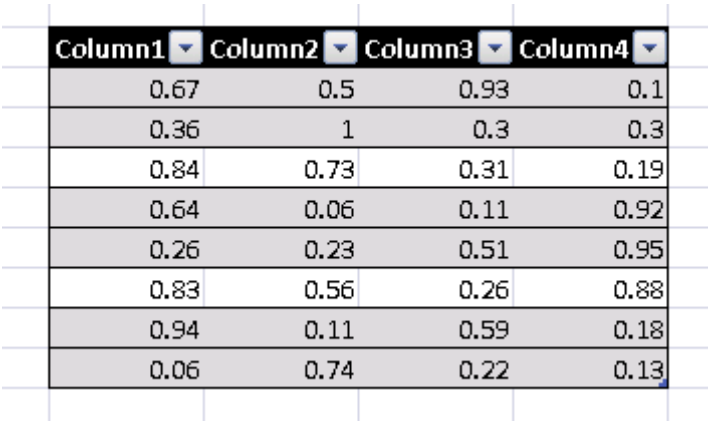
The order in which table style element formatting is applied is as follows:

Table Style Element Order

- Whole Table
 - First Column Stripe
 - Second Column Stripe
 - First Row Stripe
 - Second Row Stripe
 - Last Column
 - First Column
 - Header Row
 - Total Row
 - First Header Cell
 - Last Header Cell
 - First Total Cell
 - Last Total Cell
1. For instance, row stripe formatting 'wins' over column stripe formatting, and both 'win' over whole table formatting.
1. **PivotTable Style Element Order**
 - Whole Table

- Page Field Labels
- Page Field Values
- First Column Stripe
- Second Column Stripe
- First Row Stripe
- Second Row Stripe
- First Column
- Header Row
- First Header Cell
- Subtotal Column 1
- Subtotal Column 2
- Subtotal Column 3
- Blank Row
- Subtotal Row 1
- Subtotal Row 2
- Subtotal Row 3
- Column Subheading 1
- Column Subheading 2
- Column Subheading 3
- Row Subheading 1
- Row Subheading 2
- Row Subheading 3
- Grand Total Column
- Grand Total Row

Attributes	Description
dxfld (Formatting Id)	<p>Zero-based index to a dxf record in the dxfs collection, specifying differential formatting to use with this Table or PivotTable style element.</p> <p>The possible values for this attribute are defined by the ST_Dxfld simple type (§18.18.25).</p>
size (Band Size)	<p>Number of rows or columns in a single band of striping. Applies only when type is firstRowStripe, secondRowStripe, firstColumnStripe, or secondColumnStripe.</p> <p><i>[Example:</i></p> <p>In this example, the firstRowStripe size is set to 2, and the secondRowStripe size is set to 1:</p>

Attributes	Description
	 <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
type (Table Style Type)	<p>Identifies this table style element's type.</p> <p>The possible values for this attribute are defined by the ST_TableStyleType simple type (§18.18.77).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TableStyleElement](#)) is located in §A.2. *end note*]

18.8.42 tableStyles (Table Styles)

This element represents a collection of Table style definitions for Table styles and PivotTable styles used in this workbook. It consists of a sequence of tableStyle records, each defining a single Table style.

A Table style is a collection of formatting that applies to structured regions of a Table or PivotTable [*Example*: make the header row & totals bold face, and apply light gray fill to alternating rows in the data portion of the table to achieve striped or banded rows. *end example*]

See the enumeration values in ST_TableStyleType for a listing of structured Table regions to which formatting can be applied, and which together make up a single Table style definition.

Attributes	Description
count (Table Style Count)	<p>Count of table styles defined in this collection.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
defaultPivotStyle (Default Pivot Style)	<p>Name of the default table style to apply to new PivotTables. This can be set by the user interface.</p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema string datatype.
defaultTableStyle (Default Table Style)	Name of default table style to apply to new Tables. This can be set by the user interface. The possible values for this attribute are defined by the W3C XML Schema string datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TableStyles](#)) is located in §A.2. *end note*]

18.8.43 top (Top Border)

This element specifies the color and line style for the top border of a cell.

Attributes	Description
style (Line Style)	The line style for this border. The possible values for this attribute are defined by the ST_BorderStyle simple type (§18.18.3).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_BorderPr](#)) is located in §A.2. *end note*]

18.8.44 vertical (Vertical Inner Border)

This element specifies the color and line style for the vertical inner border(s) of a range of cells. Used in the context of dxf elements only. [*Example:* see the borders definitions for **TableStyleMedium28**. *end example*]

Attributes	Description
style (Line Style)	The line style for this border. The possible values for this attribute are defined by the ST_BorderStyle simple type (§18.18.3).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_BorderPr](#)) is located in §A.2. *end note*]

18.8.45 xf (Format)

A single xf element describes all of the formatting for a cell.

Attributes	Description
applyAlignment (Apply Alignment)	<p>A boolean value indicating whether the alignment formatting specified for this xf should be applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
applyBorder (Apply Border)	<p>A boolean value indicating whether the border formatting specified for this xf should be applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
applyFill (Apply Fill)	<p>A boolean value indicating whether the fill formatting specified for this xf should be applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
applyFont (Apply Font)	<p>A boolean value indicating whether the font formatting specified for this xf should be applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
applyNumberFormat (Apply Number Format)	<p>A boolean value indicating whether the number formatting specified for this xf should be applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
applyProtection (Apply Protection)	<p>A boolean value indicating whether the protection formatting specified for this xf should be applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
borderId (Border Id)	<p>Zero-based index of the border record used by this cell format.</p> <p>The possible values for this attribute are defined by the ST_BorderId simple type (§18.18.2).</p>
fillId (Fill Id)	<p>Zero-based index of the fill record used by this cell format.</p> <p>The possible values for this attribute are defined by the ST_FillId simple type (§18.18.30).</p>
fontId (Font Id)	<p>Zero-based index of the font record used by this cell format.</p> <p>The possible values for this attribute are defined by the ST_FontId simple type (§18.18.32).</p>
numFmtId	<p>Id of the number format (numFmt) record used by this cell format.</p>

Attributes	Description
(Number Format Id)	The possible values for this attribute are defined by the ST_NumFmtId simple type (§18.18.47).
pivotButton (Pivot Button)	<p>A boolean value indicating whether the cell rendering includes a pivot table dropdown button.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
quotePrefix (Quote Prefix)	<p>A boolean value indicating whether the text string in a cell should be prefixed by a single quote mark (e.g., 'text). In these cases, the quote is not stored in the Shared Strings Part.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
xfId (Format Id)	<p>For xf records contained in cellXfs this is the zero-based index of an xf record contained in cellStyleXfs corresponding to the cell style applied to the cell.</p> <p>Not present for xf records contained in cellStyleXfs.</p> <p>The possible values for this attribute are defined by the ST_CellStyleXfId simple type (§18.18.10).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Xf](#)) is located in §A.2. *end note*]

18.9 Metadata

A cell in a spreadsheet application can have metadata associated with it. Metadata is just a set of additional properties about the particular cell, and this metadata is stored in the metadata xml part.

There are two types of metadata: cell metadata and value metadata. Cell metadata contains information about the cell itself, and this metadata can be carried along with the cell as it moves (insert, shift, copy/paste, merge, unmerge, etc). Value metadata is information about the value of a particular cell. Value metadata properties can be propagated along with the value as it is referenced in formulas.

The file format is architected such that it supports both value and cell metadata, as well as even allowing for future extensions. Formulas, such as CUBEMEMBER() or CUBE*, shall make use of value metadata as part of the SpreadsheetML standard. So, only value metadata shall be implemented as it is used by MDX cube functions for retrieving data from OLAP data sources. The other parts are allowed for future extensibility.

See the informative material for background information on OLAP and the various CUBE* functions.

[Example: The CUBEMEMBER() function is used to return a specific member from an OLAP cube. The metadata will express the connection name (used as a friendly identifier for the external data connection to the OLAP server and cube), the MDX statement retrieving that member, and a set of operational attributes of the

metadata that specify how it behaves in the spreadsheet application (i.e., whether it propagates through formula assignment, is able to be copy/pasted, etc).

```
<metadata xmlns="http://purl.oclc.org/ooxml/spreadsheetml/main">
  <metadataTypes count="1">
    <metadataType name="XLMDX" minSupportedVersion="120000" copy="1"
      pasteAll="1" pasteValues="1" merge="1" splitFirst="1" rowColShift="1"
      clearFormats="1" clearComments="1" assign="1" coerce="1"/>
  </metadataTypes>
  <metadataStrings count="2">
    <s v="My Connection"/>
    <s v="[Measures].[Internet Sales Amount]"/>
  </metadataStrings>
  <mdxMetadata count="1">
    <mdx n="0" f="m">
      <t c="1">
        <n x="1"/>
      </t>
    </mdx>
  </mdxMetadata>
  <valueMetadata count="1">
    <bk>
      <rc t="1" v="0"/>
    </bk>
  </valueMetadata>
</metadata>
```

As seen above, the metadata string table contains two entries: the name of the connection (My Connection), and the expression that returns the Internet Sales Amount member from the cube. The metadataType specifies that the metadata persists with assignment, cell merging, copy/pasting, shifting rows/columns, when the formatting or comments are deleted from the cell, and is assigned to the upper left most cell if a merged cell is split. In the valueMetadata collection, the metadata block specifies that the first metadataType is used, and indexes the first (0th) entry in the mdxMetadata collection. This MDX element in the mdxMetadata collection in turn specifies the cube function type (m= cube member) and an index into the string table that specifies the connection name. It also contains a tuple (t) element which specifies, via index into the string table, which tuple is returned. *end example*

[Note: When copying a cell with metadata, and the cell contains an array formula, each pasted cell must contain the value from the corresponding position in the array and should contain the metadata corresponding to that cell. *end note*]

18.9.1 bk (Metadata Block)

This element represents a block of metadata records.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_MetadataBlock](#)) is located in §A.2. *end note*]

18.9.2 **bk (Future Metadata Block)**

This element represents a block of future metadata information. This is a location for storing feature extension information.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FutureMetadataBlock](#)) is located in §A.2. *end note*]

18.9.3 **cellMetadata (Cell Metadata)**

This element represents cell metadata information. Cell metadata is information metadata about a specific cell, and it stays tied to that cell position.

[*Note:* Applications should not use this for storing metadata, but instead use `valueMetadata`. Cell metadata is included for storing information from future application. *end note*]

Attributes	Description
count (Metadata Block Count)	Number of blocks of metadata records. The possible values for this attribute are defined by the W3C XML Schema <code>unsignedInt</code> datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_MetadataBlocks](#)) is located in §A.2. *end note*]

18.9.4 **futureMetadata (Future Metadata)**

This element represents future metadata information.

Future data storage areas are xml storage areas that a later version of the spreadsheet application can store data into. So a V2 spreadsheet application can store data for new features that don't exist in the V1 version in a future storage area when saving to a format that the V1 version can open. The V1 version might be able to open the file, but won't necessarily be able to understand data that is stored in a future storage area. So the V1 version might ignore this data, but still round trip it in the file format so that V2 and V1 users can collaborate on the same spreadsheet.

Attributes	Description
count (Future Metadata Block Count)	Number of future metadata blocks. The possible values for this attribute are defined by the W3C XML Schema <code>unsignedInt</code> datatype.
name (Metadata	Metadata type name.

Attributes	Description
Type Name)	The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element's content model ([CT_FutureMetadata](#)) is located in §A.2. *end note*]

18.9.5 k (KPI MDX Metadata)

This element represents key performance indicator (KPI) MDX metadata. A KPI is typically an image that represents the state of some specific business measure at a given point in time. For instance, an image of a green traffic light indicating that customer satisfaction is good.

Attributes	Description
n (Member Unique Name Index)	Index of member unique name in string store. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
np (KPI Index)	Index of key performance indicator name in string store. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
p (KPI Property)	Key performance indicator property. The possible values for this attribute are defined by the ST_MdxKPIProperty simple type (§18.18.45).

[Note: The W3C XML Schema definition of this element's content model ([CT_MdxKPI](#)) is located in §A.2. *end note*]

18.9.6 mdx (MDX Metadata Record)

This element represents a single record of MDX metadata information which can express a tuple, KPI, set, or member property.

Attributes	Description
f (Cube Function Tag)	This is an enumeration representing the function type of the calling cube function from the spreadsheet. The possible values for this attribute are defined by the ST_MdxFunctionType simple type (§18.18.44).
n (Connection	The zero based index of connection name in metadata string store, <code>metadataStrings</code> .

Attributes	Description
Name Index)	The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Mdx](#)) is located in §A.2. *end note*]

18.9.7 mdxMetadata (MDX Metadata Information)

This element represents a collection of specific MDX metadata records for the spreadsheet. This is used to build up the members, sets, tuples, KPIs, and member properties for the spreadsheet.

Attributes	Description
count (MDX Metadata Record Count)	Number of MDX metadata metadata records. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_MdxMetadata](#)) is located in §A.2. *end note*]

18.9.8 metadata (Metadata)

This element represents the root node for all metadata information in the spreadsheet.

[Note: The W3C XML Schema definition of this element's content model ([CT_Metadata](#)) is located in §A.2. *end note*]

18.9.9 metadataStrings (Metadata String Store)

This element represents the metadata string store. This is a collection of strings that are used as a resource for the rest of the metadata part. It contains all the required OLAP strings used in the spreadsheet including the connection name, as well as MDX expressions identifying specific members and sets. It is indexed from individual metadata records so that the records can use these strings to build up the necessary MDX statements to retrieve the correct data from the OLAP cube.

Attributes	Description
count (MDX Metadata String Count)	Number of records in the string store. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_MetadataStrings](#)) is located in §A.2.
end note]

18.9.10 metadataType (Metadata Type Information)

This element represents information about metadata on cells - it defines a specific set of behaviors that the metadata shall adhere to when subject to other spreadsheet operations.

In general, many of these attributes represent operations that can be performed on a cell that allow the metadata to remain associated with the cell. Operations that are set to 0 or false, will cause the metadata to be disassociated from the cell when that operation is performed.

Attributes	Description
adjust (Adjust Metadata)	<p>A Boolean flag indicating that metadata corresponding to a particular cell needs to be notified when that cell's location is changed.</p> <p>[Note: This is included in the file format for future extensibility.end note]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
assign (Metadata Formula Assignment)	<p>A Boolean flag indicating whether metadata is propagated by formula assignment operation. True when metadata should be propagated by assignment, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
cellMeta (Cell Metadata)	<p>A Boolean flag indicating whether metadata is cell metadata. True when the metadata is cell metadata, false otherwise - in the false case it is considered to be value metadata.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
clearAll (Metadata Clear All)	<p>A Boolean flag indicating whether metadata survives a "Clear: All" operation. True if the metadata persists after a clear all, false otherwise.</p> <p>The Clear operations can be implemented by the run time application to provide an easy way to allow users to delete everything from a cell (Clear: All), remove only comments (Clear: Comments), only remove formats (Clear: Formats), or only remove the contents but leave the comments and formatting (Clear: Contents). Note these operations can also be performed by the user manually deleting each item.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
clearComments (Metadata Clear Comments)	<p>A Boolean flag indicating whether metadata remains after comments have been cleared from the cell. True if the metadata persists after Clear:Comments, false otherwise.</p> <p>The Clear operations can be implemented by the run time application to provide an easy way to allow users to delete everything from a cell (Clear: All), remove only comments</p>

Attributes	Description
	<p>(Clear: Comments), only remove formats (Clear: Formats), or only remove the contents but leave the comments and formatting (Clear: Contents). Note these operations can also be performed by the user manually deleting each item.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
clearContents (Metadata Clear Contents)	<p>A Boolean flag indicating whether metadata remains after the contents of a cell are removed. True if metadata persists after a "Clear: Contents" action, false otherwise.</p> <p>The Clear operations can be implemented by the run time application to provide an easy way to allow users to delete everything from a cell (Clear: All), remove only comments (Clear: Comments), only remove formats (Clear: Formats), or only remove the contents but leave the comments and formatting (Clear: Contents). Note these operations can also be performed by the user manually deleting each item.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
clearFormats (Metadata Clear Formats)	<p>A Boolean flag indicating whether metadata remains after formatting is removed from a cell. True if metadata persists after a "Clear: Formats", false otherwise.</p> <p>The Clear operations can be implemented by the run time application to provide an easy way to allow users to delete everything from a cell (Clear: All), remove only comments (Clear: Comments), only remove formats (Clear: Formats), or only remove the contents but leave the comments and formatting (Clear: Contents). Note these operations can also be performed by the user manually deleting each item.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
coerce (Metadata Coercion)	<p>A Boolean flag indicating whether value metadata can be removed when this metadata data type is coerced to another data type. True if the value metadata is removed upon coercion, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
copy (Metadata Copy)	<p>A Boolean flag indicating whether metadata is copied with a cell. True if the metadata is copied to other cells when this cell is copied, false otherwise.</p> <p>This shall be set to true if the paste attributes for the metadataType are going to be used.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
delete (Metadata Cell Value Delete)	<p>A Boolean flag indicating whether metadata survives deletion of a cell value. True when the metadata persists after the deletion of a cell value, false otherwise.</p>

Attributes	Description
	<p>This attribute is equivalent to the <code>clearContents</code> attribute.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
edit (Metadata Edit)	<p>A Boolean flag indicating whether metadata survives the editing of the cell's value. True if the metadata remains unchanged after the cell's value edit, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
ghostCol (Metadata Ghost Column)	<p>A Boolean flag indicating whether metadata is copied to/from a ghost column. True when the metadata is copied to/from a ghost column, false otherwise.</p> <p>A ghost column is a single column that exists for the row header. It is not displayed to the end user. It is used to store default formatting for an entire row (i.e. the row gets the formatting for the corresponding cell in the ghost column). For instance, when an entire row is selected and a cell color is applied, this is stored once for the cell in the ghost column instead of for each cell in the row.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
ghostRow (Metadata Ghost Row)	<p>A Boolean flag indicating whether metadata is copied to/from a ghost row. True when the metadata is copied to/from a ghost row, false otherwise.</p> <p>A ghost row is a single row that exists for the column header. It is not displayed to the end user. It is used to store default formatting for an entire column (i.e. the column gets the formatting for the corresponding cell in the ghost row). For instance, when an entire column is selected and a cell color is applied, this is stored once for the cell in the ghost row instead of for each cell in the column.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
merge (Metadata Merge)	<p>A Boolean flag indicating whether metadata survives cell merge. True if the metadata persists after a cell merge, false otherwise.</p> <p>It is up to the spreadsheet application on how to deal with conflicts when two cells that each have metadata are merged. The guidance here is to treat it the same as a 'regular' cell merge with the default behavior being that the data in the upper left cell wins.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
minSupportedVersion (Minimum Supported Version)	<p>The earliest version of the spreadsheet application that supports this metadata type.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt</p>

Attributes	Description
	datatype.
name (Metadata Type Name)	<p>Represents the name of this particular metadata type. This name shall be unique amongst all other metadataTypes.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
pasteAll (Metadata Paste All)	<p>A Boolean flag indicating whether metadata is populated to a new cell by "Paste: All". True when the metadata is populated on a Paste:All, false otherwise. Paste:All and regular paste should be implemented so that they are equivalent by the spreadsheet application.</p> <p>The copy flag shall be set to true for this paste behavior to be respected.</p> <p>[Note: the spreadsheet application can implement special pasting behavior, such as pasting everything from a cell (paste all/normal paste), pasting only borders, pasting only comments, or pasting only any other specific cell property. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
pasteBorders (Metadata Paste Borders)	<p>A Boolean flag indicating whether metadata is populated with Paste: Borders. True when the metadata is populated when only borders are pasted, false otherwise.</p> <p>The copy flag shall be set to true for this paste behavior to be respected.</p> <p>[Note: The spreadsheet application can implement special pasting behavior, such as pasting everything from a cell (paste all/normal paste), pasting only borders, pasting only comments, or pasting only any other specific cell property. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
pasteColWidths (Metadata Paste Column Widths)	<p>A Boolean flag indicating whether metadata is populated by Paste: Column Widths. True if the metadata is populated when only column widths are pasted, false otherwise.</p> <p>The copy flag shall be set to true for this paste behavior to be respected.</p> <p>[Note: the spreadsheet application can implement special pasting behavior, such as pasting everything from a cell (paste all/normal paste), pasting only borders, pasting only comments, or pasting only any other specific cell property. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
pasteComments (Metadata Paste Comments)	<p>A Boolean flag indicating whether metadata is populated by Paste: Comments. True when metadata is populated when only comments are pasted, false otherwise.</p>

Attributes	Description
	<p>The copy flag shall be set to true for this paste behavior to be respected.</p> <p>[<i>Note</i>: the spreadsheet application can implement special pasting behavior, such as pasting everything from a cell (paste all/normal paste), pasting only borders, pasting only comments, or pasting only any other specific cell property. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
pasteDataValidation (Metadata Paste Data Validation)	<p>A Boolean flag indicating whether metadata is populated by Paste: Validation. True when metadata is populated when only data validation is pasted, false otherwise.</p> <p>The copy flag shall be set to true for this paste behavior to be respected.</p> <p>[<i>Note</i>: the spreadsheet application can implement special pasting behavior, such as pasting everything from a cell (paste all/normal paste), pasting only borders, pasting only comments, or pasting only any other specific cell property. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
pasteFormats (Metadata Paste Formats)	<p>A Boolean flag indicating whether metadata is populated by Paste Special: Formats. True when metadata is populated when only formatting is pasted, false otherwise.</p> <p>The copy flag shall be set to true for this paste behavior to be respected.</p> <p>[<i>Note</i>: the spreadsheet application can implement special pasting behavior, such as pasting everything from a cell (paste all/normal paste), pasting only borders, pasting only comments, or pasting only any other specific cell property. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
pasteFormulas (Metadata Paste Formulas)	<p>A Boolean flag indicating whether metadata is populated by Paste: Formulas. True when the metadata is populated when only formulas are pasted, false otherwise.</p> <p>The copy flag shall be set to true for this paste behavior to be respected.</p> <p>[<i>Note</i>: the spreadsheet application can implement special pasting behavior, such as pasting everything from a cell (paste all/normal paste), pasting only borders, pasting only comments, or pasting only any other specific cell property. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
pasteNumberFormats (Metadata Paste Number Formats)	<p>A Boolean flag indicating whether metadata is populated with Paste: Number Formats. True when metadata is populated when only number formatting is pasted, false otherwise.</p>

Attributes	Description
	<p>The copy flag shall be set to true for this paste behavior to be respected.</p> <p>[<i>Note</i>: the spreadsheet application can implement special pasting behavior, such as pasting everything from a cell (paste all/normal paste), pasting only borders, pasting only comments, or pasting only any other specific cell property. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
pasteValues (Metadata Paste Special Values)	<p>A Boolean flag indicating whether metadata is populated by Paste: Values.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
rowColShift (Metadata Insert Delete)	<p>A Boolean flag indicating whether metadata survives shifting due to row/column insertion/deletion. True if the metadata persists after the cell has been shifted, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
splitAll (Metadata Split All)	<p>A Boolean flag indicating whether a merged cell split action has its metadata copied to all of the resulting cells. True if the metadata is copied to all new cells resulting from a split, false otherwise.</p> <p>If <code>splitFirst</code> is also set to true, <code>splitAll</code> wins - that is all the cells shall have the metadata copied to them.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
splitFirst (Metadata Split First)	<p>A Boolean flag indicating whether when a merged cell is split its metadata is copied to only the first resulting cell. True when the metadata from a split cell is only copied to the first resulting cell, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_MetadataType](#)) is located in §A.2. *end note*]

18.9.11 metadataTypes (Metadata Types Collection)

This element is a collection of metadata types.

Attributes	Description
count (Metadata	Number of metadata types.

Attributes	Description
Type Count)	The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_MetadataTypes](#)) is located in §A.2. end note]

18.9.12 ms (Set MDX Metadata)

This element represents an MDX set.

Attributes	Description
c (Sort By Member Index Count)	Number of sort-by member indices. This is essentially the number of coordinates in the cube that this member is defined by. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
ns (Set Definition Index)	Zero based index of the set definition in the metadata string store. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
o (Set Sort Order)	An enumeration specifying what sort order is used to sort the set. The possible values for this attribute are defined by the ST_MdxSetOrder simple type (§18.18.46).

[Note: The W3C XML Schema definition of this element's content model ([CT_MdxSet](#)) is located in §A.2. end note]

18.9.13 n (Member Unique Name Index)

This element represents an index of a member unique name in metadata string store that is used to define the sort-by set.

Attributes	Description
s (String is a Set)	A Boolean flag indicating whether this string represents a set. True if the string represents a set, false otherwise. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
x (Index Value)	Value of the zero based index.

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_MetadataStringIndex](#)) is located in §A.2. end note]

18.9.14 p (Member Property MDX Metadata)

This element represents an MDX member property.

Attributes	Description
n (Member Unique Name Index)	The zero based index of member unique name in the metadata string store. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
np (Property Name Index)	The zero based index of the property name in metadata string store. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_MdxMemeberProp](#)) is located in §A.2. end note]

18.9.15 rc (Metadata Record)

This element represents a reference to a specific metadata record.

Attributes	Description
t (Metadata Record Type Index)	A 1-based index to the metadata record type in metadataTypes. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
v (Metadata Record Value Index)	A zero based index to a specific metadata record. If the corresponding metadataType has name="XLMDX", then this is an index to a record in mdxMetadata, otherwise this is an index to a record in the futureMetadata section whose name matches the name of the metadataType. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_MetadataRecord](#)) is located in §A.2. end note]

18.9.16 t (Tuple MDX Metadata)

This element represents an MDX tuple. A tuple is the intersection of two or more members of distinct dimensions in the cube. For instance, the three members (product, City, month) that are used to show the data point for how many products were sold.

The spreadsheet application should allow the values for the attributes of this element to be specified by the OLAP server.

Attributes	Description
b (Server Formatting Bold Font)	<p>A Boolean flag indicating whether the bold style is applied. True if bold shall be applied, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
bc (Server Formatting Background Color)	<p>Specifies the background color in RGB values. It is in hex and is read in the form of 0x00RRGGBB.</p> <p>The possible values for this attribute are defined by the ST_UnsignedIntHex simple type (§18.18.86).</p>
c (Member Index Count)	<p>The number of member expressions in the tuple.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
ct (Server Formatting Culture Currency)	<p>The culture tag to use for currency number format.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
fc (Server Formatting Foreground Color)	<p>Represents the foreground color in RGB. It is in hex and is read in the form of 0x00RRGGBB.</p> <p>The possible values for this attribute are defined by the ST_UnsignedIntHex simple type (§18.18.86).</p>
fi (Server Formatting Built-In Number Format Index)	<p>Server formatting built-in number format index. This is an index into the spreadsheet application's built in number formats that is used to specify formatting.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
i (Server Formatting Italic Font)	<p>A Boolean flag indicating that the italic formatting shall be applied. True if italic formatting is applied, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
si (Server Formatting String)	<p>Server formatting string index in the metadata string store, used to index to a string that contains information on how to format the number.</p>

Attributes	Description
Index)	The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
st (Server Formatting Strikethrough Font)	A Boolean flag indicating whether the strikethrough font style is applied. True if strikethrough shall be applied, false otherwise. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
u (Server Formatting Underline Font)	A Boolean flag indicating whether the underline font style is applied. True if underline shall be applied, false otherwise. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_MdxTuple](#)) is located in §A.2. *end note*]

18.9.17 valueMetadata (Value Metadata)

This element represents the value metadata information for the spreadsheet. It is essentially a collection of block elements that each define the value metadata for a particular cell. Cells in the workbook index into this collection, and each block element in this collection in turn references the `mdxMetadata` records.

Attributes	Description
count (Metadata Block Count)	Number of blocks of metadata records. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_MetadataBlocks](#)) is located in §A.2. *end note*]

18.10 Pivot Tables

PivotTables display aggregated views of data easily and in an understandable layout. Hundreds or thousands of pieces of underlying information can be aggregated on row and column axes, revealing the meanings behind the data. PivotTable reports are used to organize and summarize your data in different ways. Creating a PivotTable report is about moving pieces of information around to see how they fit together. In a few gestures the pivot rows and columns can be moved into different arrangements and layouts.

A PivotTable object has a row axis area, a column axis area, a data area, and a page/report filter area. Additionally, PivotTables have a corresponding field list pane, or similar user interface, that displays all the fields

of data that can be placed on one of the PivotTable areas. In SpreadsheetML, each PivotTable area maps to a collection of fields in the PivotTableDefinition that correspond to each area.

The following image shows the layout for the PivotTable areas.

Page/Filter Fields	
	Column Fields
Row Fields	Data Items

[Example:

The following image shows a table of data in a worksheet.

	A	C	F	H	I	O	P	Q	Z	AA	AB
1	Customer Name	Country	City	Product Category	Product Subcategory	Year	Quarter	Month	Sales Amount	Tax Amount	Freight
2	Michele Raman	Australia	Bendigo	Bikes	Road Bikes	2001	3	September	3578.27	286.2616	89.4568
3	Misty Raji	Australia	Bendigo	Bikes	Road Bikes	2001	3	July	3578.27	286.2616	89.4568
4	Tabitha E Arthur	Australia	Bendigo	Bikes	Road Bikes	2001	3	July	3578.27	286.2616	89.4568
5	Clarence D Rai	Australia	Bendigo	Bikes	Mountain Bikes	2001	3	July	3399.99	271.9992	84.9998
6	Jimmy L Moreno	Australia	Bendigo	Bikes	Mountain Bikes	2001	3	July	3399.99	271.9992	84.9998
7	Rob Verhoff	Australia	Bendigo	Bikes	Mountain Bikes	2001	3	July	3374.99	269.9992	84.3748
8	Levi Sai	Australia	Bendigo	Bikes	Road Bikes	2001	3	July	3578.27	286.2616	89.4568
9	Logan Gonzales	Australia	Brisbane	Bikes	Road Bikes	2001	3	July	3578.27	286.2616	89.4568
10	Dalton J Lee	Australia	Brisbane	Bikes	Road Bikes	2001	3	August	3578.27	286.2616	89.4568
11	Jessie J Ortega	Australia	Brisbane	Bikes	Road Bikes	2001	3	August	3578.27	286.2616	89.4568
12	Paul J. Shakespear	Australia	Caloundra	Bikes	Road Bikes	2001	3	September	3578.27	286.2616	89.4568
13	Joan R Martin	Australia	Caloundra	Bikes	Road Bikes	2001	3	September	699.0982	55.9279	17.4775
14	Casey Pal	Australia	Caloundra	Bikes	Road Bikes	2001	3	July	3578.27	286.2616	89.4568
15	Ethan G Coleman	Australia	Caloundra	Bikes	Road Bikes	2001	3	August	3578.27	286.2616	89.4568
16	Kendra Rubio	Australia	Caloundra	Bikes	Road Bikes	2001	3	August	3578.27	286.2616	89.4568
17	Bethany G Yuan	Australia	Cloverdale	Bikes	Mountain Bikes	2001	3	August	3399.99	271.9992	84.9998
18	Jasmine Wilson	Australia	Coffs Hart	Bikes	Road Bikes	2001	3	September	3578.27	286.2616	89.4568
19	Micah Wu	Australia	Coffs Hart	Bikes	Road Bikes	2001	3	September	3578.27	286.2616	89.4568
20	Warren L Zhang	Australia	Coffs Hart	Bikes	Road Bikes	2001	3	July	699.0982	55.9279	17.4775
21	Ariana Stewart	Australia	Coffs Hart	Bikes	Road Bikes	2001	3	August	3578.27	286.2616	89.4568
22	Suzanne K Lu	Australia	Coffs Hart	Bikes	Road Bikes	2001	3	August	3578.27	286.2616	89.4568
23	Randall M Rubio	Australia	Cranbourr	Bikes	Road Bikes	2001	3	September	3578.27	286.2616	89.4568
24	Deborah K Kumar	Australia	Cranbourr	Bikes	Road Bikes	2001	3	September	3578.27	286.2616	89.4568
25	Krystal Holt	Australia	Cranbourr	Bikes	Road Bikes	2001	3	July	3578.27	286.2616	89.4568
26	Patricia T Raman	Australia	Cranbourr	Bikes	Road Bikes	2001	3	August	3578.27	286.2616	89.4568
27	Wendy Dominguez	Australia	Cranbourr	Bikes	Mountain Bikes	2001	3	August	3374.99	269.9992	84.3748
28	Willie She	Australia	Darlinghu	Bikes	Road Bikes	2001	3	September	3578.27	286.2616	89.4568
29	Alan Zhu	Australia	Darlinghu	Bikes	Road Bikes	2001	3	September	3578.27	286.2616	89.4568
30	Dawn R Tang	Australia	Darlinghu	Bikes	Road Bikes	2001	3	July	3578.27	286.2616	89.4568

The following image shows a PivotTable summary of the worksheet table data.

	A	B	C	D	E	F	G
1							
2		Country	(All)				
3		State	(All)				
4		City	(All)				
5							
6		Sum of Sales Amount	Column Labels				
7			2001			2001 Total	
8			3			3 Total	
9		Row Labels	July	August	September		
10		Bikes	209652.9046	222538.2892	173993.5128	606184.7066	606184.7066
11		Mountain Bikes	64424.81	60899.82	10174.97	135499.6	135499.6
12		Road Bikes	145228.0946	161638.4692	163818.5428	470685.1066	470685.1066
13		Grand Total	209652.9046	222538.2892	173993.5128	606184.7066	606184.7066

The filter area consists of the "Country", "State", and "City" fields. The row area consists of the "Product Category" and "Product Subcategory" fields. "Bikes" belongs to the "Product Category" field and both "Mountain Bikes" and "Road Bikes" belong to the "Product Subcategory" field. The column consists of the "Year" ("2001"), "Quarter" ("3"), and "Month" ("July", "August", and "September") fields.

The following image shows the field list for the PivotTable in the previous image.

PivotTable Field List

Choose fields to add to report:

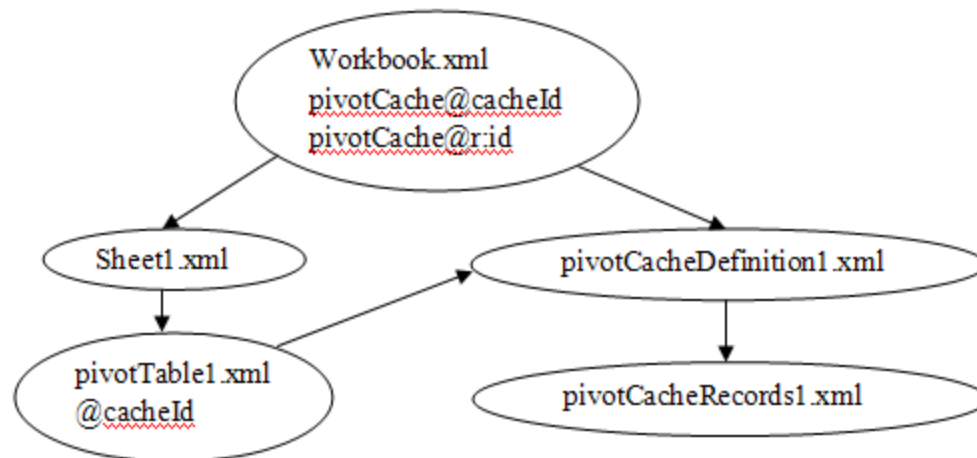
- ☒ **City**
- ☒ **Country**
- ☐ Currency
- ☒ **Customer Name**
- ☐ Discount Amount
- ☐ Discount Pct
- ☐ Extended Amount
- ☐ Freight
- ☐ Group
- ☐ Month
- ☐ Order Quantity
- ☐ Postal Code
- ☒ **Product Category**
- ☐ Product Description
- ☐ Product Name
- ☐ Product Standard Cost
- ☐ Product Subcategory
- ☐ Promotion

Drag fields between areas below

Report Filter	Column Labels
Customer Name ▼	Σ Values ▼
Product Cate... ▼	Year ▼
	Quarter ▼

Row Labels	Σ Values
Country ▼	Sum of Sales ... ▼
City ▼	Sum of Tax A... ▼

File Structure



The workbook points to (and owns the longevity of) the *pivotCacheDefinition* part, which in turn points to and owns the *pivotCacheRecords* part. The workbook also points to and owns the sheet part, which in turn points to and owns a *pivotTable* part definition, when a PivotTable is on the sheet. There can be multiple PivotTables on a sheet. The *pivotTable* part points to the appropriate *pivotCacheDefinition* which it is using. Since multiple PivotTables can use the same cache, the *pivotTable* part does not own the longevity of the *pivotCacheDefinition*.

The *pivotTable* part describes the particulars of the layout of the PivotTable on the sheet. It indicates what fields are on the row axis, the column axis, report filter, and values areas of the PivotTable. It also indicates formatting information about the PivotTable. If conditional formatting has been applied to the PivotTable, that is also expressed in the *pivotTable* part.

Outline of XML for pivotTableDefinition

```

<pivotTableDefinition>
  <location/>
  <pivotFields/>
  <rowFields/>
  <rowItems/>
  <colFields/>
  <colItems/>
  <pageFields/>
  <dataFields/>
  <conditionalFormats/>
  <pivotTableStyleInfo/>
</pivotTableDefinition>

```

The *pivotCacheRecords* part contains the underlying data to be aggregated. It is a cache of the source data.

Outline of XML for pivotCacheRecords

```
<pivotCacheRecords/>
  <r/>
</pivotCacheRecords>
```

The *pivotCacheDefinition* part defines each field in the *pivotCacheRecords* part, including field name and information about the data contained in the field. The *pivotCacheDefinition* part also defines pivot items that are shared among the *pivotTableDefinition* and *pivotCacheRecords* parts.

Outline of XML for *pivotCacheDefinition*

```
<pivotCacheDefinition>
  <cacheSource/>
  <cacheFields>
    <cacheField>
      <sharedItems>
        <d/>
      </sharedItems>
      <fieldGroup/>
    </cacheField>
  </cacheFields>
</pivotCacheDefinition>
```

18.10.1 Pivot Tables

This section describes the definition of PivotTables in SpreadsheetML.

18.10.1.1 autoSortScope (AutoSort Scope)

Represents the sorting scope for the PivotTable.

[Note: The W3C XML Schema definition of this element's content model ([CT_AutoSortScope](#)) is located in §A.2. end note]

18.10.1.2 b (Boolean)

Represents a boolean value for an item in the PivotTable.

Attributes	Description
c (Caption)	Specifies the caption for the item. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
cp (Member Property Count)	Specifies the number of property values for this item. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
f (Calculated Item)	Specifies a boolean value that indicates whether this item has a calculated value.

Attributes	Description
	<p>A value of 1 or true indicates the item has a calculated value.</p> <p>A value of 0 or false indicates the item does not have a calculated value.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
u (Unused Item)	<p>Specifies a boolean value that indicates whether this is an unused item. The application marks an item as unused when an item is deleted from the data source. The item and associated metadata are retained in the cache until the threshold for unused items specified in missingItemsLimit is reached.</p> <p>A value of 1 or true indicates this item is unused.</p> <p>A value of 0 or false indicates this item is used.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
v (Value)	<p>Specifies the value of the item. This attribute is required.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.2. *end note*]

18.10.1.3 cacheField (PivotCache Field)

Represent a single field in the PivotCache. This definition contains information about the field, such as its source, data type, and location within a level or hierarchy. The sharedItems element stores additional information about the data in this field. If there are no shared items, then values are stored directly in the pivotCacheRecords part.

[Example:

```
<cacheField name="Group" numFmtId="0">
  <sharedItems count="3">
    <s v="Pacific"/>
    <s v="North America"/>
    <s v="Europe"/>
  </sharedItems>
</cacheField>
```

end example]

Attributes	Description
caption (PivotCache Field Caption)	<p>Specifies the caption of the cache field.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
databaseField (Database Field)	<p>Specifies a boolean value that indicates whether this field came from the source database rather having been created by the application.</p> <p>A value of 1 or true indicates the field is from the source database.</p> <p>A value of 0 or false indicates the field was created by the application.</p> <p>[<i>Note</i>: This attribute could be used for a defined grouped or calculated field. In this case, source database fields should precede defined grouped or calculated fields. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
formula (Calculated Field Formula)	<p>Specifies the formula for the calculated field. This formula is specified by the end-user. Calculated fields can perform calculations by using the contents of other fields in the PivotTable.</p> <p>In formulas you create for calculated fields or calculated items, you can use operators and expressions as you do in other worksheet formulas. You can use constants and refer to data from the PivotTable, but you cannot use cell references or defined names. You cannot use worksheet functions that require cell references or defined names as arguments, and you cannot use array functions.</p> <p>Further behaviors and restrictions apply to formulas for calculated fields:</p> <ul style="list-style-type: none"> Formulas for calculated fields operate on the sum of the underlying data for any fields in the formula. [<i>Example</i>: The formula =Sales * 1.2 multiplies the sum of the sales for each type and region by 1.2; it does not multiply each individual sale by 1.2 and then sum the multiplied amounts. <i>end example</i>] Formulas cannot refer to totals. <p>For more information about formulas see §18.17 in Formulas. For more information about defined names see §18.2.6 in Workbook.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
hierarchy (Hierarchy)	<p>Specifies the hierarchy that this field is part of.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
level (Hierarchy Level)	<p>Specifies the hierarchy level that this field is part of.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt</p>

Attributes	Description
	datatype.
mappingCount (Member Property Count)	<p>Specifies the number of property mappings for this field.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
memberPropertyField (Member Property Field)	<p>Specifies a boolean value that indicates whether the field contains OLAP member property information.</p> <p>A value of 1 or true indicates this field contains OLAP member property information.</p> <p>A value of 0 or false indicates this field does not contain OLAP member property information.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
name (PivotCache Field Name)	<p>Specifies the name of the cache field.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
numFmtId (Number Format Id)	<p>Specifies the number format that is applied to all items in the field. Number formats are written to the styles part. For more information see §18.8.31 in Styles.</p> <p>[<i>Note:</i> Formatting information provided by cell table and by PivotTable need not agree. If the two formats differ, the cell-level formatting takes precedence. If you change the layout of the PivotTable, the PivotTable formatting will then take precedence. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_NumFmtId simple type (§18.18.47).</p>
propertyName (Property Name)	<p>Specifies the name of the property if this field is an OLAP property field.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
serverField (Server-based Field)	<p>Specifies a boolean value that indicates whether the field is a server-based page field.</p> <p>A value of 1 or true indicates this field is a server-based page field.</p> <p>A value of 0 or false indicates this field is not a server-based page field.</p> <p>This attribute applies to ODBC sources only.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
sqlType (SQL Data Type)	<p>Specifies the SQL data type of the field. This attribute stores an ODBC data type and applies to ODBC data sources only. A value is supplied for this</p>

Attributes	Description
	<p>attribute only if it is provided to the application.</p> <p>The following are data types supported by ODBC. For a more information, see the ODBC specification.</p> <ul style="list-style-type: none"> • 0 SQL_UNKNOWN_TYPE • 1 SQL_CHAR • 2 SQL_VARCHAR • -1 SQL_LONGVARCHAR • -8 SQL_WCHAR • -9 SQL_WVARCHAR • -10 SQL_WLONGVARCHAR • 3 SQL_DECIMAL • 2 SQL_NUMERIC • 5 SQL_SMALLINT • 4 SQL_INTEGER • 7 SQL_REAL • 6 SQL_FLOAT • 8 SQL_DOUBLE • -7 SQL_BIT • -6 SQL_TINYINT • -5 SQL_BIGINT • -2 SQL_BINARY • -3 SQL_VARBINARY • -4 SQL_LONGVARBINARY • 9 SQL_TYPE_DATE or SQL_DATE • 10 SQL_TYPE_TIME or SQL_TIME • 11 SQL_TYPE_TIMESTAMP or SQL_TIMESTAMP • 102 SQL_INTERVAL_MONTH • 101 SQL_INTERVAL_YEAR • 107 SQL_INTERVAL_YEAR_TO_MONTH • 103 SQL_INTERVAL_DAY • 104 SQL_INTERVAL_HOUR • 105 SQL_INTERVAL_MINUTE • 106 SQL_INTERVAL_SECOND • 108 SQL_INTERVAL_DAY_TO_HOUR • 109 SQL_INTERVAL_DAY_TO_MINUTE • 110 SQL_INTERVAL_DAY_TO_SECOND • 111 SQL_INTERVAL_HOUR_TO_MINUTE • 112 SQL_INTERVAL_HOUR_TO_SECOND • 113 SQL_INTERVAL_MINUTE_TO_SECOND • -11 SQL_GUID • -20 SQL_SIGNED_OFFSET • -22 SQL_UNSIGNED_OFFSET

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema int datatype.
uniqueList (Unique List Retrieved)	<p>Specifies a boolean value that indicates whether the application was able to get a list of unique items for the field. The attribute only applies to PivotTables that use ODBC and is intended to be used in conjunction with optimization features in the application. <i>[Example: the application can optimize memory usage when populating PivotCache records if it has a list of unique items for a field before all the records are retrieved from ODBC. end example]</i></p> <p>A value of 1 or true indicates the application was able to get a list of unique values for the field.</p> <p>A value of 0 or false indicates the application was unable to get a list of unique values for the field.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT CacheField](#)) is located in §A.2. end note]

18.10.1.4 cacheFields (PivotCache Fields)

Represents the collection of field definitions in the source data.

[Example:

```
<cacheFields count="1">
  <cacheField name="Group" numFmtId="0">
    <sharedItems count="3">
      <s v="One"/>
      <s v="Two"/>
      <s v="Three"/>
    </sharedItems>
  </cacheField>
</cacheFields>
```

end example]

Attributes	Description
count (Field Count)	<p>Specifies the number of fields in the cache.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_CacheFields](#)) is located in §A.2. *end note*]

18.10.1.5 `cacheHierarchies` (PivotCache Hierarchies)

Represents the collection of OLAP hierarchies in the PivotCache.

[Example:

```
<cacheHierarchies count="2">
  <cacheHierarchy uniqueName="[Account].[Account]" caption="Account"
    attribute="1" keyAttribute="1"
    defaultMemberUniqueName="[Account].[Account].[All Accounts]"
    allUniqueName="[Account].[Account].[All Accounts]"
    dimensionUniqueName="[Account]" count="0"/>
  <cacheHierarchy uniqueName="[Account].[Account Number]" caption="Account
    Number" attribute="1" defaultMemberUniqueName="[Account].[Account
    Number].[All Accounts]" allUniqueName="[Account].[Account Number].[All
    Accounts]" dimensionUniqueName="[Account]" count="0"/>
</cacheHierarchies>
```

end example]

Attributes	Description
count (Hierarchy Count)	Specifies the number of OLAP hierarchies in the cache. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_CacheHierarchies](#)) is located in §A.2. *end note*]

18.10.1.6 `cacheHierarchy` (PivotCache Hierarchy)

Represents an OLAP hierarchy in the PivotCache.

[Example:

```
<cacheHierarchy uniqueName="[Account].[Account Number]" caption="Account Number"
  attribute="1" defaultMemberUniqueName="[Account].[Account Number].[All
  Accounts]" allUniqueName="[Account].[Account Number].[All Accounts]"
  dimensionUniqueName="[Account]" count="0"/>
```

end example]

Attributes	Description
allCaption (Display Name of 'All')	<p>Specifies the display name of the "all" member of this hierarchy.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
allUniqueName (Unique Name of 'All')	<p>Specifies the unique name of the "all" member of this hierarchy.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
attribute (Attribute Hierarchy)	<p>Specifies a boolean value that indicates whether this hierarchy is an attribute hierarchy. An attribute hierarchy is an OLAP member that is exposed as a flat, single-level hierarchy on the OLAP server.</p> <p>A value of 1 or true indicates this hierarchy is an attribute hierarchy.</p> <p>A value of 0 or false indicates this hierarchy is not an attribute hierarchy.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
caption (Hierarchy Display Name)	<p>Specifies the display name of the hierarchy.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
count (Levels Count)	<p>Specifies the number of levels in this hierarchy.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
defaultMemberUniqueName (Default Member Unique Name)	<p>Specifies the unique name of the default member of this hierarchy</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
dimensionUniqueName (Dimension Unique Name)	<p>Specifies the unique name of the dimension to which this hierarchy belongs.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
displayFolder (Display Folder)	<p>Specifies the display folder in which this hierarchy should be displayed.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
hidden (Hidden)	<p>Specifies a boolean value that indicates whether the hierarchy is hidden.</p> <p>A value of 1 or true indicates this hierarchy is hidden.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean</p>

Attributes	Description
	datatype.
iconSet (KPI Icon Set)	<p>Specifies the icon set to use to visualize a KPI trend or status expression. PivotTables use the icon sets available for conditional formatting in SpreadsheetML. See associated simple type definition for details. The following values are used by PivotTables:</p> <ul style="list-style-type: none"> • no value: default iconset. For status KPI this corresponds to 3 traffic lights. For trend KPI this corresponds to 3-arrows. • 1: Variance Arrow - 3 arrow. • 2: 3 arrows • 3: Status Arrow Ascending - 5 arrows. • 4: Status Arrow Descending - 5 arrows • 5: Standard Arrow - 5 arrows gray. • 6: Traffic Light Single - 3 traffic lights 1. • 7: Traffic Light, Traffic Light Multiple - 3 traffic lights 2. • 8: Gauge Ascending - 5 quarters. • 9: Gauge Descending - 5 quarters. • 10: Thermometer, Cylinder, Smiley Face - 3 signs. • 11: Road Signs - 3 symbols. <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
keyAttribute (Key Attribute Hierarchy)	<p>Specifies a boolean value that indicates whether this hierarchy is the key attribute hierarchy in an OLAP dimension.</p> <p>A value of 1 or true indicates this hierarchy is the key attribute hierarchy in an OLAP dimension.</p> <p>A value of 0 or false indicates this hierarchy is not a key attribute hierarchy.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
measure (Measure Hierarchy)	<p>Specifies a boolean value that indicates whether this hierarchy is a measure.</p> <p>A value of 1 or true indicates this hierarchy is a measure.</p> <p>A value of 0 or false indicates this hierarchy is not a measure.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
measureGroup (Measure Group Name)	<p>Specifies the name of the measure group to which this hierarchy belongs.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
measures (Measures)	<p>Specifies a boolean value that indicates whether this hierarchy contains all the measures.</p> <p>A value of 1 or true indicates this hierarchy contains all the measures.</p>

Attributes	Description
	<p>A value of 0 or false indicates this hierarchy does not contain all the measures.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
memberValueDatatype (Member Value Data Type)	<p>Specifies the data type of the member value. This attribute stores an OLEDB data type.</p> <p>[Note: Data connectivity can use a number of different technologies. One example of potential values stored in this attribute can be found at: http://msdn.microsoft.com/library/default.asp?url=/library/en-us/oledb/htm/oledbtype_indicators.asp end note]</p> <p>memberValueDataType is stored for key attribute hierarchies in order to tell when the application will offer date filtering instead of label filtering in OLAP PivotTables. Date filtering is only offered when the data type is Date/Time. memberValueDatatype="7" indicates a date/time data type.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedShort datatype.</p>
oneField (One Field)	<p>Specifies a boolean value that indicates whether this hierarchy is associated with only one field due to its position in the view.</p> <p>A value of 1 or true indicates this hierarchy is associated with only one field.</p> <p>A value of 0 or false indicates this field is not restricted to only one association due to its position in the user interface.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
parentSet (Parent Set)	<p>Specifies the parent hierarchy of the set. If the attribute is missing it means that the parent hierarchy is unknown or doesn't exist in the cache.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
set (Set)	<p>Specifies a boolean value that indicates whether this hierarchy is a set.</p> <p>A value of 1 or true indicates this hierarchy is a set.</p> <p>A value of 0 or false indicates this hierarchy is not a set.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
time (Time)	<p>Specifies a boolean value that indicates whether this hierarchy is of type time.</p>

Attributes	Description
	<p>A value of 1 or true indicates this hierarchy is of type time.</p> <p>A value of 0 or false indicates is of a different type.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
unbalanced (Unbalanced)	<p>Specifies a boolean value that indicates whether this hierarchy is an unbalanced hierarchy. If value is not written, then this attribute either cannot be determined or does not apply to the current hierarchy.</p> <p>A value of 1 or true indicates this hierarchy is unbalanced.</p> <p>A value of 0 or false indicates is balanced.</p> <p>For more information on balanced hierarchies, see the documentation provided for your OLAP server.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
unbalancedGroup (Unbalanced Group)	<p>Specifies a boolean value that indicated whether the grouped version of this hierarchy is an unbalanced hierarchy. If value is not written, then this attribute either cannot be determined or does not apply to the current hierarchy.</p> <p>A value of 1 or true indicates this hierarchy is unbalanced when grouped.</p> <p>A value of 0 or false indicates is balanced when grouped.</p> <p>For more information on balanced hierarchies, see the documentation provided for your OLAP server.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
uniqueName (Hierarchy Unique Name)	<p>Specifies the unique name of the hierarchy.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_CacheHierarchy](#)) is located in §A.2.
end note]

18.10.1.7 [cacheSource \(PivotCache Source Description\)](#)

Represents the description of data source whose data is stored in the pivot cache. The data source refers to the underlying rows or database records that provide the data for a PivotTable. You can create a PivotTable report

from a SpreadsheetML table, an external database (including OLAP cubes), multiple SpreadsheetML worksheets, or another PivotTable.

Quarter	Region	Sport	Sales
Qtr1	East	Golf	\$5,000
Qtr1	East	Safari	\$9,000
Qtr1	East	Tennis	\$1,500
Qtr2	East	Golf	\$2,000
Qtr2	East	Safari	\$6,000
Qtr2	East	Tennis	\$500
Qtr1	West	Golf	\$3,500
Qtr1	West	Tennis	\$6,000
Qtr2	West	Golf	\$2,500
Qtr2	West	Tennis	\$3,200

Information about the data source is stored in the connection element and is retrieved using the `connectionId` attribute.

[Example:

```
<cacheSource type="external" connectionId="1"/>
```

end example]

OLAP data sources are distinguished from other data sources in SpreadsheetML. OLAP records are not stored in the *pivotCacheRecords* part, whereas all records for non-OLAP data sources are stored in the cache.

Attributes	Description
connectionId (Connection Index)	Specifies the index to the workbook connection. This attribute is used when the cache type is 'External.' See §18.13.1 for more information about the connection element. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
type (Cache Type)	Specifies the cache type. The possible values for this attribute are defined by the ST_SourceType simple type (§18.18.75).

[Note: The W3C XML Schema definition of this element’s content model ([CT_CacheSource](#)) is located in §A.2.
end note]

18.10.1.8 **calculatedItem** (Calculated Item)

Represents an item within a PivotTable field that uses a formula . The formula is specified in the `formula` attribute.

Calculations and options available for a PivotTable depend on whether the source data came from an OLAP database or another type of database. This complex type applies to non-OLAP external data or on worksheet data. See `calculatedMember` for information on calculations on OLAP data sources.

Attributes	Description
field (Field Index)	<p>Specifies the index of the pivotField with which this calculated item is associated.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
formula (Calculated Item Formula)	<p>Specifies the formula of the calculated item. In formulas you create for calculated items, you can use operators and expressions as you do in other worksheet formulas. You can use constants and refer to data from the PivotTable, but you cannot use cell references or defined names. You cannot use worksheet functions that require cell references or defined names as arguments, and you cannot use array functions.</p> <p>Further behaviors and restrictions apply to formulas for calculatedItems:</p> <ul style="list-style-type: none"> Formulas for calculated items operate on the individual records; the calculated item formula =Dairy *115% multiplies each individual sale of Dairy times 115%, after which the multiplied amounts are summarized together in the data area. Formulas cannot refer to totals. You can include the field name in a reference to an item. The item name shall be in square brackets. Use this format to avoid #NAME? errors when two items in two different fields in a report have the same name. You can refer to an item by its position in the PivotTable as currently sorted and displayed. The item referred to in this way can change whenever the positions of items change or different items are displayed or hidden. Hidden items are not counted in this index. You can use relative positions to refer to items. The positions are determined relative to the calculated item that contains the formula. If the position you give is before the first item or after the last item in the field, the formula results in a #REF! error. <p>For more information about formulas see §18.17 in Formulas. For more information about defined names see §18.2.6 in Workbook.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_CalculatedItem](#)) is located in §A.2. end note]

18.10.1.9 [calculatedItems \(Calculated Items\)](#)

Represents the collection of calculated items.

Attributes	Description
count (Calculated Item Formula Count)	<p>Specifies the number of calculated item formulas in the cache.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt</p>

Attributes	Description
	datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CalculatedItems](#)) is located in §A.2.
end note]

18.10.1.10 **calculatedMember** (Calculated Member)

A calculated member is a member in an OLAP hierarchy for which the value is calculated by an OLAP server using a Multidimensional Expressions (MDX) expression. For PivotTables that are created from OLAP cubes the summarized values are calculated by an OLAP server before the SpreadsheetML application displays the results. In OLAP PivotTables, the consuming application cannot change the summary function used to calculate totals and subtotals.

Calculated members are defined by the Multidimensional Expressions (MDX) expression in the `mdx` attribute.

[*Example:*

```
<calculatedMembers count="1">
  <calculatedMember name="[Product].[Product Categories].[All
    Products].[Calculated Member]" mdx="'[Product].[Product Categories].[All
    Products].[Accessories]'" memberName="Calculated Member"
    hierarchy="[Product].[Product Categories]" parent="[Product].[Product
    Categories].[All Products]"/>
</calculatedMembers>
```

end example]

Attributes	Description
hierarchy (Hierarchy Name)	Specifies the name of the hierarchy to which the calculated member belongs. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
mdx (Calculated Member MDX Formula)	Specifies the MDX formula for the calculated member. [<i>Note:</i> Data connectivity can use a number of different technologies. One example of potential values stored in this attribute can be found at: http://msdn2.microsoft.com/en-us/library/ms145595.aspx <i>end note</i>] The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
memberName (OLAP Calculated Member Name)	Specifies the OLAP member name for the calculated member. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

Attributes	Description
name (Calculated Member Name)	Specifies the name of the calculated member. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
parent (Parent Name)	Specifies the name of the parent of the calculated member. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
set (Set)	Specifies a boolean value that indicates whether this calculated member describes a calculated set rather than a calculated member. A value of 1 or true indicates this is a calculated set. A value of 0 or false indicates this is a calculated member. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
solveOrder (Calculated Members Solve Order)	Specifies the order in which this calculated member is calculated in relation to other calculated members. The possible values for this attribute are defined by the W3C XML Schema int datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_CalculatedMember](#)) is located in §A.2. end note]

18.10.1.11 [calculatedMembers \(Calculated Members\)](#)

Represents the collection of calculated members in an OLAP PivotTable.

[Example:

```
<calculatedMembers count="1">
  <calculatedMember name="[Product].[Product Categories].[All
    Products].[Calculated Member]" mdx="'[Product].[Product Categories].[All
    Products].[Accessories]'" memberName="Calculated Member"
    hierarchy="[Product].[Product Categories]" parent="[Product].[Product
    Categories].[All Products]"/>
</calculatedMembers>
```

end example]

Attributes	Description
count (Calculated Members Count)	Specifies the number of calculated members.

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element’s content model ([CT_CalculatedMembers](#)) is located in §A.2. end note]

18.10.1.12 `chartFormat` (PivotChart Format)

Represents the format defined in the PivotChart that is associated with this PivotTable.

[Example:

```
<sh:pivotTableDefinition xmlns:sh="..." name="PivotTable1" cacheId="0"
  applyNumberFormats="0" applyBorderFormats="0" applyFontFormats="0"
  applyPatternFormats="0" applyAlignmentFormats="0" applyWidthHeightFormats="1"
  dataCaption="Values" updatedVersion="3" minRefreshableVersion="3"
  showCalcMbrs="0" useAutoFormatting="1" colGrandTotals="0" itemPrintTitles="1"
  createdVersion="3" indent="0" outline="1" outlineData="1"
  multipleFieldFilters="0" chartFormat="1" fieldListSortAscending="1">
```

end example]

Attributes	Description
chart (Chart Index)	<p>Specifies the index of the chart part to which the formatting applies. For more information see the DrawingML specification for more information on the chart part.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
format (Pivot Format Id)	<p>Specifies the index of the pivot format that is currently in use. This index corresponds to a dxf element in the Styles part. For more information see the Styles section (§18.8).</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
series (Series Format)	<p>Specifies a boolean value that indicates whether format applies to a series.</p> <p>A value of 1 or true indicates this format applies to a series.</p> <p>A value of 0 or false indicates this format applies to a data point.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_ChartFormat](#)) is located in §A.2.
end note]

18.10.1.13 `chartFormats` (PivotChart Formats)

Represents the collection of formats applied to PivotChart.

[Example:

```
<sh:chartFormats count="4">
  <sh:chartFormat chart="0" format="0" series="1">
    <sh:pivotArea type="data" outline="0">
      <sh:references count="3">
        <sh:reference field="4294967294" count="1" selected="0">
          <sh:x v="0"/>
        </sh:reference>
        <sh:reference field="14" count="1" selected="0">
          <sh:x v="0"/>
        </sh:reference>
        <sh:reference field="15" count="1" selected="0">
          <sh:x v="2"/>
        </sh:reference>
      </sh:references>
    </sh:pivotArea>
  </sh:chartFormat>
  <sh:chartFormat chart="0" format="1" series="1">
    <sh:pivotArea type="data" outline="0">
      <sh:references count="3">
        <sh:reference field="4294967294" count="1" selected="0">
          <sh:x v="0"/>
        </sh:reference>
        <sh:reference field="14" count="1" selected="0">
          <sh:x v="0"/>
        </sh:reference>
        <sh:reference field="15" count="1" selected="0">
          <sh:x v="3"/>
        </sh:reference>
      </sh:references>
    </sh:pivotArea>
  </sh:chartFormat>
```

```
<sh:chartFormat chart="0" format="2" series="1">
  <sh:pivotArea type="data" outline="0">
    <sh:references count="3">
      <sh:reference field="4294967294" count="1" selected="0">
        <sh:x v="1"/>
      </sh:reference>
      <sh:reference field="14" count="1" selected="0">
        <sh:x v="0"/>
      </sh:reference>
      <sh:reference field="15" count="1" selected="0">
        <sh:x v="2"/>
      </sh:reference>
    </sh:references>
  </sh:pivotArea>
</sh:chartFormat>
<sh:chartFormat chart="0" format="3" series="1">
  <sh:pivotArea type="data" outline="0">
    <sh:references count="3">
      <sh:reference field="4294967294" count="1" selected="0">
        <sh:x v="1"/>
      </sh:reference>
      <sh:reference field="14" count="1" selected="0">
        <sh:x v="0"/>
      </sh:reference>
      <sh:reference field="15" count="1" selected="0">
        <sh:x v="3"/>
      </sh:reference>
    </sh:references>
  </sh:pivotArea>
</sh:chartFormat>
</sh:chartFormats>
```

end example]

Attributes	Description
count (Format Count)	Specifies the number of formats in the collection. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_ChartFormats](#)) is located in §A.2.
end note]

18.10.1.14 colFields (Column Fields)

Represents the collection of fields that are on the column axis of the PivotTable.

	A	B	C
1	Region	(All) ▼	
2			
3	Sum of Sales	Quarter ▼	
4	Sport ▼	Qtr1	Qtr2
5	Golf	8,500	4,500

In the image above, the blue field is a column field.

[Example: In the following SpreadsheetML example, "Year", "Quarter" and "Month" are on the column axis of the PivotTable, in that order.

```
<colFields count="3">
  <field x="14"/>
  <field x="15"/>
  <field x="16"/>
</colFields>
```

end example]

Attributes	Description
count (Repeated Items Count)	Specifies the number of items in this collection. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_ColFields](#)) is located in §A.2. *end note]*

18.10.1.15 colHierarchiesUsage (Column OLAP Hierarchy References)

Represents the collection of references to OLAP hierarchies on the column axis of a PivotTable.

[Example:

```
<sh:colHierarchiesUsage count="2">
  <sh:colHierarchyUsage hierarchyUsage="33"/>
  <sh:colHierarchyUsage hierarchyUsage="-2"/>
</sh:colHierarchiesUsage>
```

end example]

Attributes	Description
count (Items Count)	Specifies the number of items in the collection.

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ColHierarchiesUsage](#)) is located in §A.2. *end note*]

18.10.1.16 colHierarchyUsage (Column OLAP Hierarchies)

Represents the collection of references to OLAP Hierarchies on the column axis of a PivotTable.

[*Example:*

```
<sh:colHierarchyUsage hierarchyUsage="33"/>
```

end example]

Attributes	Description
hierarchyUsage (Hierarchy Usage)	Specifies the reference to an OLAP hierarchy in a PivotTable. The possible values for this attribute are defined by the W3C XML Schema int datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_HierarchyUsage](#)) is located in §A.2. *end note*]

18.10.1.17 colItems (Column Items)

Represents the collection of column items of the PivotTable.

[*Example:* In the following SpreadsheetML example the item values are found in cells C6:H8. For example "2001" / "3" / "July" values are in C7:C9. Those are the first column item values and are referenced by the first `<i>` element below.

```
<colItems count="5">
  <i>
    <x/>
    <x/>
    <x/>
  </i>
  <i r="2">
    <x v="1"/>
  </i>
```

```
<i r="2">
  <x v="2"/>
</i>
<i t="default" r="1">
  <x/>
</i>
<i t="default">
  <x/>
</i>
</colItems>
```

end example]

The first `<i>` collection represents all item values for the first column in the column axis area of the PivotTable. The first `<x>` in the first `<i>` corresponds to the first field in the columns area of the PivotTable, namely "Year". The implied index value of '0' on this `<x>` indicates that the item value for this first item in the column is the 0th item for this pivotField. The 0th item for this pivotField is itself an index to an item value into this field's shared items collection in the pivotCacheDefinition part, namely "2001".

The item values corresponding to the second and third `<x>` elements can be found in the same way, arriving at "3" for the second item value, and arriving at "July" for the third item value for this first column.

The second `<i>` collection expresses all 3 item values for the second column in the column axis area. The `@r` value of '2' indicates that the first two item values from the previous column is repeated here, which means that the first item value for this second column is "2001" again and the second item value for this second column is "3". The third item value is expressed by the only `<x>` element under this second `<i>` element, and without further explanation is understood to reference the item value "August".

Attributes	Description
count (Column Item Count)	Specifies the number of items on the column axis of the PivotTable. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_collItems](#)) is located in §A.2. *end note*]

18.10.1.18 conditionalFormat (Conditional Formatting)

Represents the conditional formatting defined in the PivotTable.

Attributes	Description
priority (Priority)	Specifies the priority of PivotTable conditional formatting rule. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
scope (Conditional Formatting Scope)	Specifies the scope of PivotTable conditional formatting rule. The possible values for this attribute are defined by the ST_Scope simple type (§18.18.67).
type (Conditional Formatting Rule Type)	Specifies the type of PivotTable conditional formatting rule. See associated simple type definition for details. The possible values for this attribute are defined by the ST_Type simple type (§18.18.84).

[Note: The W3C XML Schema definition of this element's content model ([CT_ConditionalFormat](#)) is located in §A.2. end note]

18.10.1.19 conditionalFormats (Conditional Formats)

Represents the collection of conditional formats applied to a PivotTable.

[Example:

```
<sh:conditionalFormats count="1">
  <sh:conditionalFormat priority="1">
    <sh:pivotAreas count="1">
      <sh:pivotArea type="data" collapsedLevelsAreSubtotals="1">
        <sh:references count="5">
          <sh:reference field="4294967294" count="1" selected="0">
            <sh:x v="0"/>
          </sh:reference>
          <sh:reference field="2" count="1" selected="0">
            <sh:x v="0"/>
          </sh:reference>
          <sh:reference field="14" count="1" selected="0">
            <sh:x v="0"/>
          </sh:reference>
        </sh:references>
      </sh:pivotArea>
    </sh:pivotAreas>
  </sh:conditionalFormat>
</sh:conditionalFormats>
```



```

    <sh:reference field="15" count="2" selected="0">
      <sh:x v="2"/>
      <sh:x v="3"/>
    </sh:reference>
  </sh:references>
</sh:pivotArea>
</sh:pivotAreas>
</sh:conditionalFormat>
</sh:conditionalFormats>

```

end example]

Attributes	Description
count (Conditional Format Count)	<p>Specifies the number of conditional formats defined for the PivotTable.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_ConditionalFormats](#)) is located in §A.2. *end note*]

18.10.1.20 consolidation (Consolidation Source)

Represents the description of the PivotCache source using multiple consolidation ranges. This element is used when the source of the PivotTable is a collection of ranges in the workbook. The ranges are specified in the rangeSets collection. The logic for how the application consolidates the data in the ranges is application-defined. [*Example:* the application might consolidate data based on its position in the worksheet that the end-user specifies. *end example*]

Attributes	Description
autoPage (Auto Page)	<p>Specifies a boolean value that indicates whether the application will automatically create one additional page field to describe/qualify the source ranges.</p> <p>A value of 1 or true indicates the application will create an additional page field.</p> <p>A value of 0 or false indicates will not create an additional page field.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Consolidation](#)) is located in §A.2. *end note*]

18.10.1.21 d (Date Time)

Represents a date-time value in the PivotTable.

Attributes	Description
c (Caption)	<p>Specifies the caption for the item.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
cp (Member Property Count)	<p>Specifies the number of member property values.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
f (Calculated Item Value)	<p>Specifies a boolean value that indicates whether this is a calculated item value.</p> <p>A value of 1 or true indicates this is a calculated item value.</p> <p>A value of 0 or false indicates this is not a calculated item value.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
u (Unused Item)	<p>Specifies a boolean value that indicates whether this is an unused item. The application marks an item as unused when an item is deleted from the data source. The item and associated metadata are retained in the cache until the threshold for unused items specified in missingItemsLimit is reached.</p> <p>A value of 1 or true indicates this is an unused item.</p> <p>A value of 0 or false indicates this item is used.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
v (Value)	<p>Specifies the value of the item.</p> <p>The possible values for this attribute are defined by the W3C XML Schema dateTime datatype.</p>

[Note: The W3C XML Schema definition of this element's content model (CT_DateTime) is located in §A.2. *end note*]

18.10.1.22 dataField (Data Field Item)

Represents a field from a source list, table, or database that contains data that is summarized in a PivotTable.

	A	B	C
1	Region	(All) ▼	
2			
3	Sum of Sales	Quarter ▼	
4	Sport ▼	Qtr1	Qtr2
5	Golf	8,500	4,500

A data field represents data that is derived from a field in the source list or database. *[Example: The Sport field, for example, might come from a column in the source list that is labeled Sport and contains the names of various sports (Golf, Tennis) for which the source list has sales figures. end example]*

Source data can be taken from an SpreadsheetML list or range, an external database or cube, or another PivotTable. Data fields use summary functions to combine values from the underlying source data. You can also use custom calculations to compare data values, or add your own formulas that use elements of the report or other worksheet data.

[Example:

```
<dataFields count="1">
  <dataField name="Sum of Sales Amount" fld="25" baseField="0" baseItem="0"/>
</dataFields>
```

end example]

Attributes	Description
baseField ('Show Data As' Base Field)	Specifies the index to the base field when the ShowDataAs calculation is in use. The possible values for this attribute are defined by the W3C XML Schema int datatype.
baseItem ('Show Data As' Base Setting)	Specifies the index to the base item when the ShowDataAs calculation is in use. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
fld (Field)	Specifies the index to the field (<r>) in the pivotCacheRecords part that this data item summarizes. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
name (Data Field Name)	Specifies the name of the data field. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
numFmtId (Number Format Id)	Specifies the index to the number format applied to this data field. Number formats are written to the styles part. See the Styles section (§18.8) for more information on number formats. Formatting information provided by cell table and by PivotTable need not agree. If the two formats differ, the cell-level formatting takes precedence. If you change the layout

Attributes	Description
	<p>the PivotTable, the PivotTable formatting will then take precedence.</p> <p>The possible values for this attribute are defined by the ST_NumFmtId simple type (§18.18.47).</p>
showDataAs (Show Data As Display Format)	<p>Specifies the display format for this data field.</p> <p>Formatting information provided by cell table and by PivotTable need not agree. If the two formats differ, the cell-level formatting takes precedence. If you change the layout the PivotTable, the PivotTable formatting will then take precedence.</p> <p>The possible values for this attribute are defined by the ST_ShowDataAs simple type (§18.18.70).</p>
subtotal (Subtotal)	<p>Specifies the aggregation function that applies to this data field.</p> <p>The possible values for this attribute are defined by the ST_DataConsolidateFunction simple type (§18.18.17).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_DataField](#)) is located in §A.2. *end note*]

18.10.1.23 dataFields (Data Fields)

Represents the collection of items in the data region of the PivotTable.

[Example:

```
<dataFields count="1">
  <dataField name="Sum of Sales Amount" fld="25" baseField="0" baseItem="0"/>
</dataFields>
```

end example]

Attributes	Description
count (Data Items Count)	<p>Specifies the number of items in the data region of the PivotTable.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_DataFields](#)) is located in §A.2. *end note*]

18.10.1.24 dimension (OLAP Dimension)

Represents a PivotTable OLAP Dimension. A dimension is a field that organizes a single type of data into a hierarchy with levels of detail. *[Example: An OLAP database could contain a Time dimension providing data for levels Year, Month, Week, and Day, allowing you to create reports that let you compare day-to-day sales results or view a summary of your sales for an entire year. end example]*

Attributes	Description
caption (Dimension Display Name)	Specifies the display name of the dimension. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
measure (Measure)	Specifies a boolean value that indicates whether this is a measure dimension. A value of 1 or true indicates this dimension is a measure dimension. A value of 0 or false indicates this dimension is not a measure dimension. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
name (Dimension Name)	Specifies the name of the dimension. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
uniqueName (Dimension Unique Name)	Specifies the unique name of the dimension. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element's content model ([CT_PivotDimension](#)) is located in §A.2. end note]

18.10.1.25 dimensions (OLAP Dimensions)

Represents the collection of PivotTable OLAP dimensions.

[Example:

```
<dimensions count="22">
  <dimension name="Account" uniqueName="[Account]" caption="Account"/>
  <dimension name="Customer" uniqueName="[Customer]" caption="Customer"/>
  <dimension name="Date" uniqueName="[Date]" caption="Date"/>
  <dimension name="Delivery Date" uniqueName="[Delivery Date]"
    caption="Delivery Date"/>
```

```
<dimension name="Department" uniqueName="[Department]" caption="Department"/>
<dimension name="Destination Currency" uniqueName="[Destination Currency]"
  caption="Destination Currency"/>
<dimension name="Employee" uniqueName="[Employee]" caption="Employee"/>
<dimension name="Geography" uniqueName="[Geography]" caption="Geography"/>
<dimension name="Internet Sales Order Details" uniqueName="[Internet Sales
  Order Details]" caption="Internet Sales Order Details"/>
<dimension measure="1" name="Measures" uniqueName="[Measures]"
  caption="Measures"/>
<dimension name="Organization" uniqueName="[Organization]"
  caption="Organization"/>
<dimension name="Product" uniqueName="[Product]" caption="Product"/>
<dimension name="Promotion" uniqueName="[Promotion]" caption="Promotion"/>
<dimension name="Reseller" uniqueName="[Reseller]" caption="Reseller"/>
<dimension name="Reseller Sales Order Details" uniqueName="[Reseller Sales
  Order Details]" caption="Reseller Sales Order Details"/>
<dimension name="Sales Channel" uniqueName="[Sales Channel]" caption="Sales
  Channel"/>
<dimension name="Sales Reason" uniqueName="[Sales Reason]" caption="Sales
  Reason"/>
<dimension name="Sales Summary Order Details" uniqueName="[Sales Summary Order
  Details]" caption="Sales Summary Order Details"/>
<dimension name="Sales Territory" uniqueName="[Sales Territory]"
  caption="Sales Territory"/>
<dimension name="Scenario" uniqueName="[Scenario]" caption="Scenario"/>
<dimension name="Ship Date" uniqueName="[Ship Date]" caption="Ship Date"/>
<dimension name="Source Currency" uniqueName="[Source Currency]"
  caption="Source Currency"/>
</dimensions>
```

end example]

Attributes	Description
count (OLAP Dimensions Count)	Specifies the number of OLAP dimensions in the PivotTable. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element’s content model ([CT_Dimensions](#)) is located in §A.2. *end note*]

18.10.1.26 [discretePr \(Discrete Grouping Properties\)](#)

Represents the collection of discrete grouping properties for a field group.

[Example:

```

...
    <fieldGroup par="6" base="0">
      <rangePr groupBy="months" startDate="2002-01-01T00:00:00"
        endDate="2006-05-06T00:00:00"/>
      <groupItems count="14">
        <s v="&lt;1/1/2002"/>
        <s v="Jan"/>
        <s v="Feb"/>
        <s v="Mar"/>
        <s v="Apr"/>
        <s v="May"/>
        <s v="Jun"/>
        <s v="Jul"/>
        <s v="Aug"/>
        <s v="Sep"/>
        <s v="Oct"/>
        <s v="Nov"/>
        <s v="Dec"/>
        <s v="&gt;5/6/2006"/>
      </groupItems>
    </fieldGroup>
  </cacheField>
  <cacheField name="Name" numFmtId="0">
    <sharedItems count="4">
      <s v="Joe"/>
      <s v="John"/>
      <s v="Bob"/>
      <s v="Robert"/>
    </sharedItems>
    <fieldGroup par="4"/>
  </cacheField>
  <cacheField name="ProductID" numFmtId="0">
    <sharedItems containsSemiMixedTypes="0" containsString="0" containsNumber="1"
      containsInteger="1" minValue="1" maxValue="4" count="4">
      <n v="1"/>
      <n v="2"/>
      <n v="3"/>
      <n v="4"/>
    </sharedItems>

```

```

<fieldGroup base="2">
  <rangePr startNum="1" endNum="4" groupInterval="2"/>
  <groupItems count="4">
    <s v="&lt;1"/>
    <s v="1-2"/>
    <s v="3-4"/>
    <s v="&gt;5"/>
  </groupItems>
</fieldGroup>
</cacheField>

```

end example]

Attributes	Description
count (Mapping Index Count)	<p>Specifies the number of mapping indexes for this grouped field.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_DiscretePr](#)) is located in §A.2. *end note*]

18.10.1.27 e (Error Value)

Represents an error value. The use of this item indicates that an error value is present in the PivotTable source. The error is recorded in the value attribute.

Attributes	Description
b (Bold)	<p>Specifies a boolean value that indicates whether the value contains bold formatting on the OLAP server. This attribute applies to OLAP-based PivotTables only.</p> <p>A value of 1 or true indicates this value contains bold formatting on the server.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
bc (background Color)	<p>Specifies the background color for this value that was provided by the OLAP server. This attribute applies to OLAP-based PivotTables only. The color is specified as a HEX value in RGB space.</p> <p>The possible values for this attribute are defined by the ST_UnsignedIntHex simple type (§18.18.86).</p>
c (Item Caption)	<p>Specifies the item/member caption</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type</p>

Attributes	Description
	(§22.9.2.19).
cp (Member Property Count)	<p>Specifies the number of member property values.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
f (Calculated Item)	<p>Specifies a boolean value that indicates whether this is a calculated item value.</p> <p>A value of 1 or true indicates value is a calculated item value.</p> <p>A value of 0 or false indicates this value is not a calculated item value.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fc (Foreground Color)	<p>Specifies the foreground color for this value that was provided by the OLAP server. This attribute applies to OLAP-based PivotTables only. The color is specified as a HEX value in RGB space.</p> <p>The possible values for this attribute are defined by the ST_UnsignedIntHex simple type (§18.18.86).</p>
i (Italic)	<p>Specifies a boolean value that indicates whether the value contains italic formatting on the OLAP server. This attribute applies to OLAP-based PivotTables only.</p> <p>A value of 1 or true indicates this value contains italic formatting on the server.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
in (Format Index)	<p>Specifies the index to the OLAP serverformat element where the format string for this entry is stored.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
st (Strikethrough)	<p>Specifies a boolean value that indicates whether the value contains strikethrough formatting on the OLAP server. This attribute applies to OLAP-based PivotTables only.</p> <p>A value of 1 or true indicates this value contains strikethrough formatting on the server.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
u (Unused Item)	<p>Specifies a boolean value that indicates whether this is an unused item. The application marks an item as unused when an item is deleted from the data source. The item and associated metadata are retained in the cache until the threshold for unused items specified in missingItemsLimit is reached.</p> <p>A value of 1 or true indicates this item is not used.</p>

Attributes	Description
	<p>A value of 0 or false indicates this item is used.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
un (Underline)	<p>Specifies a boolean value that indicates whether the value contains underline formatting on the OLAP server. This attribute applies to OLAP-based PivotTables only.</p> <p>A value of 1 or true indicates this value contains underline formatting on the server.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
v (Value)	<p>Specifies the value of the item. This attribute depends on how the application records errors.</p> <p>[Note: While the error values are determined by the application, the following are some example error values that could be used:</p> <ul style="list-style-type: none"> • #DIV/0! • #NAME? • #VALUE! • #NULL! • #NUM! • #REF! • #N/A • #GETTING_DATA <p>end note]</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Error](#)) is located in §A.2. end note]

18.10.1.28 entries (Entries)

Represents the collection of OLAP sheet data entries.

Attributes	Description
count (Tuple Count)	<p>Specifies the number of tuple entries.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_PCDSDTCEntries](#)) is located in §A.2. end note]

18.10.1.29 field (Field)

Represents a generic field that can appear either on the column or the row region of the PivotTable. There areas many <x> elements as there are item values in any particular column or row.

[Example:

```
<sh:field x="2"/>
```

end example]

Attributes	Description
x (Field Index)	Specifies the index to a pivotField item value. There are as many x elements as there are item values in any particular column. Note that these x elements sometimes are not explicitly written, but instead "inherited" from the previous column or i element, via the value of @r. The pivotField items don't list values explicitly, but instead reference a shared item value in the pivotCacheDefinition part. The first instance of x has no attribute value @v associated with it, so the default value for @v is assumed to be "0". The possible values for this attribute are defined by the W3C XML Schema int datatype.

[Note: The W3C XML Schema definition of this element’s content model ([CT_Field](#)) is located in §A.2. end note]

18.10.1.30 fieldGroup (Field Group Properties)

Represents the collection of properties for a field group.

[Example:

```
...
<fieldGroup par="6" base="0">
  <rangePr groupBy="months" startDate="2002-01-01T00:00:00"
    endDate="2006-05-06T00:00:00"/>
  <groupItems count="14">
    <s v="1/1/2002"/>
    <s v="Jan"/>
    <s v="Feb"/>
    <s v="Mar"/>
    <s v="Apr"/>
    <s v="May"/>
    <s v="Jun"/>
    <s v="Jul"/>
    <s v="Aug"/>
    <s v="Sep"/>
```

```

        <s v="Oct"/>
        <s v="Nov"/>
        <s v="Dec"/>
        <s v="&gt;5/6/2006"/>
    </groupItems>
</fieldGroup>
</cacheField>
<cacheField name="Name" numFmtId="0">
    <sharedItems count="4">
        <s v="Joe"/>
        <s v="John"/>
        <s v="Bob"/>
        <s v="Robert"/>
    </sharedItems>
    <fieldGroup par="4"/>
</cacheField>
<cacheField name="ProductID" numFmtId="0">
    <sharedItems containsSemiMixedTypes="0" containsString="0" containsNumber="1"
        containsInteger="1" minValue="1" maxValue="4" count="4">
        <n v="1"/>
        <n v="2"/>
        <n v="3"/>
        <n v="4"/>
    </sharedItems>
    <fieldGroup base="2">
        <rangePr startNum="1" endNum="4" groupInterval="2"/>
        <groupItems count="4">
            <s v="&lt;1"/>
            <s v="1-2"/>
            <s v="3-4"/>
            <s v="&gt;5"/>
        </groupItems>
    </fieldGroup>
...

```

end example]

Attributes	Description
base (Field Base)	Specifies the base of this field, if any. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
par (Parent)	Specifies the parent of this field, if any.

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_FieldGroup](#)) is located in §A.2. *end note*]

18.10.1.31 fieldsUsage (Fields Usage)

Represents the fields in the cache that are being used by this hierarchy.

[Example:

```
<fieldsUsage count="6">
  <fieldUsage x="-1"/>
  <fieldUsage x="2"/>
  <fieldUsage x="3"/>
  <fieldUsage x="4"/>
  <fieldUsage x="5"/>
  <fieldUsage x="6"/>
</fieldsUsage>
```

end example]

Attributes	Description
count (Field Count)	Specifies the number of fields that are being used by this hierarchy.
	The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_FieldsUsage](#)) is located in §A.2. *end note*]

18.10.1.32 fieldUsage (PivotCache Field Id)

Represents a cache field used in this hierarchy.

[Example:

```
<fieldUsage x="-1"/>
```

end example]

Attributes	Description
x (Field Index)	Specifies the index of a field.

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema int datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FieldUsage](#)) is located in §A.2. *end note*]

18.10.1.33 filter (PivotTable Advanced Filter)

Represents a PivotTable advanced filter.

[*Example:*

```
<sh:filter fld="3" type="count" id="1" iMeasureHier="187">
  <sh:autoFilter ref="A1">
    <sh:filterColumn colId="0">
      <sh:top10 val="5"/>
    </sh:filterColumn>
  </sh:autoFilter>
</sh:filter>
```

end example]

Attributes	Description
description (Pivot Filter Description)	Specifies the description of the pivot filter. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
evalOrder (Evaluation Order)	Specifies the evaluation order of the pivot filter. This attribute is zero-based. The possible values for this attribute are defined by the W3C XML Schema int datatype.
fld (Field Index)	Specifies the index of the field to which this pivot filter belongs. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
id (Pivot Filter Id)	Specifies the unique identifier of the pivot filter as assigned by the PivotTable. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
iMeasureFld (Measure Field Index)	Specifies the index of the measure field. This attribute is used only by filters in Relational pivots and specifies on which measure a value filter should apply. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

Attributes	Description
iMeasureHier (Measure Index)	Specifies the index of the measure cube field. This attribute is used only by filters in OLAP pivots and specifies on which measure a value filter should apply. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
mpFld (Member Property Field Id)	Specifies the index of the field representing the member property field on which this pivot filter is defined. This attribute is used only by label pivot filters. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
name (Pivot Filter Name)	Specifies the name of the pivot filter. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
stringValue1 (Label Pivot)	Specifies the string value "1" used by label pivot filters. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
stringValue2 (Label Pivot Filter String Value 2)	Specifies the string value "2" used by label pivot filters. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
type (Pivot Filter Type)	Specifies the type of the pivot filter. The possible values for this attribute are defined by the ST_PivotFilterType simple type (§18.18.59).

[Note: The W3C XML Schema definition of this element's content model ([CT_PivotFilter](#)) is located in §A.2. *end note*]

18.10.1.34 filters (Filters)

Represents the collection of filters that apply to this PivotTable.

[Example:

```
<sh:filters count="1">
  <sh:filter fld="3" type="count" id="1" iMeasureHier="187">
    <sh:autoFilter ref="A1">
      <sh:filterColumn colId="0">
        <sh:top10 val="5"/>
      </sh:filterColumn>
    </sh:autoFilter>
  </sh:filter>
</sh:filters>
```

end example]

Attributes	Description
count (Pivot Filter Count)	<p>Specifies the number of pivot filters in the collection.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_PivotFilters](#)) is located in §A.2. *end note*]

18.10.1.35 format (PivotTable Format)

Represents the format defined in the PivotTable.

Attributes	Description
action (Format Action)	<p>Specifies the formatting behavior for the area indicated in the pivotArea element. The default value for this attribute is "formatting," which indicates that the specified cells have some formatting applied. The format is specified in the dxflId attribute. If the formatting is cleared from the cells, then the value of this attribute becomes "blank."</p> <p>The possible values for this attribute are defined by the ST_FormatAction simple type (§18.18.34).</p>
dxflId (Format Id)	<p>Specifies the identifier of the format the application is currently using for the PivotTable. Formatting information is written to the styles part. See the Styles section (§18.8) for more information on formats.</p> <p>Formatting information provided by cell table and by PivotTable need not agree. If the two formats differ, the cell-level formatting takes precedence. If you change the layout the PivotTable, the PivotTable formatting will then take precedence.</p> <p>The possible values for this attribute are defined by the ST_DxflId simple type (§18.18.25).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Format](#)) is located in §A.2. *end note*]

18.10.1.36 formats (PivotTable Formats)

Represents the collection of formats applied to PivotTable.

Attributes	Description
count (Formats Count)	Specifies the number of formats in the collection. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Formats](#)) is located in §A.2. *end note*]

18.10.1.37 group (OLAP Group)

Represents an OLAP level group.

[Example:

```
<group name="CategoryX1_Grp_1" uniqueName="[Product].[Product Categories].
[Product Categories1].[GROUPMEMBER.[CategoryX1_Grp_1]].[Product]].
[Product Categories]].[All Products]]]" caption="Group1"
uniqueParent="[Product].[Product Categories].[All Products]" id="1">
  <groupMembers count="2">
    <groupMember
      uniqueName="[Product].[Product Categories].[Category].&[4]"/>
    <groupMember
      uniqueName="[Product].[Product Categories].[Category].&[1]"/>
  </groupMembers>
</group>
```

end example]

Attributes	Description
caption (Group Caption)	Specifies the caption for this group. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
id (Group Id)	Specifies the unique number for this group within the level. The possible values for this attribute are defined by the W3C XML Schema int datatype.
name (Group	Specifies the name of this group.

Attributes	Description
Name)	The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
uniqueName (Unique Group Name)	Specifies the unique name of this group. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
uniqueParent (Parent Unique Name)	Specifies the unique name of the parent of this group. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element's content model ([CT_LevelGroup](#)) is located in §A.2. *end note*]

18.10.1.38 groupItems (OLAP Group Items)

Represents the collection of items in a field group.

[Example:

```

...
<fieldGroup par="6" base="0">
  <rangePr groupBy="months" startDate="2002-01-01T00:00:00"
    endDate="2006-05-06T00:00:00"/>
  <groupItems count="14">
    <s v="&lt;1/1/2002"/>
    <s v="Jan"/>
    <s v="Feb"/>
    <s v="Mar"/>
    <s v="Apr"/>
    <s v="May"/>
    <s v="Jun"/>
    <s v="Jul"/>
    <s v="Aug"/>
    <s v="Sep"/>
    <s v="Oct"/>
    <s v="Nov"/>
    <s v="Dec"/>
    <s v="&gt;5/6/2006"/>
  </groupItems>
</fieldGroup>
</cacheField>

```

```
<cacheField name="Name" numFmtId="0">
  <sharedItems count="4">
    <s v="Joe"/>
    <s v="John"/>
    <s v="Bob"/>
    <s v="Robert"/>
  </sharedItems>
  <fieldGroup par="4"/>
</cacheField>
<cacheField name="ProductID" numFmtId="0">
  <sharedItems containsSemiMixedTypes="0" containsString="0" containsNumber="1"
    containsInteger="1" minValue="1" maxValue="4" count="4">
    <n v="1"/>
    <n v="2"/>
    <n v="3"/>
    <n v="4"/>
  </sharedItems>
  <fieldGroup base="2">
    <rangePr startNum="1" endNum="4" groupInterval="2"/>
    <groupItems count="4">
      <s v="&lt;1"/>
      <s v="1-2"/>
      <s v="3-4"/>
      <s v="&gt;5"/>
    </groupItems>
  </fieldGroup>
...
end example]
```

Attributes	Description
count (Items Created Count)	Specifies the number of items created for this grouped field. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element’s content model ([CT_GroupItems](#)) is located in §A.2. *end note*]

18.10.1.39 [groupLevel \(OLAP Grouping Levels\)](#)

Represents the collection of OLAP grouping levels.

[Example:

```

<groupLevel uniqueName="[Product].[Product Categories].[Category]"
  caption="Category">
  <groups count="1">
    <group name="CategoryXl_Grp_1" uniqueName="[Product].[Product
      Categories].[Product Categories1].
      [GROUPMEMBER.[CategoryXl_Grp_1]].[Product]].[Product Categories]].
      [All Products]]]" caption="Group1" uniqueParent="[Product].
      [Product Categories].[All Products]" id="1">
      <groupMembers count="2">
        <groupMember
          uniqueName="[Product].[Product Categories].[Category].&[4]"/>
        <groupMember
          uniqueName="[Product].[Product Categories].[Category].&[1]"/>
      </groupMembers>
    </group>
  </groups>
</groupLevel>

```

end example]

Attributes	Description
caption (Grouping Level Display Name)	<p>Specifies the display name for this grouping level.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
customRollUp (Custom Roll Up)	<p>Specifies a boolean value that indicates whether this group level has a custom roll up. A value of 1 or true indicates this group level has a custom roll up.</p> <p>A value of 0 or false indicates this group level does not have a custom roll up.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
uniqueName (Unique Name)	<p>Specifies the unique name for this grouping level.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
user (User-Defined Group Level)	<p>Specifies a boolean value that indicates whether this is a user-defined group level.</p> <p>A value of 1 or true indicates this is a user-defined group.</p> <p>A value of 0 or false indicates this group is not user-defined.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_GroupLevel](#)) is located in §A.2. *end note*]

18.10.1.40 groupLevels (OLAP Grouping Levels)

Represents the collection of OLAP grouping levels.

[Example:

```
<groupLevels count="5">
  <groupLevel uniqueName="[Product].[Product Categories].[All]"
    caption="(All)"/>
  <groupLevel uniqueName="[Product].[Product Categories].[Product Categories1]"
    caption="Product Categories1" user="1"/>
  <groupLevel uniqueName="[Product].[Product Categories].[Category]"
    caption="Category">
    <groups count="1">
      <group name="CategoryXl_Grp_1" uniqueName="[Product].[Product Categories].
        [Product Categories1].[GROUPMEMBER.[CategoryXl_Grp_1]].
        [Product]].[Product Categories]].[All Products]]" caption="Group1"
        uniqueParent="[Product].[Product Categories].[All Products]" id="1">
        <groupMembers count="2">
          <groupMember
            uniqueName="[Product].[Product Categories].[Category].&[4]"/>
          <groupMember
            uniqueName="[Product].[Product Categories].[Category].&[1]"/>
        </groupMembers>
      </group>
    </groups>
  </groupLevel>
  <groupLevel uniqueName="[Product].[Product Categories].[Subcategory]"
    caption="Subcategory"/>
  <groupLevel uniqueName="[Product].[Product Categories].[Product]"
    caption="Product"/>
</groupLevels>
```

end example]

Attributes	Description
count (Grouping Level Count)	<p>Specifies the number of grouping levels.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_GroupLevels](#)) is located in §A.2. *end note*]

18.10.1.41 groupMember (OLAP Group Member)

Represents an OLAP group member.

[Example:

```
<groupMember uniqueName="[Product].[Product Categories].[Category].&[1]"/>
```

end example]

Attributes	Description
group (Group)	Specifies a boolean value that indicates whether this member represents a group. A value of 1 or true indicates this member represents a group. A value of 0 or false indicates this member does not represent a group. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
uniqueName (Group Member Unique Name)	Specifies the unique name of this group member. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element's content model ([CT_GroupMember](#)) is located in §A.2. *end note*]

18.10.1.42 groupMembers (OLAP Group Members)

Represents the collection of OLAP group members.

[Example:

```
<groupMembers count="2">  
  <groupMember uniqueName="[Product].[Product Categories].[Category].&[4]"/>  
  <groupMember uniqueName="[Product].[Product Categories].[Category].&[1]"/>  
</groupMembers>
```

end example]

Attributes	Description
count (Group Member Count)	Specifies the number of group members in the collection. The possible values for this attribute are defined by the W3C XML Schema unsignedInt

Attributes	Description
	datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_GroupMembers](#)) is located in §A.2. end note]

18.10.1.43 groups (OLAP Level Groups)

Represents the collection of OLAP level groups.

[Example:

```
<groups count="1">
  <group name="CategoryX1_Grp_1" uniqueName="[Product].[Product Categories].
    [Product Categories1].[GROUPMEMBER].[CategoryX1_Grp_1].[Product]].
    [Product Categories]].[All Products]]]" caption="Group1"
    uniqueParent="[Product].[Product Categories].[All Products]" id="1">
    <groupMembers count="2">
      <groupMember
        uniqueName="[Product].[Product Categories].[Category].&[4]"/>
      <groupMember
        uniqueName="[Product].[Product Categories].[Category].&[1]"/>
    </groupMembers>
  </group>
</groups>
```

end example]

Attributes	Description
count (Level Group Count)	Specifies the number of level groups in the collection. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Groups](#)) is located in §A.2. end note]

18.10.1.44 i (Row Items)

Represents the collection of items in the row region of the PivotTable.

[Example: In this example the item values are found in cells B10:B13. For example "Bikes" is in B10, and corresponds to the first <i> element below.

```
<rowItems count="4">
  <i>
    <x/>
  </i>
  <i r="1">
    <x/>
  </i>
  <i r="1">
    <x v="1"/>
  </i>
  <i t="grand">
    <x/>
  </i>
</rowItems>
```

end example]

Attributes	Description
i (Data Field Index)	<p>Specifies a zero-based index indicating the referenced data item it in a data field with multiple data items.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
r (Repeated Items Count)	<p>Specifies the number of items to repeat from the previous row item. The first item has no @r explicitly written. Since a default of "0" is specified in the schema, for any item whose @r is missing, a default value of "0" is implied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
t (Item Type)	<p>Specifies the type of the item. Value of 'default' indicates a grand total as the last row item value</p> <p>The possible values for this attribute are defined by the ST_ItemType simple type (§18.18.43).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_I](#)) is located in §A.2. *end note*]

18.10.1.45 [item \(PivotTable Field Item\)](#)

Represents a single item in PivotTable field.

[Example:

```
<sh:item x="66"/>
```


end example]

Attributes	Description
c (Child Items)	<p>Specifies a boolean value that indicates whether the approximate number of child items for this item is greater than zero.</p> <p>A value of 1 or true indicates the approximate number of child items for this item is greater than zero.</p> <p>A value of 0 or false indicates the approximate number of child items for this item is zero.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
d (Expanded)	<p>Specifies a boolean value that indicates whether this item has been expanded in the PivotTable view.</p> <p>A value of 1 or true indicates this item has been expanded.</p> <p>A value of 0 or false indicates this item is collapsed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
e (Drill Across Attributes)	<p>Specifies a boolean value that indicates whether attribute hierarchies nested next to each other on a PivotTable row or column will offer drilling "across" each other or not. <i>[Example: if the application offers drill across for attribute hierarchies and not for user hierarchies, this attribute would only be written when two attribute hierarchies are placed next to each other on an axis. end example]</i></p> <p>A value of 1 or true indicates there is a drill across attribute hierarchies positioned next to each other on a pivot axis.</p> <p>A value of 0 or false indicates there is not drill across attribute hierarchies.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
f (Calculated Member)	<p>Specifies a boolean value that indicates whether this item is a calculated member.</p> <p>A value of 1 or true indicates this item is a calculated member.</p> <p>A value of 0 or false indicates this item is not calculated.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
h (Hidden)	<p>Specifies a boolean value that indicates whether the item is hidden.</p>

Attributes	Description
	<p>A value of 1 or true indicates item is hidden.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
m (Missing)	<p>Specifies a boolean value that indicate whether the item has a missing value.</p> <p>A value of 1 or true indicates the item value is missing. The application should still retain the item settings in case the item reappears during a later refresh.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
n (Item User Caption)	<p>Specifies the user caption of the item.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
s (Character)	<p>Specifies a boolean value that indicates whether the item has a character value.</p> <p>A value of 1 or true indicates the item has a string/character value.</p> <p>A value of 0 or false indicates item the item has a value of a different type.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
sd (Hide Details)	<p>Specifies a boolean value that indicates whether the details are hidden for this item.</p> <p>A value of 1 or true indicates item details are hidden.</p> <p>A value of 0 or false indicates item details are shown.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
t (Item Type)	<p>Specifies the type of this item. A value of 'default' indicates the subtotal or total item.</p> <p>The possible values for this attribute are defined by the ST_ItemType simple type (§18.18.43).</p>
x (Item Index)	<p>Specifies the item index in pivotFields collection in the PivotCache.</p> <p>[Example: In the following example, "Product Category" and "Product Subcategory" are on the row axis of the PivotTable, in that order.</p> <pre><rowFields count="2"> <field x="7"/> <x="8"/> </rowFieldsfield ></pre>

Attributes	Description
	<p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Item](#)) is located in §A.2. *end note*]

18.10.1.46 items (Field Items)

Represents the collection of items in a PivotTable field. The items in the collection are ordered by index. Items represent the unique entries from the field in the source data.

In the following image, the item Golf represents all rows of data in the source list for which the Sport field contains the entry Golf.

	A	B	C
1	Region	(All)	
2			
3	Sum of Sales	Quarter	
4	Sport	Qtr1	Qtr2
5	Golf	8,500	4,500

The order in which the items are listed is the order they would appear on a particular axis [*Example: Row or column. end example*]

[*Example:* In the following SpreadsheetML example, the first field is "Customer Name" and the first item referenced here is `<item x="66"/>`, which references the value "Adam L Flores" in the pivotCacheDefinition. Therefore, if you added "Customer Name" to the row axis, "Adam L Flores" would be the first row item listed.

```
<pivotFields count="28">
  <pivotField showAll="0" includeNewItemsInFilter="1">
    <items count="8">
      <item x="66"/>
      <item x="133"/>
      <item x="74"/>
      <item x="27"/>
      <item x="118"/>
      <item x="63"/>
      <item x="141"/>
      <item t="default"/>
    </items>
  </pivotField>
  <pivotField showAll="0" includeNewItemsInFilter="1"/>
```

```

<pivotField axis="axisPage" showAll="0" includeNewItemsInFilter="1">
  <items count="2">
    <item x="0"/>
    <item t="default"/>
  </items>
</pivotField>
<pivotField showAll="0" includeNewItemsInFilter="1"/>

```

end example]

Attributes	Description
count (Field Count)	Specifies the number of fields in the PivotTable. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Items](#)) is located in §A.2. *end note*]

18.10.1.47 kpi (OLAP KPI)

Represents the KPI defined on the OLAP server and stored in the PivotCache.

[Example:

```

<kpi uniqueName="Growth in Customer Base" caption="Growth in Customer Base"
  displayFolder="Customer Perspective\Expand Customer Base"
  measureGroup="Internet Sales" value="[Measures].[Growth in Customer Base]"
  goal="[Measures].[Growth in Customer Base Goal]"
  status="[Measures].[Growth in Customer Base Status]"
  trend="[Measures].[Growth in Customer Base Trend]"/>

```

end example]

Attributes	Description
caption (KPI Display Name)	Specifies the display name of the KPI. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
displayFolder (KPI Display Folder)	Specifies the folder where this KPI is displayed in a list of fields for the PivotTable. This attribute depends on how the application exposes a list of fields in the user interface. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
goal (KPI Goal Unique Name)	Specifies the unique name of the KPI goal measure.

Attributes	Description
	The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
measureGroup (KPI Measure Group Name)	Specifies the name of the measure group to which this KPI belongs. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
parent (Parent KPI)	Specifies the name of the parent KPI for this KPI. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
status (KPI Status Unique Name)	Specifies the unique name of the KPI status measure. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
time (Time Member KPI Unique Name)	Specifies the unique name of the KPI current time member. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
trend (KPI Trend Unique Name)	Specifies the unique name of the KPI trend measure. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
uniqueName (KPI Unique Name)	Specifies the unique name of the KPI. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
value (KPI Value Unique Name)	Specifies the unique name of the KPI value measure. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
weight (KPI Weight Unique Name)	Specifies the unique name of the KPI weight measure. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element's content model ([CT_PCDKPI](#)) is located in §A.2. *end note*]

18.10.1.48 kpis (OLAP KPIs)

Represents the collection of Key Performance Indicators (KPIs) defined on the OLAP server and stored in the PivotCache.

[Example:

```
<kpis count="3">
  <kpi uniqueName="Growth in Customer Base" caption="Growth in Customer Base"
    displayFolder="Customer Perspective\Expand Customer Base"
    measureGroup="Internet Sales" value="[Measures].[Growth in Customer Base]"
    goal="[Measures].[Growth in Customer Base Goal]"
    status="[Measures].[Growth in Customer Base Status]"
    trend="[Measures].[Growth in Customer Base Trend]"/>
  <kpi uniqueName="Net Income" caption="Net Income"
    displayFolder="Financial Perspective\Maintain Overall Margins"
    measureGroup="Financial Reporting" value="[Measures].[Net Income Value]"
    goal="[Measures].[Net Income Goal]" status="[Measures].[Net Income Status]"
    trend="[Measures].[Net Income Trend]"/>
  <kpi uniqueName="Operating Profit" caption="Operating Profit"
    displayFolder="Financial Perspective\Maintain Overall Margins"
    measureGroup="Financial Reporting" parent="Net Income"
    value="[Measures].[Operating Profit Value]"
    goal="[Measures].[Operating Profit Goal]"
    status="[Measures].[Operating Profit Status]"
    trend="[Measures].[Operating Profit Trend]"/>
  ...
end example]
```

Attributes	Description
count (KPI Count)	Specifies the number of KPIs stored in the PivotCache. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element’s content model ([CT_PCDKPIs](#)) is located in §A.2. end note]

18.10.1.49 location (PivotTable Location)

Represents location information for the PivotTable.

[Example:

```
<location ref="B6:G13" firstHeaderRow="1" firstDataRow="4" firstDataCol="1"
  rowPageCount="3" colPageCount="1"/>
```

end example]

Attributes	Description
colPageCount (Columns Per Page)	Specifies the number of columns per page for this PivotTable that the filter area will occupy. By default there is a single column of filter fields per page and the fields occupy as many rows as there are fields. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
firstDataCol (First Data Column)	Specifies the first column of the PivotTable data, relative to the top left cell in the ref value. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
firstDataRow (PivotTable Data First Row)	Specifies the first row of the PivotTable data, relative to the top left cell in the ref value. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
firstHeaderRow (First Header Row)	Specifies the first row of the PivotTable header, relative to the top left cell in the ref value. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
ref (Reference)	Specifies the first row of the PivotTable. The possible values for this attribute are defined by the ST_Ref simple type (§18.18.62).
rowPageCount (Rows Per Page Count)	Specifies the number of rows per page for this PivotTable that the filter area will occupy. By default there is a single column of filter fields per page and the fields occupy as many rows as there are fields. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Location](#)) is located in §A.2. *end note*]

18.10.1.50 m (No Value)

Represents a value that was not specified.

[Example:

```
<sharedItems containsString="0" containsBlank="1" count="1">
  <m/>
</sharedItems>
```

end example]

Attributes	Description
b (Bold)	<p>Specifies a boolean value that indicates whether the value contains bold formatting on the OLAP server. This attribute applies to OLAP-based PivotTables only.</p> <p>A value of 1 or true indicates this value contains bold formatting on the server.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
bc (background Color)	<p>Specifies the background color for this value that was provided by the OLAP server. This attribute applies to OLAP-based PivotTables only. The color is specified as a HEX value in RGB space.</p> <p>The possible values for this attribute are defined by the ST_UnsignedIntHex simple type (§18.18.86).</p>
c (Caption)	<p>Specifies the caption for this item.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
cp (Member Property Count)	<p>Specifies the number of member property values for this item.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
f (Calculated Item)	<p>Specifies a boolean value that indicates whether this is a calculated item value.</p> <p>A value of 1 or true indicates this item is a calculated value.</p> <p>A value of 0 or false indicates this item is not calculated.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fc (Foreground Color)	<p>Specifies the foreground color for this value that was provided by the OLAP server. This attribute applies to OLAP-based PivotTables only. The color is specified as a HEX value in RGB space.</p> <p>The possible values for this attribute are defined by the ST_UnsignedIntHex simple type (§18.18.86).</p>
i (Italic)	<p>Specifies a boolean value that indicates whether the value contains italic formatting on the OLAP server. This attribute applies to OLAP-based PivotTables only.</p> <p>A value of 1 or true indicates this value contains underline formatting on the server.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
in (Format Index)	<p>Specifies the index to the OLAP serverformat element where the format string for this</p>

Attributes	Description
	<p>entry is stored.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
st (Strikethrough)	<p>Specifies a boolean value that indicates whether the value contains strikethrough formatting on the OLAP server. This attribute applies to OLAP-based PivotTables only.</p> <p>A value of 1 or true indicates this value contains underline formatting on the server.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
u (Unused Item)	<p>Specifies a boolean value that indicates whether this is an unused item. The application marks an item as unused when an item is deleted from the data source. The item and associated metadata are retained in the cache until the threshold for unused items specified in missingItemsLimit is reached.</p> <p>A value of 1 or true indicates this item is unused.</p> <p>A value of 0 or false indicates this item is used.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
un (Underline)	<p>Specifies a boolean value that indicates whether the value contains underline formatting on the OLAP server. This attribute applies to OLAP-based PivotTables only.</p> <p>A value of 1 or true indicates this value contains underline formatting on the server.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Missing](#)) is located in §A.2. *end note*]

18.10.1.51 map (OLAP Measure Group)

Represents a PivotTable OLAP measure group - Dimension map.

[Example:

```
<map measureGroup="0" dimension="2"/>
```

end example]

Attributes	Description
dimension (Dimension Id)	Specifies the identifier for the dimension. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
measureGroup (Measure Group Id)	Specifies the identifier of the measure group. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_MeasureDimensionMap](#)) is located in §A.2. *end note*]

18.10.1.52 maps (OLAP Measure Group)

Represents the PivotTable OLAP measure group - Dimension maps.

[Example:

```
<maps count="3">
  <map measureGroup="0" dimension="2"/>
  <map measureGroup="1" dimension="19"/>
  <map measureGroup="2" dimension="8"/>
</maps>
```

end example]

Attributes	Description
count (Measure Group Count)	Specifies the number of measure groups, or dimension maps, in the PivotTable. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_MeasureDimensionMaps](#)) is located in §A.2. *end note*]

18.10.1.53 measureGroup (OLAP Measure Group)

Represents a PivotTable OLAP measure group.

[Example:

```
<measureGroup name="Sales Orders" caption="Sales Orders"/>
```

end example]

Attributes	Description
caption (Measure Group Display Name)	Specifies the display name of the measure group. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
name (Measure Group Name)	Specifies the name of the measure group. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element's content model ([CT_MeasureGroup](#)) is located in §A.2.
end note]

18.10.1.54 [measureGroups](#) (OLAP Measure Groups)

Represents the collection of PivotTable OLAP measure groups.

[Example:

```
<measureGroups count="11">
  <measureGroup name="Exchange Rates" caption="Exchange Rates"/>
  <measureGroup name="Financial Reporting" caption="Financial Reporting"/>
  <measureGroup name="Internet Customers" caption="Internet Customers"/>
  <measureGroup name="Internet Orders" caption="Internet Orders"/>
  <measureGroup name="Internet Sales" caption="Internet Sales"/>
  <measureGroup name="Reseller Orders" caption="Reseller Orders"/>
  <measureGroup name="Reseller Sales" caption="Reseller Sales"/>
  <measureGroup name="Sales Orders" caption="Sales Orders"/>
  <measureGroup name="Sales Reasons" caption="Sales Reasons"/>
  <measureGroup name="Sales Summary" caption="Sales Summary"/>
  <measureGroup name="Sales Targets" caption="Sales Targets"/>
</measureGroups>
```

end example]

Attributes	Description
count (Measure Group Count)	Specifies the number of measure groups in the PivotTable. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_MeasureGroups](#)) is located in §A.2.
end note]

18.10.1.55 member (Member)

Represents an item that can be included or excluded.

Attributes	Description
name (Hidden Item Name)	Specifies the name of a hidden item. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element's content model ([CT_Member](#)) is located in §A.2. *end note*]

18.10.1.56 members (Members)

Represents the collection of items that can be included or excluded.

Attributes	Description
count (Item Count)	Specifies the number of items in the collection. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
level (Hierarchy Level)	Specifies the hierarchy level with which these items are associated. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Members](#)) is located in §A.2. *end note*]

18.10.1.57 mp (OLAP Member Property)

Represents an OLAP member property.

[Example:

```
<sh:mp field="7"/>
```

end example]

Attributes	Description
field (Field Index)	Specifies the index of the field with which this member property is associated. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

Attributes	Description
level (Level Index)	<p>Specifies the index of the level to which this member property applies.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
name (OLAP Member Property Unique Name)	<p>Specifies the unique name of the OLAP member property. The following attributes depend on the name attribute:</p> <ul style="list-style-type: none"> • nameLen • pLen • pPos <p>These attributes consist of metadata about a member in an OLAP cube and are usually displayed in a tooltip or mechanism in the user interface.</p> <p>[<i>Example</i>: If the value for name equals "[Store].[Store Name].[Store Manager]":</p> <ul style="list-style-type: none"> • nameLen will equal 20. This would refer to "[Store].[Store Name]" • pPos will equal 22. This would refer to starting character of "Store Manager" • pLen will equal 13. This would to length of "Store Manager" <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
nameLen (Name Length)	<p>Specifies the length of the unique name portion of name. [<i>Example</i>: If the value for name equals "[Store].[Store Name].[Store Manager]", nameLen will equal 20. This would refer to "[Store].[Store Name]". <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
pLen (Property Name Length)	<p>Specifies the length of the property name portion of name. [<i>Example</i>: If the value for name equals "[Store].[Store Name].[Store Manager]", pLen will equal 13. This would to length of "Store Manager". <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
pPos (Property Name Character Index)	<p>Specifies the index of the character where the property name portion begins in name. [<i>Example</i>: If the value for name equals "[Store].[Store Name].[Store Manager]", pPos will equal 22. This would refer to starting character of "Store Manager". <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
showAsCaption (Show As Caption)	<p>Specifies a boolean value that indicates whether to show the property a member caption.</p> <p>A value of 1 or true indicates member property value is shown in as a caption.</p>

Attributes	Description
	<p>A value of 0 or false indicates member property value will not be shown.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showCell (Show Cell)	<p>Specifies a boolean value that indicates whether to show the member property value in a PivotTable cell.</p> <p>A value of 1 or true indicates member property value is shown in a cell.</p> <p>A value of 0 or false indicates member property value will not be shown.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showTip (Show Tooltip)	<p>Specifies a boolean value that indicates whether to show the member property value in a tooltip on the appropriate PivotTable view cells.</p> <p>A value of 1 or true indicates member property value is shown in a tooltip.</p> <p>A value of 0 or false indicates member property value will not be shown. This attribute depends on whether the application employs tooltips or similar mechanism in the user interface.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_MemberProperty](#)) is located in §A.2. *end note*]

18.10.1.58 mpMap (Member Properties Map)

Represents a mapping to cached member properties.

[Example:

```
<mpMap v="7"/>
```

end example]

Attributes	Description
v (Shared Items Index)	<p>Specifies the index into the shared items table in the PivotCache that identifies this item.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_X](#)) is located in §A.2. *end note*]

18.10.1.59 mps (OLAP Member Properties)

Represents the collection of OLAP member property. Member properties contain additional information that is available about the items in an OLAP dimension field. *[Example: If a Geography dimension has property fields Population and Average Income available, you could create a PivotTable report that displays the sales figures for cities where your products are selling well. By displaying and analyzing the population and income figures for these cities, you could target cities with similar demographics for your marketing campaign. end example]*

[Example:

```
<sh:mps count="3">
  <sh:mp field="7"/>
  <sh:mp field="8"/>
  <sh:mp field="9"/>
</sh:mps>
```

end example]

Attributes	Description
count (OLAP Member Properties Count)	Specifies the number of OLAP member properties in the collection. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_MemberProperties](#)) is located in §A.2. end note]

18.10.1.60 n (Numeric)

Represents a numeric value in the PivotTable.

[Example:

```
<sharedItems containsSemiMixedTypes="0" containsString="0" containsNumber="1"
  containsInteger="1" minValue="3" maxValue="3" count="1">
  <n v="3"/>
</sharedItems>
```

end example]

Attributes	Description
b (Bold)	Specifies a boolean value that indicates whether this value contains bold formatting on the OLAP server. This attribute applies to OLAP-based PivotTables only. A value of 1 or true indicates this value contains italic formatting on the server.

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
bc (Background Color)	<p>Specifies the background color for this value that was provided by the OLAP server. This attribute applies to OLAP-based PivotTables only. The color is specified as a HEX value in RGB space.</p> <p>The possible values for this attribute are defined by the ST_UnsignedIntHex simple type (§18.18.86).</p>
c (Caption)	<p>Specifies the caption for this item.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
cp (Member Property Count)	<p>Specifies the number of member property values for this item.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
f (Calculated Item)	<p>Specifies a boolean value that indicates whether this is a calculated item value.</p> <p>A value of 1 or true indicates this item is a calculated value.</p> <p>A value of 0 or false indicates this item is not calculated.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fc (Foreground Color)	<p>Specifies the foreground color for this value that was provided by the OLAP server. This attribute applies to OLAP-based PivotTables only. The color is specified as a HEX value in RGB space.</p> <p>The possible values for this attribute are defined by the ST_UnsignedIntHex simple type (§18.18.86).</p>
i (Italic)	<p>Specifies a boolean value that indicates whether the value contains italic formatting on the OLAP server. This attribute applies to OLAP-based PivotTables only.</p> <p>A value of 1 or true indicates this value contains italic formatting on the server.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
in (Format Index)	<p>Specifies the index to the OLAP serverformat element where the format string for this entry is stored.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
st (Strikethrough)	Specifies a boolean value that indicates whether the value contains strikethrough

Attributes	Description
	<p>formatting on the OLAP server. This attribute applies to OLAP-based PivotTables only.</p> <p>A value of 1 or true indicates this value contains strikethrough formatting on the server.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
u (Unused Item)	<p>Specifies a boolean value that indicates whether this is an unused item. The application marks an item as unused when an item is deleted from the data source. The item and associated metadata are retained in the cache until the threshold for unused items specified in missingItemsLimit is reached.</p> <p>A value of 1 or true indicates this item is not used.</p> <p>A value of 0 or false indicates this item is used.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
un (Underline)	<p>Specifies a boolean value that indicates whether the value contains underline formatting on the OLAP server. This attribute applies to OLAP-based PivotTables only.</p> <p>A value of 1 or true indicates this value contains underline formatting on the server.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
v (Value)	<p>Specifies the value of this item.</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Number](#)) is located in §A.2. *end note*]

18.10.1.61 [page \(Page Items\)](#)

Represents the collection of page item values for a page field.

Attributes	Description
count (Page Item String Count)	<p>Specifies the number of page item strings in the collection.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_PCDSCPage](#)) is located in §A.2. *end note*]

18.10.1.62 **pageField (Page Field)**

Represents a field on the page or report filter of the PivotTable.

	A	B	C
1	Region	(All) ▼	
2			
3	Sum of Sales	Quarter ▼	
4	Sport ▼	Qtr1	Qtr2
5	Golf	8,500	4,500

In the image above, the blue field is a page or report filter field. Page/filter fields allow you to filter the entire PivotTable to display data for a single item or all the items.

[Example:

```
<sh:pageField fld="43" hier="103"
  name="[Product].[Product Categories].[All Products]" cap="All Products"/>
```

end example]

Attributes	Description
cap (Hierarchy Display Name)	Specifies the display name of the hierarchy. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
fld (Field)	Specifies the index of the field that appears on the page or filter report area of the PivotTable. The possible values for this attribute are defined by the W3C XML Schema int datatype.
hier (OLAP Hierarchy Index)	Specifies the index of the OLAP hierarchy to which this item belongs. The possible values for this attribute are defined by the W3C XML Schema int datatype.
item (Item Index)	Specifies the index of the item in the PivotCache. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
name (Hierarchy Unique Name)	Specifies the unique name of the hierarchy. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element’s content model ([CT_PageField](#)) is located in §A.2. *end note*]

18.10.1.63 `pageFields` (Page Field Items)

Represents the collection of items in the page or report filter region of the PivotTable.

[Example:

```
<sh:pageFields count="2">
  <sh:pageField fld="43" hier="103"
    name="[Product].[Product Categories].[All Products]" cap="All Products"/>
  <sh:pageField fld="66" hier="126"
    name="[Promotion].[Promotions].[All Promotions]" cap="All Promotions"/>
</sh:pageFields>
```

end example]

Attributes	Description
count (Page Item Count)	Specifies the number of items in the page region of the PivotTable. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_PageFields](#)) is located in §A.2. *end note]*

18.10.1.64 `pageItem` (Page Item)

Represents an item value for a PivotTable page.

Attributes	Description
name (Page Item Name)	Specifies the name of this page item. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element's content model ([CT_PageItem](#)) is located in §A.2. *end note]*

18.10.1.65 `pages` (Page Item Values)

Represents the collection of page item values for each page field.

Attributes	Description
count (Page Item String Count)	Specifies the number of page item strings in the collection. The possible values for this attribute are defined by the W3C XML Schema unsignedInt

Attributes	Description
	datatype.

[Note: The W3C XML Schema definition of this element’s content model ([CT_Pages](#)) is located in §A.2. *end note*]

18.10.1.66 [pivotAreas \(Pivot Areas\)](#)

Represents the collection of pivot areas that comprise the PivotTable location.

[Example:

```
<sh:pivotAreas count="1">
  <sh:pivotArea field="2" dataOnly="0" outline="0"/>
</sh:pivotAreas>
```

end example]

Attributes	Description
count (Pivot Area Count)	Specifies the number of PivotAreas for the PivotTable location. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element’s content model ([CT_PivotAreas](#)) is located in §A.2. *end note*]

18.10.1.67 [pivotCacheDefinition \(PivotCache Definition\)](#)

Represents the pivotCacheDefinition part. This part defines each field in the source data, including the name, the string resources of the instance data (for shared items), and information about the type of data that appears in the field.

[Example:

```
<pivotCacheDefinition xmlns="..." xmlns:r="..." r:id="rId1" refreshedBy="AnonUser"
  refreshedDateIso="2006-05-22T10:07:16Z" createdVersion="3"
refreshedVersion="3"
  minRefreshableVersion="3" recordCount="182">
  <cacheSource type="worksheet">
    <worksheetSource name="Table1"/>
  </cacheSource>
```

```

<cacheFields count="28">
  <cacheField name="Customer Name" numFmtId="0">
    <cacheField name="Postal Code" numFmtId="0">
      <sharedItems/>
    </cacheField>
    <cacheField name="Product Category" numFmtId="0">
      <sharedItems count="1">
        <s v="Bikes"/>
      </sharedItems>
    </cacheField>
    <cacheField name="Year" numFmtId="0">
      <sharedItems count="1">
        <s v="2001"/>
      </sharedItems>
    </cacheField>
    <cacheField name="Quarter" numFmtId="0">
      <sharedItems containsSemiMixedTypes="0" containsString="0"
        containsNumber="1" containsInteger="1" minValue="3" maxValue="3"
        count="1">
        <n v="3"/>
      </sharedItems>
    </cacheField>
  </cacheFields>
</pivotCacheDefinition>

```

end example]

Attributes	Description
backgroundQuery (Background Query)	<p>Specifies a boolean value that indicates whether the application should query and retrieve records asynchronously from the cache.</p> <p>A value of 1 or true indicates the application will retrieve records asynchronously from the cache.</p> <p>A value of 0 or false indicates the application will retrieve records synchronously.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
createdVersion (PivotCache Created Version)	<p>Specifies the version of the application that created the cache. This attribute is application-dependent.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedByte datatype.</p>
enableRefresh	Specifies a boolean value that indicates whether the end-user can refresh the cache. This

Attributes	Description
(Enable PivotCache Refresh)	<p>attribute depends on whether the application exposes a method for allowing end-users control over refreshing the cache via the user interface.</p> <p>A value of 1 or true indicates the end-user can refresh the cache.</p> <p>A value of 0 or false indicates the end-user cannot refresh the cache.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>id (Relationship Identifier)</p> <p>Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships</p>	<p>Specifies the unique identifier that corresponds to the related pivotCacheRecords part. See (§18.10.1.68) for more information.</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
invalid (Invalid Cache)	<p>Specifies a boolean value that indicates whether the cache needs to be refreshed.</p> <p>A value of 1 or true indicates the cache needs to be refreshed.</p> <p>A value of 0 or false indicates the cache does not need to be refreshed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
minRefreshableVersion (Minimum Version Required for Refresh)	<p>Specifies the earliest version of the application that is required to refresh the cache. This attribute is application-dependent.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedByte datatype.</p>
missingItemsLimit (Missing Items Limit)	<p>Specifies the number of unused items to allow before discarding unused items. This attribute is application-dependent. The application shall specify a threshold for unused items.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
optimizeMemory (Optimize Cache for Memory)	<p>Specifies a boolean value that indicates whether the application will apply optimizations to the cache to reduce memory usage. This attribute is application-dependent. This application shall define its own cache optimization methods. The application shall also decide whether to expose cache optimization status via the user interface or an object model.</p> <p>A value of 1 or true indicates the application will apply optimizations to the cache.</p>

Attributes	Description
	<p>A value of <code>0</code> or <code>false</code> indicates the application will not apply optimizations to the cache.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
recordCount (PivotCache Record Count)	<p>Specifies the number of records in the cache.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
refreshedBy (Last Refreshed By)	<p>Specifies the name of the end-user who last refreshed the cache. This attribute is application-dependent and is specified by applications that track and store the identity of the current user. This attribute also depends on whether the application exposes mechanisms via the user interface whereby the end-user can refresh the cache.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
refreshedDateIso (PivotCache Last Refreshed Date ISO)	<p>Specifies the date when the cache was last refreshed. This attribute depends on whether the application exposes mechanisms via the user interface whereby the end-user can refresh the cache.</p> <p>The possible values for this attribute are defined by the W3C XML Schema dateTime datatype.</p>
refreshedVersion (PivotCache Last Refreshed Version)	<p>Specifies the version of the application that last refreshed the cache. This attribute depends on whether the application exposes mechanisms via the user interface whereby the end-user can refresh the cache.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedByte datatype.</p>
refreshOnLoad (Refresh On Load)	<p>Specifies a boolean value that indicates whether the application will refresh the cache when the workbook has been opened.</p> <p>A value of <code>1</code> or <code>true</code> indicates that application will refresh the cache when the workbook is loaded.</p> <p>A value of <code>0</code> or <code>false</code> indicates the application will not automatically refresh cached data. The end user shall trigger refresh of the cache manually via the application user interface.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
saveData (Save Pivot Records)	<p>Specifies a boolean value that indicates whether the pivot records are saved with the cache.</p> <p>A value of <code>1</code> or <code>true</code> indicates pivot records are saved in the cache.</p> <p>A value of <code>0</code> or <code>false</code> indicates are not saved in the cache.</p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
supportAdvancedDrill (Supports Attribute Drilldown)	<p>Specifies whether the cache's data source supports attribute drilldown.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
supportSubquery (Supports Subqueries)	<p>Specifies whether the cache's data source supports subqueries.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
tupleCache (Stores Cache for OLAP Functions)	<p>Specifies a boolean value that indicates whether the PivotCache is used store information for OLAP sheet data functions.</p> <p>A value of 1 or true indicates information about OLAP sheet data functions are stored in the cache.</p> <p>A value of 0 or false indicates the PivotCache does not contain information about OLAP sheet data functions.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
upgradeOnRefresh (Upgrade PivotCache on Refresh)	<p>Specifies a boolean value that indicates whether the cache is scheduled for version upgrade. This attribute depends on whether the application exposes mechanisms via the user interface whereby the cache might be upgraded.</p> <p>A value of 1 or true indicates the cache is scheduled for upgrade.</p> <p>A value of 0 or false indicates the cache is not scheduled for upgrade.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT PivotCacheDefinition](#)) is located in §A.2. end note]

18.10.1.68 pivotCacheRecords (PivotCache Records)

Represents the collection of records in the PivotCache. This part stores the underlying source data that the PivotTable aggregates.

[Example:


```
<pivotCacheRecords xmlns="..." xmlns:r="..." count="2">
  <r>
    <x v="0"/>
    <s v="Pacific"/>
    <x v="0"/>
    <s v="Australia"/>
    <x v="0"/>
    <x v="0"/>
    <s v="3550"/>
    <x v="0"/>
    <x v="0"/>
    <s v="Road-150 Red, 62"/>
    <s v="This bike is ridden by race winners. Developed with the Adventure
      Works Cycles professional race team, it has a extremely light
      heat-treated aluminum frame, and steering that allows precision
      control."/>
    <s v="No Discount"/>
  ...
  <n v="89.456800000000001"/>
</r>
...
```

end example]

Attributes	Description
count (PivotCache Records Count)	Specifies the number of records in the cache. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element’s content model ([CT PivotCacheRecords](#)) is located in §A.2. *end note*]

18.10.1.69 pivotField (PivotTable Field)

Represents a single field in the PivotTable. This element contains information about the field, including the collection of items in the field.

[Example:

```
<pivotField axis="axisRow" allDrilled="1" showAll="0" measureFilter="1"
  sortType="descending">
```

```

<items count="8">
  <item s="1" c="1" x="0"/>
  <item s="1" c="1" x="1"/>
  <item c="1" x="2"/>
  <item c="1" x="3"/>
  <item c="1" x="4"/>
  <item c="1" x="5"/>
  <item c="1" x="6"/>
  <item t="default"/>
</items>
<autoSortScope>
  <pivotArea dataOnly="0" outline="0" fieldPosition="0">
    <references count="2">
      <reference field="4294967294" count="1" selected="0">
        <x v="0"/>
      </reference>
      <reference field="25" count="1" selected="0">
        <x v="0"/>
      </reference>
    </references>
  </pivotArea>
</autoSortScope>
</pivotField>

```

end example]

Attributes	Description
allDrilled (All Items Expanded)	<p>Specifies a boolean value that indicates whether all items in the field are expanded. Applies only to OLAP PivotTables.</p> <p>A value of 1 or true indicates all items in the field are expanded.</p> <p>A value of 0 or false indicates all items are not expanded. However some items might be expanded.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
autoShow (Auto Show)	<p>Specifies a boolean value that indicates whether an "AutoShow" filter is applied to this field. This attribute depends on the implementation of filtering in the application.</p> <p>A value of 1 or true indicates an "AutoShow" filter is applied to the field.</p> <p>A value of 0 or false indicates an "AutoShow" filter is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean</p>

Attributes	Description
	datatype.
avgSubtotal (Average)	<p>Specifies a boolean value that indicates whether to apply the 'Average' aggregation function in the subtotal of this field.</p> <p>A value of 1 or true indicates the subtotal for this field is 'Average.'</p> <p>A value of 0 or false indicates a different aggregation function is applied to the subtotal for this field.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
axis (Axis)	<p>Specifies the region of the PivotTable that this field is displayed.</p> <p>The possible values for this attribute are defined by the ST_Axis simple type (§18.18.1).</p>
compact (Compact)	<p>Specifies a boolean value that indicates whether the application will display fields compactly in the sheet on which this PivotTable resides.</p> <p>A value of 1 or true indicates the next field should be displayed in the same column of the sheet.</p> <p>A value of 0 or false indicates each pivot field will display in its own column in the sheet.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
countASubtotal (CountA)	<p>Specifies a boolean value that indicates whether to apply the 'countA' aggregation function in the subtotal of this field.</p> <p>A value of 1 or true indicates the subtotal for this field is 'countA.'</p> <p>A value of 0 or false indicates a different aggregation function is applied to the subtotal for this field.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
countSubtotal (Count)	<p>Specifies a boolean value that indicates whether to apply the 'count' aggregation function in the subtotal of this field.</p> <p>A value of 1 or true indicates the subtotal for this field is 'count.'</p> <p>A value of 0 or false indicates a different aggregation function is applied to the subtotal for this field.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

Attributes	Description
dataField (Data Field)	<p>Specifies a boolean value that indicates whether this field appears in the data region of the PivotTable.</p> <p>A value of 1 or true indicates this field appears in the data region of the PivotTable.</p> <p>A value of 0 or false indicates this field appears in another region of the PivotTable.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
dataSourceSort (Data Source Sort)	<p>Specifies a boolean value that indicates whether sort is applied to this field in the data source.</p> <p>A value of 1 or true indicates this field is sorted in the data source.</p> <p>A value of 0 or false indicates this field is not sorted in the data source.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
defaultAttributeDrillState (Drill State)	<p>Specifies a boolean value that indicates the drill state of the attribute hierarchy in an OLAP-based PivotTable.</p> <p>A value of 1 or true indicates the attribute hierarchy is expanded.</p> <p>A value of 0 or false indicates the attribute hierarchy is collapsed.</p> <p>This attribute is designed to allow the application to issue more optimized queries when all items of each field have the same drill state.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
defaultSubtotal (Show Default Subtotal)	<p>Specifies a boolean value that indicates whether the default subtotal aggregation function is displayed for this field.</p> <p>A value of 1 or true indicates the default subtotal aggregation function is displayed for this field.</p> <p>A value of 0 or false indicates the default aggregation function is not displayed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
dragOff (Drag Off)	<p>Specifies a boolean value that indicates whether the field can be removed from the PivotTable.</p> <p>A value of 1 or true indicates the field can be removed from the PivotTable.</p>

Attributes	Description
	<p>A value of 0 or false indicates the field cannot be removed from the PivotTable.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
dragToCol (Drag To Column)	<p>Specifies a boolean value that indicates whether the field can be dragged to the column axis.</p> <p>A value of 1 or true indicates the field can be dragged to the column axis.</p> <p>A value of 0 or false indicates the field cannot be dragged to the column axis.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
dragToData (Field Can Drag to Data)	<p>Specifies a boolean value that indicates whether the field can be dragged to the data region.</p> <p>A value of 1 or true indicates the field can be dragged to the data region.</p> <p>A value of 0 or false indicates the field cannot be dragged to the data region.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
dragToPage (Drag Field to Page)	<p>Specifies a boolean value that indicates whether the field can be dragged to the page region.</p> <p>A value of 1 or true indicates the field can be dragged to the page region.</p> <p>A value of 0 or false indicates the field cannot be dragged to the page region.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
dragToRow (Drag To Row)	<p>Specifies a boolean value that indicates whether the field can be dragged to the row axis.</p> <p>A value of 1 or true indicates the field can be dragged to the row axis.</p> <p>A value of 0 or false indicates the field cannot be dragged to the row axis.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
hiddenLevel (Hidden Level)	<p>Specifies a boolean value that indicates whether there is a hidden level in the PivotTable. This attribute applies to OLAP-based PivotTables only.</p> <p>A value of 1 or true indicates the OLAP PivotTable contains a hidden level.</p>

Attributes	Description
	<p>A value of 0 or false indicates the OLAP PivotTable does not contain any hidden levels.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
hideNewItem (Hide New Items)	<p>Specifies a boolean value that indicates whether new items that appear after a refresh should be hidden by default.</p> <p>A value of 1 or true indicates that items that appear after a refresh should be hidden by default.</p> <p>A value of 0 or false indicates that items that appear after a refresh should be shown by default.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
includeNewItemsInFilter (Inclusive Manual Filter)	<p>Specifies a boolean value that indicates whether manual filter is in inclusive mode.</p> <p>A value of 1 or true indicates the manual filter is inclusive.</p> <p>A value of 0 or false indicates the manual filter is not inclusive.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
insertBlankRow (Insert Blank Row)	<p>Specifies a boolean value that indicates whether to insert a blank row after each item.</p> <p>A value of 1 or true indicates that a blank row is inserted after each item.</p> <p>A value of 0 or false indicates no additional rows are inserted after each item.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
insertPageBreak (Insert Item Page Break)	<p>Specifies a boolean value that indicates whether to insert a page break after each item.</p> <p>A value of 1 or true indicates that a page break is inserted after each item.</p> <p>A value of 0 or false indicates no page breaks are inserted after items.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
itemPageCount (Items Per Page Count)	<p>Specifies the number of items showed per page in the PivotTable.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

Attributes	Description
maxSubtotal (Max Subtotal)	<p>Specifies a boolean value that indicates whether to apply the 'max' aggregation function in the subtotal of this field.</p> <p>A value of 1 or true indicates that the 'max' aggregation function is applied in the subtotal for this field.</p> <p>A value of 0 or false indicates another aggregation function is applied in the subtotal for this field.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
measureFilter (Measure Filter)	<p>Specifies a boolean value that indicates whether field has a measure based filter.</p> <p>A value of 1 or true indicates the field has a measure-based filter.</p> <p>A value of 0 or false indicates does not have a measure-based filter.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
minSubtotal (Min Subtotal)	<p>Specifies a boolean value that indicates whether to apply the 'min' aggregation function in the subtotal of this field.</p> <p>A value of 1 or true indicates that the 'min' aggregation function is applied in the subtotal for this field.</p> <p>A value of 0 or false indicates another aggregation function is applied in the subtotal for this field.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
multipleItemSelectionAllowed (Multiple Field Filters)	<p>Specifies a boolean value that indicates whether the field can have multiple items selected in the page field.</p> <p>A value of 1 or true indicates the PivotTable can have multiple items selected in the page field.</p> <p>A value of 0 or false indicates the PivotTable cannot have multiple items selected in the page field. This attribute depends on the application support for selecting multiple items in page fields.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
name (Field Name)	<p>Specifies the name of the field.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type</p>

Attributes	Description
	(§22.9.2.19).
nonAutoSortDefault (Auto Sort)	<p>Specifies a boolean value that indicates whether sort operation that is applied to field should be AutoSort operation or simple data sort operation.</p> <p>A value of 1 or true indicates that an AutoSort operation is applied to the field.</p> <p>A value of 0 or false indicates a simple data sort operation is applied to the field.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
numFmtId (Number Format Id)	<p>Specifies the identifier of the number format to apply to this field. Number formats are written to the styles part. See the Styles section (§18.8) for more information on number formats.</p> <p>Formatting information provided by cell table and by PivotTable need not agree. If the two formats differ, the cell-level formatting takes precedence. If you change the layout the PivotTable, the PivotTable formatting will then take precedence.</p> <p>The possible values for this attribute are defined by the ST_NumFmtId simple type (§18.18.47).</p>
outline (Outline Items)	<p>Specifies a boolean value that indicates whether the items in this field should be shown in Outline form.</p> <p>A value of 1 or true indicates the items in this field is shown in Outline form.</p> <p>A value of 0 or false indicates the items in this field will not be shown in Outline form. This attribute depends on the application support for displaying items in Outline form.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
productSubtotal (Product Subtotal)	<p>Specifies a boolean value that indicates whether to apply 'product' aggregation function in the subtotal of this field.</p> <p>A value of 1 or true indicates that the 'product' aggregation function is applied in the subtotal for this field.</p> <p>A value of 0 or false indicates another aggregation function is applied in the subtotal for this field.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
rankBy (Auto Show Rank By)	<p>Specifies the index of the data field by which AutoShow will rank.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt</p>

Attributes	Description
	datatype.
serverField (Server-based Page Field)	<p>Specifies a boolean value that indicates whether this is a server-based page field.</p> <p>A value of 1 or true indicates this is a server-based page field.</p> <p>A value of 0 or false indicates this is a local page field.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showAll (Show All Items)	<p>Specifies a boolean value that indicates whether to show all items for this field.</p> <p>A value of 1 or true indicates that all items be shown.</p> <p>A value of 0 or false indicates items be shown according to user specified criteria.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showDropDowns (Show PivotField Header Drop Downs)	<p>Specifies a boolean value that indicates whether to hide drop down buttons on PivotField headers. This attribute depends on the application implementation for filtering in the user interface.</p> <p>A value of 1 or true indicates the application will display some mechanism for selecting and applying filters – <i>[Example: A dropdown menu end example]</i> – in the user interface.</p> <p>A value of 0 or false indicates for mechanism for applying a filter is displayed in the user interface.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showPropAsCaption (Show As Caption)	<p>Specifies a boolean value that indicates whether to show the property as a member caption.</p> <p>A value of 1 or true indicates the property is shown as a member caption.</p> <p>A value of 0 or false indicates the property will not be shown as a member caption.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showPropCell (Show Member Property in Cell)	<p>Specifies a boolean value that indicates whether to show the member property value in a PivotTable cell.</p> <p>A value of 1 or true indicates the property value is shown in a PivotTable cell.</p> <p>A value of 0 or false indicates the property value will not be shown in a PivotTable cell.</p>

Attributes	Description
	<p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>showPropTip (Show Member Property ToolTip)</p>	<p>Specifies a boolean value that indicates whether to show the member property value in a tooltip on the appropriate PivotTable cells.</p> <p>A value of 1 or true indicates the property value is shown in a tooltip in the user interface.</p> <p>A value of 0 or false indicates the property will not be shown in a tooltip. This attribute depends on whether the application employs tooltips or similar mechanism in the user interface.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>sortType (Auto Sort Type)</p>	<p>Specifies the type of sort that is applied to this field.</p> <p>The possible values for this attribute are defined by the ST_FieldSortType simple type (§18.18.28).</p>
<p>stdDevPSubtotal (StdDevP Subtotal)</p>	<p>Specifies a boolean value that indicates whether to apply the 'stdDevP' aggregation function in the subtotal of this field.</p> <p>A value of 1 or true indicates that the 'stdDevP' aggregation function is applied in the subtotal for this field.</p> <p>A value of 0 or false indicates another aggregation function is applied in the subtotal for this field.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>stdDevSubtotal (StdDev Subtotal)</p>	<p>Specifies a boolean value that indicates whether to use 'stdDev' in the subtotal of this field.</p> <p>A value of 1 or true indicates that the 'stdDev' aggregation function is applied in the subtotal for this field.</p> <p>A value of 0 or false indicates another aggregation function is applied in the subtotal for this field.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>subtotalCaption (Custom Subtotal Caption)</p>	<p>Specifies the custom text that is displayed for the subtotals label.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type</p>

Attributes	Description
	(§22.9.2.19).
subtotalTop (Subtotals At Top)	<p>Specifies a boolean value that indicates whether to display subtotals at the top of the group. Applies only when Outline its true.</p> <p>A value of 1 or true indicates a subtotal is display at the top of the group.</p> <p>A value of 0 or false indicates subtotal will not be displayed at the top of the group.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
sumSubtotal (Sum Subtotal)	<p>Specifies a boolean value that indicates whether apply the 'sum' aggregation function in the subtotal of this field.</p> <p>A value of 1 or true indicates the 'sum' aggregation function is applied in the subtotal of this field.</p> <p>A value of 0 or false indicates another aggregation function is applied in the subtotal of this field.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
topAutoShow (Top Auto Show)	<p>Specifies a boolean value that indicates whether an AutoShow filter applied to this field is set to show the top ranked values.</p> <p>A value of 1 or true indicates whether an AutoShow filter will show top values for this field.</p> <p>A value of 0 or false indicates bottom ranked values are shown.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
uniqueMemberProperty (Unique Member Property)	<p>Specifies the unique name of the member property to be used as a caption for the field and field items.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
varPSubtotal (VarP Subtotal)	<p>Specifies a boolean value that indicates whether to apply the 'varP' aggregation function in the subtotal of this field.</p> <p>A value of 1 or true indicates the 'varP' aggregation function is applied in the subtotal of this field.</p> <p>A value of 0 or false indicates another aggregation function is applied in the subtotal of this field.</p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
varSubtotal (Variance Subtotal)	<p>Specifies a boolean value that indicates whether to apply the 'variance' aggregation function in the subtotal of this field.</p> <p>A value of 1 or true indicates the 'variance' aggregation function is applied in the subtotal of this field.</p> <p>A value of 0 or false indicates another aggregation function is applied in the subtotal of this field.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_PivotField](#)) is located in §A.2. *end note*]

18.10.1.70 pivotFields (PivotTable Fields)

Represents the collection of fields that appear on the PivotTable.

[Example:

```
<pivotFields count="28">
  <pivotField showAll="0" includeNewItemInFilter="1">
    <items count="8">
      <item x="66"/>
      <item x="133"/>
      <item x="74"/>
      <item x="27"/>
      <item x="118"/>
      <item x="63"/>
      <item x="141"/>
      <item t="default"/>
    </items>
  </pivotField>
  <pivotField showAll="0" includeNewItemInFilter="1"/>
</pivotFields>
```

```

<pivotField axis="axisPage" showAll="0" includeNewItemsInFilter="1">
  <items count="2">
    <item x="0"/>
    <item t="default"/>
  </items>
</pivotField>
<pivotField showAll="0" includeNewItemsInFilter="1"/>

```

end example]

Attributes	Description
count (Field Count)	Specifies the number of fields in the PivotTable. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_PivotFields](#)) is located in §A.2. *end note*]

18.10.1.71 pivotHierarchies (PivotTable OLAP Hierarchies)

Represents the collection of OLAP hierarchies associated with the PivotTable.

[Example:

```

<sh:pivotHierarchies count="3">
  <sh:pivotHierarchy dragToRow="0" dragToCol="0" dragToPage="0" dragToData="1"/>
  <sh:pivotHierarchy dragToRow="0" dragToCol="0" dragToPage="0" dragToData="1"/>
  <sh:pivotHierarchy dragToRow="0" dragToCol="0" dragToPage="0" dragToData="1"/>
  <sh:pivotHierarchy dragToRow="0" dragToCol="0" dragToPage="0" dragToData="1"/>
</sh:pivotHierarchies>

```

end example]

Attributes	Description
count (OLAP Hierarchy Count)	Specifies the number of OLAP hierarchies in the collection. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_PivotHierarchies](#)) is located in §A.2. *end note*]

18.10.1.72 pivotHierarchy (OLAP Hierarchy)

Represents a OLAP hierarchy associated with the PivotTable. A hierarchy is a hierarchical representation of related OLAP dimensions. Hierarchies are defined on the OLAP server and cannot be changed in the PivotTable.

[Example: Hierarchy "A" might be defined as follows:

Level 1 Country/Region

Level 2 State\Provence

Level 3 City

end example]

[Example:

```
<sh:pivotHierarchy dragToRow="0" dragToCol="0" dragToPage="0" dragToData="1"/>
```

end example]

Attributes	Description
caption (Hierarchy Caption)	Specifies the user defined caption of the hierarchy. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
dragOff (Drag Off)	Specifies a boolean value that indicates whether the user is allowed to remove this hierarchy from the PivotTable. A value of 1 or true indicates the user can remove this hierarchy from the PivotTable. A value of 0 or false indicates the user cannot remove the hierarchy from the PivotTable. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
dragToCol (Drag To Column)	Specifies a boolean value that indicates whether the user is allowed to put this hierarchy into the column area of the PivotTable. A value of 1 or true indicates the user can put this hierarchy into the column area of the PivotTable. A value of 0 or false indicates the user cannot remove this hierarchy. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
dragToData (Drag To Data)	Specifies a boolean value that indicates whether the user is allowed to put this hierarchy into the data area of the view.

Attributes	Description
	<p>A value of 1 or true indicates</p> <p>A value of 0 or false indicates</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
dragToPage (Drag to Page)	<p>Specifies a boolean value that indicates whether the user is allowed to put this hierarchy into the page area of the PivotTable.</p> <p>A value of 1 or true indicates the user can put this hierarchy into the page area of the PivotTable.</p> <p>A value of 0 or false indicates cannot put this hierarchy into the page area.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
dragToRow (Drag To Row)	<p>Specifies a boolean value that indicates whether the user is allowed to put this hierarchy into the row area of the PivotTable.</p> <p>A value of 1 or true indicates the user can put this hierarchy into the row area of the PivotTable.</p> <p>A value of 0 or false indicates cannot put this hierarchy into the row area.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
includeNewItemsl nFilter (Inclusive Manual Filter)	<p>Specifies a boolean value that indicates whether the application will show only the items the user has selected.</p> <p>A value of 1 or true indicates the application will show only items the user has selected; all other items are hidden.</p> <p>A value of 0 or false indicates the application will show all items.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
multipleItemSelect ionAllowed (Multiple Field Filters)	<p>Specifies a boolean value that indicates whether the user can select multiple members when the hierarchy is in the page field area of the view.</p> <p>A value of 1 or true indicates the user can select multiple members.</p> <p>A value of 0 or false indicates the user cannot select multiple members.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean</p>

Attributes	Description
	datatype.
outline (Outline New Levels)	<p>Specifies a boolean value that indicates whether new levels added to the PivotTable are shown in Outline mode.</p> <p>A value of 1 or true indicates new levels are shown in Outline mode.</p> <p>A value of 0 or false indicates new items are not shown in Outline mode.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showInFieldList (Show In Field List)	<p>Specifies a boolean value that indicates whether this hierarchy is omitted from the field list. This attribute depends on how the application exposes a list of fields for PivotTables in the user interface.</p> <p>A value of 1 or true indicates this hierarchy is show in the field list or similar mechanism in the user interface.</p> <p>A value of 0 or false indicates is not shown in the field list.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
subtotalTop (New Levels Subtotals At Top)	<p>Specifies a boolean value that indicates whether new levels added to the view will show their subtotals at the top.</p> <p>A value of 1 or true indicates new levels added to the view show their subtotals at the top.</p> <p>A value of 0 or false indicates new levels added to the view show their subtotals at the bottom.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_PivotHierarchy](#)) is located in §A.2. end note]

18.10.1.73 pivotTableDefinition (PivotTable Definition)

Represents the PivotTable root element for non-null PivotTables. There exists one pivotTableDefinition for each PivotTableDefinition part. The PivotTable definition encompasses the following information:

Structure

- Top-level attributes

- Location information
- Collection of fields
- Fields on the row axis
- Items on the row axis (specific values)
- Fields on the column axis
- Items on the column axis (specific values)
- Fields on the report filter region
- Fields in the values region
- Style information

Outline of the XML for a pivotTableDefinition

```
<pivotTableDefinition>
  <location/>
  <pivotFields/>
  <rowFields/>
  <rowItems/>
  <colFields/>
  <colItems/>
  <pageFields/>
  <dataFields/>
  <conditionalFormats/>
  <pivotTableStyleInfo/>
</pivotTableDefinition>
```

Layout

The reference specified in the ref attribute on the location element specifies the location of the PivotTable body. The data area, row, column, and data fields and value items are located in this area. More specifically, the row fields begin below the A1-most cell in the reference, and the column fields begin adjacent to that cell, in the same row, extending out into the PivotTable body away from column A. *[Note: How far below or across the field labels begin are dependent upon how many row, column, and data fields are shown in the PivotTable. More detail is provided below. end note]*

[Note: All layout discussion and examples are given for outline mode layout. There two additional layout modes: compact and tabular. See Other layout modes below for a discussion of how those differ from outline mode. end note]

When encountering sheet boundaries, the PivotTable is truncated rather than wrapped, and as much as possible shall be shown.

The graphics given in this section are meant to illustrate layout only, and do not require implementation of any implied controls, like dropdowns or expand/collapse functionality.

Page Field Layout

	A	B	C	D
1				
2		SSN	(All) ▼	
3				
4		State ▼	City ▼	Sum of Amount
5		CA		195.51
6			San Diego	195.51
7		OR		54.97
8			Portland	12.54
9			Tillamook	42.43
10		WA		244.12
11			Seattle	96.72
12			Tacoma	79.83
13			Everett	67.57
14		Grand Total		494.6

In the above picture, SSN is a page field, State and City are row fields, and Amount is a data field. There are no column fields.

Page fields allow you to filter the entire PivotTable report to display data for a single item or all items.

The page field area always ends (vertically) so that there is always 1 row of space between the page field area and the top row of the PivotTable body, and always begins (horizontally) in the same column as the A1-most column of the PivotTable body. Each page field occupies two cells: the A1-most for displaying the field name, and the next cell over for displaying the selected item values. *[Example: (see above picture) If the top row in the PivotTable body reference is row 4, then page field layout ends (vertically) in row 2, and if the A1-most column of the PivotTable body is column B, then page field layout begins (horizontally) in column B. end example]*

Aside from the number of fields in the page field area, there are two attributes of `pivotTableDefinition` that affect page field layout: `pageOverThenDown` and `pageWrap`. `pageOverThenDown = 1` specifies that when there is more than 1 page field, lay them out horizontally across the sheet (extending in the direction of the PivotTable body area, away from column A) until the maximum specified in `pageWrap` is reached, and then begin a new row. If the `pageWrap` value is high and there are many page fields, then it is possible (and allowed) for page fields to extend beyond the edge of the PivotTable body. When laying out page fields in the same row (side by side), each shall be separated by a single column. However, multiple rows of page fields are not separated by single rows between them. `pageOverThenDown = 0` specifies that when there is more than 1 page

field, lay them out vertically down the sheet (always keeping 1 row of space between the PivotTable body and page field area) until the maximum specified in `pageWrap` is reached, and then begin a new column. Again, for multiple page fields, if they shall occupy more than 1 column, then each column of page fields is separated by a single column, and multiple rows of page fields are not separated by single rows between them.

[*Example:* This example shows a PivotTable body occupying B5:B6 and 6 page fields in the page field area, where `pageOverThenDown` = 0 and `pageWrap` = 2. This means that the first column of the page field area contains 2 page fields, and then, because the `pageWrap` value only allows 2 page fields per column, a new column of page fields is started, and so on until all 6 page fields are shown.

	A	B	C	D	E	F	G	H	I	J
1										
2		Postal Code	(All) ▾		City	(All) ▾		Last Name	(All) ▾	
3		State	(All) ▾		SSN	(All) ▾		Home Phone	(All) ▾	
4										
5		Sum of Amount								
6		494.6								
7										

The order of assignment of position within page field layout for this example is:

- Postal Code
- State
- City
- SSN
- Last Name
- Home Phone

Aside from the 6 page fields, the only other field in this PivotTable example is a data field called Amount.

end example]

[*Note:* When the user gestures to add a page field and there are not enough free cells above the PivotTable body area to allow for page fields to be added, the application must determine the best response. The application may decide to shift the PivotTable down some number of rows to make room, or overwrite existing data or features that might be above the PivotTable, or simply block the user gesture completely. In any result, however, the application should adhere to the layout principles given above. *end note]*

Row Field Layout

	A	B	C	D
1				
2		SSN	(All) ▼	
3				
4		State ▼	City ▼	Sum of Amount
5		CA		195.51
6			San Diego	195.51
7		OR		54.97
8			Portland	12.54
9			Tillamook	42.43
10		WA		244.12
11			Seattle	96.72
12			Tacoma	79.83
13			Everett	67.57
14		Grand Total		494.6

The **State** and **City** fields are row fields, **SSN** is a page field, there are no column fields, and **Amount** is a data field.

Row fields provide for and specify how the data is summarized, grouped, and viewed as rows in the PivotTable.

The row field area always begins in the A1-most column of the PivotTable body area. The layout of page fields does not affect the layout of row fields.

Row Field Layout - 1 Row Field and 0 Column Fields

When there is only 1 row field and 0 column fields,

the first row field is located in the A1-most cell of the PivotTable body, and
the values for that field are expressed in the cells directly under that row field, in the same column.

[Example:

State ▼	Sum of Amount
CA	195.51
OR	54.97
WA	244.12
Grand Total	494.6

In this example, there are no page fields, no column fields, **State** is a row field, and **Amount** is a data field. *end example]*

Row Field Layout - 2 or More Row Fields and 0 Column Fields

When there are 2 or more row fields and 0 column fields to be displayed,

- the row field labels are located adjacent to each other and in the same row as the first row field label
- Each corresponding set of values for the row field in question are located in the cells under that row field (same column)

- Innermost row field values (the ones closest to the data summary area) are grouped and organized by values in the next outer row field, in the following fashion: starting with the outermost row field, the first value is listed. For the next innermost row field, starting on the next row and over one column (toward the data summary area), the value list for that field begins. If that is the innermost row field, all values are listed for that row field, and then moving down a row and back to the outer column, the next value for the outermost row field is listed. If there are more inner row fields, the same layout rules apply until the innermost row field is reached.
- In this case of 0 column fields, only the top row of the PivotTable body is used for row field labels.

[Example:

	A	B	C	D	E
1					
2					
3					
4		Postal Co	State	City	Sum of Amount
5		09999			54.97
6			OR		54.97
7				Portland	12.54
8				Tillamook	42.43
9		12345			195.51
10			CA		195.51
11				San Diego	195.51
12		456789			244.12
13			WA		244.12
14				Seattle	96.72
15				Tacoma	79.83
16				Everett	67.57
17		Grand Total			494.6

In this example **Postal Code**, **State**, and **City** are row fields and **Amount** is a data field. There are no page fields and no column fields. *end example*]

Row Field Layout - 1 or More Row Fields and 1 or More Column Fields

When there are row fields and 1 or more column fields, the row fields are not located in the topmost row of the PivotTable body. Instead the row fields are located in the n+1st topmost row of the PivotTable body, where n is the number of column fields in the PivotTable.

[Example:

	A	B	C	D	E
1					
2					
3					
4					
5		Sum of Amount	Postal Code <input type="button" value="v"/>	State <input type="button" value="v"/>	City <input type="button" value="v"/>
6			<input type="button" value="v"/> 09999		
7			<input type="button" value="v"/> OR		OR Total
8		Last Name <input type="button" value="v"/>	Portland	Tillamook	
9		Cencini	12.54		12.54
10		Freehafer			
11		Giussani			
12		Hellung-Larsen			
13		Kotas		42.43	42.43
14		Neipper			
15		Sergienko			
16		Thorpe			
17		Zare			
18		Grand Total	12.54	42.43	54.97

This example shows 3 column fields in the PivotTable (**Postal Code**, **State**, and **City**), a single row field **Last Name**, and a single data field **Amount**. The PivotTable body area begins at B5 and the row field label **Last Name** is located in the 4th row of the PivotTable body area, in row 8 of the spreadsheet, cell B8. Since **Last Name** is the only row field in this example, its row field values begin and are listed directly under the label. *end example*]

Column Field Layout

	A	B	C	D	E	F	G	H
1								
2								
3								
4								
5		Sum of Amount	State	City				
6			CA	OR	WA			
7		Last Name	San Diego	Portland	Tillamook	Seattle	Tacoma	Everett
8		Cencini		12.54				
9		Freehafer				53.34		
10		Giussani					79.83	
11		Hellung-Larsen						67.57
12		Kotas			42.43			
13		Neipper	63.67					
14		Sergienko	50.69					
15		Thorpe	81.15					
16		Zare				43.38		

State and **City** are column fields, **Last Name** is a row field, and **Amount** is a data field.

Column fields provide for and specify how the data is summarized, grouped, and viewed horizontally in the PivotTable.

The layout of page fields does not affect the layout of column fields.

The column field label area is always located in the top row of the PivotTable body.

Column Field Layout - 0 Row Fields and 0 Data Fields

- When there are no row fields and no data fields, then the first column field is located in the A1-most column of the PivotTable body.
- When there are multiple column fields
- the labels are located adjacent to each other in the same row as the first column field label.
- Each corresponding set of values for each of the column fields are located in the rows directly below the column field label row and above the data area, one row of values for each column field.
- The first column field's values are located in the row directly under the column field row.
- Column field values are displayed starting directly underneath the first column field label's cell and filling adjacent cells in the same row. The second column field's values are located two rows under the column field label row, and values are again displayed starting directly underneath the first column field label's cell, filling adjacent cells in the same manner as the first set of values. The layout of column field values continues in this way until all column field values are displayed.

Inner column field values (the ones closer to the data summary area) are grouped and organized by values in the next outer column field, similarly to how row field values are grouped. [Example:

	A	B	C	D	E	F	G
1							
2							
3							
4							
5		State	City				
6		CA	OR	WA			
7		San Diego	Portland	Tillamook	Seattle	Tacoma	Everett
8							
9							
10							
11							
12							

In this example, **State** and **City** are column fields, and there are no row fields, no page fields, and no data fields.
end example]

Column Field Layout – 1 or More Column Fields and 1 or More Row Fields

When there are 1 or more column fields and 1 or more row fields in the PivotTable, then:

- First, row fields are displayed according to the row field layout described earlier
- The first column field label is located in the top row of the PivotTable body area, and adjacent to any row field labels that are displayed.
- Multiple column fields shall be displayed as described earlier

[*Example:* In this example, **State** and **City** are column fields, **Amount** is a data field, and **Last Name** is a row field.

	A	B	C	D	E	F	G	H
1								
2								
3								
4								
5		Sum of Amount	State	City				
6			CA	OR	WA			
7		Last Name	San Diego	Portland	Tillamook	Seattle	Tacoma	Everett
8		Cencini		12.54				
9		Freehafer				53.34		
10		Giussani					79.83	
11		Hellung-Larsen						67.57
12		Kotas			42.43			
13		Neipper	63.67					
14		Sergienko	50.69					
15		Thorpe	81.15					
16		Zare				43.38		

end example]

Data Field Layout

	A	B	C
1			
2			
3			
4			
5		Last Name	Sum of Amount
6		Cencini	12.54
7		Freehafer	53.34
8		Giussani	79.83
9		Hellung-Larsen	67.57
10		Kotas	42.43
11		Neipper	63.67
12		Sergienko	50.69
13		Thorpe	81.15
14		Zare	43.38

Last Name is a row field, **Sum of Amount** is a data field label, and the data underneath Sum of Amount are the summarized data values.

Data fields specify which fields are summarized in the PivotTable report.

The summarized data always appears below the column field and value area, and any row field values are closer to column A than any of the summarized data. When there are no row fields and no column fields, the summarized data is located directly under the A1-most cell of the PivotTable body. Each cell in the summarized data area represents an aggregation of a set of records. The set of records that a particular cell is summarizing is determined by looking at the row field value(s) and column field value(s) that intersect on that particular cell, and then determining which records in the source data contain all of those row and column field values.

Data Field Layout - 0 Row Fields and 0 Column Fields and 1 Data Field

When there are no row fields and no column fields and only 1 data field being summarized, the data field label is located in the A1-most cell of the PivotTable body.

[Example:

	A	B
1		
2		Sum of Amount
3		494.6

In this example there is only 1 field in the PivotTable, a data field **Amount**. *end example]*

Data Field Layout - More Than 1 Data Field

When there is more than 1 data field being summarized,

- An additional field (in these examples labeled “Values”, but the label can be specified by the user) is added to the field list, located as either a row field label or a column field label (depending on user choice and behaviour as specified by the dataOnRows and dataPosition attributes), and
- each data field being summarized is displayed either in the row area (when the additional field is a row field) as if it were an item value of that row field (see row field layout description above), or in the column area (when the additional field is a column field) as if it were an item value of that column field (see column field layout description above).

[Example:

	A	B	C
1			
2		Values	
3		Sum of Amount	Sum of Tax
4		494.6	28.71

In this example there are 2 data fields **Amount** and **Tax**. There are no page fields, no column fields, no row fields, and the additional field labeled Values is placed on the column area.

	A	B	C
1			
2		Values	
3		Sum of Amount	494.6
4		Sum of Tax	28.71

Above is the same PivotTable, with the Values field placed on the row area.

end example]

Data Field Layout - 0 Row Fields, 1 or More Column Fields, and 1 Data Field

When there are no row fields, 1 or more column fields, and only 1 data field being summarized, the data field label is located in the A1-most column of the PivotTable body, directly under the column field area.

[Example:

	A	B	C	D	E
1					
2		State ▼			
3		CA	OR	WA	
4		Sum of Amount	195.51	54.97	244.12

In this example there is 1 column field **State** and 1 data field **Amount**. There are no row fields or page fields. *end example]*

Data Field Layout - 0 Column Fields, 1 or More Row Fields, and 1 Data Field

When there are no column fields, 1 or more row fields, and only 1 data field being summarized, the data field label is located in the same row as the row field labels, above the data summary area.

[Example:

	A	B	C
1			
2		State ▼	Sum of Amount
3		CA	195.51
4		OR	54.97
5		WA	244.12

In this example there is 1 data field **Amount** and 1 row field **State**. There are no column fields or page fields. *end example]*

Subtotal and grand total layout

If subtotals are *on*, the values for row subtotals are placed at either the top of each group of data being summarized or at the bottom of each group, as indicated by the `subtotalTop` attribute value on the `pivotField` element. Row subtotal values appear in the same column as the data being subtotalled. If placed at the top of the group, then the subtotal value for the group appears in the row above the group of values, in the same row as the group's parent row field value. When there is only a single row field, no subtotal is shown.

[Example:

	A	B	C	D	E
1					
2		Postal Code ▾	State ▾	City ▾	Sum of Amount
3		09999			54.97
4			OR		54.97
5				Portland	12.54
6				Tillamook	42.43
7		12345			195.51
8			CA		195.51
9				San Diego	195.51
10		456789			244.12
11			WA		244.12
12				Seattle	96.72
13				Tacoma	79.83
14				Everett	67.57

Subtotal for Postal Code 09999

Subtotal for State OR

Subtotal for Postal Code 12345

Subtotal for State CA

Subtotal for Postal Code 456789

Subtotal for State WA

In this example, there are 3 row fields (**Postal Code**, **State**, and **City**) and 1 data field **Amount**.

end example]

If row subtotals are placed at the bottom of each data group, then a new row is inserted directly below the data group in question, and a new row field value is inserted, in the same column as the row field in question, whose caption indicates that this row represents a subtotal value.

[Example:

	A	B	C	D	E
1					
2		Postal Code ▾	State ▾	City ▾	Sum of Amount
3		09999			
4			OR		
5				Portland	12.54
6				Tillamook	42.43
7			OR Total		54.97
8		09999 Total			54.97
9		12345			
10			CA		
11				San Diego	195.51
12			CA Total		195.51
13		12345 Total			195.51
14		456789			
15			WA		
16				Seattle	96.72
17				Tacoma	79.83
18				Everett	67.57
19			WA Total		244.12
20		456789 Total			244.12

Subtotal for State OR

Subtotal for Postal Code 09999

Subtotal for State CA

Subtotal for Postal Code 12345

Subtotal for State WA

Subtotal for Postal Code 456789

In this example, there are 3 row fields (**Postal Code**, **State**, and **City**) and 1 data field **Amount**.

end example]

If subtotals are *on*, for column subtotals a new column is inserted directly after the data group being subtotalled. A new column field value is inserted, in the same row as the column field in question, whose caption indicates that this column represents a subtotal value. When there is only a single column field, no subtotal is shown.

[Example:

	A	B	C	D	E	F	G	H	I
1									
2		Postal Code ▾	State ▾	City ▾					
3		09999				09999 Total	12345		12345 Total
4		OR			OR Total		CA	CA Total	
5		Portland	Tillamook				San Diego		
6		Sum of Amount	12.54	42.43	54.97	54.97	195.51	195.51	195.51

Subtotal for State OR

Subtotal for State CA

Subtotal for Postal Code 09999

Subtotal for Postal Code 12345

In this example, there are 3 column fields (**Postal Code**, **State**, and **City**) and a data field **Amount**. *end example]*

If row grand totals are on and there are column fields, a new column item is inserted at the very edge of the PivotTable body furthest away from column A, in the same row as the outermost column field values. The caption indicates that this is a grand total, and the values total all values across the row. When row grand totals are *on* but there are no column fields, no row grand total is shown.

[*Example:*

	A	B	C	D	E	F
1						
2		State ▼				
3		CA	OR	WA	Grand Total	
4		Sum of Amount	195.51	54.97	244.12	494.6

In this example there is 1 column field **State** and 1 data field **Amount**, and row grand totals are on.

end example]

When column grand totals are *on* and there are row fields, a new row item is inserted at the very bottom of the PivotTable body, in the same column as the outermost row field values. The caption indicates that this is a grand total, and the values total all values in the column. When column grand totals are *on* but there are no row fields, no column grand total is shown.

[*Example:*

	A	B	C
1			
2		State ▼	Sum of Amount
3		CA	195.51
4		OR	54.97
5		WA	244.12
6		Grand Total	494.6

In this example there is 1 row field **State** and 1 data field **Amount**, and column grand totals are on.

end example]

Other Layout Modes

A PivotTable can be displayed in Compact, Outline, or Tabular form. In addition, Classic layout can be applied to any of the 3 layout forms.

Outline mode has been discussed in the above sections, and all examples are shown using outline mode with classic layout off (`gridDropZones = 0`).

For Compact mode, the layout differs from outline mode by:

- Instead of multiple row fields occupying multiple columns, the A1-most column of the PivotTable body contains all row field labels and values. A single label, “Row Labels”, is located where the first (outermost) row label is placed. When there are multiple row fields, the outermost list of values is not indented, then next inner row field values are indented (as specified in the indent attribute), and so on until each set of values for inner row fields are shown.
- Instead of multiple column fields being listed and located across a row, the first column field position is labeled “Column Labels”, and there is only this label, located in the first column field position.

[Example:

Outline mode:

	A	B	C	D	E	F	G
1							
2		Sum of Amount	Postal Code	▼	Last Name	▼	
3			09999			12345	
4		State	▼	City	▼	Cencini	Kotas
5		CA				Neipper	Sergienko
6			San Diego			63.67	50.69
7		OR					
8			Portland	12.54			
9			Tillamook		42.43		
10		WA					
11			Seattle				
12			Tacoma				
13			Everett				

The above picture shows 2 column fields (**Postal Code** and **Last Name**), 1 data field (**Amount**), and 2 row fields (**State** and **City**). There are no page fields shown.

Same PivotTable in compact mode:

	A	B	C	D	E	F
1						
2		Sum of Amount	Column Labels			
3			09999		12345	
4		Row Labels	Cencini	Kotas	Neipper	Sergienko
5		CA				
6		San Diego			63.67	50.69
7		OR				
8		Portland	12.54			
9		Tillamook		42.43		
10		WA				
11		Seattle				
12		Tacoma				
13		Everett				

The above picture shows all column field labels collapsed into a single label **Column Labels** and all row field labels collapsed into a single label **Row Labels**. There is 1 data field **Amount** and no page fields. *end example]*

For Tabular mode, the layout differs from outline mode by:

Instead of beginning new inner row field values on the next row down from the outer row field value parent, the first next-inner row field value is located on the same row as the parent value.

Row subtotals can only appear at the bottom of a group, not at the top

[Example:

Outline mode:

	A	B	C	D	E
1					
2		Postal Code	State	City	Sum of Amount
3		09999			
4			OR		
5				Portland	12.54
6				Tillamook	42.43
7		12345			
8			CA		
9				San Diego	195.51
10		456789			
11			WA		
12				Seattle	96.72
13				Tacoma	79.83
14				Everett	67.57

The above picture shows 3 row fields (**Postal Code**, **State**, and **City**) and 1 data field, **Amount**.

Same PivotTable in tabular mode:

	A	B	C	D	E
1					
2		Postal Code ▼	State ▼	City ▼	Sum of Amount
3		09999	OR	Portland	12.54
4				Tillamook	42.43
5		12345	CA	San Diego	195.51
6		456789	WA	Seattle	96.72
7				Tacoma	79.83
8				Everett	67.57

The above picture shows 3 row fields (**Postal Code**, **State**, and **City**) and 1 data field, **Amount**.

end example]

For Classic layout, the layout differs by:

- When there are row fields, no column fields, and 1 data field, instead of displaying the data field label adjacent to and in the same row as the row field labels, the data field label is located in the A1-most cell of the PivotTable body, and the row directly under this cell contains the row field labels.
- In the exact location where the data field label is located when classic layout is off, a label titled “Total” is displayed when classic layout is on.

[Example:

Outline mode, classic layout off:

	A	B	C	D	E
1					
2		Postal Code ▼	State ▼	City ▼	Sum of Amount
3		09999			
4			OR		
5				Portland	12.54
6				Tillamook	42.43
7		12345			
8			CA		
9				San Diego	195.51
10		456789			
11			WA		
12				Seattle	96.72
13				Tacoma	79.83
14				Everett	67.57

The above picture shows 3 row fields (**Postal Code**, **State**, and **City**) and 1 data field, **Amount**.

Same PivotTable in Outline mode, classic layout applied:

	A	B	C	D	E
1					
2		Sum of Amount			
3		Postal Code	State	City	Total
4		09999			
5		OR			
6			Portland	12.54	
7			Tillamook	42.43	
8		12345			
9		CA			
10			San Diego	195.51	
11		456789			
12		WA			
13			Seattle	96.72	
14			Tacoma	79.83	
15			Everett	67.57	

The above picture shows 3 row fields (**Postal Code**, **State**, and **City**) and 1 data field, **Amount**.

end example]

Attributes	Description
applyAlignmentFor mats (Apply Alignment Formats)	If true apply legacy table autoformat alignment properties. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
applyBorderForma ts (Apply Border Formats)	If true apply legacy table autoformat border properties. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
applyFontFormats (Apply Font Formats)	If true apply legacy table autoformat font properties. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
applyNumberForm ats (Apply Number Formats)	If true apply legacy table autoformat number format properties. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
applyPatternForm ats (Apply Pattern Formats)	If true apply legacy table autoformat pattern properties. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

Attributes	Description
applyWidthHeightFormats (Apply Width / Height Formats)	<p>If true apply legacy table autoformat width/height properties.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
asteriskTotals (Asterisk Totals)	<p>Specifies a boolean value that indicates whether an asterisks should be displayed in subtotals and totals when visual totals are not used in OLAP -based PivotTables.</p> <p>A value of 1 or true indicates an asterisks are displayed in subtotals and totals for OLAP PivotTables when visual tools are not available.</p> <p>A value of 0 or false indicates an asterisk will not be displayed. This attribute depends on the implementation and availability of visual tools in the application user interface.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
autoFormatId (Auto Format Id)	<p>Identifies which legacy table autoformat to apply.</p> <p>Annex D contains a listing of the supported PivotTable AutoFormats, example formatting, and a sample workbook with each of those AutoFormats applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
cacheId (PivotCache Definition Id)	<p>Specifies the identifier of the related PivotCache definition. This Id is listed in the pivotCaches collection in the workbook part.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
chartFormat (Chart Format Id)	<p>Specifies the next chart formatting identifier to use on the PivotTable.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
colGrandTotals (Grand Totals On Columns)	<p>Specifies a boolean value that indicates whether grand totals should be displayed for the PivotTable columns.</p> <p>A value of 1 or true indicates grand totals should be displayed.</p> <p>A value of 0 or false indicates grand totals should not be displayed for PivotTable columns.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

Attributes	Description
colHeaderCaption (Column Header Caption)	<p>Specifies the string to be displayed in column header in compact mode. This attribute depends on whether the application implements a compact mode for displaying PivotTables in the user interface.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
compact (Compact New Fields)	<p>Specifies a boolean value that indicates whether new fields should have their compact flag set to true.</p> <p>A value of 1 or true indicates new fields should default to compact mode equal to true.</p> <p>A value of 0 or false indicates new fields should default to compact mode equal to false. This attribute depends on whether the application implements a compact mode in the user interface.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
compactData (Compact Data)	<p>Specifies a boolean value that indicates whether the field next to the data field in the PivotTable should be displayed in the same column of the spreadsheet</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
createdVersion (PivotCache Created Version)	<p>Specifies the version of the application that created the cache. This attribute is application-dependent.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedByte datatype.</p>
customListSort (Custom List AutoSort)	<p>Specifies a boolean value that indicates whether the "custom lists" option is offered when sorting this PivotTable.</p> <p>A value of 1 or true indicates custom lists are offered when sorting this PivotTable.</p> <p>A value of 0 or false indicates custom lists are not offered. This attribute depends on the implementation of sorting features in the application.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
dataCaption (Data Field Header Name)	<p>Specifies the name of the value area field header in the PivotTable. This caption is shown when the PivotTable when two or more fields are in the values area.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
dataOnRows (Data On Rows)	<p>Specifies a boolean value that indicates whether the field representing multiple fields in the data region is located in the row area or the column area.</p>

Attributes	Description
	<p>A value of 1 or true indicates that this field is located in the row area.</p> <p>A value of 0 or false indicates that this field is located in the column area.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
dataPosition (Default Data Field Position)	<p>Specifies the position for the field representing multiple data field in the PivotTable, whether that field is located in the row area or column area.</p> <p>Missing attribute indicates this field is last, or innermost in the field list.</p> <p>0 indicates this field is first, or outermost in the field list.</p> <p>1 indicates this field is second in the field list.</p> <p>2 indicates this field is third in the field list, and increasing values follow this pattern.</p> <p>If this value is higher than the number of fields in the field list, then this field is last, or innermost in the field list.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
disableFieldList (Disable Field List)	<p>Specifies a boolean value that indicates whether to disable the PivotTable field list.</p> <p>A value of 1 or true indicates the field list, or similar mechanism for selecting fields in the user interface, is disabled.</p> <p>A value of 0 or false indicates the field list is enabled.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
editData (Allow Edit Data)	<p>Specifies a boolean value that indicates whether the user is allowed to edit the cells in the data area of the PivotTable.</p> <p>A value of 1 or true indicates the user can edit values in the data area.</p> <p>A value of 0 or false indicates the cells in the data area are not editable.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
enableDrill (Enable Drill Down)	<p>Specifies a boolean value that indicates whether the user is prevented from drilling down on a PivotItem or aggregate value.</p> <p>A value of 1 or true indicates the user can drill down on a pivot item or aggregate value.</p>

Attributes	Description
	<p>A value of 0 or false indicates the user is prevented from drilling down pivot item.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
enableFieldProperties (Enable Field Properties)	<p>Specifies a boolean value that indicates whether the user is prevented from displaying PivotField properties.</p> <p>A value of 1 or true indicates the user can display pivot field properties.</p> <p>A value of 0 or false indicates the user cannot display pivot field properties. This attribute depends on how pivot field properties are exposed in the application user interface.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
enableWizard (Enable PivotTable Wizard)	<p>Specifies a boolean value that indicates whether the user is prevented from displaying the PivotTable wizard.</p> <p>A value of 1 or true indicates the user can display the PivotTable wizard.</p> <p>A value of 0 or false indicates the user can not display the PivotTable wizard. This attribute depends on whether the application exposes a wizard or similar mechanism for creating and working with PivotTables in the user interface.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
errorCaption (Error Caption)	<p>Specifies the string to be displayed in cells that contain errors.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
fieldListSortAscending (Default Sort Order)	<p>Specifies a boolean value that indicates whether fields in the PivotTable are sorted in non-default order in the field list.</p> <p>A value of 1 or true indicates fields for the PivotTable are sorted in the field list. The sort order from the data source is applied for range-based PivotTables. Alphabetical sorting is applied for external data PivotTables.</p> <p>A value of 0 or false indicates fields in the field list are not sorted.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fieldPrintTitles (Field Print Titles)	<p>Specifies a boolean value that indicates whether the row and column titles from the PivotTable should be printed.</p>

Attributes	Description
	<p>A value of 1 or true indicates row and column titles should be printed.</p> <p>A value of 0 or false indicates row and column titles should not be printed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
grandTotalCaption (Grand Totals Caption)	<p>Specifies the string to be displayed for grand totals.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
gridDropZones (Enable Drop Zones)	<p>Specifies a boolean value that indicates whether the in-grid drop zones should be displayed at runtime, and whether classic layout is applied.</p> <p>A value of 1 or true indicates in-grid drop zones should be displayed and classic layout should be applied to the PivotTable.</p> <p>A value of 0 or false indicates in-grid drop zones should be disabled and classic layout should not be applied.</p> <p>[Note: Grid drop zones are optional runtime UI, determined by the application, that indicate to the user the locations of the page, row, column, and data fields in the PivotTable report. See layout discussion under pivotTableDefinition for the precise locations of these areas. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
immersive (Stop Immersive UI)	<p>Specifies a boolean value that indicates whether PivotTable immersive experience user interface should be turned off.</p> <p>A value of 1 or true indicates the PivotTable immersive experience should be turned off for this PivotTable.</p> <p>A value of 0 or false indicates the immersive experience should be left on. This attribute depends on whether the application implements an immersive experience in the user interface.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
indent (Indentation for Compact Axis)	<p>Specifies the indentation increment for compact axis and can be used to set the Report Layout to Compact Form.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

Attributes	Description
itemPrintTitles (Item Print Titles)	<p>Specifies a boolean value that indicates whether PivotItem names should be repeated at the top of each printed page.</p> <p>A value of 1 or true indicates pivot items names should be repeated at the top of each page.</p> <p>A value of 0 or false indicates should not be repeated.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
mdxSubqueries (MDX Subqueries Supported)	<p>Specifies a boolean value that indicates whether MDX sub-queries are supported by OLAP data provider for this PivotTable.</p> <p>A value of 1 or true indicates MDX sub-queries are supported by the OLAP data provider.</p> <p>A value of 0 or false indicates MDX sub-queries are not supported.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
mergeItem (Merge Titles)	<p>Specifies a boolean value that indicates whether row or column titles that span multiple cells should be merged into a single cell.</p> <p>A value of 1 or true indicates that titles that span multiple cells are merged into a single cell.</p> <p>A value of 0 or false indicates titles are not merged.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
minRefreshableVersion (Minimum Refreshable Version)	<p>Specifies the minimum version of the application required to update this PivotTable view. This attribute is application-dependent.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedByte datatype.</p>
missingCaption (Caption for Missing Values)	<p>Specifies the string to be displayed in cells with no value</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
multipleFieldFilters (Multiple Field Filters)	<p>Specifies a boolean value that indicates whether the fields of a PivotTable can have multiple filters set on them.</p> <p>A value of 1 or true indicates the fields of a PivotTable can have multiple filters.</p> <p>A value of 0 or false indicates the fields of a PivotTable can only have a simple filter.</p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
name (Name)	<p>Specifies the PivotTable name.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
outline (Outline New Fields)	<p>Specifies a boolean value that indicates whether new fields should have their outline flag set to true.</p> <p>A value of 1 or true indicates new fields are created with outline equal to true.</p> <p>A value of 0 or false indicates new fields are created with outline equal to false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
outlineData (Outline Data Fields)	<p>Specifies a boolean value that indicates whether data fields in the PivotTable should be displayed in outline form.</p> <p>A value of 1 or true indicates data fields will display in outline form.</p> <p>A value of 0 or false indicates data fields will not display in outline form.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
pageOverThenDown (Page Over Then Down)	<p>Specifies a boolean value that indicates how the page fields are laid out when there are multiple PivotFields in the page area.</p> <p>A value of 1 or true indicates the fields will display "Over, then down"</p> <p>A value of 0 or false indicates the fields will display "down, then Over"</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
pageStyle (Page Header Style Name)	<p>Specifies the name of the style to apply to each of the field item headers in the page area of the PivotTable.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
pageWrap (Page Wrap)	<p>Specifies the number of page fields to display before starting another row or column.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
pivotTableStyle	Specifies the name of the style to apply to the main table area of the PivotTable.

Attributes	Description
(Table Style Name)	<p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
preserveFormatting (Preserve Formatting)	<p>Specifies a boolean value that indicates whether the formatting applied by the user to the PivotTable cells is discarded on refresh.</p> <p>A value of 1 or true indicates the formatting applied by the end user is discarded on refresh.</p> <p>A value of 0 or false indicates the end-user formatting is retained on refresh.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
printDrill (Print Drill Indicators)	<p>Specifies a boolean value that indicates whether drill indicators expand collapse buttons should be printed.</p> <p>A value of 1 or true indicates that these buttons should be printed.</p> <p>A value of 0 or false indicates that these buttons should not be printed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
published (Data Fields Published)	<p>Specifies a boolean value that indicates whether data fields in the PivotTable are published and available for viewing in a server rendering environment.</p> <p>A value of 1 or true indicates that the data fields in the PivotTable are published and shall be available for viewing in a server rendering environment.</p> <p>A value of 0 or false indicates that the data fields in the PivotTable are not published and shall not be available for viewing in a server rendering environment.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
rowGrandTotals (Row Grand Totals)	<p>Specifies a boolean value that indicates whether grand totals should be displayed for the PivotTable rows. The default value for this attribute is true.</p> <p>A value of 1 or true indicates grand totals are displayed for the PivotTable rows.</p> <p>A value of 0 or false indicates grand totals will not be displayed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
rowHeaderCaption (Row Header)	<p>Specifies the string to be displayed in row header in compact mode.</p>

Attributes	Description
Caption)	The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
showCalcMbrs (Show Calculated Members)	<p>Specifies a boolean value that indicates whether calculated members should be shown in the PivotTable view. This attribute applies to PivotTables from OLAP-sources only.</p> <p>A value of 1 or true indicates that calculated members should be shown.</p> <p>A value of 0 or false indicates calculated members should not be shown.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showDataDropDo wn (Show Drop Down)	<p>Specifies a boolean value that indicates whether the drop-down lists for the fields in the PivotTable should be hidden. This attribute depends on whether the application implements drop down lists or similar mechanism in the user interface.</p> <p>A value of 1 or true indicates drop down lists are displayed for fields.</p> <p>A value of 0 or false indicates drop down lists will not be displayed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showDataTips (Show ToolTips on Data)	<p>Specifies a boolean value that indicates whether tooltips should be displayed for PivotTable data cells.</p> <p>A value of 1 or true indicates tooltips are displayed.</p> <p>A value of 0 or false indicates tooltips will not be displayed. This attribute depends on whether the application employs tooltips or similar mechanism in the user interface.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showDrill (Show Expand Collapse)	<p>Specifies a boolean value that indicates whether drill indicators should be hidden.</p> <p>A value of 1 or true indicates drill indicators are displayed.</p> <p>A value of 0 or false indicates drill indicators will not be displayed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showDropZones (Show Drop Zones)	<p>Specifies a boolean value that indicates whether the PivotTable should display large drop zones when there are no fields in the data region.</p> <p>A value of 1 or true indicates a large drop zone is displayed.</p>

Attributes	Description
	<p>A value of 0 or false indicates a large drop zone will not be displayed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showEmptyCol (Show Empty Column)	<p>Specifies a boolean value that indicates whether to include empty columns in the table.</p> <p>A value of 1 or true indicates empty columns are included in the PivotTable.</p> <p>A value of 0 or false indicates empty columns are excluded.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showEmptyRow (Show Empty Row)	<p>Specifies a boolean value that indicates whether to include empty rows in the table.</p> <p>A value of 1 or true indicates empty rows are included in the PivotTable.</p> <p>A value of 0 or false indicates empty rows are excluded.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showError (Show Error)	<p>Specifies a boolean value that indicates whether to show error messages in cells.</p> <p>A value of 1 or true indicates error messages are shown in cells.</p> <p>A value of 0 or false indicates error messages are shown through another mechanism the application provides in the user interface.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showHeaders (Show Field Headers)	<p>Specifies a boolean value that indicates whether to suppress display of pivot field headers.</p> <p>A value of 1 or true indicates field headers are shown in the PivotTable.</p> <p>A value of 0 or false indicates field headers are excluded.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showItems (Show Item Names)	<p>Specifies a boolean value that indicates whether to display item names when adding a field onto a PivotTable that has no data fields.</p> <p>A value of 1 or true indicates item names are displayed.</p> <p>A value of 0 or false indicates item names will not be displayed.</p>

Attributes	Description
	<p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>showMemberPropertyTips (Show Member Property ToolTips)</p>	<p>Specifies a boolean value that indicates whether member property information should be omitted from PivotTable tooltips.</p> <p>A value of 1 or true indicates member property information is included.</p> <p>A value of 0 or false indicates member property information is excluded. This attribute depends on whether the application employs tooltips or similar mechanism in the user interface.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>showMissing (Show Missing)</p>	<p>Specifies a boolean value that indicates whether to show a message in cells with no value.</p> <p>A value of 1 or true indicates to show a message string in cells without values.</p> <p>A value of 0 or false indicates no message string will shown in cells without values.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>showMultipleLabel (Show Multiple Labels)</p>	<p>Specifies a boolean value that indicates whether a page field with multiple selected items should display "(multiple items)" instead of "All". This attribute applies only to non-OLAP PivotTables. The messages displayed depend on the application implementation.</p> <p>A value of 1 or true indicates a different message string is displayed for a page field with multiple items.</p> <p>A value of 0 or false indicates the same message string is displayed for all page fields.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>subtotalHiddenItems (Subtotal Hidden Items)</p>	<p>Specifies a boolean value that indicates whether data for hidden pivotItems for PivotFields in the data area should be included in subtotals.</p> <p>A value of 1 or true indicates that data for hidden pivot items in the data area is included in subtotals.</p> <p>A value of 0 or false indicates hidden pivot items will not be included in subtotals.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

Attributes	Description
tag (PivotTable Custom String)	<p>Specifies a user-defined string that is associated with this PivotTable.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
updatedVersion (PivotTable Last Updated Version)	<p>Specifies the version of the application that last updated the PivotTable view. This attribute is application-dependent.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedByte datatype.</p>
useAutoFormatting (Auto Formatting)	<p>Specifies a boolean value that indicates whether legacy auto formatting has been applied to the PivotTable view.</p> <p>A value of 1 or true indicates that legacy auto formatting has been applied to the PivotTable.</p> <p>A value of 0 or false indicates that legacy auto formatting has not been applied to the PivotTable.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
vacatedStyle (Vacated Style)	<p>Specifies the name of the style to apply to the cells left blank when a PivotTable shrinks during a refresh operation</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
visualTotals (Total Visual Data)	<p>Specifies a boolean value that indicates whether totals should be based on visible data only. This attribute applies to OLAP PivotTables only.</p> <p>A value of 1 or true indicates subtotals are computed on visible data only.</p> <p>A value of 0 or false indicates subtotals are computed on all data.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_pivotTableDefinition](#)) is located in §A.2. end note]

18.10.1.74 pivotTableStyleInfo (PivotTable Style)

Represent information on style applied to the PivotTable.

[Example:

```
<sh:pivotTableStyleInfo name="PivotStyleLight16" showRowHeaders="1"
  showColHeaders="1" showRowStripes="0" showColStripes="0" showLastColumn="1"/>
```

end example]

Attributes	Description
name (Table Style Name)	<p>Specifies the name of the table style to use with this table.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
showColHeaders (Show Table Style Column Header Formatting)	<p>Specifies a boolean value that indicates whether to show column headers for the table.</p> <p>A value of 1 or true indicates column headers are shown.</p> <p>A value of 0 or false indicates column headers are omitted.</p> <p>'True' if table style column header formatting should be displayed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showColStripes (Show Column Stripes)	<p>Specifies a boolean value that indicates whether to show column stripe formatting for the table.</p> <p>A value of 1 or true indicates column stripe formatting is shown.</p> <p>A value of 0 or false indicates no column formatting is shown.</p> <p>True if table style column stripe formatting should be displayed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showLastColumn (Show Last Column)	<p>Specifies a boolean value that indicates whether to show the last column.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showRowHeaders (Show Row Header Formatting)	<p>Specifies a boolean value that indicates whether to show row headers for the table.</p> <p>A value of 1 or true indicates table style formatting is displayed.</p> <p>A value of 0 or false indicates table style formatting will not be displayed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
showRowStripes (Show Row Stripes)	<p>Specifies a boolean value that indicates whether to show row stripe formatting for the table.</p>

Attributes	Description
	<p>A value of 1 or true indicates row stripe formatting is displayed.</p> <p>A value of 0 or false indicates no row formatting is shown.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_PivotTableStyle](#)) is located in §A.2. *end note*]

18.10.1.75 query (Query)

Represents an OLAP sheet data cached query.

Attributes	Description
mdx (MDX Query String)	<p>Specifies the Multidimensional Expressions (MDX) query string.</p> <p>[Note: Data connectivity can use a number of different technologies. One example of potential values stored in this attribute can be found at: http://msdn2.microsoft.com/en-us/library/ms145595.aspx <i>end note</i>]</p> <p>See the MDX Language Reference for more information:</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Query](#)) is located in §A.2. *end note*]

18.10.1.76 queryCache (OLAP Query Cache)

Represents the cache of OLAP sheet data queries.

Attributes	Description
count (Cached Query Count)	<p>Specifies the number of cached queries in the collection.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_QueryCache](#)) is located in §A.2. *end note*]

18.10.1.77 `r` (PivotCache Record)

Represents a single record of data in the PivotCache.

[Example:

```
<r>
  <s v="3550"/>
  <s v="Road-150 Red, 62"/>
  <s v="This bike is ridden by race winners. Developed with the Adventure Works
    Cycles professional race team, it has a extremely light heat-treated
    aluminum frame, and steering that allows precision control."/>
  <s v="No Discount"/>
  <x v="0"/>
  <s v="Australian Dollar"/>
  <n v="1"/>
  <n v="3578.27"/>
  <n v="0"/>
  <n v="2171.29419999999998"/>
  <n v="3578.27"/>
  <n v="89.4568000000000001"/>
</r>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_Record](#)) is located in §A.2. *end note]*

18.10.1.78 `rangePr` (Range Grouping Properties)

Represents the collection of range grouping properties.

[Example:

```
<rangePr groupBy="months" startDate="2002-01-01T00:00:00"
  endDate="2006-05-06T00:00:00"/>
```

end example]

Attributes	Description
autoEnd (Source Data Ending Range)	<p>Specifies a boolean value that indicates whether the application uses the source data to set the ending range value.</p> <p>A value of 1 or true indicates the ending range value is set from the source data.</p> <p>A value of 0 or false indicates ending range values are set by the value specified in endDate or endNum.</p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
autoStart (Source Data Set Beginning Range)	<p>Specifies a boolean value that indicates whether we use source data to set the beginning range value.</p> <p>A value of 1 or true indicates the beginning range value is set from the source data.</p> <p>A value of 0 or false indicates the beginning range value is set from the value specified in startDate or startNum.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
endDate (Date Grouping End Value)	<p>Specifies the ending value for date grouping if autoEnd is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema dateTime datatype.</p>
endNum (Numeric Grouping End Value)	<p>Specifies the ending value for numeric grouping if autoEnd is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>
groupBy (Group By)	<p>Specifies the grouping.</p> <p>The possible values for this attribute are defined by the ST_GroupBy simple type (§18.18.38).</p>
groupInterval (Grouping Interval)	<p>Specifies the grouping interval for numeric range grouping. Specifies the number of days to group by in date range grouping.</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>
startDate (Date Grouping Start Value)	<p>Specifies the starting value for date grouping if autoStart is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema dateTime datatype.</p>
startNum (Numeric Grouping Start Value)	<p>Specifies the starting value for numeric grouping if autoStart is false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_RangePr](#)) is located in §A.2. *end note*]

18.10.1.79 rangeSet (Range Set)

Represents a single range in the rangeSets collection. element is intended to facilitate creating a PivotTable report by consolidating SpreadsheetML ranges that have similar categories of data to be summarized. The simplest layout for the data source is for each rangeSets of data to be in list-like format, with column labels in the first row, row labels in the first column, the rest of the rows having similar items in the same row and column, and no blank rows or columns within the range. A particular rangeSet can consist of a built-in named range that is provided by the application, a user defined named range, a range reference, or a reference to an external workbook.

When multiple ranges are consolidated using this functionality, up to 4 custom report filters (also known as page fields) can be created to help filter the PivotTable report, by specifically enabling one or more of the individual ranges to be selected in the report filter. For each custom page field created, a custom label can be specified and assigned to each range participating in the consolidation range, so that the PivotTable can be filtered by one or more of the ranges being summarized.

[Example: Consider a workbook with 6 worksheets. On Sheet1 we have:

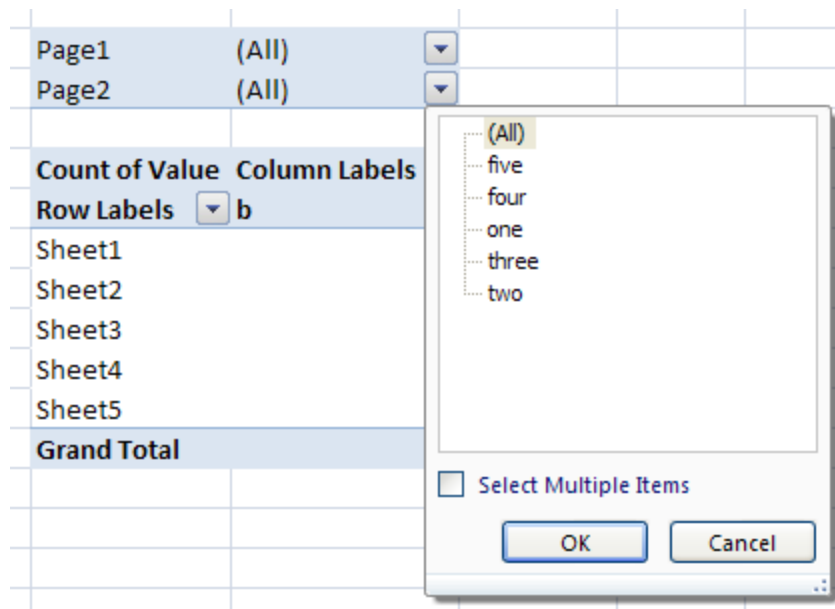
a	b
Sheet1	Sheet1
Sheet1	Sheet1

On Sheet2 we have:

a	b
Sheet2	Sheet2
Sheet2	Sheet2

... and so on up through Sheet5.

On Sheet6, we have the consolidated ranges being summarized by a PivotTable, and two page filters exist for the PivotTable.



Notice that for the second page filter, the items have been assigned a custom label, "one", "two", ..., "five", for each of Sheet1, Sheet2, ..., Sheet5 data sources, respectively. Similarly, the items have been assigned a custom label, "1", "2", ..., "5" for each of Sheet1, Sheet2, ..., Shet5 data sources, respectively.

The XML representing these custom page filters must be like the following:

```
<cacheSource type="consolidation">
  <consolidation autoPage="0">
    <pages count="2">
      <page count="5">
        <pageItem name="1"/>
        <pageItem name="2"/>
        <pageItem name="3"/>
        <pageItem name="4"/>
        <pageItem name="5"/>
      </page>
      <page count="5">
        <pageItem name="one"/>
        <pageItem name="two"/>
        <pageItem name="three"/>
        <pageItem name="four"/>
        <pageItem name="five"/>
      </page>
    </pages>
  </consolidation>
</cacheSource>
```

```

<rangeSets count="5">
  <rangeSet i1="0" i2="0" ref="A1:B3" sheet="Sheet1"/>
  <rangeSet i1="1" i2="1" ref="A1:B3" sheet="Sheet2"/>
  <rangeSet i1="2" i2="2" ref="A1:B3" sheet="Sheet3"/>
  <rangeSet i1="3" i2="3" ref="A1:B3" sheet="Sheet4"/>
  <rangeSet i1="4" i2="4" ref="A1:B3" sheet="Sheet5"/>
</rangeSets>
</consolidation>
</cacheSource>

```

end example]

[*Note:* Attributes i1, i2, i3, and i4 correspond to custom page fields created in the user interface. Spreadsheet ML only supports 4 custom page fields. *end note*]

Attributes	Description
i1 (Field Item Index Page 1)	Specifies the index of a page field item in page filter one. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
i2 (Field Item Index Page 2)	Specifies the index of a page field item in page filter two. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
i3 (Field Item Index Page 3)	Specifies the index of a page field item in page filter three. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
i4 (Field Item Index Page 4)	Specifies the index of a page field item in page filter four. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
id (Relationship Id) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the unique identifier of the Workbook part where the range set is stored. See Workbook (§18.2) for more information. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).
name (Named Range)	Specifies the named range. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
ref (Reference)	Specifies the cell range.

Attributes	Description
	The possible values for this attribute are defined by the ST_Ref simple type (§18.18.62).
sheet (Sheet Name)	Specifies the sheet name. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element’s content model ([CT_RangeSet](#)) is located in §A.2. *end note*]

18.10.1.80 rangeSets (Range Sets)

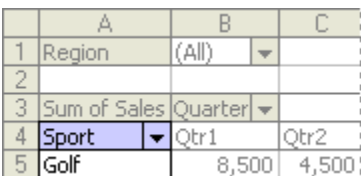
Represents the collection of reference-page items pairs.

Attributes	Description
count (Reference and Page Item Count)	Specifies the number of reference and page items. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element’s content model ([CT_RangeSets](#)) is located in §A.2. *end note*]

18.10.1.81 rowFields (Row Fields)

Represents the collection of row fields for the PivotTable.



The image shows a PivotTable report with the following structure:

	A	B	C
1	Region	(All)	
2			
3	Sum of Sales	Quarter	
4	Sport	Qtr1	Qtr2
5	Golf	8,500	4,500

In this example, 'Region' and 'Sum of Sales' are column fields, while 'Sport' and 'Golf' are row fields. 'Sport' is highlighted in blue, indicating it is the active row field.

In the image above, the blue field is a row field. A PivotTable report that has more than one row field has one inner row field (Sport, in the example below), the one closest to the data area. Any other row fields are outer row fields (Region, in the example below). Items in the outermost row field are displayed only once, but items in the rest of the row fields are repeated as needed.

[Example:

	A	B	C
3	Sum of Sales		Quarter ▼
4	Region ▼	Sport ▼	Qtr1
5	East	Golf	5,000
6		Safari	9,000
7		Tennis	1,500
8	East Total		15,500
9	West	Golf	3,500

In the image above, Region is an outer row field. Sport is an inner row field.

```
<rowFields count="2">
  <field x="7"/>
  <field x="8"/>
</rowFields>
```

end example]

Attributes	Description
count (Repeated Items Count)	Specifies the number of repeated items in the collection. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_RowFields](#)) is located in §A.2. *end note*]

18.10.1.82 rowHierarchiesUsage (Row OLAP Hierarchy References)

Represents the collection of references to OLAP hierarchies on the row axis of a PivotTable.

[Example:

```
<sh:rowHierarchiesUsage count="1">
  <sh:rowHierarchyUsage hierarchyUsage="9"/>
</sh:rowHierarchiesUsage>
```

end example]

Attributes	Description
count (Item Count)	Specifies the number of items in the collection. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_RowHierarchiesUsage](#)) is located in §A.2. *end note*]

18.10.1.83 rowHierarchyUsage (Row OLAP Hierarchies)

Represents a references to an OLAP Hierarchy on the row axis of a PivotTable.

[Example:

```
<sh:rowHierarchyUsage hierarchyUsage="9"/>
```

end example]

Attributes	Description
hierarchyUsage (Hierarchy Usage)	Specifies the reference to an OLAP hierarchy in a PivotTable. The possible values for this attribute are defined by the W3C XML Schema int datatype.

[Note: The W3C XML Schema definition of this element’s content model ([CT_HierarchyUsage](#)) is located in §A.2.
end note]

18.10.1.84 rowItems (Row Items)

Represents the collection of items in row axis of the PivotTable.

[Example: In the SpreadsheetML example below, the item values are found in cells B10:B13. For example "Bikes" is in B10, and corresponds to the first <i> element below.

```
<rowItems count="4">
  <i>
    <x/>
  </i>
  <i r="1">
    <x/>
  </i>
  <i r="1">
    <x v="1"/>
  </i>
  <i t="grand">
    <x/>
  </i>
</rowItems>
```

Looking at the layout of the PivotTable in this example, "Bikes" is the first (and only) item value in the first row, in cell B10. In the XML defining the PivotTable row item values, the first <i> element corresponds to the first row. There is a single index element <x>. The first (and only) <x> element corresponds to the first field on the row axis, namely "Product Category", and an index value of "0" indicates that the 0th item in the items collection for that pivotField definition is how to obtain the item value. Note that "Bikes" isn't explicitly listed

as a value here, but instead the 0th item is an index to this field's shared items collection in the `pivotCacheDefinition` part.

For the second row there are two item values, one item value (Bikes) from the first field in that row (Product Category) and one item value (Mountain Bikes) from the second field in that row (Product Subcategory). In the PivotTable, the first item value "Bikes" is hidden from view. In the XML for this example, the second `<i>` element expresses both item values for this row. The first item value "Bikes" is expressed implicitly, because the value of `@r` on the second `<i>` element is '1', indicating that the first item value from the previous row is reused again as the first item value for the current row. The second item value is expressed explicitly via the `<x>` element under the second `<i>` element. The index of '0' indicates that the 0th item in the `<pivotField>` element for that field is how to obtain the item value. Note again that the 0th item is itself an index into this field's shared items collection in the `pivotCacheDefinition` part.

The item values for the third row can be discovered in a similar way. *end example]*

Attributes	Description
count (Items in a Row Count)	Specifies the number of items in the row axis of the PivotTable. The possible values for this attribute are defined by the W3C XML Schema <code>unsignedInt</code> datatype.

[Note: The W3C XML Schema definition of this element's content model (`CT_rowItems`) is located in §A.2. *end note]*

18.10.1.85 `s` (Character Value)

Represents a character value in a PivotTable.

[Example:

```
<sharedItems count="2">
  <s v="7527 Brook Way"/>
  <s v="3310 Harvey Way"/>
</sharedItems>
```

end example]

Attributes	Description
b (Bold)	Specifies a boolean value that indicates whether this value contains bold formatting on the OLAP server. This attribute applies to OLAP-based PivotTables only. A value of 1 or true indicates this value contains bold formatting on the server. The possible values for this attribute are defined by the W3C XML Schema <code>boolean</code> datatype.

Attributes	Description
bc (Background Color)	<p>Specifies the background color for this value that was provided by the OLAP server. This attribute applies to OLAP-based PivotTables only. The color is specified as a HEX value in RGB space.</p> <p>The possible values for this attribute are defined by the ST_UnsignedIntHex simple type (§18.18.86).</p>
c (Item Caption)	<p>Specifies the caption for the this item.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
cp (Member Property Count)	<p>Specifies the number of member property values.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
f (Calculated Item)	<p>Specifies a boolean value that indicates whether this is a calculated item value.</p> <p>A value of 1 or true indicates this item is a calculated value.</p> <p>A value of 0 or false indicates this item is not a calculated value.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fc (Foreground Color)	<p>Specifies the foreground color for this value that was provided by the OLAP server. This attribute applies to OLAP-based PivotTables only. The color is specified as a HEX value in RGB space.</p> <p>The possible values for this attribute are defined by the ST_UnsignedIntHex simple type (§18.18.86).</p>
i (Italic)	<p>Specifies a boolean value that indicates whether the value contains italic formatting on the OLAP server. This attribute applies to OLAP-based PivotTables only.</p> <p>A value of 1 or true indicates this value contains italic formatting on the server.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
in (Format Index)	<p>Specifies the index to the OLAP serverformat element where the format string for this entry is stored.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
st (Strikethrough)	<p>Specifies a boolean value that indicates whether the value contains strikethrough formatting on the OLAP server. This attribute applies to OLAP-based PivotTables only.</p> <p>A value of 1 or true indicates this value contains strikethrough formatting on the server.</p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
u (Unused Item)	<p>Specifies a boolean value that indicates whether this is an unused item. The application marks an item as unused when an item is deleted from the data source. The item and associated metadata are retained in the cache until the threshold for unused items specified in <code>missingItemsLimit</code> is reached.</p> <p>A value of 1 or <code>true</code> indicates this item is unused.</p> <p>A value of 0 or <code>false</code> indicates this item is used.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
un (Underline)	<p>Specifies a boolean value that indicates whether the value contains underline formatting on the OLAP server. This attribute applies to OLAP-based PivotTables only.</p> <p>A value of 1 or <code>true</code> indicates this value contains underline formatting on the server.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
v (Value)	<p>Specifies the value of the item.</p> <p>The possible values for this attribute are defined by the <code>ST_Xstring</code> simple type (§22.9.2.19).</p>

[Note: The W3C XML Schema definition of this element's content model (`CT_String`) is located in §A.2. *end note*]

18.10.1.86 `serverFormat` (Server Format)

Represents the numeric format specified by the OLAP server for a tuple.

Attributes	Description
culture (Culture)	<p>Specifies a language used to determine the currency symbol to display for currency values. [Example: if the culture is "en-us", the values in the application will format the values with a dollar sign. If the culture is "fr-fr" the application will format the values with a euro sign. <i>end example</i>]</p> <p>This value conforms to the language tagging conventions of RFC 3066 and later. The pattern <code><language>-<REGION></code> is used, e.g., "en-us" or "fr-fr".</p> <p>The possible values for this attribute are defined by the <code>ST_Xstring</code> simple type (§22.9.2.19).</p>
format (Format)	Specifies the format string to use for all other numeric values. This string is supplied by

Attributes	Description
	<p>the OLAP server. Therefore, the syntax for reading the format string depends on the server implementation.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_ServerFormat](#)) is located in §A.2.
end note]

18.10.1.87 [serverFormats \(Server Formats\)](#)

Represents the collection of numeric and currency formats specified by the OLAP server for a tuple

Attributes	Description
count (Format Count)	<p>Specifies the number of formats in the collection.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_ServerFormats](#)) is located in §A.2.
end note]

18.10.1.88 [set \(OLAP Set\)](#)

Represents an OLAP sheet data set or tuple set. The set is defined by a Multidimensional Expressions (MDX) query that specifies criteria for the dimension members that belong to the set.

[Example: the following MDX expression defines the set for the 10 salespersons with the lowest sales:

```
BottomCount([Salesperson].[Salesperson Name].Members,10,[Measures].[Sales])
```

end example]

The MDX expression is specified in the setDefinition attribute.

Attributes	Description
count (Number of Tuples)	<p>Specifies the number of tuples in the set.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
maxRank (Maximum Rank Requested)	<p>Specifies the largest rank entry the user has requested.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>

Attributes	Description
queryFailed (Query Failed)	<p>Specifies a boolean value that indicates whether querying on this set failed.</p> <p>A value of 1 or true indicates a query against this set failed.</p> <p>A value of 0 or false indicates a query against this set succeeded.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
setDefinition (MDX Set Definition)	<p>Specifies the Multidimensional Expressions (MDX) set definition.</p> <p>[Note: Data connectivity can use a number of different technologies. One example of potential values stored in this attribute can be found at: http://msdn2.microsoft.com/en-us/library/ms145595.aspx end note]</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
sortType (Set Sort Order)	<p>Specifies the sort order of the set.</p> <p>The possible values for this attribute are defined by the ST_SortType simple type (§18.18.74).</p>

[Note: The W3C XML Schema definition of this element's content model (CT_Set) is located in §A.2. end note]

18.10.1.89 sets (Sets)

Represents the collection of OLAP sheet data entries or tuple sets.

Attributes	Description
count (Tuple Set Count)	<p>Specifies the number of tuple sets.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model (CT_Sets) is located in §A.2. end note]

18.10.1.90 sharedItems (Shared Items)

Represents the collection of unique items for a field in the PivotCacheDefinition. The sharedItems complex type stores data type and formatting information about the data in a field. Items in the PivotCacheDefinition can be shared in order to reduce the redundancy of those values that are referenced in multiple places across all the PivotTable parts. [Example: A value might be part of a filter, it might appear on a row or column axis, and will appear in the pivotCacheRecords definition as well. However, because of the performance cost of creating the optimized shared items, items are only shared if they are actually in use in the PivotTable. Therefore, depending

on user actions on the PivotTable layout, the pivotCacheDefinition and underlying PivotCacheRecords part can be updated. *end example*]

If there are no shared items, then field values are stored directly in the pivotCacheRecords part.

[*Example:*

```
<sharedItems count="1">
  <s v="[Customer].[Customer Geography].[Country].&[United States]"
    c="United States"/>
</sharedItems>
```

end example]

The following attributes are not required or used if there are no items in sharedItems.

- containsBlank
- containsSemiMixedTypes
- containsMixedTypes
- longText

The following attributes are not used unless there is more than one item in sharedItems or the one and only item is not a blank item. If the first item is a blank item the data type the field cannot be verified.

- containsNumber
- containsDates
- containsString
- containsInteger

The following attributes can be omitted without loss of functionality.

- containsNonDate
- count

The following attributes are not required and can be omitted. However, refreshing the PivotTable could produce different groupings than before.

- maxDate
- minDate
- maxValue
- minValue

Applications should ensure that “date” attributes are not mixed with “value” attributes.

Attributes	Description
containsBlank	Specifies a boolean value that indicates whether this field contains a blank value.

Attributes	Description
(Contains Blank)	<p>A value of 1 or true indicates this field contains one or more blank values.</p> <p>A value of 0 or false indicates this field does not contain blank values.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
containsDate (Contains Date)	<p>Specifies a boolean value that indicates that the field contains at least one date.</p> <p>A value of 1 or true indicates the field contains at least one date value.</p> <p>A value of 0 or false indicates the field does not contain any date values.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
containsInteger (Contains Integer)	<p>Specifies a boolean value that indicates whether this field contains integer values.</p> <p>A value of 1 or true indicates this field contains integer values.</p> <p>A value of 0 or false indicates non-integer or mixed values.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
containsMixedTypes (Contains Mixed Data Types)	<p>Specifies a boolean value that indicates whether this field contains more than one data type.</p> <p>A value of 1 or true indicates this field contains more than one data type.</p> <p>A value of 0 or false indicates contains only one data type. The field can still contain blank values.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
containsNonDate (Contains Non Date)	<p>Specifies a boolean value that indicates that the field contains at least one value that is not a date.</p> <p>A value of 1 or true indicates the field contains at least one non-date values.</p> <p>A value of 0 or false indicates this field contains no date fields.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
containsNumber (Contains Numbers)	<p>Specifies a boolean value that indicates whether this field contains numeric values.</p>

Attributes	Description
	<p>A value of 1 or true indicates this field contains at least one numeric value.</p> <p>A value of 0 or false indicates this field contains no numeric values.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
containsSemiMixedTypes (Contains Semi Mixed Data Types)	<p>Specifies a boolean value that indicates that this field contains text values. The field can also contain a mix of other data type and blank values.</p> <p>A value of 1 or true indicates at least one text value, and can also contain a mix of other data types and blank values.</p> <p>A value of 0 or false indicates the field does not have a mix of text and other values.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
containsString (Contains String)	<p>Specifies a boolean value that indicates whether this field contains a text value.</p> <p>A value of 1 or true indicates this field contains at least one text value.</p> <p>A value of 0 or false indicates this field does not contain any text values.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
count (Shared Items Count)	<p>Specifies the number of shared items to load for this field.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
longText (Long Text)	<p>Specifies a boolean value that indicates whether this field contains a long text value. A string is considered long if it is over 255 Unicode scalar values.</p> <p>A value of 1 or true indicates the value contains more than 255 Unicode scalar values of text.</p> <p>A value of 0 or false indicates the value contains less than 255 Unicode scalar values.</p> <p>[Note: This is used as many legacy spreadsheet application support a limit of 255 characters for text values. end note]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
maxDate (Maximum Date Time Value)	<p>Specifies the maximum date/time value found in a date field.</p> <p>The possible values for this attribute are defined by the W3C XML Schema dateTime</p>

Attributes	Description
	datatype.
maxValue (Maximum Numeric Value)	Specifies the maximum numeric value found in a numeric field. The possible values for this attribute are defined by the W3C XML Schema double datatype.
minDate (Minimum Date Time)	Specifies the minimum date/time value found in a date field. The possible values for this attribute are defined by the W3C XML Schema dateTime datatype.
minValue (Minimum Numeric Value)	Specifies the minimum numeric value found in a numeric field. The possible values for this attribute are defined by the W3C XML Schema double datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_SharedItems](#)) is located in §A.2. *end note*]

18.10.1.91 sortByTuple (Sort By Tuple)

Represents the sort applied to a tuple.

Attributes	Description
c (Member Name Count)	Specifies the number of member names. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Tuples](#)) is located in §A.2. *end note*]

18.10.1.92 tpl (Tuple)

Represents an OLAP sheet data entry member.

Attributes	Description
fld (Field Index)	Specifies the index of the field to which the member belongs. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
hier (Hierarchy Index)	Specified the index of the hierarchy to which the member belongs. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

Attributes	Description
item (Item Index)	Specifies the index of the item in the field that represents this item. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Tuple](#)) is located in §A.2. *end note*]

18.10.1.93 [tpls \(Tuples\)](#)

Represents members for the OLAP sheet data entry, also known as a tuple.

Attributes	Description
c (Member Name Count)	Specifies the number of member names. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Tuples](#)) is located in §A.2. *end note*]

18.10.1.94 [tupleCache \(Tuple Cache\)](#)

Represents the cache of OLAP sheet data members, or tuples.

[Note: The W3C XML Schema definition of this element's content model ([CT_TupleCache](#)) is located in §A.2. *end note*]

18.10.1.95 [worksheetSource \(Worksheet PivotCache Source\)](#)

Represents the location of the source of the data that is stored in the cache.

[Example:

```
<cacheSource type="worksheet">
  <worksheetSource name="Table1" r:id="rId2"/>
</cacheSource>
```

end example]

Attributes	Description
id (Relationship Id) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the identifier to the Sheet part whose data is stored in the cache. See the Sheet section (§18.2) for more information. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

Attributes	Description
ps	
name (Named Range)	Specifies the named range that is the source of the data. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
ref (Reference)	Specifies the reference that defines a cell range that is the source of the data. This attribute depends on how the application implements cell references. The possible values for this attribute are defined by the ST_Ref simple type (§18.18.62).
sheet (Sheet Name)	Specifies the name of the sheet that is the source for the cached data. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element's content model ([CT_WorksheetSource](#)) is located in §A.2. *end note*]

18.10.1.96 x (Member Property Index)

Represents an array of indexes to cached member property values.

Attributes	Description
v (Shared Items Index)	Specifies the index into the shared items table in the PivotCache that identifies this item. The possible values for this attribute are defined by the W3C XML Schema int datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_X](#)) is located in §A.2. *end note*]

18.10.1.97 x (Shared Items Index)

This element represents an array of indexes to cached shared item values

Attributes	Description
v (Shared Items Index)	Specifies the index into the shared items table in the PivotCache that identifies this item. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Index](#)) is located in §A.2. *end note*]

18.10.2 Shared Pivot Table Data

This section defines the part where shared PivotTable data is stored.

18.10.2.1 [reference \(Reference\)](#)

Represents a set of selected fields and selected items within those fields.

[Example:

```
<sh:reference field="4294967294" count="1" selected="0">
  <sh:x v="0"/>
</sh:reference>
```

end example]

Attributes	Description
avgSubtotal (Include Average Filter)	<p>Specifies a boolean value that indicates whether the 'average' aggregate function is included in the filter.</p> <p>A value of 1 or true indicates the average aggregation function is included in the filter.</p> <p>A value of 0 or false indicates another aggregation function is included in the filter.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
byPosition (Positional Reference)	<p>Specifies a boolean value that indicates whether the item is referred to by position rather than item index.</p> <p>A value of 1 or true indicates the item is referred to by position.</p> <p>A value of 0 or false indicates the item is referred to by index.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
count (Item Index Count)	<p>Specifies the number of item indexes in the collection of indexes (x tags).</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
countASubtotal (Include CountA Filter)	<p>Specifies a boolean value that indicates whether the 'countA' subtotal is included in the filter.</p> <p>A value of 1 or true indicates the count aggregation function is included in the filter.</p> <p>A value of 0 or false indicates another aggregation function is included in the filter.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
countSubtotal (Include Count)	<p>Specifies a boolean value that indicates whether the count aggregate function is included in the filter.</p>

Attributes	Description
Subtotal)	<p>A value of 1 or true indicates the count aggregation function is included in the filter.</p> <p>A value of 0 or false indicates another aggregation function is included in the filter.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
defaultSubtotal (Include Default Filter)	<p>Specifies a boolean value that indicates whether the default subtotal is included in the filter.</p> <p>A value of 1 or true indicates the default subtotal is included in the filter. The default is to display the total or the grand total.</p> <p>A value of 0 or false indicates another subtotal or aggregation function is included in the filter.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
field (Field Index)	<p>Specifies the index of the field to which this filter refers. A value of -2 indicates the 'data' field.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
maxSubtotal (Include Maximum Filter)	<p>Specifies a boolean value that indicates whether the 'maximum' aggregate function is included in the filter.</p> <p>A value of 1 or true indicates the maximum aggregation function is included in the filter.</p> <p>A value of 0 or false indicates another aggregation function is included in the filter.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
minSubtotal (Include Minimum Filter)	<p>Specifies a boolean value that indicates whether the 'minimum' aggregate function is included in the filter.</p> <p>A value of 1 or true indicates the minimum aggregation function is included in the filter.</p> <p>A value of 0 or false indicates another aggregation function is included in the filter.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
productSubtotal (Include Product Filter)	<p>Specifies a boolean value that indicates whether the 'product' aggregate function is included in the filter.</p>

Attributes	Description
	<p>A value of 1 or true indicates the product aggregation function is included in the filter.</p> <p>A value of 0 or false indicates another aggregation function is included in the filter.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
relative (Relative Reference)	<p>Specifies a boolean value that indicates whether the item is referred to by a relative reference rather than an absolute reference. This attribute is used if posRef is set to true.</p> <p>A value of 1 or true indicates the item is referred to by a relative reference.</p> <p>A value of 0 or false indicates the item is referred to by an absolute reference.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
selected (Selected)	<p>Specifies a boolean value that indicates whether this field has selection. This attribute is used when the PivotTable is in Outline view. It is also used when both header and data cells have selection.</p> <p>A value of 1 or true indicates the field has selection.</p> <p>A value of 0 or false indicates the field does not have selection.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
stdDevPSubtotal (Include StdDevP Filter)	<p>Specifies a boolean value that indicates whether the population standard deviation aggregate function is included in the filter.</p> <p>A value of 1 or true indicates the population standard deviation aggregation function is included in the filter.</p> <p>A value of 0 or false indicates another aggregation function is included in the filter.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
stdDevSubtotal (Include StdDev Filter)	<p>Specifies a boolean value that indicates whether the standard deviation aggregate function is included in the filter.</p> <p>A value of 1 or true indicates the standard deviation aggregation function is included in the filter.</p> <p>A value of 0 or false indicates another aggregation function is included in the filter.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean</p>

Attributes	Description
	datatype.
sumSubtotal (Include Sum Filter)	<p>Specifies a boolean value that indicates whether the sum aggregate function is included in the filter.</p> <p>A value of 1 or true indicates the sum aggregation function is included in the filter.</p> <p>A value of 0 or false indicates another aggregation function is included in the filter.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
varPSubtotal (Include VarP Filter)	<p>Specifies a boolean value that indicates whether the population variance aggregate function is included in the filter.</p> <p>A value of 1 or true indicates the population variance aggregation function is included in the filter.</p> <p>A value of 0 or false indicates another aggregation function is included in the filter.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
varSubtotal (Include Var Filter)	<p>Specifies a boolean value that indicates whether the variance aggregate function is included in the filter.</p> <p>A value of 1 or true indicates the variance aggregation function is included in the filter.</p> <p>A value of 0 or false indicates another aggregation function is included in the filter.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_PivotAreaReference](#)) is located in §A.2. end note]

18.10.2.2 references (References)

Represents the set of selected fields and the selected items within those fields.

[Example:

```
<sh:references count="5">
  <sh:reference field="4294967294" count="1" selected="0">
    <sh:x v="0"/>
  </sh:reference>
```

```

    <sh:reference field="2" count="1" selected="0">
      <sh:x v="0"/>
    </sh:reference>
    <sh:reference field="14" count="1" selected="0">
      <sh:x v="0"/>
    </sh:reference>
    <sh:reference field="15" count="2" selected="0">
      <sh:x v="2"/>
      <sh:x v="3"/>
    </sh:reference>
  </sh:references>

```

end example]

Attributes	Description
count (Pivot Filter Count)	<p>Specifies the number of filtered records available in the PivotTable.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_PivotAreaReferences](#)) is located in §A.2. *end note*]

18.11 Shared Workbook Data

The Shared Workbooks architecture enables a spreadsheet application to record revisions made to a workbook (e.g., track changes), and is designed to enable either single, or multiple users editing the same workbook at the same time. Therefore, the application needs to support the ability to read changes made by another user and update its own state of the same workbook with those changes, even when those changes are made concurrently with other changes made by other users. Inevitably there are conflicts, and therefore merge conflict resolution should be supported the runtime application. The file format only contains enough information so that the spreadsheet application can deal with conflicts, and can undo/redo changes from the change history at run time.

18.11.1 Shared Workbook Data

Within a shared workbook, the changes made to the spreadsheet at runtime are persisted as sets of different revisions collectively forming a revision history. These are persisted to the file on disk during a save event, and are saved in different xml parts known as revision logs. There is a headers table xml part that summarizes when changes were made, who made them, and it lists the relationship from each header to the individual revision log that records the specific changes.

[Example: This example shows the header and revision log for two simple events: adding text to a cell, and inserting a new sheet.

First, take a look at the header table, and revision log:

```
<headers xmlns="..." xmlns:r="..." guid="{A84A6777-8908-4CB9-9EB6-625CEFF419D3}">
  <header guid="{A84A6777-8908-4CB9-9EB6-625CEFF419D3}"
    dateTime="2006-07-14T13:42:54" maxSheetId="4" userName="UserName"
    r:id="rId1">
    <sheetIdMap count="3">
      <sheetId val="1"/>
      <sheetId val="2"/>
      <sheetId val="3"/>
    </sheetIdMap>
  </header>
</headers>
```

And the revision log is essentially empty:

```
<revisions xmlns="..." xmlns:r="..." />
```

Now, after inserting the text "foo" into cell A1, and saving, the header looks like this:

```
<headers xmlns="..." xmlns:r="..." guid="{CFEA9B63-728B-4274-A346-0440E1573AB4}"
  diskRevisions="1" revisionId="1" version="2">
  <header guid="{A84A6777-8908-4CB9-9EB6-625CEFF419D3}"
    dateTime="2006-07-14T13:42:54" maxSheetId="4" userName="UserName"
    r:id="rId1">
    <sheetIdMap count="3">
      <sheetId val="1"/>
      <sheetId val="2"/>
      <sheetId val="3"/>
    </sheetIdMap>
  </header>
  <header guid="{CFEA9B63-728B-4274-A346-0440E1573AB4}"
    dateTime="2006-07-14T13:44:40" maxSheetId="4" userName="UserName"
    r:id="rId2" minRId="1">
    <sheetIdMap count="3">
      <sheetId val="1"/>
      <sheetId val="2"/>
      <sheetId val="3"/>
    </sheetIdMap>
  </header>
</headers>
```

A new header entry is added, with a GUID and a revision ID (rId2) that specifies which log to look into to see the details about the revision.

The old log is saved, and the newly created log (corresponding to rId2) now looks like this:

```
<revisions xmlns="..." xmlns:r="...">
  <rcc rId="1" sId="1">
    <nc r="A1" t="inlineStr">
      <is>
        <t>foo</t>
        <phoneticPr fontId="0"/>
      </is>
    </nc>
  </rcc>
</revisions>
```

The log shows that the contents of a cell were revised, and the new cell contents is text containing "foo" as the string.

After inserting a new sheet, the header looks like this:

```
<headers xmlns="..." xmlns:r="..." guid="{7E1DAFA8-EF95-4865-8FE8-CC17B28635CF}"
  diskRevisions="1" revisionId="2" version="3">
  <header guid="{A84A6777-8908-4CB9-9EB6-625CEFF419D3}"
    dateTime="2006-07-14T13:42:54" maxSheetId="4"
    userName="UserName" r:id="rId1">
    <sheetIdMap count="3">
      <sheetId val="1"/>
      <sheetId val="2"/>
      <sheetId val="3"/>
    </sheetIdMap>
  </header>
  <header guid="{CFEA9B63-728B-4274-A346-0440E1573AB4}"
    dateTime="2006-07-14T13:44:40" maxSheetId="4" userName="UserName"
    r:id="rId2" minRId="1">
    <sheetIdMap count="3">
      <sheetId val="1"/>
      <sheetId val="2"/>
      <sheetId val="3"/>
    </sheetIdMap>
  </header>
  <header guid="{7E1DAFA8-EF95-4865-8FE8-CC17B28635CF}"
    dateTime="2006-07-14T13:48:56" maxSheetId="5" userName="UserName"
    r:id="rId3" minRId="2">
```

```
<sheetIdMap count="4">
  <sheetId val="1"/>
  <sheetId val="2"/>
  <sheetId val="3"/>
  <sheetId val="4"/>
</sheetIdMap>
</header>
</headers>
```

You can see that the last, most recent, header entry shows an entry for the new sheet. The most recent log looks like this:

```
<revisions xmlns="..." xmlns:r="...">
  <ris rId="2" sheetId="4" name="[shared example.xlsx]Sheet4"
    sheetPosition="3"/>
  <rcv guid="{841DBE00-ECD0-478E-893B-30CE5DABBEF5}" action="delete"/>
  <rcv guid="{841DBE00-ECD0-478E-893B-30CE5DABBEF5}" action="add"/>
</revisions>
```

This shows the new sheet, sheetId 4, is added to the workbook. The custom view (rcv) for the user is updated as a new sheet was added.

end example]

18.11.1.1 [header \(Header\)](#)

This element is essentially a table that contains metadata about a list of specific changes that have taken place for this workbook. It lists when the changes were made, who made them, and the relationship IDs so that the log detailing the specific change can be found. If tracking changes, or sharing workbooks, are enabled, then changes are persisted on the Save event, or at a specified time interval. A header is created for each set of changes.

Attributes	Description
dateTime (Date Time)	The date and time when this set of revisions was saved. [Note: This can happen when the user explicitly saves, or the save can occur due to a time interval, specified in the spreadsheet application, elapsing. <i>end note</i>] The possible values for this attribute are defined by the W3C XML Schema dateTime datatype.
guid (GUID)	A globally unique identifier for this set of revisions. The possible values for this attribute are defined by the ST_Guid simple type (§22.9.2.4).
id (Relationship ID)	This is the ID that is used to find the corresponding log record of the changes made for this header.

Attributes	Description
Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Use the corresponding relationship expressed in the revisionHeaders part to locate the log record that lists the specific changes. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).
maxRId (Max Revision Id)	The highest revision Id that belongs to this header. <i>[Note: This can be used when, given a revision ID, the spreadsheet application needs to determine which revision log to access. end note]</i> The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
maxSheetId (Last Sheet Id)	Internal identifier of the next available sheet in this workbook. The numbering here is the index of the next available sheet in the workbook in a 1-based index system. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
minRId (Minimum Revision Id)	The lowest revision id that belongs to this header. <i>[Note: this can be used when, given a revision ID, the spreadsheet application needs to determine which revision log to access. end note]</i> The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
userName (User Name)	A string representing the name of the user making the revision.. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element's content model ([CT_RevisionHeader](#)) is located in §A.2. end note]

18.11.1.2 headers (Revision Headers)

This element represents the list of revision headers.

This section contains many references to history, versions, and revisions, and it is helpful to clarify the relationships here. In general, a series of changes (revisions) can be made to a spreadsheet. When a batch of those revisions is saved to disk, the version number of the spreadsheet is incremented. The batch of changes is saved to the revision history, which is persisted on disk with the file in the form of different log files and headers.

There are some attributes that deal with history which might seem redundant (such as `diskRevisions`, and `history`, among others) - these are there for backwards compatibility with older versions of spreadsheet applications and do not need to be used for creating new files.

Attributes	Description
<code>diskRevisions</code> (Disk Revisions)	<p>A Boolean value indicating that this shared workbook file contains revisions. <code>True</code> when the workbook does have revisions, <code>false</code> otherwise.</p> <p>[<i>Note: this attribute is used for backwards compatibility. end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<code>exclusive</code> (Exclusive Mode)	<p>A Boolean value indicating that this shared workbook is in exclusive mode.</p> <p>A workbook is in exclusive mode when a user has a lock on it for appending revisions to the file.</p> <p>[<i>Note: This is used for backwards compatibility with older spreadsheet applications. end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<code>guid</code> (Last Revision GUID)	<p>The globally unique identifier of the last set of revisions. This shall match the GUID for the most recent header.</p> <p>The possible values for this attribute are defined by the <code>ST_Guid</code> simple type (§22.9.2.4).</p>
<code>history</code> (History)	<p>A Boolean value indicating that this shared workbook maintains a revision history. <code>True</code> if a history is maintained, <code>false</code> otherwise.</p> <p>[<i>Note: This is used for backwards compatibility with older spreadsheet applications. end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<code>keepChangeHistory</code> (Keep Change History)	<p>A Boolean value indicating whether the revision history should be kept for this shared workbook. <code>True</code> if the history should be kept, <code>false</code> otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<code>lastGuid</code> (Last GUID)	<p>Unique identifier of the last set of revisions that was saved into the file.</p> <p>The spreadsheet application can have certain modes, such as a timed save mode, where the application doesn't do a full save, but instead just appends the most recent revision records. In cases like this, for a new user that opens such a file while it is being edited, the file that was loaded from disk only have the changes that were saved during a full</p>

Attributes	Description
	<p>save. To get the current state of the file which includes edits by other users, the spreadsheet application would need to apply all the revisions from lastGuid to guid.</p> <p>The possible values for this attribute are defined by the ST_Guid simple type (§22.9.2.4).</p>
preserveHistory (Preserve History)	<p>An integer representing the number of days the spreadsheet application shall keep the change history for this workbook.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
protected (Protected)	<p>A Boolean value indicating whether the change tracking in this shared workbook can be removed. True if the tracking can be removed, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
revisionId (Revision Id)	<p>The current revision number of this shared workbook.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
shared (Shared Workbook)	<p>A Boolean value indicating that this workbook is shared. True when the workbook is shared, false otherwise.</p> <p>[Note: This is used for backwards compatibility with older spreadsheet applications. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
trackRevisions (Track Revisions)	<p>A Boolean value indicating that revisions are tracked in this shared workbook. True when revisions are tracked, false otherwise.</p> <p>[Note: This is used for backwards compatibility with older spreadsheet applications. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
version (Version)	<p>An integer representing the current version of this shared workbook. The integer should begin counting from 1 for the first version.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_RevisionHeaders](#)) is located in §A.2. *end note*]

18.11.1.3 `nc` (New Cell Data)

This element represents new cell data that was added to the worksheet.

For most spreadsheet application purposes, only the data type and reference need to be used for revision tracking purposes. The rest of the cell properties can be written out, but are not necessarily needed as they can be recorded in other areas of the spreadsheet. For instance the `<rfmt>` element can be used to record style information instead of the `S (style index)` attribute.

Attributes	Description
<code>cm</code> (Cell Metadata Index)	<p>The zero-based index of the cell metadata record associated with this cell. Metadata information is found in the Metadata Part. Cell metadata is extra information stored at the cell level, and is attached to the cell (travels through moves, copy / paste, clear, etc). Cell metadata is not accessible via formula reference.</p> <p>The possible values for this attribute are defined by the W3C XML Schema <code>unsignedInt</code> datatype.</p>
<code>ph</code> (Show Phonetic)	<p>A Boolean value indicating if the spreadsheet application should show phonetic information. Phonetic information is displayed in the same cell across the top of the cell and serves as a 'hint' which indicates how the text should be pronounced. This should only be used for East Asian languages.</p> <p>The possible values for this attribute are defined by the W3C XML Schema <code>boolean</code> datatype.</p>
<code>r</code> (Reference)	<p>An A1 style reference to the location of this cell</p> <p>The possible values for this attribute are defined by the <code>ST_CellRef</code> simple type (§18.18.7).</p>
<code>s</code> (Style Index)	<p>The index of this cell's style. Style records are stored in the Styles Part.</p> <p>The possible values for this attribute are defined by the W3C XML Schema <code>unsignedInt</code> datatype.</p>
<code>t</code> (Cell Data Type)	<p>An enumeration representing the cell's data type.</p> <p>The possible values for this attribute are defined by the <code>ST_CellType</code> simple type (§18.18.11).</p>
<code>vm</code> (Value Metadata Index)	<p>The zero-based index of the value metadata record associated with this cell's value. Metadata records are stored in the Metadata Part. Value metadata is extra information stored at the cell level, but associated with the value rather than the cell itself. Value metadata is accessible via formula reference.</p> <p>The possible values for this attribute are defined by the W3C XML Schema <code>unsignedInt</code> datatype.</p>

[Note: The W3C XML Schema definition of this element's content model (`CT_Cell`) is located in §A.2. *end note*]

18.11.1.4 ndxf (New Formatting Information)

This element represents new differential formatting information for this cell. This formatting is applied to the existing formatting of the cell.

[Note: The W3C XML Schema definition of this element's content model ([CT_Dxf](#)) is located in §A.2. *end note*]

18.11.1.5 oc (Old Cell Data)

This element represents old cell data. Old cell data is data that was previously stored in the cell.

For most spreadsheet application purposes, only the data type and reference need to be used for revision tracking purposes. The rest of the cell properties can be written out, but are not necessarily needed as they can be recorded in other areas of the spreadsheet. For instance the <rfmt> element can be used to record style information instead of the S (style index) attribute.

Attributes	Description
cm (Cell Metadata Index)	<p>The zero-based index of the cell metadata record associated with this cell. Metadata information is found in the Metadata Part. Cell metadata is extra information stored at the cell level, and is attached to the cell (travels through moves, copy / paste, clear, etc). Cell metadata is not accessible via formula reference.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
ph (Show Phonetic)	<p>A Boolean value indicating if the spreadsheet application should show phonetic information. Phonetic information is displayed in the same cell across the top of the cell and serves as a 'hint' which indicates how the text should be pronounced. This should only be used for East Asian languages.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
r (Reference)	<p>An A1 style reference to the location of this cell</p> <p>The possible values for this attribute are defined by the ST_CellRef simple type (§18.18.7).</p>
s (Style Index)	<p>The index of this cell's style. Style records are stored in the Styles Part.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
t (Cell Data Type)	<p>An enumeration representing the cell's data type.</p> <p>The possible values for this attribute are defined by the ST_CellType simple type (§18.18.11).</p>
vm (Value Metadata Index)	<p>The zero-based index of the value metadata record associated with this cell's value. Metadata records are stored in the Metadata Part. Value metadata is extra information stored at the cell level, but associated with the value rather than the cell itself. Value</p>

Attributes	Description
	<p>metadata is accessible via formula reference.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Cell](#)) is located in §A.2. *end note*]

18.11.1.6 [odxf \(Old Formatting Information\)](#)

This element represents the old differential formatting information for this cell. Old differential formatting is differential formatting that was previously applied to the cell.

[Note: The W3C XML Schema definition of this element's content model ([CT_Dxf](#)) is located in §A.2. *end note*]

18.11.1.7 [oldFormula \(Old Formula\)](#)

This element represents the old formula for a defined name in this cell. This is only used for named cells. Formulas that are entered in a cell with no name are represented by the formula element <f>.

The possible values for this element are defined by the ST_Formula simple type (§18.18.35).

[Note: The W3C XML Schema definition of this element's content model ([ST_Formula](#)) is located in §A.2. *end note*]

18.11.1.8 [raf \(Revision AutoFormat\)](#)

This element represents a revision record of auto formatting change information for a table.

Attributes	Description
applyAlignmentFormats (Apply Alignment Formats)	<p>If true apply legacy table autoformat alignment properties.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
applyBorderFormats (Apply Border Formats)	<p>If true apply legacy table autoformat border properties.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
applyFontFormats (Apply Font Formats)	<p>If true apply legacy table autoformat font properties.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
applyNumberFormats (Apply Number Formats)	<p>If true apply legacy table autoformat number format properties.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

Attributes	Description
applyPatternFormats (Apply Pattern Formats)	<p>If true apply legacy table autoformat pattern properties.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
applyWidthHeightFormats (Apply Width / Height Formats)	<p>If true apply legacy table autoformat width/height properties.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
autoFormatId (Auto Format Id)	<p>Identifies which legacy table autoformat to apply.</p> <p>Annex D contains a listing of the supported PivotTable AutoFormats, example formatting, and a sample workbook with each of those AutoFormats applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
ref (Reference)	<p>A-1 style reference to the location where the formatting was applied</p> <p>The possible values for this attribute are defined by the ST_Ref simple type (§18.18.62).</p>
sheetId (Sheet Id)	<p>An integer representing the internal id of the sheet on which the revision occurred.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_RevisionAutoFormatting](#)) is located in §A.2. *end note*]

18.11.1.9 rcc (Revision Cell Change)

This element stores information about the contents of the cell that was replaced.

Attributes	Description
dxfl (Formatting)	<p>A Boolean flag indicating that there was a differential formatting change for this cell - true if there was a formatting change, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
endOfListFormulaUpdate (End of List Formula Update)	<p>A Boolean flag indicating that indicates that the formula used at the end of a list has been updated. True if the formula was updated, false otherwise.</p> <p>List in this context does not mean table, rather it refers to the feature where the</p>

Attributes	Description
	<p>spreadsheet application automatically creates an internal structure for making data input more consistent on adjacent rows or columns. For instance, if 3 cells in a row are entered with the same format, then when entering data into the 4th adjacent cell, the spreadsheet application might automatically apply that same format. In this case, those cells are treated as a list.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
numFmtId (Number Format Id)	<p>Zero-based index of the number format (Fmt) record used by this cell format (XF).</p> <p>The possible values for this attribute are defined by the ST_NumFmtId simple type (§18.18.47).</p>
odxf (Old Formatting)	<p>Flag indicating that there is old formatting information available for this cell.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
oldPh (Old Phonetic Text)	<p>A Boolean flag indicating whether there is old phonetic text information available. True when there is old phonetic text information available, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
oldQuotePrefix (Old Quote Prefix)	<p>A Boolean value indicating if a single quote prefix is was used on this cell previously. Single quote prefixes are used to cause a formula to be evaluated as a string. True if a single quote prefix was used previously, false otherwise</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
ph (Phonetic Text)	<p>A Boolean flag indicating whether this cell contains phonetic text or not. True when the cell contains phonetic text, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
quotePrefix (Quote Prefix)	<p>A Boolean value indicating if a single quote prefix is used. Single quote prefixes are used to cause a formula to be evaluated as a string. True if a single quote prefix is used, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
ra (Revision Undo Rejected)	<p>A Boolean flag which indicates that this revision was due to a previous undo (ua) revision being rejected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

Attributes	Description
rId (Revision Id)	<p>An integer representing the number of this revision. This id shall apply to reviewable revision types only.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
s (Style Revision)	<p>Flag indicating that formatting change for this cell affected the cell's style. (Only applicable for Undo operations)</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
sId (Sheet Id)	<p>Internal identifier of the sheet on which the revision occurred.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
ua (Revision From Rejection)	<p>A Boolean flag indicating that this revision occurred because another revision was rejected and therefore undone.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
xDxf (Row Column Formatting Change)	<p>Flag indicating that the formatting change had an effect on the formatting of the entire row or column that this cell belongs to. (Only applicable for Undo operations).</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_RevisionCellChange](#)) is located in §A.2. end note]

18.11.1.10 rcft (Revision Merge Conflict)

This element represents a revision record which indicates that there was a merge conflict.

Attributes	Description
ra (Revision Undo Rejected)	<p>A Boolean flag which indicates that this revision was due to a previous undo (ua) revision being rejected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
rId (Revision Id)	<p>An integer representing the number of this revision. This id shall apply to reviewable revision types only.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

Attributes	Description
sheetId (Sheet Id)	An integer representing the internal id of the sheet on which the revision occurred. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
ua (Revision From Rejection)	A Boolean flag indicating that this revision occurred because another revision was rejected and therefore undone. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_RevisionConflict](#)) is located in §A.2.
end note]

18.11.1.11 rcmt (Revision Cell Comment)

This element represents a revision record of a cell comment change.

Attributes	Description
action (User Action)	An enumeration identifying what kind of an operation the user performed on the comment. The possible values for this attribute are defined by the ST_RevisionAction simple type (§18.18.65).
alwaysShow (Always Show Comment)	A Boolean value indicating that the user has set this comment to always be visible. True if the comment is set to always be visible, false otherwise. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
author (Author)	A string representing the name of the author who changed this comment. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
cell (Cell)	An A-1 style reference to the cell where the comment was changed. The possible values for this attribute are defined by the ST_CellRef simple type (§18.18.7).
guid (GUID)	A globally unique identifier of this comment. The possible values for this attribute are defined by the ST_Guid simple type (§22.9.2.4).
hiddenColumn (Hidden Column)	A Boolean value indicating that the comment belongs to a cell in a hidden column. True if the comment is in a hidden column, false otherwise. The possible values for this attribute are defined by the W3C XML Schema boolean

Attributes	Description
	datatype.
hiddenRow (Comment In Hidden Row)	<p>A Boolean value indicating that the comment belongs to a cell in a hidden row. True if the comment is in a hidden row, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
newLength (New Comment Length)	<p>Length of the comment text added in this revision.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
old (Old Comment)	<p>An ignorable Boolean value used for backwards compatibility that indicates that the original comment was created by a legacy spreadsheet application.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
oldLength (Original Comment Length)	<p>Length of the comment before this revision was made.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
sheetId (Sheet Id)	<p>An integer representing the internal id of the sheet on which the revision occurred.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_RevisionComment](#)) is located in §A.2. end note]

18.11.1.12 rcv (Revision Custom View)

This element represents a revision record of adding or removing a custom view to the workbook

Attributes	Description
action (User Action)	<p>An enumeration representing the action that the user performed.</p> <p>The possible values for this attribute are defined by the ST_RevisionAction simple type (§18.18.65).</p>
guid (GUID)	<p>A globally unique identifier of the custom view.</p> <p>The possible values for this attribute are defined by the ST_Guid simple type (§22.9.2.4).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_RevisionCustomView](#)) is located in §A.2. end note]

18.11.1.13 rdn (Revision Defined Name)

This element represents a revision record of a defined name change.

Attributes	Description																		
comment (Name Comment)	<p>A string representing a comment about the defined name.</p> <p>This comment can be shown by the spreadsheet application in a names management UI so that users have more information about what the defined name is used for.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>																		
customMenu (New Custom Menu)	<p>A string representing the new custom menu text</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>																		
customView (Custom View)	<p>A Boolean flag indicating that this named range belongs to a custom view</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>																		
description (Description)	<p>A string representing the new description text for the defined name.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>																		
function (Function)	<p>A Boolean value indicating that the defined name refers to a function. True if the defined name is a function, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>																		
functionGroupId (Function Group Id)	<p>Represents the new function group id.</p> <p>Function group ids are used to help classify functions. For instance, functions in the same group can be searched or selected easily from the spreadsheet applications UI. For instance, filtering the list of all functions to allow the user to choose from functions used for financial data.</p> <p>The following group ids should be used:</p> <table> <tr> <td>ID</td><td>Function group</td></tr> <tr> <td>1</td><td>Financial</td></tr> <tr> <td>2</td><td>Date and Time</td></tr> <tr> <td>3</td><td>Math and Trig</td></tr> <tr> <td>4</td><td>Statistical</td></tr> <tr> <td>5</td><td>Lookup & Reference</td></tr> <tr> <td>6</td><td>Database</td></tr> <tr> <td>7</td><td>Text</td></tr> <tr> <td>8</td><td>Logical</td></tr> </table>	ID	Function group	1	Financial	2	Date and Time	3	Math and Trig	4	Statistical	5	Lookup & Reference	6	Database	7	Text	8	Logical
ID	Function group																		
1	Financial																		
2	Date and Time																		
3	Math and Trig																		
4	Statistical																		
5	Lookup & Reference																		
6	Database																		
7	Text																		
8	Logical																		

Attributes	Description
	<p>9 Information</p> <p>10 Commands</p> <p>11 Customizing</p> <p>12 Macro Control</p> <p>13 DDE/External</p> <p>14 User Defined</p> <p>15 Engineering</p> <p>14 Cube</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedByte datatype.</p>
help (New Help Topic)	<p>A string representing the new help topic text.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
hidden (Named Range Hidden)	<p>A Boolean value indicating whether the named range is now hidden.</p> <p>Hidden refers to whether the defined name is of a 'hidden' type. This applies to things like a custom filter on a cell, it has a name, but is hidden and so is not visible in any name management UI.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
localSheetId (Local Name Sheet Id)	<p>An integer representing the id of the sheet to which this defined name belongs. This shall be used local defined names only.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
name (Name)	<p>A string representing the name for this defined name.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
oldComment (Old Name Comment)	<p>A string representing the old comment about the defined name.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
oldCustomMenu (Old Custom Menu Text)	<p>A string representing the old custom menu text</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
oldDescription (Old Description)	<p>A string representing the old description text</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

Attributes	Description
oldFunction (Old Function)	<p>A Boolean flag indicating that the old name was a function</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
oldFunctionGroupID (Old Function Group Id)	<p>Old function group ID.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedByte datatype.</p>
oldHelp (Old Help Topic)	<p>A string representing the old help topic text</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
oldHidden (Old Hidden)	<p>A Boolean flag indicating whether the named range was hidden</p> <p>Hidden refers to whether the defined name is of a 'hidden' type. This applies to things like a custom filter on a cell, it has a name, but is hidden and so is not visible in any name management UI.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
oldShortcutKey (Old Short Cut Key)	<p>Old keyboard shortcut.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedByte datatype.</p>
oldStatusBar (Old Status Bar)	<p>A string representing the old status bar text</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
ra (Revision Undo Rejected)	<p>A Boolean flag which indicates that this revision was due to a previous undo (ua) revision being rejected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
rId (Revision Id)	<p>An integer representing the number of this revision. This id shall apply to reviewable revision types only.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
shortcutKey (Shortcut Key)	<p>Represents the new keyboard shortcut.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedByte datatype.</p>
statusBar (Status)	<p>A string representing the new status bar text.</p>

Attributes	Description
Bar)	The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
ua (Revision From Rejection)	<p>A Boolean flag indicating that this revision occurred because another revision was rejected and therefore undone.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_RevisionDefinedName](#)) is located in §A.2. *end note*]

18.11.1.14 reviewed (Reviewed)

This element represents an identifier of a single reviewed revision. A reviewed revision, is a revision that has been reviewed via the spreadsheet application's track changes feature, has been accepted, and has been saved.

Attributes	Description
rId (revision Id)	<p>ID of a reviewed revision.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Reviewed](#)) is located in §A.2. *end note*]

18.11.1.15 reviewedList (Reviewed List)

This element maintains a list of reviewed revisions.

Attributes	Description
count (Reviewed Revisions Count)	<p>Number of reviewed revisions.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_ReviewedRevisions](#)) is located in §A.2. *end note*]

18.11.1.16 revisions (Revisions)

This element represents the root node of a list of revisions made in this shared workbook. This root node shows up at the beginning of every log file that contains specific revisions made to the workbook.

When multiple users are sharing, and editing, a workbook at the same time, there can be conflicting changes. The spreadsheet application should have logic to resolve such conflicts, and the file format should only contain enough information so that the spreadsheet application can restore the workbook to the correct state after conflict resolution. Revisions can also be tracked by the spreadsheet application for review by the user at a later time (as opposed to only dealing with conflicts on a save event.) Some edits to workbooks are made as a result of this conflict resolution. So, there are cases where a revision is effectively undone by another user, and as a result that undoing is itself a revision that adds or changes data in the file. These operations are tracked by the `ua` and `ra` attributes of many different elements.

[Example:

Step 1:

User 1 inserts Column A. So the XML in the revision log would look like this:

```
<revisions xmlns="..." xmlns:r="...">
  <rrc rId="1" sId="1" ref="A1:A1048576" action="insertCol"/>
</revisions>
```

Step 2:

User 2 synchronizes the file to pick up that change, but then activates the Track Changes feature, and rejects that change. This effectively performs an undo on User 1's insertion. This is denoted in the file with the `ua` attribute meaning that this change happened as the result of an undo. The XML for the revision log would look like this:

```
<revisions xmlns="..." xmlns:r="...">
  <rrc rId="2" ua="1" sId="1" ref="A1:A1048576" action="deleteCol"/>
  <rcft rId="1" ua="1" sheetId="1"/>
</revisions>
```

Step 3:

User 1 enters "foo" in A1, and saves the file. A conflict resolution dialog is shown since User 2's version of the file removed the inserted Column A. User 1 chooses to accept their own changes. This undoes the change that User 2 made. So, in effect, it performed an undo on a previous undo operation. This is denoted in the file format by the `ra` attribute meaning that the change occurred because a previous undo was undone. So the resulting XML for the newest log file looks like this:

```
<revisions xmlns="..." xmlns:r="...">
  <rrc rId="3" ua="1" ra="1" sId="1" ref="A1:A1048576" action="insertCol"/>
  <rcft rId="2" ua="1" sheetId="1"/>
  <rcc rId="4" sId="1">
    <nc r="A1" t="inlineStr">
      <is>
        <t>foo</t>
      </is>
    </nc>
  </rcc>
  <rcft rId="2" sheetId="1"/>
</revisions>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Revisions](#)) is located in §A.2. *end note*]

18.11.1.17 rfmt (Revision Format)

This element represents a revision record of information about a formatting change.

Attributes	Description
length (Length)	<p>The number of characters that were affected by a string change, counting from start.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
s (Style)	<p>Flag indicating that this formatting change affected a cell's style. (Only applicable for Undo operations).</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
sheetId (Sheet Id)	<p>An integer representing the internal id of the sheet on which the revision occurred.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
sqref (Sequence Of References)	<p>A worksheet range to which this formatting was applied. [<i>Note:</i> For applications supporting the default grid size (see §18.17.5), full column and row references shall explicitly state the row and column components, e.g., "A1:A1048576" For column "A", and A1:XFD1 for row "1". Applications with larger grid sizes shall interpret these to mean "column A" and "row 1" respectively, for their larger grid size. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_Sqref simple type (§18.18.76).</p>
start (Start index)	<p>An integer representing an index showing which character a string change starts at within</p>

Attributes	Description
	<p>the string in the cell.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
xfDxf (Row or Column Formatting Change)	<p>A Boolean flag indicating that this formatting change had an affect on the formatting of an entire row or column that an affected cell(s) belongs to. (Only applicable for Undo operations)</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_RevisionFormatting](#)) is located in §A.2. *end note*]

18.11.1.18 [ris](#) (Revision Insert Sheet)

This element represents a revision record of a sheet that was inserted.

Attributes	Description
name (Sheet Name)	<p>The name of the new sheet.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
ra (Revision Undo Rejected)	<p>A Boolean flag which indicates that this revision was due to a previous undo (ua) revision being rejected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
rId (Revision Id)	<p>An integer representing the number of this revision. This id shall apply to reviewable revision types only.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
sheetId (Sheet Id)	<p>An integer representing the internal id of the sheet on which the revision occurred</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
sheetPosition (Sheet Position)	<p>An integer representing the zero based position of the new sheet in the sheet tab bar.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
ua (Revision From Rejection)	<p>A Boolean flag indicating that this revision occurred because another revision was rejected and therefore undone.</p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_RevisionInsertSheet](#)) is located in §A.2. *end note*]

18.11.1.19 **rm** (Revision Cell Move)

This element represents a revision record on a cell(s) that moved.

Attributes	Description
destination (Destination)	New A1 style location of the cell(s) that were moved The possible values for this attribute are defined by the ST_Ref simple type (§18.18.62).
ra (Revision Undo Rejected)	A Boolean flag which indicates that this revision was due to a previous undo (ua) revision being rejected. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
rId (Revision Id)	An integer representing the number of this revision. This id shall apply to reviewable revision types only. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
sheetId (Sheet Id)	An integer representing the internal id of the sheet on which the revision occurred. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
source (Source)	The original A1 style location of the cell(s) that were moved The possible values for this attribute are defined by the ST_Ref simple type (§18.18.62).
sourceSheetId (Source Sheet Id)	An integer representing the internal id of the sheet where the cell(s) originally resided. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
ua (Revision From Rejection)	A Boolean flag indicating that this revision occurred because another revision was rejected and therefore undone. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_RevisionMove](#)) is located in §A.2. *end note*]

18.11.1.20 [rqt \(Revision Query Table\)](#)

This element represents a revision record of a query table field change.

Attributes	Description
fieldId (Field Id)	ID of the specific query table field that was removed. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
ref (QueryTable Reference)	Location of the affected query table. The possible values for this attribute are defined by the ST_Ref simple type (§18.18.62).
sheetId (Sheet Id)	An integer representing the internal id of the sheet on which the revision occurred. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_RevisionQueryTableField](#)) is located in §A.2. *end note*]

18.11.1.21 [rrc \(Revision Row Column Insert Delete\)](#)

This element represents a revision record of a row/column insert/delete action.

Attributes	Description
action (User Action)	Indicates the action most recently performed on the row or column. The possible values for this attribute are defined by the ST_rwColActionType simple type (§18.18.66).
edge (Edge Deleted)	A Boolean flag indicating that a row or column is being deleted at the edge of a sorted range (only applicable to a Delete Row/Column revision types). The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
eol (End Of List)	A Boolean flag indicating that a row or a column is being inserted at the end of a list of data. List in this context does not mean table, rather it refers to the feature where the spreadsheet application automatically creates an internal structure for making data input more consistent on adjacent rows or columns. For instance, if 3 cells in a row are entered with the same format, then when entering data into the 4th adjacent cell, the spreadsheet application might automatically apply that same format. In this case, those

Attributes	Description
	<p>cells are treated as a list.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
ra (Revision Undo Rejected)	<p>A Boolean flag which indicates that this revision was due to a previous undo (ua) revision being rejected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
ref (Reference)	<p>A reference to the location of the rows/columns that were inserted or deleted.</p> <p>[<i>Note: A reference to a whole column or row must include both the column and row components. For example, column A is referenced by "A1:A1048576", and row 1 is referenced by "A1:XFD1". However, because this attribute value is occurring in the context of an entire row or column insert, the column component of a row reference can be ignored, and the row component of a column reference can be ignored. end note</i>]</p> <p>The possible values for this attribute are defined by the ST_Ref simple type (§18.18.62).</p>
rId (Revision Id)	<p>An integer representing the number of this revision. This id shall apply to reviewable revision types only.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
sId (Sheet Id)	<p>An integer representing the internal id of the sheet on which the revision occurred.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
ua (Revision From Rejection)	<p>A Boolean flag indicating that this revision occurred because another revision was rejected and therefore undone.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note: The W3C XML Schema definition of this element's content model ([CT_RevisionRowColumn](#)) is located in §A.2. end note*]

18.11.1.22 rsnm (Revision Sheet Name)

This element represents a revision record tracking the renaming a sheet.

Attributes	Description
newName (New Sheet Name)	A string representing the new sheet name

Attributes	Description
	The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
oldName (Old Sheet Name)	A string representing the old sheet name The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
ra (Revision Undo Rejected)	A Boolean flag which indicates that this revision was due to a previous undo (ua) revision being rejected. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
rId (Revision Id)	An integer representing the number of this revision. This id shall apply to reviewable revision types only. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
sheetId (Sheet Id)	An integer representing the internal id of the sheet on which the revision occurred. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
ua (Revision From Rejection)	A Boolean flag indicating that this revision occurred because another revision was rejected and therefore undone. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_RevisionSheetRename](#)) is located in §A.2. *end note*]

18.11.1.23 sheetId (Sheet Id)

This element represents a sheet that revision can take place on. Each sheet in the workbook should be represented by one of these elements, and each sheet has an id associated with it. Sheet ids are used to refer to sheets internally by the spreadsheet application.

Attributes	Description
val (Sheet Id)	An integer serving as a number by which to reference the sheet internally. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_SheetId](#)) is located in §A.2. *end note*]

18.11.1.24 [sheetIdMap \(Sheet Id Map\)](#)

This element represents a list of sheets and corresponding ids that are used for tracking revision records.

Attributes	Description
count (Sheet Count)	Number of sheets. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_SheetIdMap](#)) is located in §A.2. *end note*]

18.11.1.25 [undo \(Undo\)](#)

This element represents undo information for row/column deletion when there are functions in the spreadsheet that reference the deleted rows/columns. This element is not applicable for insert revisions.

Attributes	Description
array (Array Formula)	Flag indicating that the affected formula is an array formula. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
cs (Cross Sheet Move)	A Boolean flag indicating this was a cross-sheet move. True if it was a cross sheet move, false otherwise. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
dn (Defined Name)	Identifies the named range that referenced the deleted cell range. Mutually exclusive with the cell reference attribute. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
dr (Range)	The range which was deleted that is referenced by the affected formula. The possible values for this attribute are defined by the ST_RefA simple type (§18.18.63).
exp (Expression)	Identifies the expression that should be adjusted in the corresponding formula. The possible values for this attribute are defined by the ST_FormulaExpression simple type (§18.18.36).
index (Index)	Index of the expression within the corresponding formula that was affected by this change.

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
nf (Defined Name Formula)	<p>A Boolean flag indicating that the corresponding formula is part of a defined name. True if this formula is part of a defined name, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
r (Cell Reference)	<p>Location of the cell whose formula referenced the deleted cell range. Mutually exclusive with the defined name attribute</p> <p>The possible values for this attribute are defined by the ST_CellRef simple type (§18.18.7).</p>
ref3D (Reference 3D)	<p>A Boolean flag indicating that the expression contained the sheet name in addition to the cell reference. True if it contained the sheet name, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
sId (Sheet Id)	<p>Internal Id of the worksheet that contained the formula that referenced the deleted cell range. Mutually exclusive with the defined name attribute.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
v (Value Needed)	<p>A Boolean flag indicating the formula needs the actual value of the cell(s) it's referencing. True if the formula requires the value of the cell it references, false otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_UndoInfo](#)) is located in §A.2. *end note*]

18.11.2 Shared Workbook User Data

This subclause specifies information about the users of a shared workbook.

18.11.2.1 userInfo (User Information)

This element represents a user, and it stores information about a specific user as it relates to revisions.

Attributes	Description
dateTime (Date Time)	<p>Date and time when this user opened the shared workbook.</p> <p>The possible values for this attribute are defined by the W3C XML Schema dateTime</p>

Attributes	Description
	datatype.
guid (User Revisions GUID)	<p>A globally unique identifier identifying the last set of revisions that this uses is synchronized to.</p> <p>This attribute can be used by the spreadsheet application to ensure that revisions this user depends on aren't deleted.</p> <p>The possible values for this attribute are defined by the ST_Guid simple type (§22.9.2.4).</p>
id (User Id)	<p>An integer representing an internal user id for this user.</p> <p>This number can be negative.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
name (User Name)	<p>Display name for this user</p> <p>[<i>Note: User name strings should not be longer than 54 characters. end note</i>]</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[*Note: The W3C XML Schema definition of this element's content model ([CT_SharedUser](#)) is located in §A.2. end note*]

18.11.2.2 users (User List)

This element represents a list of users who currently have this shared workbook open. This list does not include any users who have the workbook open in Read-Only mode.

Attributes	Description
count (Active User Count)	<p>Number of users who currently have this shared workbook open.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[*Note: The W3C XML Schema definition of this element's content model ([CT_Users](#)) is located in §A.2. end note*]

18.12 QueryTable Data

Query tables are 2 dimensional tables of data bound to an external query of some kind. [*Example: A query table could for example show specific data from a text file, from a web query, or from a database query. end example*]

[*Example:*

Data connectivity can use a number of different technologies. The following spreadsheetML fragment is one an example of a query table connected to a database:

```
<queryTable xmlns="..." name="Northwind Orders" rowNumbers="1"
  growShrinkType="overwriteClear" connectionId="1" autoFormatId="16"
  applyNumberFormats="0" applyBorderFormats="0" applyFontFormats="0"
  applyPatternFormats="0" applyAlignmentFormats="0" applyWidthHeightFormats="0">
  <queryTableRefresh nextId="15">
    <queryTableFields count="12">
      <queryTableField id="1" name="OrderID" tableColumnId="1"/>
      <queryTableField id="2" name="CustomerID" tableColumnId="2"/>
      <queryTableField id="3" name="EmployeeID" tableColumnId="3"/>
      <queryTableField id="4" name="OrderDate" tableColumnId="4"/>
      <queryTableField id="5" name="RequiredDate" tableColumnId="5"/>
      <queryTableField id="6" name="ShippedDate" tableColumnId="6"/>
      <queryTableField id="7" name="ShipName" tableColumnId="7"/>
      <queryTableField id="8" name="ShipAddress" tableColumnId="8"/>
      <queryTableField id="9" name="ShipCity" tableColumnId="9"/>
      <queryTableField id="10" name="ShipRegion" tableColumnId="10"/>
      <queryTableField id="11" name="ShipPostalCode" tableColumnId="11"/>
      <queryTableField id="12" name="ShipCountry" tableColumnId="12"/>
    </queryTableFields>
  </queryTableRefresh>
</queryTable>
```

end example]

[*Example:* And here's an example of the SpreadsheetML fragment defining a query table connected to a text import:

```
<queryTable xmlns="..." name="data in text" connectionId="1" autoFormatId="16"
  applyNumberFormats="0" applyBorderFormats="0" applyFontFormats="1"
  applyPatternFormats="1" applyAlignmentFormats="0"
  applyWidthHeightFormats="0"/>
```

Elsewhere in the spreadsheetML file, a connection element is defined with the name "Northwind Orders" that describes how to connect to the appropriate database to refresh data for the query table. *end example]*

18.12.1 deletedField (Deleted Field)

This element specifies a field that has been deleted from the query table.

[*Example:*

```
<queryTableDeletedFields count="2">
  <deletedField name="ShipVia"/>
  <deletedField name="Freight"/>
</queryTableDeletedFields>
```

end example]

Attributes	Description
name (Deleted Fields Name)	Specifies the name of the deleted field. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element’s content model ([CT_DeletedField](#)) is located in §A.2.
end note]

18.12.2 queryTable (Query Table)

This element specifies all the relevant properties for a query table, one query table element is stored for each query table object in the spreadsheetML document.

Attributes	Description
adjustColumnWidth (Adjust Column Width On Refresh)	Specifies whether to automatically adjust column widths on refresh to fit the data retrieved. <code>true</code> if column widths should be adjusted. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
applyAlignmentFormats (Apply Alignment Formats)	If <code>true</code> apply legacy table autoformat alignment properties. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
applyBorderFormats (Apply Border Formats)	If <code>true</code> apply legacy table autoformat border properties. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
applyFontFormats (Apply Font Formats)	If <code>true</code> apply legacy table autoformat font properties. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
applyNumberFormats (Apply Number Formats)	If <code>true</code> apply legacy table autoformat number format properties. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
applyPatternForm	If <code>true</code> apply legacy table autoformat pattern properties.

Attributes	Description
ats (Apply Pattern Formats)	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
applyWidthHeight Formats (Apply Width / Height Formats)	<p>If <code>true</code> apply legacy table autoformat width/height properties.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
autoFormatId (Auto Format Id)	<p>Identifies which legacy table autoformat to apply.</p> <p>Annex D contains a listing of the supported PivotTable AutoFormats, example formatting, and a sample workbook with each of those AutoFormats applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
backgroundRefresh (Background Refresh)	<p>Specifies whether or not the query table shall try to refresh data in the background.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
connectionId (Connection Id)	<p>Specifies the ID number of the external data connection to use to refresh data in the query table.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
disableEdit (Disable Edit)	<p>Specifies whether the connection element used with this query table shall be editable. If <code>true</code>, then the connection is not editable.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
disableRefresh (Disable Refresh)	<p>Specifies whether the query table shall be refreshable. If <code>true</code>, then the query table is not refreshable.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fillFormulas (Fill Adjacent Formulas)	<p>Specifies whether or not formulas in columns adjacent to the query table should be filled down whenever the query table is refreshed. This is helpful since the number of rows returned by a query table refresh operation can vary.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
firstBackgroundRe	Specifies whether or not data has ever been refreshed for this query table. If the very

Attributes	Description
fresh (First Background Refresh)	<p>first background data refresh had not completed at the time the file was saved, this attribute is set to true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
growShrinkType (Grow Shrink Type)	<p>Specifies the type of behavior expected for dealing with a variable number of rows of data in the query table between refresh operations.</p> <p>The meaning of the possible values of this attribute {insertClear, insertDelete, overwriteClear} are explained in detail in the definition of the simple type.</p> <p>The possible values for this attribute are defined by the ST_GrowShrinkType simple type (§18.18.39).</p>
headers (First Row Column Titles)	<p>Specifies whether or not the query table has first row with column titles.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
intermediate (Intermediate)	<p>Specifies whether this query table is in an intermediate state, having been defined but not fully formed and populated with data.</p> <p>In this state, fields and ranges of the query table can be unknown.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
name (QueryTable Name)	<p>Specifies the name of the query table.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
preserveFormatting (Preserve Formatting On Refresh)	<p>Specifies whether the application should try to preserve formatting in the query table and copy this formatting to any new rows of data.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
refreshOnLoad (Refresh On Load)	<p>Specifies whether the query table shall refresh its data automatically when the spreadsheetML document is loaded or opened.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
removeDataOnSave (Remove Data On Save)	<p>Specifies whether the query table shall remove all data from the worksheet before the spreadsheetML document is saved.</p> <p>This is very helpful for situations where people who have different permissions to view data want to share the same spreadsheetML document. All data from the last user is</p>

Attributes	Description
	removed, and new users re-query the external data sources with their own credentials. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
rowNumbers (Row Numbers)	Specifies whether the query table shall include a first column of row numbers. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_QueryTable](#)) is located in §A.2. *end note*]

18.12.3 queryTableDeletedFields (Deleted Fields)

This element is the collection for deletedField (§18.12.1) elements, each of which represents a column or field that has been deleted from the query table.

[Example:

```
<queryTableDeletedFields count="2">
  <deletedField name="ShipVia"/>
  <deletedField name="Freight"/>
</queryTableDeletedFields>
```

end example]

Attributes	Description
count (Deleted Fields Count)	Specifies how many deleted fields there are. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_QueryTableDeletedFields](#)) is located in §A.2. *end note*]

18.12.4 queryTableField (QueryTable Field)

This element holds the properties related to a specific field or column in a query table.

Attributes	Description
clipped (Clipped Column)	Specifies whether this field/column is currently clipped and thus not visible in the worksheet.

Attributes	Description
	<p>[<i>Note</i>: this state might occur for example when a query table is defined near the edge of a worksheet or other object in the spreadsheet that can't be overwritten with external data. In this case some of the fields are displayed, but not all of them. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
dataBound (Data Bound Column)	<p>Specifies whether this column is a user-defined column or comes from the external data query. User defined columns shall be preserved during data refresh operations. User-defined columns are only supported on query tables that are attached to table objects.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fillFormulas (Fill This Formula On Refresh)	<p>Specifies whether the formula in this field/column should be filled down on data refresh.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
id (Field Id)	<p>Specifies the unique identifier of the query table field.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
name (Name)	<p>Specifies the unique name of the query table field.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
rowNumbers (Row Numbers)	<p>true if this column contains the row numbers for the records returned.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
tableColumnId (Table Column Id)	<p>Specifies the unique identifier for the table column if the query table is attached to a table object rather than just a range in the sheet.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_QueryTableField](#)) is located in §A.2. *end note*]

18.12.5 queryTableFields (Query table fields)

This element is the collection for queryTableField elements.

Attributes	Description
count (Column	Specifies the number of columns there are in this query table. Includes both query-

Attributes	Description
Count)	defined and user-defined columns, but not deleted columns. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_QueryTableFields](#)) is located in §A.2. end note]

18.12.6 queryTableRefresh (QueryTable Refresh Information)

This element contains information related to refreshing the query table.

Attributes	Description
fieldIdWrapped (Next Field Id Wrapped)	Whether or not the idFieldNext value wrapped around. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
headersInLastRefresh (Headers In Last Refresh)	Whether or not the Query Table had titles last refresh. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
minimumVersion (Minimum Refresh Version)	For backward compatibility with legacy versions of spreadsheet applications, this attribute specifies the minimum version of the application that is expected to correctly refresh the data in the query table without any problems. If this attribute is specified, an earlier version of a spreadsheet application should alert the user to the potential incompatibilities when a refresh is attempted. The possible values for this attribute are defined by the W3C XML Schema unsignedByte datatype.
nextId (Next field id)	Specifies the next unique queryTableField (§18.12.4) id number available for assignment. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
preserveSortFilterLayout (Preserve Sort & Filter Layout)	Specifies whether sorting, autofilter, layout, and table block formatting should be preserved for this query table across data refresh operations. If this attribute is set to false, the query table might be more or less recreated from scratch when data is refreshed. In this case, all user deleted or rearranged columns, user inserted columns that aren't bound to external data, and table column formatting are discarded.

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
unboundColumnsLeft (Columns Left)	Specifies the number of extra columns included at the left end of the field array that aren't bound to external data. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
unboundColumnsRight (Columns Right)	Specifies the number of extra columns included at the right end of the Table that aren't bound to external data. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_QueryTableRefresh](#)) is located in §A.2. *end note*]

18.13 External Data Connections

SpreadsheetML allows for the definition of top level data connection objects that describe how to retrieve data from external sources. These connection objects are independent of the constructs in the spreadsheet application that display data such as tables, PivotTables, etc.

Some information about a connection is considered part of the connection's definition. Other information is not inherently part of the connection, but it describes the way the connection is to be used by the containing workbook. Note that in many cases, the spreadsheet application does not need knowledge of the command syntax for the external data source (e.g., database query language), and simply stores a command string that was created by a data provider API (e.g., an ODBC driver).

A connection's definition can be established in a standalone connection file for easier sharing and reuse, but this reference documentation deals with the XML representation for external data connections that is directly embedded within a SpreadsheetML document. This embedded representation is expected whenever external data is used, and ensures portability of the document and continued operation of the external query in the most cases.

18.13.1 connection (Connection)

This element contains both the definition of how to get at an external data source as well as information describing how the connection is used within the workbook. Specific constructs in a worksheet, such as OLAP formulas, QueryTables, or PivotTables make use of information in the connection to retrieve or refresh data based on default events or the user's explicit request.

Attributes	Description
background	Indicates whether the connection can be refreshed in the background (asynchronously).

Attributes	Description
(Background Refresh)	<p>true if preferred usage of the connection is to refresh asynchronously in the background; false if preferred usage of the connection is to refresh synchronously in the foreground.</p> <p>This flag should be intentionally ignored in specific cases.</p> <p>[<i>Example:</i> An example of when the flag would be ignored is in the case of a connection to OLAP data on Microsoft SQL Server Analysis Services, where the connection is used by both a PivotTable and also by CUBE functions within the workbook. That connection will always be refreshed synchronously by the PivotTable and will always be refreshed asynchronously by the CUBE functions. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
credentials (Reconnection Method)	<p>Specifies the authentication method to be used when establishing (or re-establishing) the connection.</p> <p>The possible values for this attribute are defined by the ST_CredMethod simple type (§18.18.16).</p>
deleted (Deleted Connection)	<p>Indicates whether the associated workbook connection has been deleted. true if the connection has been deleted; otherwise, false.</p> <p>Deleted connections contain only the attributes name and deleted=true, all other information is removed from the SpreadsheetML file.</p> <p>If a new connection is created with the same name as a deleted connection, then the deleted connection is overwritten by the new connection.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
description (Connection Description)	<p>Specifies the user description for this connection.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
id (Connection Id)	<p>Specifies The unique identifier of this connection.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
interval (Automatic Refresh Interval)	<p>Specifies the number of minutes between automatic refreshes of the connection. When this attribute is not present, the connection is not automatically refreshed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
keepAlive (Keep Connection Open)	<p>true when the spreadsheet application should make efforts to keep the connection open. When false, the application should close the connection after retrieving the</p>

Attributes	Description
	<p>information. This corresponds to the MaintainConnection property of a PivotCache object.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
minRefreshableVersion (Minimum Version Required for Refresh)	<p>For compatibility with legacy spreadsheet applications. This represents the minimum version # that is required to be able to correctly refresh the data connection. This attribute applies to connections that are used by a QueryTable.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedByte datatype.</p>
name (Connection Name)	<p>Specifies the name of the connection. Each connection shall have a unique name.</p> <p>When a connection has been marked as deleted and then a new connection is added with the same name, the deleted connection is replaced with the new connection.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
new (New Connection)	<p>true if the connection has not been refreshed for the first time; otherwise, false. This state can happen when the user saves the file before a query has finished returning.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
odcFile (Connection File)	<p>Specifies the full path to external connection file from which this connection was created. If a connection fails during an attempt to refresh data, and reconnectionMethod=1, then the spreadsheet application will try again using information from the external connection file instead of the connection object embedded within the workbook.</p> <p>This is a benefit for data source and spreadsheetML document manageability. If the definition in the external connection file is changed (e.g., because of a database server name change), then the workbooks that made use of that connection will fail to connect with their internal connection information, and reload the new connection information from this file.</p> <p>This attribute is cleared by the spreadsheet application when the user manually edits the connection definition within the workbook. Can be expressed in URI or system-specific file path notation.</p> <p>[Note: Applications can decide what forms of URI they support, and whether system-specific file path notations are supported. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type</p>

Attributes	Description
	(§22.9.2.19).
onlyUseConnectionFile (Only Use Connection File)	<p>Indicates whether the spreadsheet application should always and only use the connection information in the external connection file indicated by the odcFile attribute when the connection is refreshed.</p> <p>If false, then the spreadsheet application should follow the procedure indicated by the reconnectionMethod attribute described below.</p> <p>Applies to ODBC connections, and may be applied to custom data connections. This attribute is ignored for other types of connections.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
reconnectionMethod (Reconnection Method)	<p>Specifies what the spreadsheet application should do when a connection fails.</p> <p>The values are as follows:</p> <p>1 = As required: On refresh use the existing connection information. If the existing information cannot be used to establish a connection, get updated connection information, if available from the external connection file.</p> <p>2 = Always: On every refresh get updated connection information from the external connection file, if available, and use that instead of the existing connection information. In this case the data refresh will fail if the external connection file is unavailable.</p> <p>3 = Never: Never get updated connection information from the external connection file even if it is available and even if the existing connection information cannot be used.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
refreshedVersion (Last Refresh Version)	<p>For backward compatibility purposes, this attribute indicates the version of the spreadsheet application that last refreshed the connection.</p> <p>This attribute applies to connections that are used by a query table.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedByte datatype.</p>
refreshOnLoad (Refresh on Open)	<p>true if this connection should be refreshed when opening the file; otherwise, false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
saveData (Save Data)	<p>true if the external data fetched over the connection to populate a table is to be saved with the workbook; otherwise, false.</p>

Attributes	Description
	<p>This exists for data security purposes - if no external data is saved in (or "cached") in the workbook, then current user credentials can be required every time to retrieve the relevant data, and people won't see the data the workbook author had last been using before saving the file.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
savePassword (Save Password)	<p>true if the password is to be saved as part of the connection string; otherwise, False.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
singleSignOnId (SSO Id)	<p>Identifier for Single Sign On (SSO) used for authentication between an intermediate spreadsheetML server and the external data source.</p> <p>[<i>Note</i>: Data connectivity can use a number of different technologies. One example of potential values stored in this attribute can be found at: http://msdn.microsoft.com/library/default.asp?url=/library/en-us/spptsdk/html/cSSOReturnCodes_SV01001109.asp <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
sourceFile (Source Database File)	<p>Used when the external data source is file-based. When a connection to such a data source fails, the spreadsheet application attempts to connect directly to this file. Can be expressed in URI or system-specific file path notation.</p> <p>[<i>Note</i>: Applications can decide what forms of URI they support, and whether system-specific file path notations are supported. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
type (Database Source Type)	<p>Specifies the data source type.</p> <p>Values are as follows:</p> <ol style="list-style-type: none"> 1. ODBC-based source 2. DAO-based source 3. File based database source 4. Web query 5. Custom data connection source 6. Text-based source 7. ADO record set 8. DSP <p>Custom data connection source represents an application-defined connection technology. [<i>Note</i>: For example, Microsoft Office uses this value to represent OLE DB connections. <i>end note</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Connection](#)) is located in §A.2. *end note*]

18.13.2 connections (Connections)

This element exists when there are one or more connections in the workbook. It is a container for the individual connection objects.

[Note: The W3C XML Schema definition of this element's content model ([CT_Connections](#)) is located in §A.2. *end note*]

18.13.3 dbPr (Database Properties)

This element stores all properties associated with an ODBC or OLE DB external data connection.

[Example:

Data connectivity can use a number of different technologies. The following is one example XML fragment defining an OLE DB connection and the associated dbPr element:

```
<connection id="2"
  odcFile="C:\My Documents\My Data Sources\Northwind Orders.odc" keepAlive="1"
  name="Northwind Orders" description="northwind" type="5" refreshedVersion="3">
  <dbPr connection="Provider=SQLOLEDB.1;Persist
    Security Info=True;Initial Catalog=Northwind;Data Source=dataserver1;Use
    Procedure for Prepare=1;Auto Translate=True;Packet Size=4096;Workstation
    ID=LOCAL_MACHINE_NAME;Use Encryption for Data=False;Tag with column
    collation when possible=False"
    command=""Northwind"."dbo"."Orders""
    commandType="3"/>
</connection>
```

end example]

Attributes	Description
command (Command Text)	The string containing the database command to pass to the data provider API that will interact with the external source in order to retrieve data. These strings can be constructed in a variety of ways (from simple UIs built into the spreadsheet application for browsing and choosing tables and fields, to external applications providing user interface to build up complex queries, to advanced users editing text queries). The

Attributes	Description
	<p>spreadsheetML application need not understand the command syntax; it can simply pass the command string to the data provider API in order to retrieve the latest external data.</p> <p>[Example: Data connectivity can use a number of different technologies. The following is one example of an ODBC command string of commandType=2 (for a Microsoft SQL Server database):</p> <pre>command="SELECT Orders.OrderID, Orders.OrderDate, Orders.ShipName, Orders.ShipAddress, Orders.ShipCity, Orders.ShipRegion, Orders.ShipPostalCode, Orders.ShipCountry_x000d__x000a_FROM Northwind.dbo.Orders Orders_x000d__x000a_WHERE (Orders.ShipCountry=?)"</pre> <p>Some characters in this string have been escaped - for more information on the escaping scheme, please refer to the ST_Xstring simple type definition. <i>end example]</i></p> <p>[Note: the "?" syntax in the string is something that the ODBC data provider is aware of and might replace with a parameter before execution. <i>end note]</i></p> <p>[Example: Data connectivity can use a number of different technologies. The following is one example of an OLE DB command string of commandType=3 (for an Oracle database):</p> <pre>command="&quot;TESTDB&quot;;.&quot;ShippersTable&quot;;"</pre> <p><i>end example]</i></p> <p>[Note: Data connectivity can use a number of different technologies. A few examples of potential values stored in this attribute can be found at:</p> <ul style="list-style-type: none"> • http://msdn.microsoft.com/library/default.asp?url=/library/en-us/odbc/htm/odbcsql_statements.asp • http://msdn.microsoft.com/library/default.asp?url=/library/en-us/odbc/htm/odbcsql_minimum_grammar.asp • http://msdn.microsoft.com/library/default.asp?url=/library/en-us/oledb/htm/oledbusing_commands.asp <p><i>end note]</i></p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
commandType (custom data source Command Type)	<p>Specifies the custom data source command type. Values are passed to the custom data source provider.</p> <p>[Example: For the OLE DB custom data source provider, valid values are as follows:</p> <ol style="list-style-type: none"> 1. Query specifies a cube name 2. Query specifies a SQL statement

Attributes	Description
	<p>3. Query specifies a table name</p> <p>4. Query specifies that default information has been given, and it is up to the provider how to interpret.</p> <p>5. Query is against a web based List Data Provider. <i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
connection (Connection String)	<p>The connection string is used to make contact with an ODBC or custom data source. These can be constructed in a variety of ways (from UI wizards built into the data provider code, to external query applications, to advanced users editing text files). The spreadsheetML application need not understand the connection syntax at all; it can simply pass the command string to the data provider API in order to re-establish a connection with the external data source.</p> <p>[Example: ODBC connection string to a database:</p> <pre>connection="DRIVER=SQL Server;SERVER=example_server;UID=example_useralias;APP=Microsoft Office 2007;WSID=user_alias;Trusted_Connection=Yes"</pre> <p><i>end example]</i></p> <p>[Example: of an OLE DB connection string to an Oracle database:</p> <pre>connection="Provider=OraOLEDB.Oracle.1;Password=example_password;Persist Security Info=True;User ID=example_useralias;Data Source=example_server;Extended Properties="""</pre> <p><i>end example]</i></p> <p>[Note: Data connectivity can use a number of different technologies. A few examples of potential values stored in this attribute can be found at:</p> <ul style="list-style-type: none"> • http://msdn.microsoft.com/library/default.asp?url=/library/en-us/odbc/htm/dasdkodbcoverview.asp • http://msdn.microsoft.com/library/default.asp?url=/library/en-us/odbcsql/od_odbc_d_4x4k.asp • http://msdn.microsoft.com/library/default.asp?url=/library/en-us/ado270/htm/mdreforacleprovspec.asp <p><i>end note]</i></p> <p>Connection strings syntaxes are specific to individual ODBC or custom data provider drivers.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

Attributes	Description
serverCommand (Command Text)	<p>Specifies a second command text string that is persisted when PivotTable server-based page fields are in use.</p> <p>For ODBC connections, serverCommand is usually a broader query than command (no WHERE clause is present in the former). Based on these 2 commands, parameter UI can be populated and parameterized queries can be constructed.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_DbPr](#)) is located in §A.2. *end note*]

18.13.4 m (No Value)

This element is present when tables in a web query are missing.

[Note: The W3C XML Schema definition of this element's content model ([CT_TableMissing](#)) is located in §A.2. *end note*]

18.13.5 olapPr (OLAP Properties)

This element contains all the properties needed for an OLAP data connection. OLAP connections contain both the dbPr and olapPr child elements.

[Example:

Data connectivity can use a number of different technologies. The following is an example of a connection to an SAP BW OLAP data source:

```
<connection id="1" odcFile="C:\My Documents\My Data Sources\$_INFOCUBE.odc"
  keepAlive="1" name="SAP demo cube" description="SAP DemoCube" type="5"
  refreshedVersion="3" background="1">
  <dbPr connection="Provider=MDrmSap.2;Data Source=BI2;User
    ID=TESTUSER;Location=TESTSERVERNAME;Cache Authentication=False;Encrypt
    Password=False;Integrated Security="";Mask Password=False;Persist
    Encrypted=False;Persist Security Info=True;Impersonation
    Level=Anonymous;Mode=Read;Protection Level=None;Extended
    Properties=";SFC_CLIENT=800;";Initial Catalog=$_INFOCUBE"
    command="$_OD_DECU" commandType="1"/>
  <olapPr sendLocale="1" rowDrillCount="1000" serverFill="0"
    serverNumberFormat="0" serverFont="0" serverFontColor="0"/>
</connection>
```

end example]

[Example:

Data connectivity can use a number of different technologies. The following is an example of a connection to a Microsoft SQL Server Analysis Services OLAP data source:

```
<connection id="1"
  odcFile="C:\My Documents\My Data Sources\Adventure Works DW.odc" keepAlive="1"
  name="Adventure Works DW" type="5" refreshedVersion="3" background="1">
  <dbPr connection="Provider=MSOLAP.3;Cache Authentication=False;Persist
Security Info=True;Initial Catalog=Adventure Works
  DW;Data Source=DATASERVER1;Impersonation
  Level=Impersonate;Mode=ReadWrite;Protection Level=Pkt Privacy;Auto Synch
  Period=20000;Default Isolation Mode=0;Default MDX Visual Mode=0;MDX
  Compatibility=1;MDX Unique Name Style=0;Non Empty
  Threshold=0;SQLQueryMode=Calculated;Safety Options=2;Secured Cell
  Value=0;SOURCE_DSN_SUFFIX="&quot;Prompt=CompleteRequired;Window
  Handle=0x6A903CC;&quot;;SQL Compatibility=0;Compression Level=0;Real Time
  Olap=False;Packet Size=4096" command="Adventure Works" commandType="1"/>
  <olapPr sendLocale="1" rowDrillCount="1000"/>
</connection>
```

end example]

[Note: Data connectivity can use a number of different technologies. One example of potential values stored in this attribute can be found at <http://msdn.microsoft.com/library/default.asp?url=/library/en-us/oledb/htm/dasdkoledboverview.asp> end note]

Attributes	Description
local (Local Cube)	<p>Flag indicating whether we should get data from the local cube on refresh versus the original data source. true if a local cube has been created for OLAP data, and it should be used instead of the server.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
localConnection (Local Cube Connection)	<p>Specifies a connection string to use when a local cube is available. This is used when local is set to true.</p> <p>[Example:</p> <pre><olapPr local="true" localConnection="OLEDB;Provider=MSOLAP;Data Source=C:\Data\DataCube.cub" ></pre> <p>end example]</p>

Attributes	Description
	<p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
localRefresh (Local Refresh)	<p>Flag indicating whether we should refresh the local cube from the original data source. When true, the original OLAP data source is queried each time the user explicitly refreshes the data in the application, and a new local cube is constructed from this query.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
rowDrillCount (Drill Through Count)	<p>Maximum number of drill-through rows to return when the user drills through an aggregate value in a PivotTable.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
sendLocale (Send Locale to OLAP)	<p>When true, the spreadsheetML app should send the user interface locale ID to the OLAP provider to retrieve localized member names and properties, etc. When false, no locale ID is expected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
serverFill (OLAP Fill Formatting)	<p>When true a PivotTable based on an OLAP source should format the data and aggregate cells in the PivotTable view using the background color from the OLAP source if this information is available. When false, OLAP server background fill colors are ignored, and standard formatting rules within the worksheet are followed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
serverFont (OLAP Server Font)	<p>When true, a PivotTable based on OLAP source should format the data and aggregate cells in the PivotTable view using the font from the OLAP source (e.g., Arial or Tahoma). When false, OLAP server fonts are ignored, and standard formatting rules within the worksheet are followed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
serverFontColor (OLAP Font Formatting)	<p>When true a PivotTable based on OLAP source should format the data and aggregate cells in the PivotTable view using the font color from the OLAP source. When false, OLAP server font colors are ignored, and standard formatting rules within the worksheet are followed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
serverNumberFormat (OLAP Number Format)	<p>When true, a PivotTable based on OLAP source should format the data and aggregate cells in the PivotTable view using the number format from the OLAP source. When false, OLAP server number formats are ignored, and standard formatting rules within</p>

Attributes	Description
	<p>the worksheet are followed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_OlapPr](#)) is located in §A.2. *end note*]

18.13.6 parameter (Parameter Properties)

This element stores properties about any parameters used with external data connections. Parameters are used to change the query executed externally and cause different data to be retrieved into the workbook. The type of parameter used – see `ST_parameterType` (§18.18.54) – determines whether the user is prompted for a value before data is refreshed, or the value is pulled from a cell in the workbook, or whether the same value should be used until explicitly changed in the data connection. Parameters are permitted for ODBC and web queries.

[Example:

Data connectivity can use a number of different technologies. The following is an example of XML defining a connection to a Microsoft Access database, with a parameter based on the value in cell C1 on the first sheet.

```
<connection id="1" name="Connection" type="1" refreshedVersion="2"
  background="1" saveData="1">
  <dbPr connection="DSN=MS Access
    Database;DBQ=C:\Desktop\db1.mdb;DefaultDir=C:\Desktop;DriverId=25;FIL=MS
    Access;MaxBufferSize=2048;PageTimeout=5;" command="SELECT Table1.Field1,
    Table1.Field2_x000d__x000a_FROM `C:\Desktop\db1`.Table1
    Table1_x000d__x000a_WHERE (Table1.Field2=?)" />
  <parameters count="1">
    <parameter name="user specified value" sqlType="4" parameterType="cell"
      cell="Sheet1!$C$1" />
  </parameters>
</connection>
```

end example]

Note that the command string in the `dbPr` element contains a "?" character. This character serves as a parameter marker.

[Note: Data connectivity can use a number of different technologies. One example of potential values stored in this attribute can be found at: http://msdn.microsoft.com/library/default.asp?url=/library/en-us/odbc/htm/odbcstatement_parameters.asp *end note*]

Attributes	Description
boolean (Boolean)	<p>Boolean value to use as the query parameter. Used only when parameterType = value.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
cell (Cell Reference)	<p>Cell reference indicating which cell's value to use for the query parameter. Used only when parameterType = cell.</p> <p><i>[Example:</i></p> <p style="padding-left: 40px;"><code><Parameter parameterType="cell" cell="Sheet1!\$C\$1"></code></p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
double (Double)	<p>Non-integer numeric value to use as the query parameter. Used only when parameterType = value.</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>
integer (Integer)	<p>Integer value to use as the query parameter. Used when parameterType = value.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
name (Parameter Name)	<p>The name of the parameter.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
parameterType (Parameter Type)	<p>Type of parameter used. If the parameterType=value, then the value from boolean, double, integer, or string are used. In this case, it is expected that only one of {boolean, double, integer, or string} is specified.</p> <p>The possible values for this attribute are defined by the ST_ParameterType simple type (§18.18.54).</p>
prompt (Parameter Prompt String)	<p>Prompt string for the parameter. Presented to the spreadsheet user along with input UI to collect the parameter value before refreshing the external data. Used only when parameterType = prompt.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
refreshOnChange (Refresh on Change)	<p>Flag indicating whether the query should automatically refresh when the contents of a cell that provides the parameter value changes. If true, then external data is refreshed using the new parameter value every time there's a change. If false, then external data is only refreshed when requested by the user, or some other event triggers refresh (e.g., workbook opened).</p>

Attributes	Description																																																						
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.																																																						
sqlType (SQL Data Type)	<p>SQL data type of the parameter. Only supported for ODBC sources.</p> <p>Supported values include:</p> <table data-bbox="415 472 1193 1890"> <tr> <th data-bbox="415 472 545 525">-22</th><th data-bbox="545 472 1193 525">SQL_UNSIGNED_OFFSET</th></tr> <tr><td data-bbox="415 525 545 577">-20</td><td data-bbox="545 525 1193 577">SQL_SIGNED_OFFSET</td></tr> <tr><td data-bbox="415 577 545 630">-11</td><td data-bbox="545 577 1193 630">SQL_GUID</td></tr> <tr><td data-bbox="415 630 545 682">-10</td><td data-bbox="545 630 1193 682">SQL_WLONGVARCHAR</td></tr> <tr><td data-bbox="415 682 545 735">-9</td><td data-bbox="545 682 1193 735">SQL_WVARCHAR</td></tr> <tr><td data-bbox="415 735 545 787">-8</td><td data-bbox="545 735 1193 787">SQL_WCHAR</td></tr> <tr><td data-bbox="415 787 545 840">-7</td><td data-bbox="545 787 1193 840">SQL_BIT</td></tr> <tr><td data-bbox="415 840 545 892">-6</td><td data-bbox="545 840 1193 892">SQL_TINYINT</td></tr> <tr><td data-bbox="415 892 545 945">-5</td><td data-bbox="545 892 1193 945">SQL_BIGINT</td></tr> <tr><td data-bbox="415 945 545 997">-4</td><td data-bbox="545 945 1193 997">SQL_LONGVARBINARY</td></tr> <tr><td data-bbox="415 997 545 1050">-3</td><td data-bbox="545 997 1193 1050">SQL_VARBINARY</td></tr> <tr><td data-bbox="415 1050 545 1102">-2</td><td data-bbox="545 1050 1193 1102">SQL_BINARY</td></tr> <tr><td data-bbox="415 1102 545 1155">-1</td><td data-bbox="545 1102 1193 1155">SQL_LONGVARCHAR</td></tr> <tr><td data-bbox="415 1155 545 1207">0</td><td data-bbox="545 1155 1193 1207">SQL_UNKNOWN_TYPE</td></tr> <tr><td data-bbox="415 1207 545 1260">1</td><td data-bbox="545 1207 1193 1260">SQL_CHAR</td></tr> <tr><td data-bbox="415 1260 545 1312">2</td><td data-bbox="545 1260 1193 1312">SQL_NUMERIC</td></tr> <tr><td data-bbox="415 1312 545 1365">3</td><td data-bbox="545 1312 1193 1365">SQL_DECIMAL</td></tr> <tr><td data-bbox="415 1365 545 1417">4</td><td data-bbox="545 1365 1193 1417">SQL_INTEGER</td></tr> <tr><td data-bbox="415 1417 545 1470">5</td><td data-bbox="545 1417 1193 1470">SQL_SMALLINT</td></tr> <tr><td data-bbox="415 1470 545 1522">6</td><td data-bbox="545 1470 1193 1522">SQL_FLOAT</td></tr> <tr><td data-bbox="415 1522 545 1575">7</td><td data-bbox="545 1522 1193 1575">SQL_REAL</td></tr> <tr><td data-bbox="415 1575 545 1627">8</td><td data-bbox="545 1575 1193 1627">SQL_DOUBLE</td></tr> <tr><td data-bbox="415 1627 545 1680">9</td><td data-bbox="545 1627 1193 1680">SQL_TYPE_DATE or SQL_DATE</td></tr> <tr><td data-bbox="415 1680 545 1732">10</td><td data-bbox="545 1680 1193 1732">SQL_TYPE_TIME or SQL_TIME</td></tr> <tr><td data-bbox="415 1732 545 1785">11</td><td data-bbox="545 1732 1193 1785">SQL_TYPE_TIMESTAMP or SQL_TIMESTAMP</td></tr> <tr><td data-bbox="415 1785 545 1837">12</td><td data-bbox="545 1785 1193 1837">SQL_VARCHAR</td></tr> <tr><td data-bbox="415 1837 545 1890">101</td><td data-bbox="545 1837 1193 1890">SQL_INTERVAL_YEAR</td></tr> </table>	-22	SQL_UNSIGNED_OFFSET	-20	SQL_SIGNED_OFFSET	-11	SQL_GUID	-10	SQL_WLONGVARCHAR	-9	SQL_WVARCHAR	-8	SQL_WCHAR	-7	SQL_BIT	-6	SQL_TINYINT	-5	SQL_BIGINT	-4	SQL_LONGVARBINARY	-3	SQL_VARBINARY	-2	SQL_BINARY	-1	SQL_LONGVARCHAR	0	SQL_UNKNOWN_TYPE	1	SQL_CHAR	2	SQL_NUMERIC	3	SQL_DECIMAL	4	SQL_INTEGER	5	SQL_SMALLINT	6	SQL_FLOAT	7	SQL_REAL	8	SQL_DOUBLE	9	SQL_TYPE_DATE or SQL_DATE	10	SQL_TYPE_TIME or SQL_TIME	11	SQL_TYPE_TIMESTAMP or SQL_TIMESTAMP	12	SQL_VARCHAR	101	SQL_INTERVAL_YEAR
-22	SQL_UNSIGNED_OFFSET																																																						
-20	SQL_SIGNED_OFFSET																																																						
-11	SQL_GUID																																																						
-10	SQL_WLONGVARCHAR																																																						
-9	SQL_WVARCHAR																																																						
-8	SQL_WCHAR																																																						
-7	SQL_BIT																																																						
-6	SQL_TINYINT																																																						
-5	SQL_BIGINT																																																						
-4	SQL_LONGVARBINARY																																																						
-3	SQL_VARBINARY																																																						
-2	SQL_BINARY																																																						
-1	SQL_LONGVARCHAR																																																						
0	SQL_UNKNOWN_TYPE																																																						
1	SQL_CHAR																																																						
2	SQL_NUMERIC																																																						
3	SQL_DECIMAL																																																						
4	SQL_INTEGER																																																						
5	SQL_SMALLINT																																																						
6	SQL_FLOAT																																																						
7	SQL_REAL																																																						
8	SQL_DOUBLE																																																						
9	SQL_TYPE_DATE or SQL_DATE																																																						
10	SQL_TYPE_TIME or SQL_TIME																																																						
11	SQL_TYPE_TIMESTAMP or SQL_TIMESTAMP																																																						
12	SQL_VARCHAR																																																						
101	SQL_INTERVAL_YEAR																																																						

Attributes	Description																								
	<table border="1"> <tr><td>102</td><td>SQL_INTERVAL_MONTH</td></tr> <tr><td>103</td><td>SQL_INTERVAL_DAY</td></tr> <tr><td>104</td><td>SQL_INTERVAL_HOUR</td></tr> <tr><td>105</td><td>SQL_INTERVAL_MINUTE</td></tr> <tr><td>106</td><td>SQL_INTERVAL_SECOND</td></tr> <tr><td>107</td><td>SQL_INTERVAL_YEAR_TO_MONTH</td></tr> <tr><td>108</td><td>SQL_INTERVAL_DAY_TO_HOUR</td></tr> <tr><td>109</td><td>SQL_INTERVAL_DAY_TO_MINUTE</td></tr> <tr><td>110</td><td>SQL_INTERVAL_DAY_TO_SECOND</td></tr> <tr><td>111</td><td>SQL_INTERVAL_HOUR_TO_MINUTE</td></tr> <tr><td>112</td><td>SQL_INTERVAL_HOUR_TO_SECOND</td></tr> <tr><td>113</td><td>SQL_INTERVAL_MINUTE_TO_SECOND</td></tr> </table> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>	102	SQL_INTERVAL_MONTH	103	SQL_INTERVAL_DAY	104	SQL_INTERVAL_HOUR	105	SQL_INTERVAL_MINUTE	106	SQL_INTERVAL_SECOND	107	SQL_INTERVAL_YEAR_TO_MONTH	108	SQL_INTERVAL_DAY_TO_HOUR	109	SQL_INTERVAL_DAY_TO_MINUTE	110	SQL_INTERVAL_DAY_TO_SECOND	111	SQL_INTERVAL_HOUR_TO_MINUTE	112	SQL_INTERVAL_HOUR_TO_SECOND	113	SQL_INTERVAL_MINUTE_TO_SECOND
102	SQL_INTERVAL_MONTH																								
103	SQL_INTERVAL_DAY																								
104	SQL_INTERVAL_HOUR																								
105	SQL_INTERVAL_MINUTE																								
106	SQL_INTERVAL_SECOND																								
107	SQL_INTERVAL_YEAR_TO_MONTH																								
108	SQL_INTERVAL_DAY_TO_HOUR																								
109	SQL_INTERVAL_DAY_TO_MINUTE																								
110	SQL_INTERVAL_DAY_TO_SECOND																								
111	SQL_INTERVAL_HOUR_TO_MINUTE																								
112	SQL_INTERVAL_HOUR_TO_SECOND																								
113	SQL_INTERVAL_MINUTE_TO_SECOND																								
string (String)	<p>String value to use as the query parameter. Used only when parameterType = value.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>																								

[Note: The W3C XML Schema definition of this element's content model (CT_Parameter) is located in §A.2. *end note*]

18.13.7 parameters (Query Parameters)

This element serves as a collection of parameters for an ODBC or web query.

Attributes	Description
count (Parameter Count)	<p>The number of parameters used.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model (CT_Parameters) is located in §A.2. *end note*]

18.13.8 `table` (Character Value)

This element is used to specify an HTML table to import by name. If the tables are not named, they shall be specified with the `<x v="[index]">` syntax instead.

Attributes	Description
v (Value)	<p>The name of the table to retrieve when the web query is refreshed. This corresponds to the string used for the id attribute of the HTML <code><table></code> tag.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_XStringElement](#)) is located in §A.2. *end note*]

18.13.9 `tables` (Tables)

This element serves as the collection of tables to be returned via a web query data connection. Tables are then most commonly referenced by `<x>` via their indices (in order of the `<Table>` tags in the HTML page).

Attributes	Description
count (Count of Tables)	<p>Number of tables to pull data from when refreshing from a web query.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Tables](#)) is located in §A.2. *end note*]

18.13.10 `textField` (Text Import Field Settings)

This element specifies field settings for text import.

Attributes	Description
position (Position)	<p>The character position the field starts at for fixed-length fields. The index is 0-based. If this attribute does not exist, position=0 is assumed. Subsequent <code>textField</code> elements or carriage returns in the text stream serve to denote endpoints for text fields.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
type (Field Type)	<p>Specifies the field Type. When text is imported into cells in the worksheet, the data in the cells are converted to the field type defined here.</p> <p>Types can be specified by the user, or determined algorithmically via heuristics and text</p>

Attributes	Description
	<p>analysis.</p> <p>The possible values for this attribute are defined by the ST_ExternalConnectionType simple type (§18.18.27).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TextField](#)) is located in §A.2. *end note*]

18.13.11 textFields (Fields)

This element denotes a set of fields to retrieve from a text file. Contains 1 or more textField elements.

Attributes	Description
count (Count of Fields)	<p>Number of distinct fields to retrieve.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TextFields](#)) is located in §A.2. *end note*]

18.13.12 textPr (Text Import Settings)

This element contains all of the text import settings.

[Example: Here's an example of the XML for a text connection:

```
<connection id="1" name="text data" type="6" refreshedVersion="3" background="1"
  saveData="1">
  <textPr prompt="0" characterSet="IBM437" sourceFile="C:\Desktop\text data.txt"
    delimiter="|">
    <textFields count="5">
      <textField/>
      <textField type="text" position="7"/>
      <textField type="text" position="28"/>
      <textField position="36"/>
      <textField type="text" position="41"/>
    </textFields>
  </textPr>
</connection>
```

example]

Attributes	Description																																				
characterSet (Character Set)	<p>Name of the character set associated with the text file. Values for this attribute are restricted to the names and aliases listed in the IANA CHARACTER SETS listing found at http://www.iana.org/assignments/character-sets.</p> <p>[<i>Note</i>: When reading this value, if a system does not support a particular character set, the application is allowed to decide what is the best course of fallback action. <i>end note</i>]</p> <p>If this attribute is not present then the codePage attribute are used.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>																																				
comma (Comma is Delimiter)	<p>Flag indicating whether to treat comma characters as field delimiters.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>																																				
consecutive (Consecutive Delimiters)	<p>Flag indicating whether consecutive delimiters should be treated as just one delimiter. If this flag is true than it's possible or even likely that some rows will return more fields than others, and these fields will always fill cells in the worksheet from left to right.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>																																				
decimal (Decimal Separator)	<p>The decimal separator character. This and the thousands attribute are used only when data in the text file contains decimal and thousands separators that are different from those used on the computer, due to a different language setting being used.</p> <p>The following table shows the results when you import text into a spreadsheet application using various separators. Numeric results are displayed in the rightmost column.</p> <table><tr><th>System decimal separator</th><th>System thousands separator</th><th>Text file decimal separator value</th><th>Text file thousands Separator value</th><th>Text imported</th><th>Cell value (data type)</th></tr><tr><td>Period</td><td>Comma</td><td>Comma</td><td>Period</td><td>123.123,45</td><td>123,123.45 (numeric)</td></tr><tr><td>Period</td><td>Comma</td><td>Comma</td><td>Comma</td><td>123.123,45</td><td>123.123,45 (text)</td></tr><tr><td>Comma</td><td>Period</td><td>Comma</td><td>Period</td><td>123,123.45</td><td>123,123.45 (numeric)</td></tr><tr><td>Period</td><td>Comma</td><td>Period</td><td>Comma</td><td>123 123.45</td><td>123 123.45 (text)</td></tr><tr><td>Period</td><td>Comma</td><td>Period</td><td>Space</td><td>123 123.45</td><td>123,123.45 (numeric)</td></tr></table> <p>Strings values of this attribute are expected to be one character in length.</p>	System decimal separator	System thousands separator	Text file decimal separator value	Text file thousands Separator value	Text imported	Cell value (data type)	Period	Comma	Comma	Period	123.123,45	123,123.45 (numeric)	Period	Comma	Comma	Comma	123.123,45	123.123,45 (text)	Comma	Period	Comma	Period	123,123.45	123,123.45 (numeric)	Period	Comma	Period	Comma	123 123.45	123 123.45 (text)	Period	Comma	Period	Space	123 123.45	123,123.45 (numeric)
System decimal separator	System thousands separator	Text file decimal separator value	Text file thousands Separator value	Text imported	Cell value (data type)																																
Period	Comma	Comma	Period	123.123,45	123,123.45 (numeric)																																
Period	Comma	Comma	Comma	123.123,45	123.123,45 (text)																																
Comma	Period	Comma	Period	123,123.45	123,123.45 (numeric)																																
Period	Comma	Period	Comma	123 123.45	123 123.45 (text)																																
Period	Comma	Period	Space	123 123.45	123,123.45 (numeric)																																

Attributes	Description
	<p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
<p>delimited (Delimited File)</p>	<p>true if the file is Tab or character delimited. false if the file should be parsed according to fixed length fields.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>delimiter (Custom Delimiter)</p>	<p>User-specified character to be treated as a field delimiter. Only single characters are supported.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
<p>fileType (File Type)</p>	<p>Ignorable attribute with enum value that defined by ST_FileType. Determines the kind of character set to use during import.</p> <p>Only one of fileType and characterSet or codePage shall be specified for a textPr.</p> <p>The possible values for this attribute are defined by the ST_FileType simple type (§18.18.29).</p>
<p>firstRow (First Row)</p>	<p>Indicates at what row of the file to start the data import. All unsignedInt values are permitted, although it's possible that firstRow is higher than the number of rows in the text file, in which case no data is imported.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
<p>prompt (Prompt for File Name)</p>	<p>Flag indicating whether the user wants to be prompted for the file name on refresh. If false, then the user is not prompted. If true or not present, then the user is prompted.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>qualifier (Qualifier)</p>	<p>Character used as the text string qualifier.</p> <p>The possible values for this attribute are defined by the ST_Qualifier simple type (§18.18.61).</p>
<p>semicolon (Semicolon is Delimiter)</p>	<p>Flag indicating whether to treat semicolon characters as field delimiters.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>sourceFile (Source File Name)</p>	<p>Path to the text file to use to import external data. Can be expressed in URI or system-specific file path notation.</p> <p>[Note: Applications can decide what forms of URI they support, and whether system-</p>

Attributes	Description
	<p>specific file path notations are supported. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
space (Space is Delimiter)	<p>Flag indicating whether to treat space characters as field delimiters.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
tab (Tab as Delimiter)	<p>Flag indicating whether to treat tab characters as field delimiters. If false, then tabs will not be used as delimiters. If true or not present, then they are used as delimiters.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
thousands (Thousands Separator)	<p>The thousands separator character. This and the decimal attribute are used only when data in the text file contains decimal and thousands separators that are different from those used on the computer, due to a different language setting being used. Please refer to the decimal attribute description above for a Table describing the behavior.</p> <p>Strings values of this attribute are expected to be one character in length.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TextPr](#)) is located in §A.2. *end note*]

18.13.13 webPr (Web Query Properties)

This element specifies the properties for a web query source. A web query will retrieve data from HTML tables, and can also supply HTTP "Get" parameters to be processed by the web server in generating the HTML by including the parameters and parameter elements.

Here's an example of a web query connection:

[Example:

```

<connection id="1" name="Connection" type="4" refreshedVersion="0"
  background="1" saveData="1">
  <webPr sourceData="1" parsePre="1" consecutive="1"
    url="http://ServerName/Image%20Library/Forms/AllItems.aspx" htmlTables="1">
    <tables count="1">
      <s v="contentthumbnail"/>
    </tables>
  </webPr>
</connection>

```

end example]

Attributes	Description
consecutive (Consecutive Delimiters)	<p>Flag indicating whether consecutive delimiters should be treated as just one delimiter.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
editPage (Edit Query URL)	<p>The URL of the user-facing web page showing the web query data. This URL is persisted in the case that sourceData="true" and url has been redirected to reference an XML file. Then the user-facing page can be shown in the UI, and the XML data can be retrieved behind the scenes.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
firstRow (Use First Row)	<p>Flag indicating whether to parse all tables inside a PRE block with the same width settings as the first row.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
htmlFormat (HTML Formatting Handling)	<p>How to handle formatting from the HTML source when bringing web query data into the worksheet. Relevant when sourceData is True.</p> <p>Values are as follows:</p> <ol style="list-style-type: none"> 1. None - no formatting at all 2. RTF - honor just rich text formatting 3. All - honor all html formatting. <p>The possible values for this attribute are defined by the ST_HtmlFmt simple type (§18.18.41).</p>
htmlTables (HTML Tables Only)	<p>Flag indicating whether web queries should only work on HTML tables.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
parsePre (Parse PRE)	<p>Flag indicating whether data contained within HTML <PRE> tags in the web page is parsed into columns when you import the page into a query table.</p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
post (Web Post)	<p>Returns or sets the string used with the post method of inputting data into a web server to return data from a web query.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
sourceData (Import XML Source Data)	<p>Flag indicating that XML source data should be imported instead of the HTML table itself.</p> <p>Used when a web query exists to an HTML table with the following attribute.</p> <p style="text-align: center;"><code><TABLE ... o:WebQuerySourceHRef="http://..." ... > ... </TABLE></code></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
textDates (Dates as Text)	<p>Flag indicating whether dates should be imported into cells in the worksheet as text rather than dates.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
url (URL)	<p>URL to use to refresh external data.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
xl2000 (Refreshed in Excel 2000)	<p>This flag exists for backward compatibility with older existing spreadsheet files, and is set to true if this web query was refreshed in a spreadsheet application newer than or equal to Microsoft Excel 2000.</p> <p>This is an optional attribute that can be ignored.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
xl97 (Created in Excel 97)	<p>This flag exists for backward compatibility with older existing spreadsheet files, and is set to true if this web query was created in Microsoft Excel 97.</p> <p>This is an optional attribute that can be ignored.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
xml (XML Source)	<p>true if the web query source is XML (versus HTML), otherwise false.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_WebPr](#)) is located in §A.2. *end note*]

18.14 Supplementary Workbook Data

External links are used when linking the workbook to other workbooks or external data. The most frequent feature for linking a workbook to other workbooks is through the use of formulas. In this case the formula references a range or defined name in another workbook. Hyperlinks on cells and other spreadsheet objects are also considered an external link. Object-linking technologies are yet another technology used to link the workbook to another object. [*Example:* KParts or OLE. *end example*] Finally, Dynamic Data Exchange, or DDE, servers can be used to access external data. DDE servers are accessed through formulas in the workbook.

External links are saved with the target source in a relationship file so that external resources are easily discoverable in lightweight relationship XML rather than deep in the application's XML.

For a workbook `consumer.xlsx` that makes use of data in another workbook called `data.xlsx`, the following XML would exist in `consumer.xlsx` to describe the external link:

[*Example:*

```
<Relationships xmlns="...">
  <Relationship Id="rId1" Type=".../externalLinkPath" Target="data.xlsx"
    TargetMode="External"/>
</Relationships>
```

end example]

And the following XML would exist to describe cached data retrieved from the external workbook:

[*Example:*

```
<externalLink xmlns="...">
  <externalBook xmlns:r="..." r:id="rId1">
    <sheetNames>
      <sheetName val="Sheet1"/>
      <sheetName val="Sheet2"/>
      <sheetName val="Sheet3"/>
    </sheetNames>
```

```

<sheetDataSet>
  <sheetData sheetId="0"/>
  <sheetData sheetId="1"/>
  <sheetData sheetId="2">
    <row r="11">
      <cell r="B11">
        <v>47</v>
      </cell>
    </row>
    <row r="12">
      <cell r="B12">
        <v>19</v>
      </cell>
    </row>
    <row r="13">
      <cell r="B13">
        <v>38</v>
      </cell>
    </row>
  </sheetData>
</sheetDataSet>
</externalBook>
</externalLink>

```

end example]

The Supplementary Workbook Data section of SpreadsheetML is complimentary to the External Data Connections (§18.13) section in maintaining all the information about external information that impacts the workbook.

18.14.1 cell (External Cell Data)

This element is used to store cached values from external sources such as other workbooks. Formulas from external cells are not stored in the consuming workbook. Also, for this context, the attribute `t` cannot have a value of `inlineStr`. Rich text is not supported in this context either.

Attributes	Description
r (Reference)	<p>Describes the cell location in the external book.</p> <p>[Example:</p> <pre> <cell r="B12"> <v>74</v> </cell> </pre>

Attributes	Description
	<i>end example]</i> The possible values for this attribute are defined by the ST_CellRef simple type (§18.18.7).
t (Type)	Indicates the data type of the cell value. The possible values for this attribute are defined by the ST_CellType simple type (§18.18.11).
vm (Value Metadata)	The index of the cell's value metadata, if any exists. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_ExternalCell](#)) is located in §A.2. *end note*]

18.14.2 ddeItem (DDE Item definition)

This element represents a DDE item.

Attributes	Description
advise (Advise)	Specifies whether the DDE server should notify the application when the external data changes. Default value is <code>false</code> . The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
name (DDE Name)	Specifies the DDE item name. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
ole (Object Linking TechnologyE)	Set to <code>true</code> if this is item uses an object linking technology. Default value is <code>false</code> . The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
preferPic (Data is an Image)	Set to <code>true</code> if data from this DDE item is an image format. Default value is <code>false</code> . The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_DdeItem](#)) is located in §A.2. *end note*]

18.14.3 ddeItems (DDE Items Collection)

This element serves as a collection for ddeItem elements.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DdeItems](#)) is located in §A.2. *end note*]

18.14.4 ddeLink (DDE Connection)

This element represents a connection to an external Dynamic Data Exchange (DDE) server. DDE is a method of sending data between applications using Windows messages according to a documented protocol that has been stable since about 1990.

The hierarchy of names defined by a DDE server is Application, Topics, and Items. Topics often correspond to units such as files or documents or database names, and Items refer to subsets of the data such as cell ranges, rows, fields, columns. DDE items can have multiple values as well.

[*Example:*

Data connectivity can use a number of different technologies. The following is just one example of a spreadsheetML fragment describing the product Microsoft Excel being used as a DDE server to provide data to the current spreadsheet document:

```
<ddeLink xmlns:r="..." ddeService="excel" ddeTopic="[dsource.xls]Sheet1">
  <ddeItems>
    <ddeItem name="R1C1" advise="1"/>
    <ddeItem name="StdDocumentName" ole="1" advise="1"/>
  </ddeItems>
</ddeLink>
```

end example]

Attributes	Description
ddeService (Service name)	Service name (i.e., application name) for the DDE connection. This is a required attribute. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
ddeTopic (Topic for DDE server)	Describes something for the DDE application to which the channel pertains— usually a document of that application. This is a required attribute. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DdeLink](#)) is located in §A.2. *end note*]

18.14.5 **definedName (Defined Name)**

This element contains information about a named range in an external workbook.

Attributes	Description
name (Defined Name)	<p>The defined name. This attribute is required.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
refersTo (Refers To)	<p>Name range definition string.</p> <p><i>[Example:</i></p> <pre><definedNames> <definedName name="namedrange" refersTo="'Sheet1'!\$D\$5:\$D\$10"/> </definedNames></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
sheetId (Sheet Id)	<p>The index of the worksheet that the named range applies to for named ranges that are scoped to a particular worksheet rather than the full workbook. This attribute is optional.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_ExternalDefinedName](#)) is located in §A.2. *end note*]

18.14.6 **definedNames (Named Links)**

This element is a collection of the defined names associated with the supporting workbook.

[Note: The W3C XML Schema definition of this element's content model ([CT_ExternalDefinedNames](#)) is located in §A.2. *end note*]

18.14.7 **externalBook (External Workbook)**

This element represents an external workbook which is supplying data to the current workbook.

Attributes	Description
id (Relationship to supporting book file)	Relationship ID that references a link in the relationships collection. The target attribute in the associated relationship will specify the worksheet XML file in the current

Attributes	Description
path)	spreadsheetML document ZIP archive that makes use of this externalbook.
Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

[Note: The W3C XML Schema definition of this element's content model ([CT_ExternalBook](#)) is located in §A.2. *end note*]

18.14.8 externalLink (External Reference)

This element is a container for specific types of external links.

[Note: The W3C XML Schema definition of this element's content model ([CT_ExternalLink](#)) is located in §A.2. *end note*]

18.14.9 oleItem (Object Link Item)

This element represents a single link within the object referenced by the parent element.

Attributes	Description
advise (Advise)	Set to true if the linked object should notify the application when the external data changes. Default value is false. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
icon (Icon)	Set to true if the linked object is represented by an icon. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
name (Object Name)	The linked object's name. The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).
preferPic (Object is an Image)	Set to true if the linked object is represented by an image. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_OleItem](#)) is located in §A.2. *end note*]

18.14.10 oleItems (Object Link Items)

This element is a collection of items within the link specified by the parent element.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_OleItems](#)) is located in §A.2. *end note*]

18.14.11 oleLink (Generic Object Link Connection)

This element represents an external link to an embedded object, specified by a progID/object pair. The type of object link is determined by reading the target of the id attribute.

[*Example:* The following markup defines a reference to a linked object using Bonobo. The progId attribute contains the shared library that contains the widget. The r:id identifies the referenced Bonobo object.

```
<oleLink r:id="rb1" progId="OAFIID:Bonobo_Sample_Calculator">
...
</oleLink>
```

The target of the relationship with ID rb1, defines the Bonobo object itself. This example shows a link to a sample Bonobo widget taken from the following article, which also provides an introduction to Bonobo – <http://www.ibm.com/developerworks/webservices/library/co-bnbo2.html>. *end example*]

[*Example:* The following markup defines a reference to a linked object using KParts. The progId attribute contains the shared library that contains the plugin. The r:id identifies the referenced KParts object.

```
<oleLink r:id="rKp1" progId="libhtmlvalidatorplugin">
...
</oleLink>
```

The following XML, contained in the target of the relationship with ID rKp1, defines the KPart object, and will follow the kpartgui DTD:

```
<!DOCTYPE kpartgui SYSTEM "kpartgui.dtd">
<kpartgui library="libhtmlvalidatorplugin" name="htmlvalidatorplugin"
version="1" >
  <MenuBar>
    <Menu name="tools"><Text>&Tools</Text>
      <Action name="validatewebpage"/>
    </Menu>
  </MenuBar>
</kpartgui>
```

This example is taken from the kde.org web site, and contains a tutorial on building the plugin referenced by the above markup – <http://developer.kde.org/documentation/tutorials/dot/writing-plugins.html>. *end example*]

Attributes	Description
id (Object Link Relationship) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Relationship ID that references a link in the relationships collection. The target attribute in the associated relationship will specify the external file name used for this oleLink. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).
progId (Object Link Identifier)	The ID for the object link connection. [<i>Example</i> : For a KParts link, this would store the name of the appropriate KParts library. For an OLE link, this would store the ProgID of the appropriate OLE object. <i>end example</i>] The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[*Note*: The W3C XML Schema definition of this element's content model ([CT_OleLink](#)) is located in §A.2. *end note*]

18.14.12 row (Row)

This element contains data for an external worksheet row.

Attributes	Description
r (Row)	Row number of the row in the external book containing the cell data referenced. This attribute is required. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_ExternalRow](#)) is located in §A.2. *end note*]

18.14.13 sheetData (External Sheet Data Set)

This element contains the cached worksheet data associated with a supporting workbook.

[*Note*: For an example, please refer to example at the beginning of this section. *end note*]

Attributes	Description
refreshError (Last Refresh Resulted in Error)	Specifies that the last external data refresh for this sheet did not succeed. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

Attributes	Description
sheetId (Sheet Id)	<p>Index of sheet in the external workbook that is referenced and partially cached in this data set. This is a 1-based index. This attribute is required.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ExternalSheetData](#)) is located in §A.2. *end note*]

18.14.14 sheetDataSet (Cached Worksheet Data)

This element serves as the collection for 1 or more sheetData elements.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ExternalSheetDataSet](#)) is located in §A.2. *end note*]

18.14.15 sheetName (Sheet Name)

Name of a worksheet in the supporting workbook

Attributes	Description
val (Sheet Name Value)	<p>Name of the sheet. This attribute is required.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ExternalSheetName](#)) is located in §A.2. *end note*]

18.14.16 sheetNames (Supporting Workbook Sheet Names)

This element is the container for all of the worksheet names in a supporting workbook.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ExternalSheetNames](#)) is located in §A.2. *end note*]

18.14.17 val (DDE Link Value)

This element specifies a value associated with a particular DDE item.

[*Example:* Here's an example of how values, value, and val elements are written out in the spreadsheetML for a ddeItem supplied by a DDE server. In this example different cells in the workbook are bound to these specific DDE items:

```

<ddeLink xmlns:r="..." ddeService="StockSrv" ddeTopic="Prices">
  <ddeItems>
    <ddeItem name="Bread" advise="1">
      <values>
        <value>
          <val>3.5</val>
        </value>
      </values>
    </ddeItem>
    <ddeItem name="Milk" advise="1">
      <values>
        <value>
          <val>5.7400000000000002</val>
        </value>
      </values>
    </ddeItem>
    <ddeItem name="MSFT" advise="1">
      <values>
        <value>
          <val>54.130000000000003</val>
        </value>
      </values>
    </ddeItem>
    <ddeItem name="StdDocumentName" ole="1" advise="1"/>
  </ddeItems>
</ddeLink>

```

end example]

The possible values for this element are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element's content model ([ST_Xstring](#)) is located in §A.6.9. *end note*]

18.14.18 value (Value)

This element contains a value associated with a particular DDE item. This serves as a container for the val element.

Attributes	Description
t (DDE Value Type)	Indicates the DDE value type. The possible values for this attribute are defined by the ST_DdeValueType simple type (§18.18.23).

[*Note: The W3C XML Schema definition of this element's content model ([CT_DdeValue](#)) is located in §A.2. end note*]

18.14.19 values (DDE Name Values)

This element defines a collection of values associated with DDE item.

Attributes	Description
cols (Columns)	<p>The number of columns of data that is returned by the DDE server for this DDE item. The default value of this attribute is 1.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
rows (Rows)	<p>The number of rows of data that is returned by the DDE server for this DDE item. The default value of this attribute is 1.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[*Note: The W3C XML Schema definition of this element's content model ([CT_DdeValues](#)) is located in §A.2. end note*]

18.15 Volatile Dependencies

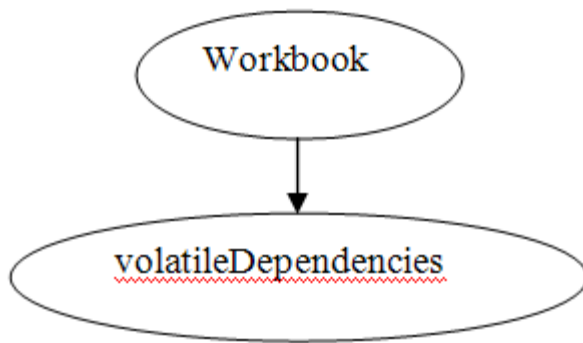
The volatileDependencies part provides a cache of data that supports Real Time Data (RTD) and CUBE functions in the workbook. Both of these types of functions require connectivity to external servers to retrieve their data. For RTD functions, an RTD interface defines how data is provided on the server, and how it is retrieved on the client. Similarly, CUBE functions access data in OLAP cubes via their own function syntax. The volatileDependencies part provides that cache of data and supporting information about these functions and their data servers and connections. This allows the spreadsheet application to work with cached values when recalculating the workbook when the external server is not available.

[*Note: How users of SpreadsheetML access RTD data depends on the integration the user's spreadsheet application provides for RTD. end note*]

[*Note: Data connectivity can use a number of different technologies. One example of potential values stored in this attribute can be found at: http://msdn.microsoft.com/library/default.asp?url=/library/en-us/vbaxl11/html/xlobjIRtdServer_HV03085058.asp end note*]

File Architecture

The workbook holds the relationship to the volatile dependencies part.



Illustration

[Example: The following image shows an example implementation of CUBE and Real Time Data (RTD) functions in a worksheet.

	A
1	=RTD("jrtdx.rtd",,"aaa")
2	
3	=CUBEMEMBER("xlextat9 Adventure Works DW Adventure Works","[Department].[Departments].[Corporate]")
4	=CUBEVALUE("xlextat9 Adventure Works DW Adventure Works",A3)
5	=CUBESET("xlextat9 Adventure Works DW Adventure Works","[Customer].[Customer Geography].[All Customers].[United Kingdom].children","Set")
6	=CUBERANKEDMEMBER("xlextat9 Adventure Works DW Adventure Works",\$A\$3,ROW(A1))
7	=CUBESETCOUNT(A3)
8	=CUBEMEMBERPROPERTY("xlextat9 Adventure Works DW Adventure Works","[Product].[Product].[All Products].[Blade]","Class")
9	=CUBEKPIMEMBER("xlextat9 Adventure Works DW Adventure Works","Growth in Customer Base",2)
10	

The following example shows the XML that describes the functions in the illustration.

```

<volTypes xmlns="...">
  <volType type="realTimeData">
    <main first="jrtdx.rtd">
      <tp t="s">
        <v>aaa: 4447</v>
        <stp/>
        <stp>aaa</stp>
        <tr r="A1" s="1"/>
      </tp>
    </main>
  </volType>

```

```
<volType type="olapFunctions">
  <main first="xlextdat9 Adventure Works DW Adventure Works">
    <tp t="e">
      <v>#N/A</v>
      <stp>1</stp>
      <tr r="A6" s="1"/>
      <tr r="A9" s="1"/>
      <tr r="A8" s="1"/>
      <tr r="A5" s="1"/>
      <tr r="A4" s="1"/>
      <tr r="A3" s="1"/>
    </tp>
  </main>
</volType>
</volTypes>
```

end example]

While RTD and Cube functions share the cache, there are differences in how the data is interpreted. [Example: RTD dependencies, volTypes/volType/main@first specifies the ProgId of the RTD server. Whereas for OLAP dependencies, main@first indicates the connection name. *end example]*

18.15.1 main (Main)

Represents dependency information for all topics within a volatile dependency type that share the same first string or function argument.

Attributes	Description
first (First String)	<p>Specifies the first string of all topics within this main. This string corresponds to the first argument to the RTD or CUBE function.</p> <p>For RTD functions, this argument represents the progID of the IRTDServer.</p> <p>[Example: <main first="jrtdx.rtd"> <i>end example]</i></p> <p>For CUBE functions, this argument represents the CUBE connection.</p> <p>[Example: <main first="xlextdat9 Adventure Works DW Adventure Works"> <i>end example]</i></p> <p>For more information on RTD and CUBE functions in SpreadsheetML, see §18.17 in Formulas.</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element's content model ([CT_VolMain](#)) is located in §A.2. *end note*]

18.15.2 stp (Strings in Subtopic)

Represents all strings in the topic except for the first. An stp is allocated for each additional argument. [Example: For the topic {"progid", "", "foo"}, there would be two STPs: "" and "foo". *end example*]

For Cube functions, value of "1" indicates that all of the related cells with calling cube functions have been refreshed.

The possible values for this element are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element's content model ([ST_Xstring](#)) is located in §A.6.9. *end note*]

18.15.3 tp (Topic)

Represents dependency information for all topics within a volatile dependency type that share the same first string or argument.

For the RTD function, this collection will contain the remaining parameters of the function, and indicate the last known value and data type of that value.

Attributes	Description
t (Type)	<p>Specifies the type of the cell value. This value corresponds to the type of data returned by the RTD or CUBE function.</p> <p>[Example: In the following RTD example, the value "aaa: 4447" has a string data type.</p> <pre><tp t="s"> <v>aaa: 4447</v> </tp></pre> <p><i>end example</i>]</p> <p>For Cube functions, this attribute can be ignored when stp value is "1".</p> <p>The possible values for this attribute are defined by the ST_VolValueType simple type (§18.18.91).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_VolTopic](#)) is located in §A.2. *end note*]

18.15.4 tr (References)

Represents the reference to a cell that depends on this topic. Each topic can have one or more cells dependencies.

For CUBE functions, each <tr> element contains a cell whose cube function call dependent on the connection in main@first.

Attributes	Description
r (Reference)	<p>Specifies a reference to the cell location. The location is scoped to the sheet specified in s.</p> <p>[Example: <tr r="A6" s="1"/> end example]</p> <p>The possible values for this attribute are defined by the ST_CellRef simple type (§18.18.7).</p>
s (Sheet Id)	<p>Specifies the sheet index.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_VolTopicRef](#)) is located in §A.2. *end note*]

18.15.5 volType (Volatile Dependency Type)

Represents dependency information for a specific type of external data server. There is no limit on the number of external dependencies that can exist for a workbook in SpreadsheetML.

Attributes	Description
type (Type)	<p>Specifies the type of the external dependency.</p> <p>[Example: <volType type="olapFunctions"> end example]</p> <p>The possible values for this attribute are defined by the ST_VolDepType simple type (§18.18.90).</p>

[*Note: The W3C XML Schema definition of this element's content model ([CT_VolType](#)) is located in §A.2. end note*]

18.15.6 volTypes (Volatile Dependency Types)

Represents the collection of external dependencies for a workbook. This element defines the structure of the volatileDependencies part. There can only be one volatileDependencies part for each workbook. However, the part can contain one or more dependency types.

The volatileDependencies part stores the following information for Real Time Data (RTD) and CUBE functions:

- Cached values
- Parameters used
- Connection and Server names

[*Example: Outline of XML Structure*

```
<volTypes xmlns="...">
  <volType type="realTimeData">
  </volType>
  <volType type="olapFunctions">
  </volType>
</volTypes>
```

end example]

[*Note: The W3C XML Schema definition of this element's content model ([CT_VolTypes](#)) is located in §A.2. end note*]

18.16 Custom XML Mappings

Custom XML Mappings enable binding of arbitrary XML data structures and arbitrary XML schema definitions to the workbook. Once a DataBinding has been established, then various XML nodes can be mapped to table columns, ranges of cells, or even single cells (for non-repeating attributes and elements). Once an XML Mapping is fully defined, the application is able to import and export XML instance structures according to the schema definition. ECMA-376 does not require any particular XML schema language.

[*Note: Some examples of XML schema languages that might be used to implement Custom XML Mappings include:*

- W3C XML Schema - <http://www.w3.org/XML/Schema>
- RELAX NG – ISO/IEC 19757-2
- Schematron – ISO/IEC 19757-3
- NVDL – ISO/IEC 19757-4

end note]

While the original schema or XML definition can reside on disk or at some file location outside the workbook, a copy of the schema is stored in the workbook.

Every time an XML instance or schema is added to the workbook, a new map object is created which ties together the schemas and where the various elements are mapped in the workbook.

[Example:

```
<MapInfo SelectionNamespaces="">
  <Schema ID="Schema1">
    <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema">
      <xsd:element nillable="true" name="Root">
        <xsd:complexType>
          <xsd:sequence minOccurs="0">
            <xsd:element minOccurs="0" nillable="true" name="EmployeeInfo"
              form="unqualified">
              <xsd:complexType>
                <xsd:sequence minOccurs="0">
                  <xsd:element minOccurs="0" nillable="true" type="xsd:string"
                    name="Name" form="unqualified"></xsd:element>
                  <xsd:element minOccurs="0" nillable="true" type="xsd:date"
                    name="Date" form="unqualified"></xsd:element>
                  <xsd:element minOccurs="0" nillable="true" type="xsd:integer"
                    name="Code" form="unqualified"></xsd:element>
                </xsd:sequence>
              </xsd:complexType></xsd:element>

            <xsd:element minOccurs="0" maxOccurs="unbounded" nillable="true"
              name="ExpenseItem" form="unqualified">
              <xsd:complexType>
                <xsd:sequence minOccurs="0">
                  <xsd:element minOccurs="0" nillable="true" type="xsd:date"
                    name="Date" form="unqualified"></xsd:element>
                  <xsd:element minOccurs="0" nillable="true" type="xsd:string"
                    name="Description" form="unqualified"></xsd:element>
                  <xsd:element minOccurs="0" nillable="true" type="xsd:double"
                    name="Amount" form="unqualified"></xsd:element>
                </xsd:sequence>
              </xsd:complexType></xsd:element>
            </xsd:sequence>
          </xsd:complexType></xsd:element>
        </xsd:sequence>
      </xsd:complexType></xsd:element>
    </xsd:schema>
  </Schema>
</MapInfo>
```

```

        <xsd:attribute name="Currency" form="unqualified"
            type="xsd:string"></xsd:attribute>
        <xsd:attribute name="Approved" form="unqualified"
            type="xsd:string"></xsd:attribute>
    </xsd:complexType>
</xsd:element>
</xsd:schema>
</Schema>
<Map ID="1" Name="Root_Map" RootElement="Root" SchemaID="Schema1"
    ShowImportExportValidationErrors="false" AutoFit="true" Append="false"
    PreserveSortAFLayout="true" PreserveFormat="true">
    <DataBinding ConnectionID="1" FileBinding="true" DataBindingLoadMode="1"/>
</Map>
</MapInfo>

```

end example]

For XML mapped into a SpreadsheetML Table there will also be additional information in the SpreadsheetML file which refers back to the XML Map and XPath of the element or attribute mapped. This information is stored in a `xmlColumnPr` element, under the `tableColumn` node.

[Example:

```

<table xmlns="..." id="1" name="Table1" displayName="Table1" ref="A1:H11"
    tableType="xml" totalsRowShown="0" connectionId="1">
    <tableColumns count="5">
        <tableColumn id="1" uniqueName="Name" name="Name">
            <xmlColumnPr mapId="1" xpath="/Root/EmployeeInfo/Name"
                xmlDataType="string"/>
        </tableColumn>
        <tableColumn id="2" uniqueName="Date" name="Date">
            <xmlColumnPr mapId="1" xpath="/Root/EmployeeInfo/Date"
                xmlDataType="date"/>
        </tableColumn>
        <tableColumn id="3" uniqueName="Code" name="Code">
            <xmlColumnPr mapId="1" xpath="/Root/EmployeeInfo/Code"
                xmlDataType="integer"/>
        </tableColumn>
        <tableColumn id="4" uniqueName="Description" name="Description">
            <xmlColumnPr mapId="1" xpath="/Root/ExpenseItem/Description"
                xmlDataType="string"/>
        </tableColumn>
    </tableColumns>

```

```

    <tableColumn id="5" uniqueName="Amount" name="Amount">
      <xmlColumnPr mapId="1" xpath="/Root/ExpenseItem/Amount"
        xmlDataType="double"/>
    </tableColumn>
  </tableColumns>
  <tableStyleInfo name="TableStyleMedium9" showFirstColumn="0"
    showLastColumn="0" showRowStripes="1" showColumnStripes="0"/>
</table>

```

end example]

For XML mapped into a single SpreadsheetML cell there will also be additional information in the TableSingleCells part which refers back to the XML Map and XPath of the element or attribute mapped. This information is stored in the xmlPr element under the xmlCellPr node.

[Example:

```

<singleXmlCells xmlns="...">
  <singleXmlCell id="2" name="Table2" displayName="Table2" r="D19"
    connectionId="1">
    <xmlCellPr id="1" uniqueName="Currency">
      <xmlPr mapId="1" xpath="/Root/@Currency" xmlDataType="string"/>
    </xmlCellPr>
  </singleXmlCell>
  <singleXmlCell id="3" name="Table3" displayName="Table3" r="D20"
    connectionId="1">
    <xmlCellPr id="1" uniqueName="Approved">
      <xmlPr mapId="1" xpath="/Root/@Approved" xmlDataType="string"/>
    </xmlCellPr>
  </singleXmlCell>
  <singleXmlCell id="4" name="Table4" displayName="Table4" r="D18"
    connectionId="1">
    <xmlCellPr id="1" uniqueName="Name">
      <xmlPr mapId="1" xpath="/Root/EmployeeInfo/Name" xmlDataType="string"/>
    </xmlCellPr>
  </singleXmlCell>
</singleXmlCells>

```

end example]

18.16.1 DataBinding (XML Mapping)

This element contains properties which specify how the XML mapping should work.

[Example:

```
<DataBinding ConnectionID="1" FileBinding="true" DataBindingLoadMode="1"/>
```

end example]

[*Note:* This element is not intended to reintroduce transitional schema into the strict conformance class. *end note]*

Attributes	Description
ConnectionID (Reference to Connection ID)	<p>Specifies the Connection ID to the external connection in the External Data Connections part.</p> <p>Required if FileBinding is true.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
DataBindingLoadMode (XML Data Loading Behavior)	<p>Specifies the mode for loading XML data related to this DataBinding.</p> <p>Supported values are as follows:</p> <ul style="list-style-type: none"> 0 - None 1 - Normal 2 - Delay Load 3 - Asynchronous 4 - Object Model <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
DataBindingName (Unique Identifier)	<p>Specifies the data binding name. These shall be unique for each DataBinding.</p> <p>[<i>Example:</i> <pre><DataBinding DataBindingName="Binding1" FileBinding="true" FileBindingName="Binding1" DataBindingLoadMode="1"/></pre> <i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
FileBinding (Binding to External File)	<p>Specifies whether the data should be retrieved directly from an XML file. The path to the file is in the corresponding connection element</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
FileBindingName (File Binding Name)	<p>Specifies the file binding name. These shall be unique for each DataBinding.</p> <p>[<i>Example:</i> <pre><DataBinding DataBindingName="Binding1" FileBinding="true" FileBindingName="Binding1" DataBindingLoadMode="1"/></pre> <i>end example]</i></p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema string datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_DataBinding](#)) is located in §A.2. *end note*]

18.16.2 Map (XML Mapping Properties)

This element contains all of the properties related to the XML map, and the behaviors expected during data refresh operations.

[Example:

```
<Map ID="1" Name="Root_Map" RootElement="Root" SchemaID="Schema1"
  ShowImportExportValidationErrors="false" AutoFit="true" Append="false"
  PreserveSortAFLayout="true" PreserveFormat="true">
  <DataBinding ConnectionID="1" FileBinding="true" DataBindingLoadMode="1"/>
</Map>
```

end example]

Attributes	Description
Append (Append Data to Table)	Specifies whether XML data should overwrite or be appended to the end of the table or range of mapped cells when data is refreshed. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
AutoFit (AutoFit Table on Refresh)	Specifies whether columns should be resized to fit the XML data after a data refresh operation. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
ID (XML Mapping ID)	Specifies the ID of the XML map. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
Name (XML Mapping Name)	Specifies the name of the XML map. The possible values for this attribute are defined by the W3C XML Schema string datatype.
PreserveFormat (Preserve Cell	Specifies whether cell number formatting in the sheet should be preserved during data refresh operations, or whether the number formatting defined by the XML data type

Attributes	Description
Formatting)	<p>should be used.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
PreserveSortAFLay out (Preserve AutoFilter State)	<p>Specifies whether to keep the filter state of the Table or cell range intact during a data refresh.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
RootElement (Root Element Name)	<p>Specifies the names of the root XML element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
SchemaID (Schema Name)	<p>Specifies the unique name of the schema used for the mapping.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
ShowImportExport ValidationErrors (Show Validation Errors)	<p>Specifies whether XML schema validation errors should be displayed during data refresh or data export.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Map](#)) is located in §A.2. *end note*]

18.16.3 MapInfo (XML Mapping)

This element acts as the container for all of the XML schemas and maps attached to the SpreadsheetML document.

Attributes	Description
SelectionNamespaces (Prefix Mappings for XPath Expressions)	<p>Specifies namespaces for use in XPath expressions when it is necessary to define new namespaces externally. Namespaces are defined in the XML style, as a space-separated list of namespace declaration attributes</p> <p>[Example: The following example contains elements that belong to "a" and "b", in addition to elements that do not belong to any namespace.</p> <pre><?xml version="1.0"?> <root> <branch>branch</branch> <a:root xmlns:a="http://myserver.com"> <a:branch>a-branch</a:branch> <b:branch xmlns:b="http://yourserver.com"></pre>

Attributes	Description
	<pre> b-branch</b:branch> </a:root> </root> end example] This is used when writing Xpath expressions at runtime against the XML instance structures, because the Xpath expressions use namespace prefixes instead of the fully spelled out namespace. The possible values for this attribute are defined by the W3C XML Schema string datatype. </pre>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_MapInfo](#)) is located in §A.2. *end note*]

18.16.4 Schema (XML Schema)

This element contains the XML tree for an attached schema.

[*Note:* This element is not intended to reintroduce transitional schema into the strict conformance class. *end note*]

Attributes	Description
ID (Schema ID)	<p>Specifies the unique name or ID for this attached schema.</p> <p>[<i>Example:</i></p> <pre> ID = "Schema1" end example]</pre> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
Namespace (Schema Root Namespace)	<p>Specifies the namespace used by the schema.</p> <p>[<i>Example:</i></p> <pre> <MapInfo SelectionNamespaces="..."> <Schema ID="Schema1" Namespace="..."> end example]</pre> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
SchemaLanguage (Schema Language)	<p>Specifies the media type of the schema language.</p> <p>[<i>Example:</i></p>

Attributes	Description
	<p><Schema ... SchemaLanguage="application/relax-ng-compact-syntax"/></p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema token datatype.</p>
SchemaRef (Schema Reference)	<p>The schemaRef attribute is used in the specific case where the schema definition happens to include another schema file that contributes to the same namespace. The value of this attribute is the relative path to a "root" schema file on disk which in turn references the other schema files contributing type definitions to the same namespace.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Schema](#)) is located in §A.2. *end note*]

18.17 Formulas

18.17.1 Introduction

A SpreadsheetML *formula* is the syntactic representation of a series of calculations that is parsed or interpreted by the spreadsheet application into a function that calculates a value or array of values based upon zero-to-many inputs.

A formula is an expression that can contain the following: constants, operators, cell references, calls to functions, and names.

[Example: Consider the formula $\text{PI}()*(A2^2)$. In this case,

- $\text{PI}()$ results in a call to the function PI , which returns the value of π .
- The cell reference $A2$ returns the value in that cell.
- 2 is a numeric constant.
- The caret (^) operator raises its left operand to the power of its right operand.
- The parentheses, (and), are used for grouping.
- The asterisk (*) operator performs multiplication of its two operands.

end example]

18.17.2 Syntax

The syntax rules in this subclause follow the system shown in ISO/IEC 14977: literal text is surrounded by double-quotes (or by apostrophes); the left-square-bracket and right-square-bracket designate the start and end of an option; the left-curly-bracket and right-curly-bracket designate the start and end of a sequence of one-or-more items; the vertical-line indicates an alternative; and each rule ends with a semicolon. Whenever hyphen is used as the exception-symbol (as per ISO/IEC 14977), it is surrounded by white space, and further clarified by a comment.

The syntax rules below are modified by the context-sensitive rules stated in other subclauses of §18.17.*, as indicated by an EBNF comment of the form “(* see semantic rules at 18.17... *)”. [Note: Thus, in order to produce an automated verifier, the context-sensitive rules in subclauses 18.17.* must all be considered. The context-free syntax rules shown in this subclause provide an overview to assist comprehension by the reader, but do not represent the entirety of the context-sensitive rules. *end note*]

When used in narrative, production names are set in an italic style, as in *array-constant*, *expression*, and *function-name*.

The syntax of a formula is as follows:

```
formula=
    expression ;
expression=
    "(", expression, ")" |
    constant |
    prefix-operator, expression |
    expression, infix-operator, expression |
    expression, postfix-operator |
    cell-reference |
    function-call |
    name ;
```

where *expression* is an arbitrarily complex expression involving constants (§18.17.2.1), operators (§18.17.2.2), cell references (§18.17.2.3), calls to functions (§18.17.2.4), and names (§18.17.2.5).

A *token* is the minimal lexical element of a formula. The categories of tokens are: constants (except for *array-constant*), operators, cell references, function names, names, and punctuators. The *punctuators* are:

- Left parenthesis (() and right parenthesis ()) used for expression grouping and in a function call.
- Comma (,) used in a function call and an *array-constant*.
- Left brace ({ }, right brace (}), and semicolon (;) used in an *array-constant*.

In a formula, an arbitrary number of space characters (U+0020) can precede the first token or follow the final token. An arbitrary number of space characters can separate two adjacent tokens, except that no space characters shall separate a *function-name* from the left parenthesis (() that follows it. Such space characters

have no effect on the semantics of a formula; however, such spaces shall be distinguished from the space operator (§18.17.2.2).

All arithmetic terms in an *expression* are numbers that can be represented by the workbook's value space. For any given workbook, the default value space is IEC 60559's double precision. However, an implementation is permitted to override that default value space by use of the characteristics markup (§22.7). [*Example*: In the expression 1/3, although the operands appear to be integers, they are, in fact, floating-point numbers, and the result is 0.33..., not 0, as would result from integer division. *end example*]

As ranges of data are fundamental to spreadsheet calculations, many SpreadsheetML functions are able to take arrays as inputs and to return arrays as outputs. Based on whether the formula is an *array formula* or not, the way in which input ranges are interpreted and output values are understood to relate to cells sharing the formula can mean one of two things.

For an array formula: All range arguments are interpreted to be their full range. If the result of the formula is an array, the values of the array are meant to be returned across all of the cells in the sheet sharing the formula. (When the size of the range for an array formula exceeds in either dimension the size of the returned array, the excess cells take on a value of #N/A.)

For a normal (non-array) formula:

- Implicit intersection (§18.17.2.2) is performed on all arguments to functions except for those that allow a range.
- If the formula results in an array, only the first value from the array is returned to the cell.

Implicit intersection is determined as follows: When a range is passed to a function which expects only a single cell, a test is made to discover whether the calling cell intersects that range at any point horizontally or vertically. If it does, the cell at the point of intersection is passed to the function. [*Example*: The formula ABS(B1:B3) is entered into A2. Because the ABS function does not expect a range, implicit intersection is performed. A2 intersects B1:B3 horizontally on row 2, and so the value in B2 is passed into the function. *end example*]

The list of function arguments that allow a range is as follows:

- AND - all arguments
- AREAS – *reference* argument
- AVEDEV - all arguments
- AVERAGE - all arguments
- AVERAGEA - all arguments
- AVERAGEIF - all arguments except for *criteria*
- AVERAGEIFS - all arguments except for *criteria1*, *criteria2*, etc.
- CELL - *reference* argument
- CHITEST - all arguments
- COLUMN - all arguments

- COLUMNS - all arguments
- CORREL - all arguments
- COUNT - all arguments
- COUNTA - all arguments
- COUNTBLANK - all arguments
- COUNTIF - all arguments except *criteria*
- COUNTIFS - all arguments except for *criteria1, criteria2, etc.*
- COVAR - all arguments
- DAVERAGE - all arguments
- DCOUNT - all arguments
- DCOUNTA - all arguments
- DEVSQ - all arguments
- DGET - all arguments
- DMAX - all arguments
- DMIN - all arguments
- DPRODUCT - all arguments
- DSTDEV - all arguments
- DSTDEVP - all arguments
- DSUM - all arguments
- DVAR - all arguments
- DVARP - all arguments
- FORECAST - all arguments except for *x*
- FREQUENCY - all arguments
- FTEST - all arguments
- FVSCHEDULE - *schedule* argument
- GCD - all arguments
- GEOMEAN - all arguments
- GROWTH - all arguments
- HARMEAN - all arguments
- HLOOKUP - *table_array* argument
- IMPRODUCT - all arguments
- IMSUM - all arguments
- INDEX - *array* or *reference* argument
- INTERCEPT - all arguments
- LARGE - *array* argument
- LCM - all arguments
- LINEST - *known-xs* and *known-ys* arguments
- LOGEST - *known-xs* and *known-ys* arguments
- LOOKUP - all arguments except *lookup_value*
- MATCH - *lookup_array* argument

- MAX - all arguments
- MAXA - all arguments
- MDETERM – *array* argument
- MEDIAN - all arguments
- MIN - all arguments
- MINA - all arguments
- MINVERSE - all arguments
- MIRR - *values* argument
- MMULT - all arguments
- MODE - all arguments
- MULTINOMIAL - all arguments
- NETWORKDAYS - *holidays* argument
- NETWORKDAYS.INTL - *holidays* argument
- NPV - all arguments except *rate*
- OFFSET - *reference* argument
- OR - all arguments
- PEARSON - all arguments
- PERCENTILE - *array* argument
- PERCENTRANK - *array* argument
- PROB - *x_range* and *prob_range* arguments
- PRODUCT - all arguments
- QUARTILE – *array* argument
- RANK - *ref* argument
- ROW – *reference* argument
- ROWS – *array* argument
- RSQ - all arguments
- SKEW - all arguments
- SLOPE - all arguments
- SMALL - *array* argument
- STDEV - all arguments
- STDEVA - all arguments
- STDEVP - all arguments
- STDEVPA - all arguments
- STEYX - all arguments
- SUBTOTAL - all arguments except *function_num*
- SUM - all arguments
- SUMIF - all arguments except *criteria*
- SUMIFS - all arguments except *criteria1*, *criteria2*, etc.
- SUMPRODUCT - all arguments
- SUMSQ - all arguments

- SUMX2MY2 - all arguments
- SUMX2PY2 - all arguments
- SUMXMY2 - all arguments
- TRANSPOSE – all arguments
- TREND – all arguments except *const-flag*
- TRIMMEAN – *array* argument
- TRUNC – *x* argument
- TTEST – *array-1* and *array-2* arguments
- TYPE – all arguments
- VALUE – all arguments
- VAR – all arguments
- VARA – all arguments
- VARP – all arguments
- VARPA – all arguments
- VLOOKUP – *table-array* argument
- WORKDAY – *holidays* argument
- WORKDAY.INTL – *holidays* argument
- XIRR – all arguments except *guess*
- XNPV – all arguments except *rate*
- ZTEST – *array* argument

[Example: Here are some formulas taking array constants and ranges:

- $(B2:B4*C2:C4)+10.5$ performs three calculations: $(B2*C2)+10.5$, $(B3*C3)+10.5$, and $(B4*C4)+10.5$.
- $SQRT(\{1, 2, 3, 4\})$ returns 1 when entered normally.
- $SQRT(\{1, 2, 3, 4\})$ returns 1 when used in an array formula in a single cell, but if the array formula spans four or more contiguous cells in a row, it will return 1, 1.41, 1.73, and 2 in the first four cells, respectively, and #N/A in any additional cells in the horizontal range spanned by the array formula. (For display purposes, the values returned have been truncated to two decimal places.)
- $SUM(SQRT(\{1, 2, 3, 4\}))$ returns 6.14 when entered normally; when used in an array formula, the intermediate calculation (in this instance performed by the SQRT function) is performed upon each element of the array.

With A1:A4 holding the values 1, 2, 3, and 4, respectively:

- $SQRT(A1:A4)$ entered normally will do implicit intersection if it is in any of the rows 1–4, and return the SQRT of the number in the same row.
- $SQRT(A1:A4)$ returns 1 when used in an array formula in a single cell, since it does not do implicit intersection in this case. If it is used in an array formula spanning multiple contiguous cells in a column, it will return 1, 1.41, 1.73, 2, #N/A, ..., respectively, in the cells in its vertical output range. *end example]*

18.17.2.1 Constants

A *constant* represents a fixed value that can be used in the calculation of a formula. A constant has the following form:

```

constant=
  error-constant |
  logical-constant |
  numerical-constant |
  string-constant |
  array-constant ;
error-constant=
  "#DIV/0!" | "#N/A" | "#NAME?" | "#NULL!" |
  "#NUM!" | "#REF!" | "#VALUE!" | "#GETTING_DATA" ;
logical-constant=
  "FALSE" | "TRUE" ;
numerical-constant=
  whole-number-part, [full-stop], [exponent-part] |
  full-stop, fractional-part, [exponent-part] |
  whole-number-part, full-stop, fractional-part [exponent-part] ;
full-stop=
  "." ; (* also known as "period" *)
whole-number-part=
  digit-sequence ;
fractional-part=
  digit-sequence ;
exponent-part=
  "e" [ sign ] digit-sequence |
  "E" [ sign ] digit-sequence ;
sign=
  "+" |
  "-" ;
digit-sequence=
  decimal-digit, {decimal-digit} ;
decimal-digit=
  "0" | "1" | "2" | "3" | "4" |
  "5" | "6" | "7" | "8" | "9" ;
string-constant=
  double-quote, [string-chars], double-quote ;
double-quote=
  '"' ; (* one double-quote character*)
string-chars=
  string-char, {string-char} ;

```

```

string-char=
  '""' | (* consecutive double-quotes, with no space between them *)
  character - double-quote ; (* any character except double-quote *)
character=
  as defined by the production Char in the XML 1.0 specification, §2.2.

```

[*Example*: =\$A\$1/3 divides the value in A1 by the constant value three; =\$A\$1&"a" appends the constant string "a" to the string representation of the contents of cell A1. *end example*]

To include a double-quote character (") in *string-chars*, precede it with another double-quote character.

[*Example*: "ab""cd" contains the characters ab"cd, and """"abcd"""" contains the characters "abcd". *end example*]

An *array constant* is a list of one or more constants organized in one or two dimensions, and delimited by braces. An array constant has the following form:

```

array-constant=
  "{", constant-list-rows, "}" ;
constant-list-rows=
  constant-list-row, { semicolon, constant-list-row } ;
semicolon=
  ";" ;
constant-list-row=
  constant, { comma, constant } ;

```

An *array-constant* shall not contain

- An *array-constant*.
- Columns or rows of unequal length.

Any *numerical-constant* in an *array-constant* can be preceded immediately by a *prefix-operator*.

The *constants* in an *array-constant* can have different types.

[*Guidance* An implementation is encouraged to not unnecessarily limit the number of rows and columns in an *array-constant*. *end guidance*]

[*Example*: {1,3.5,TRUE,"Hello"} is a 1x4 array of constants.

To represent the values 10, 20, 30, and 40, as a 1x4 array, use {10,20,30,40}.

To represent the values 10, 20, 30, and 40 in the first row, and 50, 60, 70, and 80 in the second row, use the following 2x4 array constant: {10,20,30,40;50,60,70,80}. *end example*]

error-constant is described in §18.17.3.

Each *constant* has a corresponding type (§18.17.2.6), as follows:

Constant Form	Type
<i>array-constant</i>	array
<i>error-constant</i>	error
<i>logical-constant</i>	logical
<i>numerical-constant</i>	number
<i>string-constant</i>	text

In the context of cell formulas and values in SpreadsheetML, the following definition of precision shall apply:

By default, default representation of precision shall be as defined by the XML schema double type:
<http://www.w3.org/TR/xmlschema-2/#double>. The default is therefore 53-bits of mantissa precision.

An application that uses XML schema double can optionally state the precision in the Additional Characteristics part by writing out the number of bits in the mantissa and exponent.

A compliant consumer shall parse numbers of arbitrary precision without error.

18.17.2.2 Operators

An *operator* is a symbol that specifies the type of operation to perform on one or more operands. There are arithmetic, comparison, text, and reference operators.

operator=

":" | comma | space | "^" | "*" | "/" | "+" | "-"
 | "&" | "=" | "<>" | "<" | "<=" | ">" | ">=" | "%" ;

infix-operator=

":" | comma | space | "^" | "*" | "/" | "+" | "-" | "&"
 | "=" | "<>" | "<" | "<=" | ">" | ">=" ;

postfix-operator=

"%" ;

prefix-operator=

"-" ;

The *operators* permitted in *expression* are:

Operators			
Family	Operator	Description	Precedence
Reference operators	:	Binary range operator, which takes two cell reference (§18.17.2.3) operands, and results in one reference to the cells inclusive of, and between, those references. [Example: SUM(B5:C15), which references 11 cells. end example]	highest
	,	Binary union operator, which takes two cell reference (§18.17.2.3) operands, and results	

Operators			
		in one reference to all those, possibly non-contiguous, cells. [<i>Example</i> : SUM((B5:B15,D5:D15))], which references 22 cells, 11 from column B, and 11 from column D. The grouping parentheses are necessary to indicate that the comma is an operator rather than a punctuator separating two arguments. <i>end example</i>]	
	space	Binary intersection operator, which takes two cell reference (§18.17.2.3) operands, and results in one reference to those, possibly non-contiguous, cells that are common. If the intersection is empty, the result is #NULL!. [<i>Example</i> : ((B1:C1) (C1:D1)) results in a reference to C1, while ((B1:D1) (B1,D1)) results in a single reference to B1 and D1. <i>end example</i>]	
Arithmetic operators	-	Unary minus	
	%	Percentage (unary postfix), which divides its operand by 100. [<i>Example</i> : 10.5%, which results in 0.105. <i>end example</i>]	
	^	Exponentiation	
	*	Multiplication	
	/	Division	
	+	Addition	
	-	Subtraction	
Text operator	&	Text concatenation (Each of the two operands is converted to text, if necessary, before concatenation.)	
Comparison operators	=	Equal-to	lowest
	<>	Not-equal-to	
	<	Less-than	
	<=	Less-than or equal-to	
	>	Greater-than	
	>=	Greater-than-or-equal-to	

expression can contain grouping parentheses to document the default precedence or to override it.

operators in *expression* having the same precedence associate left-to-right.

[*Example*: Given that cell E38 contains the value 4, and cell F38 contains the value 2, the formula

$$((-1+E38^2)*3-F38)/2$$

produces the result 21.5. *end example*]

The comparison operators yield TRUE for true and FALSE for false. An expression with value 0 tests logically false while one with any non-zero numeric value tests true.

For any given operator in an expression, if only one operand is an error value, the result is that error value. If more than one operand has an error value and those error values are the same, the result is that error value. If more than one operand has an error value and those error values are not all the same, as to which of those error values is used as the result is unspecified.

If the semantics of an operator having a given operand are not specified by ECMA-376, the result is #VALUE!.

[*Example*: "abc"+1 results in #VALUE!, and "abc"/0 results in #VALUE! rather than #DIV/0!. *end example*]

18.17.2.3 Cell References

Each set of horizontal cells in a worksheet is a *row*, and each set of vertical cells is a *column*. A cell's row and column combination designates the location of that cell. [*Guidance* An implementation is encouraged to not unnecessarily limit the number of rows and columns in a worksheet. *end guidance*]

A *cell reference* designates one or more cells on the same worksheet. Using references, one can:

- Use data contained in different parts of the same worksheet in a single formula.
- Use the value from a single cell in several formulas.
- Refer to cells on other sheets in the same workbook, and even to other workbooks. (References to cells in other workbooks are called *links*.)

A cell reference has the following form:

```
cell-reference=
  name          |
  [work-sheet-prefix] A1-reference      |
  [work-sheet-prefix] A1-reference, ":" , A1-reference      |
  [work-sheet-prefix] R1C1-reference    |
  [work-sheet-prefix] R1C1-reference, ":" , R1C1-reference    ;
work-sheet-prefix=
  work-sheet-prefix-special |
  sheet-name, "!"          |
  sheet-name, ":", sheet-name, "!" |
  "[", workbook-name, "]", sheet-name, ":", sheet-name, "!" ;
```

```

work-sheet-prefix-special=
    apostrophe, sheet-name-special, apostrophe, "!" |
    apostrophe, sheet-name-special, ":",
        sheet-name-special, apostrophe, "!" |
    apostrophe, "[", workbook-name-special, "]",
        sheet-name-special, apostrophe, "!" |
    apostrophe, "[", workbook-name-special, "]",
        sheet-name-special, ":", sheet-name-special,
        apostrophe, "!" ;

workbook-name=
    book-name-characters ;
book-name-characters=
    book-name-character, {book-name-character} ;
book-name-character=
    character - (operator | apostrophe | "[" | "]" | "?") ;
    (* any character except operator or ', [, ], or ? *)
apostrophe=
    "'" ; (* one apostrophe character *)
sheet-name=
    sheet-name-characters ;
sheet-name-character=
    character - (operator | apostrophe | "[" | "]" | "\" | "?") ;
    (* any character except operator or ', [, ], \, or ? *)
sheet-name-characters=
    sheet-name-character, {sheet-name-character} ;
workbook-name-special=
    book-name-start-character-special,
    [ book-name-characters-special ];
book-name-start-character-special=
    character - (apostrophe | "*" | "[" | "]" | ":" | "?") ;
    (* any character, including operator, except ', *, [, ], :, or ? *)
book-name-characters-special=
    book-name-character-special, {book-name-character-special} ;
book-name-character-special=
    apostrophe, apostrophe |
    character - (apostrophe | "*" | "[" | "]" | ":" | "?") ;
    (* any character, including operator, except ', *, [, ], :, or ? *)
sheet-name-special=
    sheet-name-start-character-special,
    [ [sheet-name-characters-special], sheet-name-end-character-special] ;

```

```

sheet-name-start-character-special=
  character - (apostrophe | "*" | "[" | "]" | "\" | ":" | "/"
              | "?") ;
  (* any character, including operator, except ', *, [, ], \, :, /, or ? *)
sheet-name-end-character-special=
  sheet-name-start-character-special ;
sheet-name-characters-special=
  sheet-name-character-special, {sheet-name-character-special} ;
sheet-name-character-special=
  apostrophe, apostrophe |
  character - (apostrophe | "*" | "[" | "]" | "\" | ":" | "/"
              | "?") ;
  (* any character, including operator, except ' *, [, ], \, :, /, or ? *)

```

A *relative cell reference* is based on the relative position of the cell that contains the formula and the cell to which the reference refers. If the position of the cell that contains the formula changes, the reference is changed along with it.

An *absolute cell reference* always refers to the absolute location of a cell. If the position of the cell that contains the formula changes, the absolute reference remains the same.

A *mixed cell reference* has either an absolute column and relative row, or an absolute row and relative column.

A *link or external reference* to a workbook is a reference that specifies the location of the workbook, including file or network path, book name, sheet name, and cell reference. Instead of writing the full file path or network location and workbook name directly in the f (formula) element, in order to make all external references more accessible, the workbook name shall be written in a Relationship part according to the Relationships semantic:

- Type shall be set to `http://purl.oclc.org/ooxml/officeDocument/relationships/externalLinkPath`,
- Target shall specify the full file path and file name, and
- TargetMode shall be set to `External`.

Additionally, in order to support the possibility that the external workbook is offline or otherwise inaccessible, a cache of the relevant sheet values in the referenced external workbook shall be stored within the referencing workbook according to §18.14.

This Supplementary Workbook Data part shall be the source part of the relationship that points to the external workbook as a target resource, and the Id of this relationship shall be referenced within the markup of the Supplementary Workbook Data part, using the `externalBook` element (§18.14.7).

The Supplementary Workbook Data part shall also be the target of a relationship whose source is the Workbook part (§18.2). The markup within the Workbook part shall reference this relationship Id using the `externalReference` element (§18.2.8).

Finally, a 1-based index referencing an externalReference within the collection externalReferences shall be written inline within the formula expression containing the reference to the external workbook. The index in this context shall be enclosed within square brackets, i.e.; left square bracket ([), followed by the index, followed by a right square bracket (]).

In this way, external resource files can more easily be accessed and updated.

[Example:

Consider the formula =SUM('C:\[Source.xlsx]Sheet1'!\$A\$1:\$A\$3)

This formula is expressed in the f element (formula) like this:

```
<f>SUM([1]Sheet1!$A$1:$A$3)</f>
```

The external reference to another workbook in this case is tokenized to [1]. The value inside the brackets is a 1-based index to the externalReferences collection in the workbook part, referencing a specific externalReference element.

The corresponding content of externalReferences in the workbook part is:

```
<externalReferences>
  <externalReference r:id="rId4"/>
</externalReferences>
```

The workbook part's externalReferences collection indicates that there is an external workbook reference in this workbook. The Supplementary Workbook Data cache, also stored in this workbook, can be found by following the relationship from the workbook whose id value is rId4.

That particular relationship (rId4) is expressed as:

```
<Relationship Id="rId4" Type=
"http://purl.oclc.org/ooxml/officeDocument/relationships/externalLinkPath"
Target="externalLinks/externalLink1.xml"/>
```

The above relationship indicates that the formula is supported by the Supplementary Workbook Data cache located at externalLinks/externalLink1.xml in the package.

The corresponding content in externalLink1.xml follows the markup specified in §18.14, Supplementary Workbook Data. The externalBook element in that markup indicates the id of the relationship that points from the source part externalLink1.xml to the location of the actual external workbook:

```
<externalBook xmlns:r="http://purl.oclc.org/ooxml/officeDocument/relationships"
r:id="rId1">
```

That relationship (rId1) is shown here:

```
<Relationship Id="rId1" Type=
"http://purl.oclc.org/ooxml/officeDocument/relationships/externalLinkPath"
Target="file:///C:/Source.xlsx" TargetMode="External"/>
```

This relationship indicates that the external workbook that the formula references resides on a local drive, at c:\source.xlsx. *end example*

It is possible to process the same cell or set of cells on multiple worksheets within a workbook, using a 3-D *reference*. A reference of this type is made up of the cell reference, preceded by a range of worksheet names, and an exclamation mark character (!), in that order. A 3-D reference can be used to refer to cells on other sheets, to defined names, and to create formulas by using the following functions: AVERAGE, AVERAGEA, COUNT, COUNTA, MAX, MAXA, MIN, MINA, PRODUCT, STDEV, STDEVA, STDEVP, STDEVPA, SUM, VAR, VARA, VARP, and VARPA.

3-D references shall not be used in array formulas.

By default, a cell reference is understood to refer to one or more cells in the current worksheet. However, a cell reference can be preceded by its parent worksheet name and an exclamation mark (!), in that order. This allows cells in one worksheet to be referenced in another worksheet of the same workbook. [*Example*: The cell reference `MonthlyTotals!D1:D12` might be used from within a sibling (or the same) worksheet of `MonthlyTotals` to refer to those 12 cells. *end example*]

An *area* is a set of rectangular-shaped contiguous cells. An area can be a single cell. [*Example*: `A5` and `B6:C10` each designate one area, and `D3:D5, E12:F15` designates two areas (the comma (,) being the union operator). *end example*] [*Note*: The number of areas designated by a cell reference can be obtained by calling the function `AREAS` (§18.17.7.10). *end note*]

There are two cell reference styles: `A1` (§18.17.2.3.1) and `R1C1` (§18.17.2.3.2).

18.17.2.3.1 A1-Style Cell References

A cell reference using the A1 reference style has the following form:

```
A1-reference=
  A1-column, ":", A1-column    |
  A1-row, ":", A1-row         |
  A1-column, A1-row ;
A1-column=
  A1-relative-column |
  A1-absolute-column ;
A1-relative-column=
  letter, {letter} ; (* see semantic rules at 3.17.2.3.1 *)
```

```

letter=
  "a"|"b"|"c"|"d"|"e"|"f"|"g"|"h"|"i"|"j"|"k"|"l"|"m"|
  "n"|"o"|"p"|"q"|"r"|"s"|"t"|"u"|"v"|"w"|"x"|"y"|"z"|
  "A"|"B"|"C"|"D"|"E"|"F"|"G"|"H"|"I"|"J"|"K"|"L"|"M"|
  "N"|"O"|"P"|"Q"|"R"|"S"|"T"|"U"|"V"|"W"|"X"|"Y"|"Z" ;
A1-absolute-column=
  "$", A1-relative-column ;
A1-row=
  A1-relative-row |
  A1-absolute-row ;
A1-relative-row=
  digit-sequence ; (* shall be non-zero; see 3.17.2.3.1 *)
A1-absolute-row=
  "$", A1-relative-row ;

```

In this style, each row has a numeric heading numbered sequentially from the top down, starting at 1. Each column has an alphabetic heading named sequentially from left-to-right, A–Z, then AA–AZ, BA–BZ, ..., ZA–ZZ, AAA–AAZ, ABA–ABZ, and so on. Column letters are not case-sensitive.

A relative reference to a single cell is written as its column letter immediately followed by its row number. A relative reference to a whole row is written as its row number. A relative reference to a whole column is written as its column letter. A reference to a range of two or more cells is written as two single-cell references separated by the binary range operator (:). An absolute A1 reference is made up of a cell's column letter followed by its row number, with each being preceded by a dollar character (\$). [*Example*: A2, B34, and B5:D8 are relative A1 references. \$A\$2, \$B\$34, and \$B\$5:\$D\$8 are absolute A1 references. \$A2, B\$34, and \$B5:D\$8 are mixed A1 references. *end example*]

[*Example*: SUM(Sheet2:Sheet13!B5) adds all the values contained in cell B5 on all the worksheets between and including Sheet2 and Sheet13. *end example*]

For rules on how deal with potential ambiguities between cell references and defined names, see §18.17.5.1.

18.17.2.3.2 R1C1-Style Cell Reference

A cell reference using the R1C1 reference style has the following form:

```

R1C1-reference=
  R1C1-row-only      |
  R1C1-column-only   |
  R1C1-row, R1C1-column ;
R1C1-row-only=
  "R", R1C1-absolute-number, |
  "R[", R1C1-relative-number, "]" ;

```



```

R1C1-row=
  R1C1-relative-row |
  R1C1-absolute-row ;
R1C1-relative-row=
  "R[", R1C1-relative-number, "]" ;
R1C1-absolute-row=
  "R" |
  "R", R1C1-absolute-number ;
R1C1-column-only=
  "C", R1C1-absolute-number |
  "C[", R1C1-relative-number, "]" ;
R1C1-column=
  R1C1-relative-column |
  R1C1-absolute-column ;
R1C1-relative-column=
  "C[", R1C1-relative-number, "]" ;
R1C1-absolute-column=
  "C" |
  "C", R1C1-absolute-number ;
R1C1-relative-number=
  ["-"], digit-sequence ;
R1C1-absolute-number=
  digit-sequence ; (* shall be non-zero; see 3.17.2.3.2 *)

```

In this style, each row has a numeric heading numbered sequentially from the top down, starting at 1. Each column has a numeric heading numbered sequentially from left-to-right, starting at 1.

A whole row is referenced by omitting the column, and a whole column is referenced by omitting the row. An absolute row or column reference uses absolute row or column numbers, respectively. A relative row or column reference uses, respectively, row or column offsets from the cell containing the formula, with a negative offset indicating a row to the left or a column above, and a positive offset indicating a row to the right or a column below. Specifying an offset of zero is equivalent to omitting that offset and its delimiting brackets. *[Example: R[-2]C refers to the cell two rows up and in the same column, R[2]C[2] refers to the cell two rows down and two columns to the right, R2C2 refers to the cell in the second row and in the second column, R[-1] refers to the entire row above the active cell, and R refers to the current row. end example]*

The R1C1 alternate reference style can only be used at runtime. See §18.17.6.1 for XML-related details.

18.17.2.4 Functions

A *function* is a named formula that takes zero or more arguments, performs an operation, and, optionally, returns a result. A function call has the following form:

```

function-call=
  function-name, "(", [argument-list], ")" ;

```

```

function-name=
    prefixed-function-name      |
    predefined-function-name    |
    user-defined-function-name  ;
predefined-function-name=
    "ABS" | "ACOS" | "ACOSH"
    | ( any of the other functions defined in §18.17.7) ;
prefixed-function-name=
    "ISO.", predefined-function-name |
    "ECMA.", predefined-function-name
user-defined-function-name=
    letter, [ user-defined-name-characters ] ;
user-defined-name-characters=
    user-defined-name-character, {user-defined-name-character} ;
user-defined-name-character=
    letter | decimal-digit | full-stop ;
argument-list=
    argument, { comma, argument } ;
comma=
    "," ;
argument=
    expression ;

```

predefined-function-names and *user-defined-function-names* are not case-sensitive.

A *user-defined-function-name* shall not have any of the following forms:

- TRUE or FALSE
- *name*
- *cell-reference*

[*Guidance*: An implementation is encouraged to support *user-defined-function-names* at least as long as 255 characters. *end guidance*]

The semantics of a call to a function having a *user-defined-function-name* are unspecified.

[*Example*: Here are some function calls: PI(), POWER(A1,B3), and SUM(C6:C10). *end example*]

An argument to a function can be a call to a function. That is, function calls can nest. [*Guidance* An implementation is encouraged to support at least 64 levels of nested function calls. *end guidance*]

Some functions take a variable number of arguments. This is indicated in the Syntax sections of §18.17.7 by their having *argument-list* as all, or the trailing part, of their argument list. The total number of arguments that shall be passed to such functions is at least 1.

[*Guidance* An implementation is encouraged to support function calls having at least 255 arguments. *end guidance*]

Expressions can have one or more values. Scalar expressions designate a single value, and cell references and array constants can designate multiple values. In the case of a multi-value expression, the way in which this is handled by a function when passed as an argument depends on a number of factors.

Most functions and operators expect either single- or multi-valued arguments and perform all of the array calculations whenever multi-valued arguments are present. [*Example*: `SQRT({1;2;3;4})`; see the examples in §18.17.2. *end example*]

When a function expects a single-valued argument but a multi-valued expression is passed, an attempt can be made to convert that set of values to a single value. For an array value or constant, the value of the expression is the value of the first element within that array value or constant. For a cell range, the first element can be used, or implicit intersection can be performed—the exact behavior is unspecified.

When a function expects a multi-valued argument but a single-valued expression is passed, that single-valued argument is treated as a 1x1 array.

For rules on how deal with potential ambiguities between function names and defined names, see §18.17.5.1.

18.17.2.5 Names

A *name* is an alias for a constant, a cell reference, or a formula. [*Note*: A name in a formula can make it easier to understand the purpose of that formula. For example, the formula `SUM(FirstQuarterSales)` is easier to identify than `SUM(C20:C30)`. *end note*]

Here is the syntax for *name*:

```
name=
  [ workbook-name, "!" ], name-start-character, [ name-characters ] ;
name-start-character=
  letter | underscore | backslash ;
underscore=
  "_" ;
backslash=
  "\" ;
name-characters=
  name-character, {name-character} ;
name-character=
  letter | decimal-digit | underscore | full-stop ;
```

names are not case-sensitive.

All *names* within a workbook shall be unique. If the same *names* are defined in two workbooks, both *names* can be used in the same context by prefixing them with their corresponding workbook name and an exclamation

mark (!). [Example: SUM(Sales.xlsx!ProjectedSales) refers to the named range ProjectedSales in the workbook named Sales.xlsx. end example]

A *name* shall not have any of the following forms:

- TRUE or FALSE
- *user-defined-function-name*
- *cell-reference*

[Guidance An implementation is encouraged to support *names* at least as long as 255 characters. end guidance]

For rules on how deal with potential ambiguities between function names and defined names, or between cell references and defined names, see §18.17.5.1.

18.17.2.6 Types and Values

Each *expression* has a type. SpreadsheetML formulas support the following types: array, error, logical, number, and text.

An array value or constant represents a collection of one or more elements, whose values can have any type (i.e., the elements of an array need not all have the same type).

An error value (§18.17.3) or constant represents an error, and can have any value defined for *error-constant* (§18.17.2.1).

A logical value or constant represents a truth value, and can have any value defined for *logical-constant* (§18.17.2.1).

A numeric value or constant represents a real number, and can have any value defined for *numeric-constant* (§18.17.2.1). The term "number" is used as a generic name for any expression of type *number*.

A text value or constant represents arbitrary text, and can have any value defined for *string-constant* (§18.17.2.1). The term "string" is used as a generic name for any expression of type *text*.

An implementation is permitted to provide an implicit conversion from *string-constant* to number. However, the rules by which such conversions take place are implementation-defined. [Example: An implementation might choose to accept "123"+10 by converting the string "123" to the number 123. Such conversions might be locale-specific in that a *string-constant* such as "10,56" might be converted to 10.56 in some locales, but not in others, depending on the radix point character. end example]

[Guidance An implementation is encouraged to support strings at least as long as 32,767 characters. end guidance]

A complex number is represented as a string in one of two equivalent text formats: $x + yi$ or $x + yj$, where x is the real part, and y is the imaginary part. [Example: "3+4i" and "-2.5-34.6j" end example]

18.17.2.7 Single- and Array Formulas

A formula can either be a single-cell formula, or an array formula.

A single-cell formula is applied to a single cell while an array formula is applied to a range of cells as a group.

When a single-cell formula results in a single value, the designated cell takes on that value. [*Example: When cell A10 contains $\text{SIN}(0.3)$, the result stored in that cell is 0.295520207 . end example*]

When a single-cell formula results in multiple values, the designated cell takes on the first of those values. [*Example: When cell A10 contains $\text{SIN}(\{0.3, 0.4, 0.5\})$, the result stored in that cell is 0.295520207 ($\text{SIN}(0.3)$). end example*]

Array formulas are an extension of the formula paradigm. They allow for combining of several formula operations into one, and the returning of multiple results. Array formulas span one or more cells. There are three primary functions that array formulas perform:

2. Returning multiple results from one single function call. [*Example: the function LINEST returns an array of several results, and, therefore, ought to be spanned across several cells as an array formula in order to display those results. end example*]
3. Executing one formula several times to generate an array of results. [*Example: The array formula $\text{SIN}(A1:A3)$ returns an array with three elements, those being the sines of A1, A2 and A3, respectively. end example*]
4. Returning one single result from an operation that incorporated arrays as an intermediate step. [*Example: The array formula $\text{SUM}(\text{SIN}(A1:A3))$ returns a single result, that being the SUM of the sines of A1, A2 and A3, respectively. end example*]

When an array formula results in a single value, all of the cells spanned by the array formula take on that value. [*Example: When the group of cells A10:A12 contains $\text{SIN}(0.3)$, the result stored in each of those cells is 0.295520207 . end example*]

When an array formula results in multiple values, the designated cells take on corresponding values, according to the shape of the cell group and the values. Specifically,

- If the cell group and values have the same shape (i.e., the same number of rows and columns), each cell takes on the value corresponding to its relative position.
- If the cell group has fewer columns than the values, the left-most columns of the values are stored in the cells.
- If the cell group has fewer rows than the values, the top-most rows of the values are stored in the cells.
- If the cell group has more columns than the values, each cell takes on the value corresponding to its relative position, except that
 - For a cell group $1 \times N$ array or a two-dimensional array, the excess right-most cells take on an unspecified value.
 - For a cell group $N \times 1$ array, the excess columns are clones of the first column.

- If the cell group has more rows than the values, each cell takes on the value corresponding to its relative position, except that:
 - For a cell group Nx1 array or a two-dimensional array, the excess bottom-most cells take on an unspecified value.
 - For a cell group 1xN array, the excess rows are clones of the first row.

[Example: Case 1: The 1x3 group of cells A20:C20 has applied to it the array formula $\text{SIN}(\{0.3, 0.4, 0.5\})$. The number of rows and columns in the group exactly matches the number of rows and columns in the result. Those cells then contain 0.295520207, 0.389418342, and 0.479425539, which correspond to $\text{SIN}(0.3)$, $\text{SIN}(0.4)$, and $\text{SIN}(0.5)$, respectively.

Case 2: The 1x2 group of cells A20:B20 has applied to it the array formula $\text{SIN}(\{0.3, 0.4, 0.5\})$. The number of columns in the group is less than the number of columns in the result. (The number of rows is the same in each.) Those cells then contain 0.295520207 and 0.389418342, which correspond to $\text{SIN}(0.3)$ and $\text{SIN}(0.4)$, respectively, the left-most part of the set of values.

Case 3: The 1x4 group of cells A20:D20 has applied to it the array formula $\text{SIN}(\{0.3, 0.4, 0.5\})$. The number of columns in the group is greater than the number of columns in the result. (The number of rows is the same in each.) Those cells then contain 0.295520207, 0.389418342, 0.479425539, and an unspecified value, which correspond to $\text{SIN}(0.3)$, $\text{SIN}(0.4)$, and $\text{SIN}(0.5)$, respectively, with the fourth value being unspecified.

Case 4: The 2x2 group of cells A30:B31 has applied to it the array formula $\text{SIN}(\{0.1, 0.2, 0.3\})$. The number of columns in the group is less than the number of columns in the result. As a result, the cells in row 30 contain 0.295520207 and 0.389418342, which correspond to $\text{SIN}(0.3)$ and $\text{SIN}(0.4)$, respectively. The number of rows in the group is greater than the number of rows in the result, so the cells in 31 are a copy of the cells in row 30. The left-most part of the set of values is propagated into the cells.

Case 5: The 2x2 group of cells A40:B41 has applied to it the array formula $\text{SIN}(\{0.1, 0.2, 0.3; 0.4, 0.5, 0.6; 0.7, 0.8, 0.9\})$. The number of columns in the group is less than the number of columns in the result. As a result, the left-most column values are stored. The number of rows in the group is less than the number of rows in the result. As a result, the top-most column values are stored. *end example*]

18.17.3 Error values

The evaluation of an expression can result in an error having one of a number of *error values*. These error values are:

Error Value	Reason for Occurrence
#DIV/0!	Intended to indicate when any number (including zero) or any error code is divided by zero.
#GETTING_DATA	Intended to indicate when a cell reference cannot be evaluated because the value for the cell has not been retrieved or calculated. [Note: This can happen when connected to an OLAP cube. <i>end note</i>]

Error Value	Reason for Occurrence
	This error constant differs from #N/A in that #GETTING_DATA is used when there is an expectation that the value for the cell will eventually be available, whereas #N/A is used when there is no such expectation.
#N/A	Intended to indicate when a designated value is not available. [Example: Some functions, such as SUMX2MY2, perform a series of operations on corresponding elements in two arrays. If those arrays do not have the same number of elements, then for some elements in the longer array, there are no corresponding elements in the shorter one; that is, one or more values in the shorter array are not available. end example] This error value can be produced by calling the function NA (§18.17.7.223).
#NAME?	Intended to indicate when what looks like a name is used, but no such name has been defined. [Example: XYZ/3, where XYZ is not a defined name. Total is & A10, where neither Total nor is is a defined name. Presumably, "Total is " & A10 was intended. SUM(A1C10), where the range A1:C10 was intended. end example]
#NULL!	Intended to indicate when two areas are required to intersect, but do not. [Example: In the case of SUM(B1 C1), the space between B1 and C1 is treated as the binary intersection operator, when a comma was intended. end example]
#NUM!	Intended to indicate when an argument to a function has a compatible type, but has a value that is outside the domain over which that function is defined. (This is known as a <i>domain error</i> .) [Example: Certain calls to ASIN, ATANH, FACT, and SQRT might result in domain errors. end example] Intended to indicate that the result of a function cannot be represented in a value of the specified type, typically due to extreme magnitude. (This is known as a <i>range error</i> .) [Example: FACT(1000) might result in a range error. end example]
#REF!	Intended to indicate when a cell reference cannot be evaluated. [Example: If a formula contains a reference to a cell, and then the row or column containing that cell is deleted, a #REF! error results. If a worksheet does not support 20,001 columns, OFFSET(A1,0,20000) will result in a #REF! error. end example]
#VALUE!	Intended to indicate when an incompatible type argument is passed to a function, or an incompatible type operand is used with an operator. [Example: In the case of a function argument, text was expected, but a number was provided end example]

Each error value has a corresponding *error-constant* (§18.17.2.1).

[Note: A number of functions operate on error values: They include ERROR.TYPE (§18.17.7.110), ISERR (§18.17.7.175), ISERROR (§18.17.7.176), and ISNA (§18.17.7.179). end note]

18.17.4 Dates and Times

Dates and times in cells in SpreadsheetML are stored as strings, using the ISO 8601 lexical formats defined below.

The earliest date permitted is 0001-01-01, 00:00. The latest date permitted is 9999-12-31, 23:59:59.999. The time midnight shall be expressed always with hour component 0 and not with hour component 24. Leap seconds are not permitted – the maximum number of seconds expressed in a minute shall be 60.

Values with only a date component shall be expressed using the Complete, Extended Format Calendar Date representation, as defined in ISO 8601, §B.1.1 and §B2.1.

[*Example:* The date 5 October 1975 is expressed in SpreadsheetML as

1975-10-05

end example]

Values with only a time-of-day component shall be expressed using the Complete, Extended Format Time Of Day representation, as defined in ISO 8601, §B.1.2 and §B2.2. The decimal separator shall be a full stop (period), and fractional seconds shall be expressed with no more than three decimal places.

[*Example:* The time-of-day 08:30 can be expressed in the following ways within SpreadsheetML:

08:30

08:30:00

08:30:00.000

end example]

Values with both date and time-of-day components shall be expressed using the Complete, Extended Format Calendar Date and Time Of Day representation, as defined in ISO 8601, §B.1.3 and §B2.3. For the time component, only seconds may use a decimal separator, the decimal separator shall be a full stop (period) and fractional seconds shall be expressed with no more than three decimal places.

[*Example:* The date 22 November 1976 at local time 08:30 can be expressed in the following ways within SpreadsheetML:

1976-11-22T08:30

1976-11-22T08:30:00

1976-11-22T08:30:00.000

The date 15 October 1582—the day the Gregorian calendar went into effect for some countries—can be expressed in the following ways:

1582-10-15

1582-10-15T00:00

1582-10-15T00:00:00
 1582-10-15T00:00:00.000

end example]

[*Note:* SpreadsheetML relates all dates to the proleptic Gregorian calendar of ISO 8601, treating time periods extending into the past and into the distant future as if the Gregorian calendar is in effect for all of those days. January 1 is always the first day of each year, ignoring historical changes to the period of the calendar year. The gaps and shifts introduced as part of calendar reforms and for introduction of leap seconds are ignored under the proleptic Gregorian calendar system. *end note]*

Wherever a calculation in a formula is specified to apply to number values and a date or time is provided, the effect shall be the same as if the date and/or time value is converted to the corresponding serial date-time. Wherever a calculation in a formula is specified to apply to or to deliver a date and/or time value, and a number value is supplied, the number value is interpreted as a serial date-time for the date and/or time. The relationships between serial date-times and dates and times are specified in §18.17.4.1, §18.17.4.2, and §18.17.4.3.

18.17.4.1 Date Conversion for Serial Date-Times

A serial date-time is a number that represents a date and time. This signed value is in units of days relative to the base date for the selected date system. Serial date-times increase by 1 into each successive day and decrease by 1 into each preceding day. Fractional portions of serial date-times represent fractions of a single day. [*Example:* When using the 1900 date system, which has a base date of 30th December 1899, a serial date-time of 1.5 represents midday on the 31st December 1899 (serial date-time day 1), or 1899-12-31T12:00. A serial date-time of -4.25 represents 6 pm on the 25th December 1899, or 1899-12-25T18:00. *end example]* The base dates and the related serial date-times represent local date and time.

Two different bases are used for converting dates to and from serial date-times:

- In the *1900 date system*, the lower limit is January 1st, 0001 00:00:00, which has a serial date-time of -693593. The upper-limit is December 31st, 9999, 23:59:59.999, which has a serial date-time of 2,958,465.9999884. The base date for this system is 00:00:00 on December 30th, 1899, which has a serial date-time of 0.
- In the *1904 date system*, the lower limit is January 1st, 0001, 00:00:00, which has a serial date-time of -695055. The upper limit is December 31st, 9999, 23:59:59.999, which has a serial date-time of 2,957,003.9999884. The base date for this system is 00:00:00 on January 1st, 1904, which has a serial date-time of 0.

A serial date-time outside the temporal range for the selected date system is invalid.

The date system is specified by the value of the date1904 attribute of the workbookPr element. [*Example:*

1900 date system: <workbookPr showObjects="all"/>

1904 date system: <workbookPr date1904="1" showObjects="all"/>

end example]

18.17.4.2 Time Conversion for Serial Date-Times

Time of day is represented by a serial date-time less than 1, but not less than 0. Values from 0–0.99999999 represent times from *the* starting instant 0:00:00 (12:00:00 AM) to the last instant 23:59:59 (11:59:59 P.M.).

For any serial date-time, the serial time-of-day is the serial date-time minus the serial date-time of the day in which the time-of-day occurs. The serial date-time of the day in which a serial date-time occurs is the greatest integer that does not exceed the serial date-time.

[Example:

The serial date-time 4.66666667 is in serial day 4, and the time-of-day serial date-time is $4.66666667 - 4$, which is 0.66666667.

The serial date-time -2.00000001 is in serial day -3, and the time-of-day serial date-time is $-2.00000001 - (-3)$, which is 0.99999999.

end example]

Going forward in time, the time component of a serial date-time increases by 1/86,400 each second. *[Note: As such, the time 12:00 has a serial date-time time component of 0.5. end note]*

[Example:

The serial date-time 0.0000000... represents 00:00:00

The serial date-time 0.0000115... represents 00:00:01

The serial date-time 0.4207639... represents 10:05:54

The serial date-time 0.5000000... represents 12:00:00

The serial date-time 0.9999884... represents 23:59:59

end example]

18.17.4.3 Combined Date and Time Conversion for Serial Date-Times

The serial date-time corresponding to a date component can be added to any serial date-time for a time-of-day component to determine the serial date-time for the combined date-time.

[Note: In the 1900 date system, the serial date-time -1.25 represents December 28, 1899, 18:00. end note]

[Example: For the 1900 date system:

The serial date-time -2337.999989... represents 1893-08-05T00:00:01

The serial date-time 3687.4207639... represents 1910-02-03T10:05:54

The serial date-time 2.5000000... represents 1900-01-01T12:00:00

The serial date-time 2958465.9999884... represents 9999-12-31T23:59:59

For the 1904 date system:

The serial date-time -3799.999989... represents 1893-08-05T00:00:01

The serial date-time 2225.4207639... represents 1910-02-03T10:05:54

The serial date-time 0.5000000... represents 1904-01-01T12:00:00

The serial date-time 2957003.9999884... represents 9999-12-31T23:59:59

end example]

18.17.5 Limits and Precision

18.17.5.1 Limits

In SpreadsheetML, cell references range from column A1–A1048576 (column A:A) to column XFD1–XFD1048576 (column XFD:XFD).

An implementation can extend this range. However, to avoid ambiguities, it is necessary to ensure that defined names are distinct from cell references, or that one takes precedence over the other. With this in mind, the following rules apply:

- A producer or consumer shall consider a defined name of the form used by cells in the range A1–XFD1048576 to be an error.
- All other names outside this range can be defined names and shall override a cell reference if an ambiguity exists.

[*Example:* LOG10 is always a cell reference, LOG10(...) is always a formula, and LOG01000 can be a defined name that overrides a cell reference. *end example]*

18.17.5.2 Precision

In order to clarify the semantics of cell formulas and values in SpreadsheetML, it is necessary to specify the precision of the numbers being represented in the file format. These numbers are therefore regarded as ranging over a specific value space, which defaults to the following:

The *value space* consists of the values $(-1)^s \times m \times 2^n$, where s is 0 or 1, m is an integer greater than or equal to 0 and less than 2^{53} , and n is an integer between -1074 and 971, inclusive. m is herein referred to as the *binary mantissa*, and n is herein referred to as the *binary exponent*. [*Note:* The default precision is patterned after the IEC double-precision 64-bit floating-point type [IEC 60559]. *end note]*

Implementing applications can use the characteristics markup (§22.7) to specify other value spaces to replace the default in a given workbook. When present in the workbook, the value space defined using the characteristics markup overrides the default value space.

Regardless of the specific value space in use, values shall have a lexical representation as described in §18.17.5.3. Any numerical expression conforming to this lexical description is permitted. However, numbers

of higher precision than available in the value space, and numbers that lie outside the range representable in the value space shall be handled as prescribed in §18.17.5.4.

18.17.5.3 Lexical Representation

The value space shall have a lexical representation consisting of a base 10 mantissa followed, optionally, by the character "E" or "e", followed by a base 10 exponent. The exponent shall be an integer. The mantissa shall be a decimal number. The representations for exponent and mantissa shall follow the lexical rules for integer and decimal below. If the "E" or "e" and the following exponent are omitted, an exponent value of 0 is assumed.

Lexical representations for zero can take a positive or negative sign.

[*Example:* -1E4, 1267.43233E12, 12.78e-2, 12, -0, and 0 are all literals for numbers in the default value space. 4503599627370497.5 is also a literal, although it represents the same value as 4503599627370497 ($2^{52} + 1$) in the default value space (as explained in §18.17.5.4). *end example*]

An *Integer* has a lexical representation consisting of a finite-length sequence of decimal digits (#x30–#x39) with an optional leading sign. If the sign is omitted, "+" is assumed. [*Example:* -1, 0, 12678967543233, +100000. *end example*]

A *Decimal Number* has a lexical representation consisting of a finite-length sequence of decimal digits (#x30–#x39) separated by a period as a decimal indicator. An optional leading sign is allowed. If the sign is omitted, "+" is assumed. Leading and trailing zeroes are optional. If the fractional part is zero, the period and following zero(s) can be omitted. [*Example:* -1.23, 12678967.543233, +100000.00, 210. *end example*]

18.17.5.4 Interpretation

Strings that are permitted according to the lexical definition in §18.17.5.3 shall be interpreted as values in the value space as follows:

1. The mantissa shall be interpreted as a real number expressed in base 10
2. The exponent shall be interpreted as an integer expressed in base 10
3. The raw value for a numerical expression shall be interpreted as
mantissa $\times 10^{\text{exponent}}$
4. If the absolute value is larger than the largest value in the value space (2^{1024} minus 2^{971}) then a consuming application shall treat this as equivalent to the error value #NUM! (§18.17.3). Otherwise the value in the value space that is closest to the raw value is chosen as the interpretation. In the case that two values are equally close, the one with the smaller absolute value is chosen.

18.17.6 XML Representation

18.17.6.1 Cell Reference Style

A workbook saved with reference style A1 (§18.17.2.3.1), shall have the refMode attribute of the calcPr element (§18.2.2) in the Workbook part's XML omitted or set to A1. A workbook saved with reference style R1C1 (§18.17.2.3.2) shall have that refMode attribute set to R1C1. [*Example:* With R1C1 mode set, here is how the XML might look:

```

<workbook ...>
...
  <calcPr calcId="122211" fullCalcOnLoad="1" refMode="R1C1"/>
...
</workbook>

```

end example]

Regardless of the value of the refMode attribute, cell references shall be stored in XML in the A1 form. This attribute's value tells an implementation which reference style to use at runtime.

18.17.6.2 Scalar Formulas

A scalar formula shall be represented in a worksheet's XML by an f element that contains the text of the formula, and a v element that contains the text version of the last computed value for that formula. This pair of elements shall be inside a c element, which is, in turn, shall be inside a row element. [Example: Consider the scalar formula SQRT(C2^2+D2^2), where C2 refers to a cell containing the number 12.5, and D2 refers to a cell containing the number 9.6. The corresponding XML might be as follows:

```

<row r="2" spans="2:4">
  <c r="B2" s="40">
    <f>SQRT(C2^2+D2^2)</f>
    <v>15.761027885261798</v>
  </c>
  <c r="C2" s="0">
    <v>12.5</v>
  </c>
  <c r="D2" s="0">
    <v>9.6</v>
  </c>
</row>

```

In the scalar formula CONCATENATE("The total is ",C7," units"), C7 refers to a cell containing the number 23. The corresponding XML might be as follows:

```

<row r="7" spans="2:4" ht="285">
  <c r="B7" s="4" t="str">
    <f>CONCATENATE("The total is ",C7," units")</f>
    <v>The total is 23 units</v>
  </c>
  <c r="C7" s="0">
    <v>23</v>
  </c>
</row>

```

As the function CONCATENATE returns a string, the value for the cell's t attribute is str.

end example]

18.17.6.3 Array Formulas

An array formula shall be represented in XML just like other formulas, except that the array formula's *f* element shall contain an attribute *t*, whose value shall be *array*.

For a single-cell formula, the *r* attribute shall designate that cell. [*Example:* Consider the array formula SUM(C11:C12*D11:D12). The corresponding XML might be as follows:

```
<row r="11" spans="2:4" ht="300">
  <c r="B11" s="16">
    <f t="array" r="B11">SUM(C11:C12*D11:D12)</f>
    <v>110</v>
  </c>
  <c r="C11" s="4">
    <v>10</v>
  </c>
  <c r="D11" s="0">
    <v>3</v>
  </c>
</row>
<row r="12" spans="2:4" ht="285">
  <c r="C12" s="4">
    <v>20</v>
  </c>
  <c r="D12" s="0">
    <v>4</v>
  </c>
</row>
```

As this formula is a single-cell formula, the *r* attribute contains the name of that cell, B11. *end example]*

For an array formula spanning multiple cells, the *r* attribute of the top-left cell of the range of cells to which that formula applies shall designate the range of cells to which that formula applies. The *c* elements for all cells except the top-left cell in that range shall not have an *f* element; however, they shall each have a *v* element.

[*Example:* Consider the array formula A1:A3*B1:B3, which is applied to the cell range C1:C3. The corresponding XML might be as follows:

```
<row r="1" spans="1:3">
  <c r="A1" s="0">
    <v>112</v>
  </c>
  <c r="B1" s="0">
    <v>2.34</v>
  </c>
```

```

    <c r="C1" s="0">
      <f t="array" r="C1:C3">A1:A3*B1:B3</f>
      <v>262.08</v>
    </c>
  </row>
  <row r="2" spans="1:3">
    <c r="A2" s="0">
      <v>209</v>
    </c>
    <c r="B2" s="0">
      <v>1.28</v>
    </c>
    <c r="C2" s="0">
      <v>267.52</v>
    </c>
  </row>
  <row r="3" spans="1:3">
    <c r="A3" s="0">
      <v>128</v>
    </c>
    <c r="B3" s="0">
      <v>3.12</v>
    </c>
    <c r="C3" s="0">
      <v>399.36</v>
    </c>
  </row>

```

As this formula is an array formula spanning multiple cells, the *r* attribute of cell C1 contains the name of that cell range, C1:C3, and cells C2 and C3 do not have an *f* element. *end example*]

18.17.6.4 Formula Evaluation Order

The order in which formulas are evaluated is determined by the order of their corresponding *c* elements in the *calcChain* element of the Calculation Chain part (§18.6.2).

18.17.6.5 Name Representation

A formula can contain one or more names. These names shall be defined in the Workbook part's XML with each being the subject of a *definedName* element, inside a *definedNames* element. [*Example*: Consider the scalar formula `SUM(value1,value2)`. The corresponding XML might be as follows:

```

<definedNames>
  <definedName name="value1" localSheetId="0">Sheet2!$B$2</definedName>
  <definedName name="value2" localSheetId="0">Sheet2!$B$3</definedName>
</definedNames>
...

```

```
<c r="E5" s="0">
  <f ce="1">SUM(value1,value2)</f>
  <v>8</v>
</c>
```

end example]

Each name shall be the subject of an lpstr element in the Application-Defined File Properties part.

```
<TitlesOfParts>
  <vt:vector ... baseType="lpstr">
    <vt:lpstr>Sheet1</vt:lpstr>
    <vt:lpstr>Sheet2</vt:lpstr>
    <vt:lpstr>Sheet3</vt:lpstr>
    <vt:lpstr>value1</vt:lpstr>
    <vt:lpstr>value2</vt:lpstr>
  </vt:vector>
</TitlesOfParts>
```

18.17.6.6 Value Representation

The most recent value of a formula shall be stored in the corresponding v element, as follows:

Result Type	Representation
array	The text form of the array's value.
error	The text form of the error value.
logical	The text 0 for FALSE and 1 for TRUE.
number	The unformatted text form of the number, as accurately as possible.
text	All of the characters in the text.

18.17.6.7 Dates and Times

When a SpreadsheetML cell contains a date-time, the value of the cell is expressed as a string conforming to one of the ISO 8601 lexical formats specified in §18.17.4.

[Example:

```
<c t="d">
  <f>DATE(1582,10,15)+0.5</f>
  <v>1582-10-15T12:00</v>
</c>
```

end example]

18.17.7 Predefined Function Definitions

Each of the subclauses below this subclause describes a separate function, and each description contains a section marked **Syntax**. That section contains pieces of the function grammar as they pertain to that specific function. These pieces are presented in a slightly simpler form to aid in the understanding of the description. In those sections, the left-square-bracket and right-square-bracket designate the start and end of an option, as used in ISO/IEC 14977. However, the function-name, the open-parenthesis and the close-parenthesis designate actual literal text, as does each comma. [Note: Therefore, in a strict presentation according to ISO/IEC 14977, each would appear with double-quotes surrounding each instance. *end note*]

The **Syntax** section for each function defined in this subclause corresponds to a call to that function. Except for *argument-list*, the names in any **Syntax** section typeset as in *number* and *string-l*, are parameter names for that function, and are local to that function definition's description. *argument-list* is the name of a production in the grammar, and, as defined in §18.17.2, permits a comma-separated list of *arguments*.

When the type of an argument passed to a function is incompatible with the type expected the error value #VALUE! is returned by that function.

The set of predefined functions is divided into the following functional categories [Note: The predefined functions defined here reflect current spreadsheet semantics and might not match common practice in other contexts. New functions might be added in future versions of the specification. *end note*]:

All predefined functions can be used with their simple name, with the prefix ECMA., or with the prefix ISO., with the following exception: the predefined function named CEILING in ECMA-376 can only be used with the prefix ECMA.. The predefined function named ISO.CEILING is specified in ECMA-376.

Category	Formulas
Cube	CUBEKPIMEMBER (§18.17.7.65), CUBEMEMBER (§18.17.7.66), CUBEMEMBERPROPERTY (§18.17.7.67), CUBERANKEDMEMBER (§18.17.7.68), CUBESET (§18.17.7.69), CUBESETCOUNT (§18.17.7.70), CUBEVALUE (§18.17.7.71)
Database	DAVERAGE (§18.17.7.77), DCOUNT (§18.17.7.81), DCOUNTA (§18.17.7.82), DGET (§18.17.7.90), DMAX (§18.17.7.92), DMIN (§18.17.7.93), DPRODUCT (§18.17.7.97), DSTDEV (§18.17.7.98), DSTDEVP (§18.17.7.99), DSUM (§18.17.7.100), DVAR (§18.17.7.102), and DVARP (§18.17.7.103).
Date and Time	DATE (§18.17.7.74), DATEDIF (§18.17.7.75), DATEVALUE (§18.17.7.76), DAY (§18.17.7.78), DAYS360 (§18.17.7.79), EDATE (§18.17.7.105), EOMONTH (§18.17.7.107), HOUR (§18.17.7.144), MINUTE (§18.17.7.214), MONTH (§18.17.7.220), NETWORKDAYS (§18.17.7.226), NETWORKDAYS.INTL (§18.17.7.227), NOW (§18.17.7.234), SECOND (§18.17.7.287), TIME (§18.17.7.323), TIMEVALUE (§18.17.7.324), TODAY (§18.17.7.326), WEEKDAY (§18.17.7.344), WEEKNUM (§18.17.7.345), WORKDAY (§18.17.7.347), WORKDAY.INTL (§18.17.7.348), YEAR (§18.17.7.351), and YEARFRAC

Category	Formulas
	(§18.17.7.352)
Engineering	BESSELI (§18.17.7.23), BESSELJ (§18.17.7.24), BESSELK (§18.17.7.25), BESSELY (§18.17.7.26), BIN2DEC (§18.17.7.29), BIN2HEX (§18.17.7.30), BIN2OCT (§18.17.7.31), COMPLEX (§18.17.7.45), CONVERT (§18.17.7.48), DEC2BIN (§18.17.7.84), DEC2HEX (§18.17.7.85), DEC2OCT (§18.17.7.86), DELTA (§18.17.7.88), ERF (§18.17.7.108), ERFI (§18.17.7.109), GESTEP (§18.17.7.136), HEX2BIN (§18.17.7.140), HEX2DEC (§18.17.7.141), HEX2OCT (§18.17.7.142), IMABS (§18.17.7.149), IMAGINARY (§18.17.7.150), IMARGUMENT (§18.17.7.151), IMCONJUGATE (§18.17.7.152), IMCOS (§18.17.7.153), IMDIV (§18.17.7.154), IMEXP (§18.17.7.155), IMLN (§18.17.7.156), IMLOG10 (§18.17.7.157), IMLOG2 (§18.17.7.158), IMPOWER (§18.17.7.159), IMPRODUCT (§18.17.7.160), IMREAL (§18.17.7.161), IMSIN (§18.17.7.162), IMSQRT (§18.17.7.163), IMSUB (§18.17.7.164), IMSUM (§18.17.7.165), OCT2BIN (§18.17.7.237), OCT2DEC (§18.17.7.238), and OCT2HEX (§18.17.7.239).
Financial	ACCRINT (§18.17.7.2), ACCRINTM (§18.17.7.3), AMORDEGRC (§18.17.7.7), AMORLINC (§18.17.7.8), COUPDAYBS (§18.17.7.57), COUPDAYS (§18.17.7.58), COUPDAYSNC (§18.17.7.59), COUPNCD (§18.17.7.60), COUPNUM (§18.17.7.61), COUPPCD (§18.17.7.62), CUMIPMT (§18.17.7.72), CUMPRINC (§18.17.7.73), DB (§18.17.7.80), DDB (§18.17.7.83), DISC (§18.17.7.90), DOLLARDE (§18.17.7.95), DOLLARFR (§18.17.7.96), DURATION (§18.17.7.101), EFFECT (§18.17.7.106), FV (§18.17.7.129), FVSCHEDULE (§18.17.7.130), INTRATE (§18.17.7.171), IPMT (§18.17.7.172), IRR (§18.17.7.173), ISPMT (§18.17.7.184), MDURATION (§18.17.7.208), MIRR (§18.17.7.216), NOMINAL (§18.17.7.228), NPER (§18.17.7.235), NPV (§18.17.7.236), ODDFPRICE (§18.17.7.241), ODDFYIELD (§18.17.7.242), ODDLPRICE (§18.17.7.243), ODDLYIELD (§18.17.7.244), PMT (§18.17.7.253), PPMT (§18.17.7.256), PRICE (§18.17.7.257), PRICEDISC (§18.17.7.258), PRICEMAT (§18.17.7.259), PV (§18.17.7.263), RATE (§18.17.7.270), RECEIVED (§18.17.7.271), SLN (§18.17.7.293), SYD (§18.17.7.314), TBILLEQ (§18.17.7.318), TBILLPRICE (§18.17.7.319), TBILLYIELD (§18.17.7.320), VDB (§18.17.7.342), XIRR (§18.17.7.349), XNPV (§18.17.7.350), YIELD (§18.17.7.353), YIELDDISC (§18.17.7.354), and YIELDMAT (§18.17.7.355).
Information	CELL (§18.17.7.34), ERROR.TYPE (§18.17.7.110), INFO (§18.17.7.168), ISBLANK (§18.17.7.174), ISERR (§18.17.7.175), ISERROR (§18.17.7.176), ISEVEN (§18.17.7.177), ISLOGICAL (§18.17.7.178), ISNA (§18.17.7.179), ISNONTTEXT (§18.17.7.180), ISNUMBER (§18.17.7.181), ISODD (§18.17.7.183), ISREF (§18.17.7.185), ISTEAD (§18.17.7.186), N (§18.17.7.223), NA (§18.17.7.224), and TYPE (§18.17.7.334).
Logical	AND (§18.17.7.9), FALSE (§18.17.7.117), IF (§18.17.7.147), IFERROR (§18.17.7.148), NOT (§18.17.7.233), OR (§18.17.7.246), and TRUE (§18.17.7.330).
Lookup and Reference	ADDRESS (§18.17.7.6), AREAS (§18.17.7.10), CHOOSE (§18.17.7.39), COLUMN (§18.17.7.42), COLUMNS (§18.17.7.43), GETPIVOTDATA (§18.17.7.137),

Category	Formulas
	HLOOKUP (§18.17.7.143), HYPERLINK (§18.17.7.145), INDEX (§18.17.7.166), INDIRECT (§18.17.7.167), LOOKUP (§18.17.7.202), MATCH (§18.17.7.204), OFFSET (§18.17.7.245), ROW (§18.17.7.281), ROWS (§18.17.7.282), RTD (§18.17.7.284), TRANSPOSE (§18.17.7.327), and VLOOKUP (§18.17.7.343).
Math and Trig	ABS (§18.17.7.1), ACOS (§18.17.7.4), ACOSH (§18.17.7.5), ASIN (§18.17.7.12), ASINH (§18.17.7.13), ATAN (§18.17.7.14), ATAN2 (§18.17.7.15), ATANH (§18.17.7.16), CEILING (§18.17.7.33), COMBIN (§18.17.7.44), COS (§18.17.7.50), COSH (§18.17.7.51), DEGREES (§18.17.7.87), ECMA.CEILING (§18.17.7.104), EVEN (§18.17.7.111), EXP (§18.17.7.113), FACT (§18.17.7.115), FACTDOUBLE (§18.17.7.116), FLOOR (§18.17.7.125), GCD (§18.17.7.134), INT (§18.17.7.169), ISO.CEILING (§18.17.7.182), LCM (§18.17.7.190), LN (§18.17.7.196), LOG (§18.17.7.197), LOG10 (§18.17.7.198), MDETERM (§18.17.7.207), MINVERSE (§18.17.7.215), MMULT (§18.17.7.217), MOD (§18.17.7.218), MROUND (§18.17.7.221), MULTINOMIAL (§18.17.7.222), ODD (§18.17.7.240), PI (§18.17.7.252), POWER (§18.17.7.255), PRODUCT (§18.17.7.261), QUOTIENT (§18.17.7.265), RADIANS (§18.17.7.266), RAND (§18.17.7.267), RANDBETWEEN (§18.17.7.268), ROMAN (§18.17.7.277), ROUND (§18.17.7.278), ROUNDDOWN (§18.17.7.279), ROUNDUP (§18.17.7.280), SERIESSUM (§18.17.7.288), SIGN (§18.17.7.289), SIN (§18.17.7.290), SINH (§18.17.7.291), SQRT (§18.17.7.296), SQRTPI (§18.17.7.297), SUBTOTAL (§18.17.7.305), SUM (§18.17.7.306), SUMIF (§18.17.7.307), SUMIFS (§18.17.7.308), SUMPRODUCT (§18.17.7.309), SUMSQ (§18.17.7.310), SUMX2MY2 (§18.17.7.311), SUMX2PY2 (§18.17.7.312), SUMXMY2 (§18.17.7.313), TAN (§18.17.7.316), TANH (§18.17.7.317), and TRUNC (§18.17.7.332).
Statistical	AVEDEV (§18.17.7.17), AVERAGE (§18.17.7.18), AVERAGEA (§18.17.7.19), AVERAGEIF (§18.17.7.20), AVERAGEIFS (§18.17.7.21), BETADIST (§18.17.7.27), BETAINV (§18.17.7.28), BINOMDIST (§18.17.7.32), CHIDIST (§18.17.7.36), CHIINV (§18.17.7.37), CHITEST (§18.17.7.38), CONFIDENCE (§18.17.7.47), CORREL (§18.17.7.49), COUNT (§18.17.7.52), COUNTA (§18.17.7.53), COUNTBLANK (§18.17.7.54), COUNTIF (§18.17.7.55), COUNTIFS (§18.17.7.56), COVAR (§18.17.7.63), CRITBINOM (§18.17.7.64), DEVSQ (§18.17.7.89), EXPONDIST (§18.17.7.114), FDIST (§18.17.7.118), FINV (§18.17.7.121), FISHER (§18.17.7.122), FISHERINV (§18.17.7.123), FORECAST (§18.17.7.126), FREQUENCY (§18.17.7.127), FTEST (§18.17.7.128), GAMMADIST (§18.17.7.131), GAMMAINV (§18.17.7.132), GAMMALN (§18.17.7.133), GEOMEAN (§18.17.7.135), GROWTH (§18.17.7.138), HARMEAN (§18.17.7.139), HYPGEOMDIST (§18.17.7.146), INTERCEPT (§18.17.7.170), KURT (§18.17.7.188), LARGE (§18.17.7.189), LINEST (§18.17.7.195), LOGEST (§18.17.7.199), LOGINV (§18.17.7.200), LOGNORMDIST (§18.17.7.201), MAX (§18.17.7.205), MAXA (§18.17.7.206), MEDIAN (§18.17.7.209), MIN (§18.17.7.212), MINA (§18.17.7.213), MODE (§18.17.7.219), NEGBINOMDIST (§18.17.7.225), NORMDIST (§18.17.7.229), NORMINV (§18.17.7.230), NORMSDIST (§18.17.7.231), NORMSINV (§18.17.7.232), PEARSON (§18.17.7.247), PERCENTILE (§18.17.7.248),

Category	Formulas
	PERCENTRANK (§18.17.7.249), PERMUT (§18.17.7.250), POISSON (§18.17.7.254), PROB (§18.17.7.260), QUARTILE (§18.17.7.264), RANK (§18.17.7.269), RSQ (§18.17.7.283), SKEW (§18.17.7.292), SLOPE (§18.17.7.294), SMALL (§18.17.7.295), STANDARDIZE (§18.17.7.298), STDEV (§18.17.7.299), STDEVA (§18.17.7.300), STDEVP (§18.17.7.301), STDEVPA (§18.17.7.302), STEYX (§18.17.7.303), TDIST (§18.17.7.321), TINV (§18.17.7.325), TREND (§18.17.7.328), TRIMMEAN (§18.17.7.330), TTEST (§18.17.7.333), VAR (§18.17.7.338), VARA (§18.17.7.339), VARP (§18.17.7.340), VARPA (§18.17.7.341), WEIBULL (§18.17.7.346), and ZTEST (§18.17.7.356).
Text and Data	ASC (§18.17.7.11), BAHTTEXT (§18.17.7.22), CHAR (§18.17.7.35), CLEAN (§18.17.7.40), CODE (§18.17.7.41), CONCATENATE (§18.17.7.46), DOLLAR (§18.17.7.94), EXACT (§18.17.7.112), FIND (§18.17.7.119), FINDB (§18.17.7.120), FIXED (§18.17.7.124), JIS (§18.17.7.187), LEFT (§18.17.7.191), LEFTB (§18.17.7.192), LEN (§18.17.7.193), LENB (§18.17.7.194), LOWER (§18.17.7.203), MID (§18.17.7.210), MIDB (§18.17.7.211), PHONETIC (§18.17.7.251), PROPER (§18.17.7.262), REPLACE (§18.17.7.272), REPLACEB (§18.17.7.273), REPT (§18.17.7.274), RIGHT (§18.17.7.275), RIGHTB (§18.17.7.276), SEARCH (§18.17.7.285), SEARCHB (§18.17.7.286), SUBSTITUTE (§18.17.7.304), T (§18.17.7.315), TEXT (§18.17.7.322), TRIM (§18.17.7.329), UPPER (§18.17.7.335), and VALUE (§18.17.7.337).

18.17.7.1 ABS

Syntax:

ABS (*x*)

Description: Computes the absolute value of *x*.

Arguments:

Name	Type	Description
<i>x</i>	number	The value whose absolute value is to be determined.

Return Type and Value: number – The absolute value of *x*.

[Example:

ABS(10.5) results in 10.5

ABS(0) results in 0

ABS(-10.5) results in 10.5

end example]

18.17.7.2 ACCRINT

Syntax:

ACCRINT (*issue* , *first-interest* , *settlement* , *rate* , [*par*] , *frequency* [, [*basis*]])

Description: Computes the accrued interest for a security that pays periodic interest.

Mathematical Formula:

$$ACCRINT = par \times \frac{rate}{frequency} \times \sum_{i=1}^{NC} \frac{A_i}{NL_i}$$

where:

- A_i = number of accrued days for the i^{th} quasi-coupon period within odd period.
- *frequency* = argument *frequency*
- *NC* = number of quasi-coupon periods that fit in odd period. If this number contains a fraction, raise it to the next whole number. The quasi-coupon period can be calculated in one of two following ways:
 - Odd long first coupon: by working backwards in time from the long coupon's interest payment date (first coupon date) and adding together the number of standard coupon periods that would fit in the long coupon, rounding up to the next whole number;
 - Odd long last coupon: by working forward in time from the long coupon's interest payment date (last coupon date before redemption) and adding together the number of standard coupon periods that would fit in the long coupon, rounding up to the next whole number.
- NL_i = normal length in days of the i^{th} quasi-coupon period within odd period.
- *par* = argument *par*
- *rate* = argument *rate*

Arguments:

Name	Type	Description
<i>issue</i>	number	The security's issue date.
<i>first-interest</i>	number	The security's first interest date.
<i>settlement</i>	number	The security's settlement date.
<i>rate</i>	number	The security's annual coupon rate.
<i>par</i>	number	The security's par value. If omitted, 1,000 is used.
<i>frequency</i>	number	The number of coupon payments per year. For annual payments, frequency is 1; for semiannual payments, frequency is 2; for quarterly payments, frequency is 4. <i>frequency</i> is truncated to an integer.
<i>basis</i>	number	The truncated integer type of day count basis to use, as

Name	Type	Description												
		<div>follows:</div> <table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td><div>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</div><ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.</td></tr><tr><td>1</td><td>Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.</td></tr><tr><td>2</td><td>Actual/360. Similar to Basis 1, but only has 360 days per year.</td></tr><tr><td>3</td><td>Actual/365. Similar to Basis 1, but always has 365 days per year.</td></tr><tr><td>4</td><td><div>European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</div><ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.</td></tr></table>	Value	Day Count Basis	0 or omitted	<div>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</div> <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.	1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.	2	Actual/360. Similar to Basis 1, but only has 360 days per year.	3	Actual/365. Similar to Basis 1, but always has 365 days per year.	4	<div>European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</div> <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.
Value	Day Count Basis													
0 or omitted	<div>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</div> <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.													
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Time information in the date arguments is ignored.

Return Type and Value: number – The accrued interest for a security that pays periodic interest.

However, if

- *issue*, *first-interest*, or *settlement* is out of range for the current date system, #NUM! is returned
- *issue* ≥ *settlement*, #NUM! is returned
- *rate* or *par* ≤ 0, #NUM! is returned
- *frequency* is any number other than 1, 2, or 4, #NUM! is returned
- *basis* < 0 or *basis* > 4, #NUM! is returned

[Example:

ACCRINT(DATE(2006,3,1),DATE(2006,9,1),DATE(2006,5,1),0.1,1100,2,0) results in 18.33

ACCRINT(DATE(2006,3,1),DATE(2006,9,1),DATE(2006,5,1),0.1,,2,0) results in 16.67

end example]

18.17.7.3 ACCRINTM

Syntax:

ACCRINTM (*issue* , *settlement* , *rate* , [[*par*] [, [*basis*]]])

Description: Computes the accrued interest for a security that pays interest at maturity.

Mathematical Formula:

$$ACCRINTM = par \times rate \times \frac{A}{D}$$

where:

- *A* = Number of accrued days counted according to a monthly basis. For interest at maturity items, the number of days from the issue date to the maturity date is used.
- *D* = Annual Year Basis.
- *par* = argument *par*
- *rate* = argument *rate*

Arguments:

Name	Type	Description
<i>issue</i>	number	The security's issue date.
<i>settlement</i>	number	The security's settlement date.

Name	Type	Description						
rate	number	The security's annual coupon rate.						
par	number	The security's par value. If omitted, 1,000 is used.						
basis	number	<div>The truncated integer type of day count basis to use, as follows:<table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td><div>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.</div></td></tr><tr><td>1</td><td><div>Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.</div></td></tr></table></div>	Value	Day Count Basis	0 or omitted	<div>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.</div>	1	<div>Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.</div>
Value	Day Count Basis							
0 or omitted	<div>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.</div>							
1	<div>Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.</div>							

Name	Type	Description	
		2	Actual/360. Similar to Basis 1, but only has 360 days per year.
		3	Actual/365. Similar to Basis 1, but always has 365 days per year.
		4	<p>European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</p> <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.

Time information in the date arguments is ignored.

Return Type and Value: number – The accrued interest for a security that pays interest at maturity.

However, if

- *issue* or *settlement* is out of range for the current date system, #NUM! is returned

- $issue \geq settlement$, #NUM! is returned
- $rate$ or $par \leq 0$, #NUM! is returned
- $basis < 0$ or $basis > 4$, #NUM! is returned

[Example:

ACCRINTM(DATE(2006,3,1),DATE(2006,5,1),0.1,1100,0) results in 18.33333333

ACCRINTM(DATE(2006,3,1),DATE(2006,5,1),0.1,,0) results in 16.66666667

ACCRINTM(DATE(2006,3,1),DATE(2006,5,1),0.1,) results in 16.66666667

end example]

18.17.7.4 ACOS

Syntax:

ACOS (x)

Description: Computes the arc cosine of x .

Arguments:

Name	Type	Description
x	number	The value whose arc cosine is to be determined.

Return Type and Value: number – The arc cosine of x , in radians.

However, if x is outside the interval $[-1,+1]$, #NUM! is returned

[Example:

ACOS(-1) results in 3.141592654

ACOS(0) results in 1.570796327

ACOS(1) results in 0

end example]

18.17.7.5 ACOSH

Syntax:

ACOSH (x)

Description: Computes the inverse hyperbolic cosine of x .

Arguments:

Name	Type	Description
x	number	The value whose inverse hyperbolic cosine is to be determined.

Return Type and Value: number – The inverse hyperbolic cosine of x .

However, if $x < 1$, #NUM! is returned.

[Example:

ACOSH(1) results in 0

ACOSH(10) results in 2.993222846

ACOSH(100) results in 5.298292366

end example]

18.17.7.6 ADDRESS

Syntax:

ADDRESS (*row-number* , *col-number* [, [*ref-type*] [, [*A1-ref-style-flag*]
[, *sheet-name*]])

Description: Creates a cell address, given the specified row and column numbers.

Arguments:

Name	Type	Description										
<i>row-number</i>	number	The number of the row.										
<i>col-number</i>	number	The number of the column.										
<i>ref-type</i>	number	<div>The type of reference to return, as follows:<table><tr><th>Value</th><th>Type of Reference Returned</th></tr><tr><td>1 or omitted</td><td>Absolute row and column</td></tr><tr><td>2</td><td>Absolute row; relative column</td></tr><tr><td>3</td><td>Relative row; absolute column</td></tr><tr><td>4</td><td>Relative row and column</td></tr></table></div>	Value	Type of Reference Returned	1 or omitted	Absolute row and column	2	Absolute row; relative column	3	Relative row; absolute column	4	Relative row and column
Value	Type of Reference Returned											
1 or omitted	Absolute row and column											
2	Absolute row; relative column											
3	Relative row; absolute column											
4	Relative row and column											
<i>A1-ref-style-flag</i>	logical	The style of the reference. If TRUE or omitted, an A1-style reference (§18.17.2.3.1) is returned; otherwise, an R1C1-style reference (§18.17.2.3.2) is returned.										
<i>sheet-name</i>	text	The name of the worksheet to be used. If omitted, no										

Name	Type	Description
		sheet name is used.

Return Type and Value: text – A cell address, given the specified row and column numbers.

However, if

- *row-number* or *col-number* < 1, #NUM! is returned.
- *ref-type* is outside the range 1–4, #NUM! is returned.

[Example:

In A1-reference style mode:

ADDRESS(5,7,1) results in \$G\$5

ADDRESS(5,7,2) results in G\$5

ADDRESS(5,7,3) results in \$G5

ADDRESS(5,7,4) results in G5

ADDRESS(5,7,,,"Sheet1") results in Sheet1!\$G\$5

In R1C1-reference style mode:

ADDRESS(5,7,1,FALSE) results in R5C7

ADDRESS(5,7,2,FALSE) results in R5C[7]

ADDRESS(5,7,3,FALSE) results in R[5]C7

ADDRESS(5,7,4,FALSE) results in R[5]C[7]

end example]

18.17.7.7 AMORDEGRC

Syntax:

AMORDEGRC (*cost* , *date-purchased* , *first-period* , *salvage* , *period* ,
rate [, [*basis*]])

Description: Computes the depreciation for each accounting period. (This function is provided for the French accounting system. If an asset is purchased in the middle of the accounting period, the prorated depreciation is taken into account. The function is similar to AMORLINC (§18.17.7.7), except that a depreciation coefficient is applied in the calculation depending on the life of the assets.)

Arguments:

Name	Type	Description
<i>cost</i>	number	The cost of the asset.

Name	Type	Description						
<i>date-purchased</i>	number	The date of the purchase of the asset.						
<i>first-period</i>	number	The date of the end of the first period.						
<i>salvage</i>	number	The salvage value at the end of the life of the asset.						
<i>period</i>	number	The period.						
<i>rate</i>	number	The rate of depreciation.						
<i>basis</i>	number	<div>The truncated integer type of day count basis to use, as follows:<table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.</td></tr><tr><td>1</td><td>Actual/actual. The actual number of days between the two dates are counted. If the</td></tr></table></div>	Value	Day Count Basis	0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.	1	Actual/actual. The actual number of days between the two dates are counted. If the
Value	Day Count Basis							
0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.							
1	Actual/actual. The actual number of days between the two dates are counted. If the							

Name	Type	Description	
			date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.
		2	Actual/360. Similar to Basis 1, but only has 360 days per year.
		3	Actual/365. Similar to Basis 1, but always has 365 days per year.
		4	European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.

Return Type and Value: number – The depreciation for each accounting period.

However, if

- *cost, salvage, period, or rate* < 0, #NUM! is returned.
- *date-purchased* or *first-period* is out of range for the current date system, #NUM! is returned.
- *basis* < 0 or *basis* > 4, #NUM! is returned.

- The life of the assets is between 0 and 1, 1 and 2, 2 and 3, or 4 and 5, #NUM! is returned.

This function returns the depreciation until the last period of the life of the assets or until the cumulated value of depreciation is greater than the cost of the assets minus the salvage value.

The depreciation coefficients are:

Life of assets (1/rate)	Depreciation Coefficient
Between 3 and 4 years	1.5
Between 5 and 6 years	2
More than 6 years	2.5

The depreciation rate grows to 50 percent for the period preceding the last period, and grows to 100 percent for the last period.

[Example:

AMORDEGRC (2400, DATE (2008, 8, 19), DATE (2008, 12, 31), 300, 1, 0.15, 1) results in 776.00

end example]

18.17.7.8 AMORLINC

Syntax:

AMORLINC (*cost* , *date-purchased* , *first-period* , *salvage* , *period* ,
rate [, [*basis*]])

Description: Computes the depreciation for each accounting period. (This function is provided for the French accounting system. If an asset is purchased in the middle of the accounting period, the prorated depreciation is taken into account.)

Arguments:

Name	Type	Description
<i>cost</i>	number	The cost of the asset.
<i>date-purchased</i>	number	The date of the purchase of the asset.
<i>first-period</i>	number	The date of the end of the first period.
<i>salvage</i>	number	The salvage value at the end of the life of the asset.
<i>period</i>	number	The period.
<i>rate</i>	number	The rate of depreciation.
<i>basis</i>	number	The truncated integer type of day count basis to use, as

Name	Type	Description								
		<div>follows:</div> <table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.</td></tr><tr><td>1</td><td>Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.</td></tr><tr><td>2</td><td>Actual/360. Similar to Basis 1, but only has 360 days per year.</td></tr></table>	Value	Day Count Basis	0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.	1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.	2	Actual/360. Similar to Basis 1, but only has 360 days per year.
Value	Day Count Basis									
0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.									
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2	Actual/360. Similar to Basis 1, but only has 360 days per year.									

Name	Type	Description	
		3	Actual/365. Similar to Basis 1, but always has 365 days per year.
		4	European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.

Return Type and Value: number – The depreciation for each accounting period.

However, if:

- *cost, salvage, period, or rate* < 0, #NUM! is returned.
- *date-purchased* or *first-period* is out of range for the current date system, #NUM! is returned.
- *basis* < 0 or *basis* > 4, #NUM! is returned.

[Example:

AMORLINC(2400,DATE(2008,8,19),DATE(2008,12,31),300,1,0.15,1) results in 360.00

end example]

18.17.7.9 AND

Syntax:

AND (*argument-list*)

Description: Tests if all *arguments* in *argument-list* are TRUE. The function evaluates all arguments prior to returning a value.

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, array, or cell reference	The <i>arguments</i> in <i>argument-list</i> designate the values to be tested. For an array or cell reference, a cell that contains text or is empty shall be ignored.

Return Type and Value: logical – TRUE if all *arguments* in *argument-list* are TRUE; otherwise, FALSE.

However, if no logical values are found, #VALUE! is returned.

[Example:

AND(TRUE) results in TRUE

AND(TRUE, FALSE) results in FALSE

AND(10>5, 3=1+2, 5) results in TRUE

AND({10,5,6,7}, TRUE, E6:F6) results in TRUE, when E6 contains TRUE and F6 contains 10

end example]

18.17.7.10 AREAS

Syntax:

AREAS (*reference*)

Description: Finds the number of areas (§18.17.2.3) designated by *reference*.

Arguments:

Name	Type	Description
<i>reference</i>	reference	A reference to a single cell or to a range of cells that can refer to multiple areas.

Return Type and Value: number – The number of areas designated by *reference*.

However, if the reference designates no areas, #NUM! is returned.

[Example:

AREAS(E312) results in 1

AREAS(E311:F313) results in 1

AREAS((E312:F314,G316:H316,G311)) results in 3, given the union of the three areas

AREAS((E312:F314 E313:F314 F312:F314)) results in 1, given the intersection of the three areas

end example]

18.17.7.11 ASC

Syntax:

ASC (*string*)

Description: For double-byte character set (DBCS) languages, converts all full-width (double-byte) characters to half-width (single-byte) characters.

Arguments:

Name	Type	Description
<i>string</i>	text	Designate the text to be converted. If <i>string</i> does not contain any full-width characters, nothing in <i>string</i> is converted.

Return Type and Value: text – The text resulting from the conversion.

[Example:

ASC("ABC") results in ABC

ASC("エクセル") results in エクセル

end example]

18.17.7.12 ASIN

Syntax:

ASIN (x)

Description: Computes the arc sine of x .

Arguments:

Name	Type	Description
x	number	The value whose arc sine is to be determined.

Return Type and Value: number – The arc sine of x , in radians.

However, if x is outside the interval $[-1,+1]$, #NUM! is returned.

[Example:

ASIN(-1) results in -1.570796327

ASIN(0) results in 0

ASIN(1) results in 1.570796327

end example]

18.17.7.13 ASINH

Syntax:

ASINH (x)

Description: Computes the inverse hyperbolic cosine of x .

Arguments:

Name	Type	Description
x	number	The value whose inverse hyperbolic sine is to be determined.

Return Type and Value: number – The inverse hyperbolic cosine of x .

[Example:

ASINH(1) results in 0.881373587

ASINH(10) results in 2.99822295

ASINH(100) results in 5.298342366

ASINH(0.5) results in 0.481211825

end example]

18.17.7.14 ATAN

Syntax:

$$\text{ATAN} (x)$$

Description: Computes the arc tangent of x .

Arguments:

Name	Type	Description
x	number	The value whose arc tangent is to be determined.

Return Type and Value: number – The arc tangent of x , in radians.

[Example:

ATAN(-1) results in -0.785398163

ATAN(0) results in 0

ATAN(1) results in 0.785398163

ATAN(-10) results in 1.471127674

ATAN(10) results in 1.471127674

end example]

18.17.7.15 ATAN2

Syntax:

$$\text{ATAN2} (x , y)$$

Description: Computes the arc tangent of the coordinates x and y .

Arguments:

Name	Type	Description
x	number	The first coordinate.
y	number	The second coordinate.

Return Type and Value: number – The arc tangent of y/x , in radians.

However, if both x and y are zero, #DIV/0! is returned.

[Example:

ATAN2(1,1) results in 0.785398163

ATAN2(-2,2) results in 2.35619449

ATAN2(3,-3) results in -0.785398163

end example]

18.17.7.16 ATANH

Syntax:

ATANH (*x*)

Description: Computes the inverse hyperbolic tangent of *x*.

Arguments:

Name	Type	Description
<i>x</i>	number	The value whose inverse hyperbolic tangent is to be determined.

Return Type and Value: number – The inverse hyperbolic tangent of *x*.

However, if *x* is outside the interval [-1,+1], #NUM! is returned.

[*Example:*

ATANH(-0.999999) results in -7.254328619

ATANH(0) results in 0

ATANH(0.999999) results in 7.254328619

end example]

18.17.7.17 AVEDEV

Syntax:

AVEDEV (*argument-list*)

Description: Computes the average of the absolute deviations of a set of data points from their mean. AVEDEV is a measure of the variability in a data set.

Mathematical Formula:

The average of the absolute deviations of a set of data points from their mean is as follows:

$$\frac{1}{n} \sum |x - \bar{x}|$$

where:

- n = the number of *arguments* in *argument-list*
- x = an *argument* in *argument-list*
- \bar{x} = the x mean value

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number, name, array, or reference that contains a number. The list can be a single argument that is an array or a reference to an array.	The <i>arguments</i> in <i>argument-list</i> designate the values for which the average of the absolute deviations is to be computed. Logical values and text representations of numbers occurring directly in the list of arguments are included. If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.

Return Type and Value: number – The average of the absolute deviations of a set of data points from their mean.

[Example:

AVEDEV(-3.5,1.4,6.9,-4.5) results in 4.075

AVEDEV({-3.5,1.4,6.9,-4.5}) results in 4.075

end example]

18.17.7.18 AVERAGE

Syntax:

AVERAGE (*argument-list*)

Description: Computes the arithmetic mean of the numeric values of its arguments.

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number, name, text, or reference that contains a number.	The <i>arguments</i> in <i>argument-list</i> designate the values to be averaged. An argument that is a logical value or the text representation of a number shall be counted. If an array or cell reference argument contains logical values, text, or empty cells, those values shall be ignored; however, cells having the value 0 shall be counted. [Note: The function AVERAGEA (§18.17.7.18) does include cell

Name	Type	Description
		reference arguments that refer to logical values or text representations of numbers. <i>end note</i>

Return Type and Value: number – The arithmetic mean of the values of its arguments.

[Example:

AVERAGE(1, 2, 3, 4, 5) results in 3

AVERAGE({1, 2; 3, 4}) results in 2.5

AVERAGE({1, 2, 3, 4, 5}, 6, "7") results in 4

AVERAGE({1, "2", TRUE, 4}) results in 2.5, as the logical value and numeric text are ignored

end example]

18.17.7.19 AVERAGEA

Syntax:

AVERAGEA (*argument-list*)

Description: Computes the arithmetic mean of the values of its arguments.

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number, text, or reference that contains a number.	The <i>arguments</i> in <i>argument-list</i> designate the values to be averaged. An argument that is a logical value or the text representation of a number shall be counted. Arguments with value TRUE evaluate to 1; arguments with value FALSE evaluate to 0. An array or cell reference argument that contains text evaluates to 0. If an argument is an array or reference, only values in that array or reference are used. Empty cells and text values in the array or reference are ignored.

[Note: The function AVERAGE (§18.17.7.18) does not include cell reference arguments that refer to logical values or text representations of numbers. *end note*]

Return Type and Value: number – The arithmetic mean of the values of its arguments.

[Example:

AVERAGEA(10, E1), where E1 is an empty cell, results in 10, as E1 is ignored

AVERAGEA(10, E2), where E2 contains TRUE, results in 5.5

AVERAGEA(10, E3), where E3 contains FALSE, results in 5

end example]

18.17.7.20 AVERAGEIF

Syntax:

AVERAGEIF (*cell-range* , *selection-criteria* [, *average-range*])

Description: Applies selection criteria on the values in one range of cells and averages the values of the cells in a corresponding range.

Arguments:

Name	Type	Description
<i>cell-range</i>	reference	The range of cells to be inspected. Cells in <i>cell-range</i> that contain TRUE or FALSE are ignored. If a cell is an empty cell, it is ignored.
<i>selection-criteria</i>	number, expression, reference, text	Designates the cells that are to be averaged. In the case of text, <i>selection-criteria</i> can consist of any comparison operator followed by the operand against which each cell's value is to be compared. <i>selection-criteria</i> can include one or more wildcard characters, question mark (?) and asterisk (*). A question mark matches any single character; an asterisk matches any sequence of characters. To search for a question mark, asterisk, or tilde character, prefix that character with a tilde (~). If a cell in <i>selection-criteria</i> is empty, it is treated as if it contained 0.
<i>average-range</i>	reference	Designates the cells whose values are averaged. In this case, <i>average-range</i> need not have the same size and shape as <i>cell-range</i> . The actual cells that are averaged are determined by using the top, left cell in <i>average-range</i> as the beginning cell, and then including cells that correspond in size and shape to <i>cell-range</i> . If <i>average-range</i> is omitted, <i>cell-range</i> also designates the cells whose values are averaged. If a cell is an empty cell, it is ignored.

Return Type and Value: number – The average of the values of the cells corresponding to those selected.

However, if no cells in the range meet the criteria, the return value is unspecified.

[Example: Assuming A2:A4 contains 10, 20, and 30:

AVERAGEIF (A2:A4, ">15") results in 25, the average of 20 and 30.

end example]

18.17.7.21 AVERAGEIFS

Syntax:

AVERAGEIFS (*average-range* , *cell-range-1* , *selection-criteria-1*
[, *cell-range-2* , *selection-criteria-2* [, ...]])

Description: The average of the values of all cells that meet multiple criteria.

Arguments:

Name	Type	Description
<i>average-range</i>	reference	Designates the cells whose values are averaged. In this case, <i>average-range</i> need not have the same size and shape as <i>cell-range-1</i> through <i>cell-range-n</i> . The actual cells that are added are determined by using the top, left cell in <i>average-range</i> as the beginning cell, and then including cells that correspond in size and shape to <i>cell-range-1</i> through <i>cell-range-n</i> . If a cell in <i>average-range</i> is empty, that cell is ignored. Each cell in <i>average-range</i> is used in the average calculation only if all of the corresponding criteria specified are true for that cell.
<i>cell-range-1</i>	number, expression, reference, text	Designates the first range of cells to be inspected.
<i>selection-criteria-1</i>	reference, text	<i>selection-criteria-1</i> specifies the criteria for the first range of cells that is averaged. In the case of text, <i>selection-criteria-1</i> can consist of any comparison operator followed by the operand against which each cell's value is to be compared. If a cell in any selection criteria range is empty, it is treated as if its value was 0. Cells that contain TRUE evaluate to 1; cells in any range that contain FALSE evaluate to 0. <i>selection-criteria-1</i> can include one or more wildcard characters, question mark (?) and asterisk (*). A question mark matches any single character; an asterisk matches any sequence of characters. To search for a question mark, asterisk, or tilde character, prefix that character with a tilde (~).
<i>cell-range-n</i>	number, expression,	The optional arguments <i>selection-criteria-2</i> through <i>selection-criteria-n</i> have corresponding arguments <i>cell-</i>

Name	Type	Description
	reference, text	<i>range-2</i> through <i>cell-range-n</i> , and have the same semantics as <i>selection-criteria-1</i> and <i>cell-range-1</i> , respectively.
<i>selection-criteria-n</i>	reference, text	

Return Type and Value: number – The average of the cells corresponding to those selected.

However, if

- Cells in *average-range* are empty or contain text values that cannot be translated into numbers, the return value is unspecified.
- There are no cells that meet all the criteria, the return value is unspecified.

[Example: Given the following data:

	A	B	C	D
1	Student	First Quiz Grade	Second Quiz Grade	Final Exam Grade
2	Emilio	75	85	87
3	Julie	94	80	88
4	Hans	86	93	Incomplete
5	Frederique	Incomplete	75	75

AVERAGEIFS(B2:B5,B2:B5,">70",B2:B5,"<90") results in 80.5 (the average for all students all first quiz grades that are between 70 and 90)

AVERAGEIFS(D2:D5,D2:D5,"<>Incomplete",D2:D5,">80") results in 87.5 (the average for all students all first quiz grades that are above 80 and not marked "Incomplete")

AVERAGEIFS(B2:D5,B2:B5,"<>Incomplete",C2:C5,"<>Incomplete",D2:D5,"<>Incomplete") results in 82.375 (the average grades for all students who do not have incomplete grades)

end example]

18.17.7.22 BAHTTEXT

Syntax:

BAHTTEXT (*number*)

Description: Produces a string containing *number* formatted according to the Thai convention.

Arguments:

Name	Type	Description
<i>number</i>	number	The value to be formatted.

Return Type and Value: text – The text containing *number* formatted.

[Example:

BAHTTEXT(1234) results in หนึ่งพันสองร้อยสามสิบลีบาทถ้วน

end example]

18.17.7.23 BESSELI

Syntax:

BESSELI (*x* , *n*)

Description: The modified Bessel function $I_n(x)$, which is equivalent to the Bessel function $J_n(x)$ evaluated for purely imaginary arguments.

Mathematical Formula:

The *n*-th order modified Bessel function of the variable *x* is:

$$I_n(x) = (i)^{-n} J_n(ix)$$

where:

- *x* = argument *x*
- *n* = argument *n*

Arguments:

Name	Type	Description
<i>x</i>	number	The value at which to evaluate the function.
<i>n</i>	number	The order of the Bessel function. This value is truncated to an integer.

Return Type and Value: number – The Bessel function $I_n(x)$.

However, if *n* < 0, #NUM! is returned.

[Example:

BESSELI(-5.6,0) results in 46.73755194

BESSELI(2.345,5) results in 0.023137792

end example]

18.17.7.24 BESSELJ

Syntax:

BESSELJ (*x* , *n*)

Description: The Bessel function $J_n(x)$.

Mathematical Formula:

The n -th order Bessel function of the variable x is:

$$J_n(x) = \sum_{k=0}^{\infty} \frac{(-1)^k}{k! \Gamma(n+k+1)} \left(\frac{x}{2}\right)^{n+2k}$$

where:

$$\Gamma(n+k+1) = \int_0^{\infty} e^{-x} x^{n+k} dx$$

is the Gamma function, and

- x = argument x
- n = argument n

Arguments:

Name	Type	Description
x	number	The value at which to evaluate the function.
n	number	The order of the Bessel function. This value is truncated to an integer.

Return Type and Value: number – The Bessel function $J_n(x)$.

However, if $n < 0$, #NUM! is returned.

[Example:

BESSELJ(-5.6,0) results in 0.026970887

BESSELJ(2.345,5) results in 0.014627862

end example]

18.17.7.25 BESSELK

Syntax:

BESSELK (x , n)

Description: The modified Bessel function $K_n(x)$, which is equivalent to using the Bessel function $J_n(x)$ and $Y_n(x)$.

Mathematical Formula:

The n -th order modified Bessel function of the variable x is:

$$K_n(x) = \frac{p}{2} i^{n+1} [J_n(ix) + iY_n(ix)]$$

where:

- J_n is the J Bessel function
- n = argument n
- $p = \pi$
- x = argument x
- Y_n is the Y Bessel function
- **Arguments:**

Name	Type	Description
x	number	The value at which to evaluate the function.
n	number	The order of the Bessel function. This value is truncated to an integer.

Return Type and Value: number – The Bessel function $K_n(x)$.

However, if $n < 0$, #NUM! is returned.

[Example:

BESSELK(2.345,5) results in 3.904137225

end example]

18.17.7.26 BESSELY

Syntax:

BESSELY (x , n)

Description: Weber's Bessel function $Y_n(x)$.

Mathematical Formula:

The n -th order Bessel function of the variable x is:

$$Y_n(x) = \lim_{v \rightarrow n} \frac{J_v(x) \cos(v \pi) - J_{-v}(x)}{\sin(v \pi)}$$

where:

- n = argument n
- x = argument x

Arguments:

Name	Type	Description
x	number	The value at which to evaluate the function.
n	number	The order of the Bessel function. This value is truncated to an integer.

Return Type and Value: number – The Weber's Bessel function $Y_n(x)$.

However, if $n < 0$, #NUM! is returned.

[Example:

BESSELY(2.345,5) results in -4.98977884

end example]

18.17.7.27 BETADIST

Syntax:

BETADIST (x , $alpha$, $beta$ [, [A] , [B]])

Description: Computes the cumulative beta probability density function.

Arguments:

Name	Type	Description
x	number	The value between A and B at which to evaluate the function.
$alpha$	number	A parameter of the distribution.
$beta$	number	A parameter of the distribution.

Name	Type	Description
<i>A</i>	number	The lower bound to the interval of <i>x</i> . If omitted, the lower bound is 0.
<i>B</i>	number	The upper bound to the interval of <i>x</i> . If omitted, the upper bound is 1.

Return Type and Value: number – The cumulative beta probability density function.

However, if

- *alpha* or *beta* ≤ 0 , #NUM! is returned.
- $x < A$, $x > B$, or $A = B$, #NUM! is returned.

[Example:

BETADIST(0.5,1,2) results in 0.75

BETADIST(0.5,1,2,-4.5,7.3) results in 0.66791152

BETADIST(0.5,1,2,,2.3) results in 0.387523629

end example]

18.17.7.28 BETAINV

Syntax:

BETAINV (*probability* , *alpha* , *beta* [, [*A*] , [*B*]])

Description: Computes the inverse of the cumulative distribution function for a specified beta distribution. Given a value for *probability*, BETAINV is used to seek for the value *x* such that BETADIST(*x*, *alpha*, *beta*, *A*, *B*) = *probability*. Thus, precision of BETAINV depends on precision of BETADIST.

Arguments:

Name	Type	Description
<i>probability</i>	number	A probability associated with the beta distribution.
<i>alpha</i>	number	A parameter of the distribution.
<i>beta</i>	number	A parameter of the distribution.
<i>A</i>	number	The lower bound to the interval of <i>x</i> . If omitted, the lower bound is 0.
<i>B</i>	number	The upper bound to the interval of <i>x</i> . If omitted, the upper bound is 1.

Return Type and Value: number – The inverse of the cumulative distribution function for a specified beta distribution.

However, if

- *alpha* or *beta* ≤ 0 , #NUM! is returned.
- *probability* < 0 or *probability* > 1 , #NUM! is returned.
- The search has not converged after some implementation-defined number of iterations, #N/A is returned.

[Example:

BETAINV(0.5,1,2) results in 0.29289341

BETAINV(0.5,1,2,-4.5,7.3) results in -1.043857765

BETAINV(0.5,1,2,,2.3) results in 0.673654842

end example]

18.17.7.29 BIN2DEC

Syntax:

BIN2DEC (*number*)

Description: Makes the decimal equivalent of *number*.

Arguments:

Name	Type	Description
<i>number</i>	number	A 10-digit binary number that is to be converted to a decimal string. If <i>number</i> has less than 10 digits, leading zero digits are implied until it has exactly 10 digits. The 10 digits use twos-complement representation with the left-most bit (10th bit from the right) representing the sign bit.

Return Type and Value: number – The decimal equivalent of *number*.

However, if

- *number* contains one or more non-binary digits, #NUM! is returned.
- *number* contains more than 10 binary digits; that is, *number* is outside the range 1000000000 (-512 decimal) to 0111111111 (511 decimal), inclusive, #NUM! is returned.

[Example:

BIN2DEC(111) results in 7

BIN2DEC(11111111) results in 255

BIN2DEC(1111111110) results in -2

BIN2DEC(1000000000) results in -512

end example]

18.17.7.30 BIN2HEX

Syntax:

BIN2HEX (*number* [, *num-hex-digits*])

Description: Makes the uppercase hexadecimal equivalent of *number*, with the result having *num-hex-digits* digits.

Arguments:

Name	Type	Description
<i>number</i>	number	A 10-digit binary number that is to be converted to a hexadecimal string. If <i>number</i> has less than 10 digits, leading zero digits are implied until it has exactly 10 digits. The 10 digits use twos-complement representation with the left-most bit (10th bit from the right) representing the sign bit.
<i>num-hex-digits</i>	number	The number of digits in the result, with leading zeros added as necessary. However, if <i>number</i> is negative, <i>num-hex-digits</i> is ignored and the result has 10 digits. If <i>num-hex-digits</i> is omitted, the minimum number of digits is used in the result. <i>num-hex-digits</i> is truncated to an integer.

Return Type and Value: text – The uppercase hexadecimal equivalent of *number*.

However, if

- *number* contains one or more non-binary digits, #NUM! is returned.
- *number* contains more than 10 binary digits; that is, *number* is outside the range 1000000000 (200 hex, -512 decimal) to 0111111111 (1FF hex, 511 decimal), inclusive, #NUM! is returned.
- *number* needs more digits than *num-hex-digits*, #NUM! is returned.
- *num-hex-digits* ≤ 0 or > 10, #NUM! is returned.

[Example:

BIN2HEX(1) results in 1

BIN2HEX(1,4) results in 0001

BIN2HEX(111111) results in 3F

BIN2HEX(1111000000) results in FFFFFFFC0

BIN2HEX(1000000000,3) results in FFFFFFFE00

end example]

18.17.7.31 BIN2OCT

Syntax:

BIN2OCT (*number* [, *num-oct-digits*])

Description: Makes the octal equivalent of *number*, with the result having *num-oct-digits* digits.

Arguments:

Name	Type	Description
<i>number</i>	number	A 10-digit binary number that is to be converted to an octal string. If <i>number</i> has less than 10 digits, leading zero digits are implied until it has exactly 10 digits. The 10 digits use two's-complement representation with the left-most bit (10th bit from the right) representing the sign bit.
<i>num-oct-digits</i>	number	<i>num-oct-digits</i> is the number of digits in the result, with leading zeros added as necessary. However, if <i>number</i> is negative, <i>num-oct-digits</i> is ignored and the result has 10 digits. If <i>num-oct-digits</i> is omitted, the minimum number of digits is used in the result. <i>num-oct-digits</i> is truncated to an integer.

Return Type and Value: text – The octal equivalent of *number*.

However, if

- *number* contains one or more non-binary digits, #NUM! is returned.
- *number* contains more than 10 binary digits; that is, *number* is outside the range 1000000000 (1000 octal, -512 decimal) to 0111111111 (0777 octal, 511 decimal), inclusive, #NUM! is returned.
- *number* needs more digits than *num-oct-digits*, #NUM! is returned.
- *num-oct-digits* < 0 or > 10, #NUM! is returned.

[Example:

BIN2OCT(1) results in 1

BIN2OCT(1,4) results in 0001

BIN2OCT(111111) results in 77

BIN2OCT(1111000000) results in 7777777700

BIN2OCT(1000000000,3) results in 7777777000

end example]

18.17.7.32 BINOMDIST

Syntax:

BINOMDIST (*number-successes* , *number-trials* , *success-probability* , *cumulative-flag*)

Description: Computes the individual term binomial distribution probability.

Mathematical Formula:

The binomial probability mass function is:

$$b(x, n, p) = \binom{n}{x} p^x (1 - p)^{n-x}$$

where:

$$\binom{n}{x}$$

is COMBIN(*n*, *x*).

The cumulative binomial distribution is:

$$B(x, n, p) = \sum_{y=0}^x b(y, n, p)$$

where:

- *n* = argument *number-trials*
- *p* = argument *success-probability*
- *x* = argument *number-successes*

Arguments:

Name	Type	Description
<i>number-successes</i>	number	The number of successes in <i>number-trials</i> , truncated to an integer.
<i>number-trials</i>	number	The number of independent trials, truncated to an integer.
<i>success-probability</i>	number	The probability of success on each trial.

Name	Type	Description
<i>cumulative-flag</i>	logical	Determines the form of the function. If TRUE, then the cumulative distribution function is returned, which is the probability that there are at most <i>number-successes</i> successes; if FALSE, the probability mass function is returned, which is the probability that there are <i>number-successes</i> successes.

Return Type and Value: number – The individual term binomial distribution probability.

However, if

- *number-successes* < 0 or *number-successes* > *number-trials*, #NUM! is returned.
- *success-probability* < 0 or *success-probability* > 1, #NUM! is returned.

[Example:

BINOMDIST(6,10,0.5,FALSE) results in 0.205078125

BINOMDIST(6,10,0.5,TRUE) results in 0.828125

end example]

18.17.7.33 CEILING

Syntax:

CEILING (*x* , *significance*)

Description: Computes a value that is *x* rounded-up, away from zero, to the nearest multiple of *significance*. Regardless of the sign of *x*, a value is rounded up when adjusted away from zero.

Arguments:

Name	Type	Description
<i>x</i>	number	The value to be rounded
<i>significance</i>	number	The multiple to which <i>x</i> is to be rounded. If <i>x</i> is negative, and <i>significance</i> is negative, then the value is rounded down (away from zero). If <i>x</i> is negative, and <i>significance</i> is positive, then the value is rounded up, towards zero.

Return Type and Value: number – The rounded-up value of *x*.

However, if *x* and *significance* have different signs, #NUM! is returned.

[Example:

CEILING(2.5,1) rounds 2.5 up to nearest multiple of 1; that is, to 3

CEILING(-2.5, -2) rounds -2.5 up to nearest multiple of -2; that is, to -4

CEILING(1.5,0.1) rounds 1.5 up to the nearest multiple of 0.1; that is, to 1.5

CEILING(0.234,0.01) rounds 0.234 up to the nearest multiple of 0.01; that is, to 0.24

end example]

18.17.7.34 CELL

Syntax:

CELL (*category* [, *reference*])

Description: Retrieves information about the formatting, location, or contents of the upper-left cell indicated by *reference*. *category* indicates the kind of information to be retrieved.

Arguments:

Name	Type	Description
<i>category</i>	text	The category string as defined in the table following.
<i>reference</i>	reference	Refers to the cell whose category information is being requested. If <i>reference</i> is a cell range, the first cell in that range is the cell whose category information is being requested. If <i>reference</i> is omitted, the information retrieved pertains to the most recent cell whose value was changed. For the category "format", if <i>reference</i> designates a cell formatted with a built-in number format, the number format string is as defined in the table following.

<i>category</i>	Meaning	Result Type
"address"	Reference of the first cell in <i>reference</i> .	text
"col"	Column number of the cell in <i>reference</i> .	number
"color"	1 if the cell is formatted in color for negative values; otherwise, 0. 0 if the cell does not contain a number.	number
"contents"	Value of the upper-left cell in <i>reference</i> .	Text or number
"filename"	Fully qualified filename of the file that contains <i>reference</i> . However, if the worksheet that contains <i>reference</i> has not yet been saved, the filename is an empty string.	text
"format"	Number format of the cell. (See the discussion of formats below.) The number format string has "-" appended if the	text

<i>category</i>	Meaning	Result Type
	cell is formatted in color for negative values. The number format string has "()" appended if the cell is formatted in color for positive or all values.	
"parentheses"	1 if the cell is formatted with parentheses for positive or all values; otherwise, 0. 0 if the cell does not contain a number.	number
"prefix"	Text value corresponding to the label prefix of the cell, as follows: <ul style="list-style-type: none"> • Single quotation mark (') if the cell contains left-aligned text • Double quotation mark (") if the cell contains right-aligned text • Caret (^) if the cell contains centered text • Backslash (\) if the cell contains fill-aligned text • Empty string if the cell contains anything else 	text
"protect"	0 if the cell is not locked; otherwise, 1.	number
"row"	Row number of the cell in reference.	number
"type"	Text value corresponding to the type of data in the cell. <ul style="list-style-type: none"> • "b" (blank) if the cell is empty • "l" (label) if the cell contains a text constant • "v" (value) if the cell contains anything else 	text
"width"	Column width of the cell rounded off to an integer. Each unit of column width is equal to the width of one character in the default font size.	number

If the SpreadsheetML is intended to be used in certain non-English locales, the *category* string can be the English value shown in the table above, or the translation shown in the following table. Locales not specified in the table below shall only use the English versions of the *category* string.

[Note: Using translated versions of the *category* string is strongly discouraged, as spreadsheet applications might not support these translations. *end note*]

Locale	address	col	color	contents	filename	format
az-latn-az	ünvan	col	rəng	mündəricat	fayladi	format
ca-es	direcció	columna	color	contenido	nombreachivo	formato
cs-cz	adresa	sloupec	barva	obsah	názvosouboru	formát
da-dk	adresse	kolonne	farve	indhold	filnavn	format
de-de	adresse	spalte	farbe	inhalt	dateiname	format
es-es	direccion	columna	color	contenido	nombreachivo	formato
et-ee	aadress	veerg	värv	sisukord	failinimi	vorming

Locale	address	col	color	contents	filename	format
fi-fi	osoite	sarake	väri	sisältö	tiedostonnimi	muoto
fr-fr	adresse	colonne	couleur	contenu	nomfichier	format
hu-hu	cím	oszlop	szín	tartalom	filenév	forma
it-it	indirizzo	col	colore	contenuto	nomefile	formato
kk-kz	мекенжай	баған	түс	мазмұны	файлатауы	пішім
lv-lv	adrese	kolonna	krāsa	saturs	faila_nosaukums	formāts
nb-no	adresse	kol	farge	innhold	filnavn	format
nl-nl	adres	kolom	kleur	inhoud	bestandsnaam	notatie
pl-pl	adres	kolumna	kolor	zawartość	nazwa_pliku	format
pt-br	endereço	col	cor	conteúdo	nome.arquivo	formato
pt-pt	endereço	col	cor	conteúdo	nome.ficheiro	formato
ru-ru	адрес	столбец	цвет	содержимое	имяфайла	формат
sk-sk	adresa	stĺpec	farba	obsah	názovsúboru	formát
sl-si	address	sto	color	contents	filename	format
sv-se	adress	kol	färg	innehåll	filnamn	format
tr-tr	adres	süt	renk	içerik	dosyaadi	biçim
uk-ua	адреса	стовпець	колір	вміст	ім'я_файлу	формат

Locale	parentheses	prefix	protect	row	type	width
az-latn-az	parentheses	prefix	protect	sətir	tip	en
ca-es	parentesis	prefijo	proteger	fila	tipo	ancho
cs-cz	závorky	prefix	zámek	řádek	typ	šířka
da-dk	parenteser	foranstillet	beskyt	række	værditype	bredde
de-de	klammern	präfix	schutz	zeile	typ	breite
es-es	parentesis	prefijo	proteger	fila	tipo	ancho
et-ee	sulud	eesliide	kaitse	rida	tüüp	laius
fi-fi	sulkeet	etuliite	suojaus	rivi	tyyppi	leveys
fr-fr	parentheses	prefixe	protege	ligne	type	largeur
hu-hu	zárójelek	előtag	védett	sor	típus	széles
it-it	parentesi	prefisso	proteggi	riga	tipo	larghezza
kk-kz	жақшалар	префикс	қорғаныс	жол	түр	ені

Locale	parentheses	prefix	protect	row	type	width
lv-lv	iekavas	prefikss	aizsargāt	rinda	tips	platums
nb-no	parenteser	prefiks	beskytt	rad	verditype	bredde
nl-nl	haakjes	voorvoegsel	bescherming	rij	type	breedte
pl-pl	nawiasy	prefiks	ochrona	wiersz	typ	szerokość
pt-br	parênteses	prefixo	proteger	lin	tipo	largura
pt-pt	parênteses	prefixo	proteger	lin	tipo	largura
ru-ru	скобки	префикс	защита	строка	тип	ширина
sk-sk	zátvorky	vloženýznak	chrániť	riadok	typ	šírka
sl-si	parentheses	prefix	protect	vrstica	type	širina
sv-se	parenteser	prefix	skydd	rad	typ	bredd
tr-tr	ayraç	önek	koruma	sat	tür	genişlik
uk-ua	дужки	префікс	захист	рядок	тип	довжина

Return Type and Value: various (see table above) – The value corresponding to *category*, and whose type is shown in the category value table above.

When the category parameter is "format", then the value returned depends upon the number format of the upper-left cell of *reference*, and, more specifically, upon the number format code of the upper-left cell of *reference*. Depending upon the number format code of the appropriate cell, the result value of CELL when the category is "format" is based upon the rules defined below.

First, some observations regarding the rules are in order:

- The various "sections" of the number format code are referred to within the rules. For more information on sections in the number format code, see numFmts (Number Formats) (§18.8.31).
- There are cases in which it is useful to discuss the characters from the number format code that are dependent upon the value in the cell. Instead of representing text or spacing in the cell's display text, these characters interpret, in some fashion, the value to be displayed. In the rules, these characters are referred to as "interpreted characters" of the number format code. The following table shows all the interpreted characters:

Interpreted Characters
0
#
@
d

Interpreted Characters
m
y
h
s
?
AM/PM
A/P
g
e
r

- There are cases in which it is also useful to discuss runs of similar interpreted characters. [*Example:* Each "d", "m", and "y" within the number format code "dd/mm/yyyy" does not represent a separate interpretation of the day of the date value to be represented, and instead helps to make up a representation of the day of the date that is two digits in length. *end example*] These runs of similar characters are referred to below as "interpreted symbols" since multiple characters are used, but the result is a single symbolic representation of at least part of the value.
- Since there are multiple different symbols for days, months, years, hours, minutes, seconds, and AM/PM, it is sometimes useful to discuss all of the representations of each of these. When any of "Day", "Month", "Year", "Hour", "Minute", etc., is referred to within a rule, what is meant is any of the possible representations for that date/time portion. For example, a "Day" symbol would be any of d, dd, ddd, or dddd.
- The use of characters such as "0", "E", and "%" as a symbol within a number format code does not include usages of these same characters either escaped (by preceding them with a backslash character "\") or as a part of a quoted string.

Here are the rules to determine the result value:

1. If the first interpreted symbols within the first section are any of the date or time characters (any of "y", "m", "d", "h", "m", "s") then the first one or two characters of the return value are determined by the order of interpreted symbols (including any interpreted symbols, not just date/time symbols) according to the following table. ("anything" can mean "no additional symbols". If the type is "anything except <type>", then the excepted symbol type cannot follow the previously specified symbol.)

Interpreted Symbols in Order	Return Value Characters
Day, month, year, anything	"D1"

Interpreted Symbols in Order	Return Value Characters
Day, month, anything besides year, anything	"D2"
Month, year, anything	"D3"
Month, day, year, anything	"D4"
Month, day, anything besides year, anything	"D5"
Hours, minutes, seconds, AM/PM, anything	"D6"
Hours, minutes, AM/PM, anything	"D7"
Hours, minutes, seconds, anything besides AM/PM, anything	"D8"
Hours, minutes, anything besides seconds or AM/PM, anything	"D9"
Any other combination of symbols	"G" or "C" depending on whether there is a \$ in the first condition

2. Otherwise, the first character of the return value is determined based upon the referenced cell's number format code according to the rules in the table below:

First Section of the Number Format Code		First Return Value Character
Absent Characters (as Symbols)	Present Characters (as Symbols)	
	@	"G"
@	\$	"C"
@, \$	%	"P"
@, \$, %	E	"S"
@, \$, %, E	A run of any combination of one or more "0", "#", and "?" characters, followed by a comma, followed by a run of any combination of one or more "0", "#", and "?" characters. This run can not be preceded by a period (".") or by any interpreted characters.	" , "
@, \$, %, E, or a run of characters	At least one of "0", "?", or "#"	"F"

First Section of the Number Format Code		First Return
containing a comma as described in the row above		
Any of the above conditions	Anything	"G"

3. The final value is determined by appending any of the applicable characters from the table below to the return value characters obtained from the previous two tables:

Case	Characters to Append
The first character of the return value is C, F, S, P, or ", and the number format code contains any of "?", "0", or "#" as a symbol.	The decimal number equal to the total number of "#", "?", and "0" characters to the right of the first "." within the first section
The first character of the return value was C, and the number format code does not contain any of "?", "0", or "#" as a symbol.	15 or the length of the string immediately following the first "\$" sign in the number format code that is a symbol.
The first section of the number format code contains an open parenthesis "(" as a symbol.	"()"
The second section of the number format code contains [Red], [Black], [Green], [White], [Blue], [Magenta], [Yellow], or [Cyan] as a symbol.	"_"

However, if *category* is not one of the defined values, #VALUE! is returned.

[Example:

CELL("address",A10) might result in \$\$289

CELL("contents",A10:B10), results in xxx, when A10 contains xxx, and B10 contains anything

CELL("filename",A10) might result in E:\Formulas\[Test.xlsx]Sheet1

CELL("format",A10) results in G, when A10 contains xxx

CELL("format",A10) results in F2-, when A10 contains (123.00)

CELL("format",A10) results in C3-, when A10 contains \$123,456.780

CELL("format",A10) results in S3, when A10 contains 1.235E+05

CELL("prefix",A10) results in ', when A10 contains xxx

CELL("type",A10) results in l, when A10 contains xxx

end example]

18.17.7.35 CHAR

Syntax:

CHAR (*x*)

Description: Determines the character that is represented by the value *number*. On the Macintosh platform, the Macintosh character set is used. On all other platforms, the Latin character set with IANA name *iso-8859-1* is used.

Arguments:

Name	Type	Description
<i>x</i>	number	A value in the range 1–255, which designates the character.

Return Type and Value: text – The character represented by the value *number*.

[Example:

CHAR(65) results in A

CHAR(A10) results in A, when A10 contains 65

end example]

18.17.7.36 CHIDIST

Syntax:

CHIDIST (*x* , *degrees-freedom*)

Description: Computes the one-tailed probability of the chi-squared distribution.

Mathematical Formula:

$$CHIDIST = P(X > x)$$

where:

- X = an χ^2 random variable
- x = argument x

Arguments:

Name	Type	Description
<i>x</i>	number	The value at which the distribution is to be evaluated.
<i>degrees-freedom</i>	number	The number of degrees of freedom, truncated to an integer.

Return Type and Value: number – The one-tailed probability of the chi-squared distribution.

However, if

- $x < 0$, #NUM! is returned.
- $degrees-freedom < 1$ or $degrees-freedom > 10^{10}$, #NUM! is returned.

[Example:

CHIDIST(3.5,4) results in 0.47787835

CHIDIST(12.34,7) results in 0.089917721

end example]

18.17.7.37 CHIINV

Syntax:

CHIINV (*probability* , *degrees-freedom*)

Description: Computes the inverse of the one-tailed probability of the chi-squared distribution. Given a value for *probability*, CHIINV seeks for a value x such that $\text{CHIDIST}(x, \text{degrees-freedom}) = \text{probability}$. Thus, precision of CHIINV depends on precision of CHIDIST.

Arguments:

Name	Type	Description
<i>probability</i>	number	A probability associated with the chi-squared distribution.
<i>degrees-freedom</i>	number	The number of degrees of freedom, truncated to an integer.

Return Type and Value: number – The inverse of the one-tailed probability of the chi-squared distribution.

However, if

- $probability < 0$ or $probability > 1$, #NUM! is returned.
- $degrees-freedom < 1$ or $degrees-freedom \geq 10^{10}$, #NUM! is returned.
- the implementation determines that a return value cannot be computed, #N/A is returned

[Example:

CHIINV(0.5,4) results in 3.356694001

CHIINV(0.3,7) results in 8.38343064

end example]

18.17.7.38 CHITEST

Syntax:

CHITEST (*actual-range* , *expected-range*)

Description: Computes the test for independence. CHITEST returns the value from the chi-squared distribution for the statistic and the appropriate degrees of freedom.

Mathematical Formula:

The χ^2 test first calculates a χ^2 statistic using the formula:

$$\chi^2 = \sum_{i=1}^r \sum_{j=1}^c \frac{(A_{ij} - E_{ij})^2}{E_{ij}}$$

where:

- A_{ij} = actual frequency in the i-th row, j-th column of the argument *actual-range*
- c = number of columns in argument *actual-range* (or argument *expected-range*)
- E_{ij} = expected frequency in the i-th row, j-th column of the argument *expected-range*
- r = number of rows in argument *actual-range* (or argument *expected-range*)

CHITEST uses the χ^2 distribution with an appropriate number of degrees of freedom, df. If $r > 1$ and $c > 1$, then $df = (r - 1)(c - 1)$. If $r = 1$ and $c > 1$, then $df = c - 1$ or if $r > 1$ and $c = 1$, then $df = r - 1$.

Arguments:

Name	Type	Description
<i>actual-range</i>	reference	The range of data that contains observations to test against expected values.
<i>expected-range</i>	reference	The range of data that contains the ratio of the product of row totals and column totals to the grand total.

Return Type and Value: number – The value from the chi-squared distribution for the statistic and the appropriate degrees of freedom.

However, if:

- The number of rows and columns is exactly one, the return value is unspecified.
- *actual-range* and *expected-range* have a different number of data points, #N/A is returned.

[Example: Given the following data:

	A	B	C
1	Men (Actual)	Women (Actual)	Description
2	58	35	Agree
3	11	25	Neutral
4	10	23	Disagree
5	Men (Expected)	Women (Expected)	Description
6	45.35	47.65	Agree
7	17.56	18.44	Neutral
8	16.09	16.91	Disagree

CHITEST(A2:B4,A6:B8) results in 0.000308

end example]

18.17.7.39 CHOOSE

Syntax:

CHOOSE (*index* , *argument-list*)

Description: Selects the *argument* in *argument-list* that corresponds by position to *index*.

Arguments:

Name	Type	Description
<i>index</i>	number	An index into <i>argument-list</i> , truncated to an integer. The value of <i>index</i> shall be in the position range 1– <i>n</i> , where <i>argument-1</i> is position 1, <i>argument-2</i> is position 2, and so on up to <i>argument-n</i> . If <i>index</i> is an array, the value or every element in that array is evaluated, and if the formula is an array formula, the result is an array of chosen values.
<i>argument-list</i>	any	The <i>arguments</i> in any given <i>argument-list</i> need not all have the same type.

Return Type and Value: any, including array – The *argument* in *argument-list* that corresponds by position to *index*.

However, if the value of *index* is not an index into *argument-list*, #VALUE! is returned.

[Example:

CHOOSE(E7,F7,G7,H7,I7,J7,K7,L7) results in Monday, when E7 contains 2, and the cells F7:L7 each contain the names of the week, from Sunday to Saturday

SUM(CHOOSE(E1,F20:G20,H20:J24)) results in the sum of the elements designated by F20:G20 or H20:J24, as determined by the value of E1

If B9:B11 contain 1, 3, and 3, respectively, and CHOOSE(B9:B11,10,20,30) is an array formula spanning 3 cells, the values of those 3 cells is 10, 30, and 30, respectively.

end example]

18.17.7.40 CLEAN

Syntax:

CLEAN (*string*)

Description:

Makes a string that is a copy of *string* with all so-called "non-printable" characters—those with internal values in the range U+0000–001F—removed.

Arguments:

Name	Type	Description
<i>string</i>	text	Designate the string to be cleaned.

Return Type and Value: text – The trimmed copy of *string*.

[*Example:*

CLEAN("A" & CHAR(2) & "BC") results in ABC, which is stored in A10
LEN(A10) results in 3

end example]

18.17.7.41 CODE

Syntax:

CODE (*string*)

Description: Determines the numeric code of the first character in *string*.

Arguments:

Name	Type	Description
<i>string</i>	text	Designates a string containing one or more characters.

Return Type and Value: number – The numeric code of the first character in *string*.

However, if *string* is empty, #VALUE! is returned.

[Example:

CODE("abc") results in 97

CODE(A10) results in 97, when A1 contains abc

end example]

18.17.7.42 COLUMN

Syntax:

COLUMN ([*reference*])

Description: Finds the number of the column(s) corresponding to *reference*.

Arguments:

Name	Type	Description
<i>reference</i>	reference	A reference to a single cell or to a range of contiguous cells. If omitted, the behavior is as if <i>reference</i> referred to the cell containing the formula.

Return Type and Value: number – If *reference* refers to a single cell or to a single column of cells, the corresponding column is returned. If *reference* refers to a range of cells involving multiple columns, a horizontal array of the corresponding columns as numbers is returned.

However, if the range of cells referred to by *reference* is not contiguous, #REF! is returned.

[Example:

COLUMN() results in 4, when the cell containing the formula is in column 4

COLUMN(E17:E19) results in 5

COLUMN(E16:F17) results in a horizontal array containing 5 and 6, respectively

end example]

18.17.7.43 COLUMNS

Syntax:

COLUMNS (*array*)

Description: Finds the number of columns corresponding to *array*.

Arguments:

Name	Type	Description
<i>array</i>	array, reference	Any array.

Return Type and Value: number – The number of columns corresponding to *array*.

However, if the range of cells referred to by *array* is not contiguous, #NULL! is returned.

[Example:

COLUMNS(E16:F16) results in 2

COLUMNS(E16:G18) results in 3

COLUMNS({1,2;3,4}) results in 2

end example]

18.17.7.44 COMBIN

Syntax:

COMBIN (*number* , *number-chosen*)

Description: Computes the possible number of groups of size *number-chosen* that can be formed from *number* objects. [Note: A combination is any set or subset of objects, regardless of their internal order. Combinations are distinct from permutations, for which the internal order is significant. end note]

Mathematical Formula:

The number of combinations is as follows, where *number* = *n* and *number-chosen* = *k*:

$$\binom{n}{k} = \frac{P_{k,n}}{k!} = \frac{n!}{k!(n-k)!}$$

where:

$$P_{k,n} = \frac{n!}{(n-k)!}$$

where:

- k = argument *number-chosen*
- n = argument *number*

Arguments:

Name	Type	Description
<i>number</i>	number	The total number of objects available, truncated to an integer.
<i>number-chosen</i>	number	The number of objects in each combination, truncated to an integer.

Return Type and Value: number – The number of different combinations of *number-chosen* in *number*.

However, if

- $number < 0$, #NUM! is returned.
- $number-chosen < 0$, #NUM! is returned.
- $number < number-chosen$, #NUM! is returned.

[Example:

COMBIN(8,2) results in 28

COMBIN(10,4) results in 210

COMBIN(6,5) results in 6

end example]

18.17.7.45 COMPLEX

Syntax:

COMPLEX (*real-number* , *imaginary-number* [, *suffix*])

Description: Makes a complex number in $x + yi$ or $x + yj$ text format from the arguments.

Arguments:

Name	Type	Description
<i>real-number</i>	number	The real number coefficient.
<i>imaginary-number</i>	number	The imaginary number coefficient.
<i>suffix</i>	text	"i" or "j". If omitted, "i" is used.

Return Type and Value: text – The complex number string specified by the arguments.

If *real-number* has the value 0 and *imaginary-number* has a non-zero value, the resulting string contains just the real number. If *real-number* has a non-zero value and *imaginary-number* has a zero value, the resulting string contains just the imaginary number and suffix. If both *real-number* and *imaginary-number* have a zero value, the resulting string is "0".

However, if *suffix* is neither "i" nor "j", #VALUE! is returned.

[Example:

COMPLEX(-3.5,19.6) results in -3.5+19.6i

COMPLEX(3.5, -19.6, "j") results in 3.5-19.6j

COMPLEX(3.5,0) results in 3.5

COMPLEX(0,2.4) results in 2.4i

COMPLEX(0,0) results in 0

end example]

18.17.7.46 CONCATENATE

Syntax:

CONCATENATE (*argument-list*)

Description: Makes a string that is the concatenation of all the strings corresponding to the *arguments* in *argument-list*, taken left-to-right.

Arguments:

Name	Type	Description
<i>argument-list</i>	text	Each <i>argument</i> in <i>argument-list</i> shall designate a string.

Return Type and Value: text – The concatenated string.

[Example:

CONCATENATE("text") results in text

CONCATENATE("The total is ",A10," units") results in The total is 43 units, when A10 contains 43

CONCATENATE(3, " + ",4, " = ",3+4) results in 3 + 4 = 7

end example]

18.17.7.47 CONFIDENCE

Syntax:

CONFIDENCE (*alpha* , *standard-dev* , *size*)

Description: Computes a value that can be used to construct a confidence interval for a population mean. The CONFIDENCE function assumes a normal distribution for calculation.

Arguments:

Name	Type	Description
<i>alpha</i>	number	The significance level used to compute the confidence level.
<i>standard-dev</i>	number	The population standard deviation for the data range.
<i>size</i>	number	The sample size, truncated to an integer.

Return Type and Value: number – A value that can be used to construct a confidence interval for a population mean.

However, if

- *alpha* ≤ 0 or *alpha* ≥ 1, #NUM! is returned.
- *standard-dev* ≤ 0, #NUM! is returned.
- *size* < 1, #NUM! is returned.

[Example:

CONFIDENCE(0.4,5,12) results in 1.214775614

CONFIDENCE(0.75,9,7) results in 1.083909234

end example]

18.17.7.48 CONVERT

Syntax:

CONVERT (*number* , *from-unit* , *to-unit*)

Description: Converts a number from one measurement system to another.

Arguments:

Name	Type	Description
<i>number</i>	number	The value to be converted from <i>from-units</i> to <i>to-units</i> .
<i>from-unit</i>	text	The unit to be converted from, where the permitted string values are shown in the tables below.
<i>to-unit</i>	text	The unit to be converted to, where the permitted string values are shown in the tables below.

Weight and Mass	
<i>Unit String</i>	<i>Meaning</i>
g	Gram
lbm	Pound mass (avoirdupois)
ozm	Ounce mass (avoirdupois)
sg	Slug
u	U (atomic mass unit)

Distance	
<i>Unit String</i>	<i>Meaning</i>
ang	Angstrom
ft	Foot
in	Inch
m	Meter
mi	Statute mile
Nmi	Nautical mile
Pica	Point (1/72 inch)
yd	Yard

Time	
<i>Unit String</i>	<i>Meaning</i>
day	Day
hr	Hour
mn	Minute
sec	Second
yr	Year

Pressure	
<i>Unit String</i>	<i>Meaning</i>
at or atm	Atmosphere
mmHg	mm of Mercury
P or p	Pascal

Force	
<i>Unit String</i>	<i>Meaning</i>
dy or dyn	Dyne
lbf	Pound force
N	Newton

Energy	
<i>Unit String</i>	<i>Meaning</i>
BTU or btu	BTU _{IT}
c	Thermodynamic calorie
cal	IT calorie
e	Erg
ev or eV	Electron volt
flb	Foot-pound
HPh or hh	Horsepower-hour
J	Joule
Wh or wh	Watt-hour

Power	
<i>Unit String</i>	<i>Meaning</i>
H or hp	Horsepower
W or w	Watt

Magnetism	
<i>Unit String</i>	<i>Meaning</i>
ga	Gauss
T	Tesla

Temperature	
<i>Unit String</i>	<i>Meaning</i>
C or cel	Degrees Celsius
F or fah	Degrees Fahrenheit
K or kel	Degrees Kelvin

Liquid Measure			
<i>Unit String</i>	<i>Meaning</i>	<i>Family Conversion Factor (Informative)</i>	<i>Metric Conversion Factor (Informative)</i>
AU_tbs	Australian tablespoon		20 ml
cup	U.S. cup (reduced accuracy)	½ pt	236.59 ml +/-0.025%
CZ_mass	Czech mass		1.4147 l
CZ_mug	Czech mug	¼ CZ_mass	0.358 l
gal	U.S. gallon (reduced accuracy)	8 pt	3.7854 l +/-0.025% For the purpose of comparison with calculations by applications using the antecedents to ECMA-376, the specific metric conversion factor value of 3.78624 l might be appropriate.
GB_tbs or CA_tbs or JP_tbs	United Kingdom tablespoon		15 ml
imperial_gal or AU_gal or CA_gal or GB_gal	Imperial gallon	8 imperial_pt	4.54609 l
imperial_oz or AU_oz or CA_oz or GB_oz	Imperial fluid ounce	1/20 imperial_pt	28.4130625 ml
imperial_pt or AU_pt or CA_pt or GB_pt or uk_pt	Imperial pint		0.56826125 l uk_pt might be reduced accuracy: +/- 0.025%
imperial_qt or AU_qt or CA_qt or GB_qt	Imperial quart	2 imperial_pt	1.1365225 l
JP_cup	Japanese cup		200 ml
l or lt	Liter		
metric_cup or AU_cup or	Metric cup		250 ml

Liquid Measure			
CA_cup or NZ_cup			
metric_tsp or AU_tsp or CA_tsp or JP_tsp or GB_tsp	Metric teaspoon		5 ml
ml	Milliliter	1/1000 l	1/1000 l
oz	U.S. fluid ounce (reduced accuracy)	1/16 pt	29.573 ml +/-0.025%
pt or us_pt	U.S. liquid pint		473.18 ml +/-0.025%
qt	U.S. liquid quart	2 pt	946.35 ml +/-0.025%
tbs	U.S. tablespoon (reduced accuracy)	½ oz	14.787 ml +/-0.025%
tsp	U.S. teaspoon (reduced accuracy)	1/6 oz	4.9289 ml +/-0.025%
US_cup	U.S. cup	½ US_pt	236.5882 ml
US_gal	U.S. gallon	8 US_pt	3.785412 l
US_oz	U.S. fluid ounce	1/16 US_pt	29.57353 ml
US_pt	U.S. liquid pint		473.1765 ml
US_qt	U.S. liquid quart	2 US_pt	946.3529 ml
US_tbs	U.S. tablespoon	½ US_oz	14.78676 ml
US_tsp	U.S. teaspoon	1/6 US_oz	4.928922 ml

The following abbreviated unit prefixes can be used with any metric unit:

Abbreviated Unit Prefixes	
Prefix String	Meaning
E	exa (1E+18)
P	peta (1E+15)
T	tera (1E+12)
G	giga (1E+09)
M	mega (1E+06)
k	kilo (1E+03)
h	hecto (1E+02)
e	deka (1E+01)

Abbreviated Unit Prefixes	
d	deci (1E-01)
c	centi (1E-02)
m	milli (1E-03)
u	micro (1E-06)
n	nano 1E-09)
p	pico (1E-12)
f	femto (1E-15)
a	atto (1E-18)

Unit names and prefixes are case-sensitive.

Return Type and Value: number – The value of *number* in *from-units* converted to *to-units*.

However, if

- The value of *from-unit* or *to-unit* is not one of the defined values, #N/A is returned.
- The *from-unit* and *to-unit* are from different measurement categories, #N/A is returned.
- The value of *from-unit* or *to-unit* has an abbreviated unit prefix, yet none is supported for that unit, #N/A is returned.

[Example:

```

CONVERT(10, "ozm", "g") results in 283.4951521
CONVERT(1, "yd", "mm") results in 914.4000003
CONVERT(1, "yd", "cm") results in 91.44000003
CONVERT(1, "yd", "m") results in 0.9144
CONVERT(1, "yd", "km") results in 0.0009144
CONVERT(1, "mi", "Nmi") results in 0.868976242
CONVERT(1, "day", "sec") results in 86400
CONVERT(0, "K", "C") results in -273.15

```

end example]

18.17.7.49 CORREL

Syntax:

```
CORREL ( array-1 , array-2 )
```

Description: Computes the correlation coefficient of the two cell ranges designated by *array-1* and *array-2*.

Mathematical Formula:

The equation for the correlation coefficient is:

$$\text{Correl}(X, Y) = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sqrt{\sum (x - \bar{x})^2 \sum (y - \bar{y})^2}}$$

where

- x = a sample value
- \bar{x} = the sample mean `AVERAGE(array-1)`
- y = a sample value
- \bar{y} = the sample mean `AVERAGE(array-2)`

Arguments:

Name	Type	Description
<i>array-1</i>	array, reference	The first cell range. If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.
<i>array-2</i>	array, reference	The second cell range. If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.

Return Type and Value: number – The correlation coefficient of the cells in two cell ranges.

However, if

- *array-1* and *array-2* have a different number of data points, the return value is unspecified.
- *array-1* and *array-2* is empty, the return value is unspecified.
- The standard deviation of the values in *array-1* or *array-2* equals zero, the return value is unspecified.

[Example:

`CORREL({2.532,5.621;2.1,3.4},{5.32,2.765;5.2,6.7})` results in `-0.714976`

end example]

18.17.7.50 COS

Syntax:

`COS (x)`

Description: Computes the cosine of x .

Arguments:

Name	Type	Description
x	number	The value, in radians, whose cosine is to be determined.

Return Type and Value: number – The cosine of x .

[Example:

COS(-1) results in 0.540302306

COS(0) results in 1

COS(1) results in 0.540302306

end example]

18.17.7.51 COSH

Syntax:

COSH (x)

Description: Computes the hyperbolic cosine of x .

Arguments:

Name	Type	Description
x	number	The value whose hyperbolic cosine is to be determined.

Return Type and Value: number – The hyperbolic cosine of x .

However, if the magnitude of x is too large, #NUM! is returned.

[Example:

COSH(-1) results in 1.543080635

COSH(0) results in 1

COSH(1) results in 1.543080635

end example]

18.17.7.52 COUNT

Syntax:

COUNT (*argument-list*)

Description: Counts the number of *arguments* in *argument-list* that contain numbers, and the number of cells referred to by *arguments* in *argument-list*, which contain numbers.

Arguments:

Name	Type	Description
<i>argument-list</i>	text	Each <i>argument</i> in <i>argument-list</i> designates a value. Arguments that are numbers, logical values, dates, or text representations of numbers shall be counted. If an argument is an array or reference, only numbers in that array or reference shall be counted. Empty cells, logical values, text, or error values in the array or reference shall be ignored. [Note: To count logical values, text, or error values as well, use the COUNTA (§18.17.7.53) function. <i>end note</i>]

Return Type and Value: number – The numeric argument and reference to numeric argument count.

[Example:

COUNT(1,2,3,4,5) results in 5

COUNT({1,2,3,4,5}) results in 5

COUNT({1,2,3,4,5},6,"7") results in 7

COUNT(10,E1), where E1 is an empty cell, results in 1, as E1 is ignored

COUNT(10,E2), where E2 contains TRUE, results in 1, as E2 is ignored

end example]

18.17.7.53 COUNTA

Syntax:

COUNTA (*argument-list*)

Description: Counts the number of arguments that are not cell references, and the number of cells, referred to by arguments, which are not empty.

Arguments:

Name	Type	Description
<i>argument-list</i>	text	Each <i>argument</i> in <i>argument-list</i> designates a value. Arguments with values of any type shall be counted. However, empty cells shall not be counted. If an argument is an array or reference, only values in that array or reference shall be counted. Empty cells and text values in the array or reference shall be ignored. [Note: To exclude logical values, text, or error values, use the COUNT (§18.17.7.52) function. <i>end note</i>]

Return Type and Value: number – The number of arguments that are not cell references, and the number of cells, referred to by arguments, which are not empty.

[Example:

COUNTA(1,2,3,4,5) results in 5

COUNTA({1,2,3,4,5}) results in 15

COUNTA({1,2,3,4,5},6,"7") results in 7

COUNTA(10,E1), where E1 is an empty cell, results in 1, as E1 is ignored

COUNTA(10,E2), where E2 contains TRUE, results in 2, as E2 is counted

end example]

18.17.7.54 COUNTBLANK

Syntax:

COUNTBLANK (*cell-range*)

Description: Counts the number of cells in a specified range of cells, which are empty. A cell containing a formula that returns an empty string is counted, whereas a cell containing a zero value is not.

Arguments:

Name	Type	Description
<i>cell-range</i>	reference	Designates the range of cells to be inspected.

Return Type and Value: number – The number of empty cells in the range specified.

[Example:

COUNTBLANK(A2:C2), where A2 and B2 are empty, but C2 is not, results in 2

end example]

18.17.7.55 COUNTIF

Syntax:

COUNTIF (*cell-range* , *selection-criteria*)

Description: Counts the number of cells in a specified range of cells, whose values meet the specified criteria.

Arguments:

Name	Type	Description
<i>cell-range</i>	reference	Designates the range of cells to be inspected.

Name	Type	Description
<i>selection-criteria</i>	number, expression, reference, text	Designates the cells to be counted. In the case of text, <i>selection-criteria</i> can consist of any comparison operator followed by the operand against which each cell's value is to be compared. <i>selection-criteria</i> can include one or more wildcard characters, question mark (?) and asterisk (*). A question mark matches any single character; an asterisk matches any sequence of characters. To search for a question mark, asterisk, or tilde character, prefix that character with a tilde (~).

Return Type and Value: number – The number of cells in the range specified that meet the criteria.

[Example: Given that A1, B1, C1, and D1, respectively, contain the values 3, 10, 7, and 10

COUNTIF(A1:D1, "=10") results in 2

COUNTIF(A1:D1, ">5") results in 30

COUNTIF(A1:D1, "<>10") results in 2

Given that A2, B2, C2, and D2, respectively, contain the values apples, oranges, grapes, and melons

COUNTIF(A2:D2, "*es") results in 3

COUNTIF(A2:D2, "?a*") results in 2

COUNTIF(A2:D2, "*1*") results in 2

end example]

18.17.7.56 COUNTIFS

Syntax:

COUNTIFS (*count-range* , *cell-range-1* , *selection-criteria-1*
[, *cell-range-2* , *selection-criteria-2* [, ...]])

Description: Counts the number of cells within a range that meet multiple criteria.

Arguments:

Name	Type	Description
<i>count-range</i>	reference	Designates the cells whose values are included. <i>count-range</i> does not have to have the same size and shape as <i>cell-range-1</i> through <i>cell-range-n</i> . The actual cells that are added are determined by using the top, left cell in <i>count-range</i> as the beginning cell, and then including cells that correspond in size and shape to <i>cell-range-1</i> through <i>cell-range-n</i> .

Name	Type	Description
<i>cell-range-1</i>	reference	Designates the first range of cells to be inspected. Each cell in a range is counted only if all of the corresponding criteria specified are true for that cell.
<i>selection-criteria-1</i>	number, expression, reference, text	Designates the first range of cells to be counted. In the case of text, <i>selection-criteria-1</i> can consist of any comparison operator followed by the operand against which each cell's value is to be compared. <i>selection-criteria</i> can include one or more wildcard characters, question mark (?) and asterisk (*). A question mark matches any single character; an asterisk matches any sequence of characters. To search for a question mark, asterisk, or tilde character, prefix that character with a tilde (~).
<i>cell-range-n</i>	reference	The optional arguments <i>selection-criteria-2</i> through <i>selection-criteria-n</i> have corresponding arguments <i>cell-range-2</i> through <i>cell-range-n</i> , and have the same semantics as <i>selection-criteria-1</i> and <i>cell-range-1</i> , respectively.
<i>selection-criteria-n</i>	number, expression, reference, text	

If a cell in any argument is an empty cell, it is treated as if it had the value 0.

Return Type and Value: number – The count of the cells corresponding to those selected.

[Example: Given the following data:

	A	B	C	D
1	Sales Person	Exceeded Tables Quota	Exceeded Chairs Quota	Exceeded Desks Quota
2	Davolio	Yes	No	No
3	Buchanan	Yes	Yes	No
4	Suyama	Yes	Yes	Yes
5	Leverling	No	Yes	Yes

COUNTIFS(B2:D2, "=Yes") results in 1 (counts how many times Davolio exceeded a sales quota for tables, chairs, and desks)

COUNTIFS(B2:B5, "=Yes", C2:C5, "=Yes") results in 2 (counts how many sales people exceeded both their tables and chairs quota)

COUNTIFS(B5:D5, "=Yes", B3:D3, "=Yes") results in 1 (counts how many times Leverling and Buchanan exceeded the same quota for tables, chairs, and desks)

end example]

18.17.7.57 COUPDAYBS

Syntax:

COUPDAYBS (*settlement* , *maturity* , *frequency* [, [*basis*]])

Description: Computes the number of days from the beginning of the coupon period to the settlement date.

Arguments:

Name	Type	Description				
<i>settlement</i>	number	The security's settlement date.				
<i>maturity</i>	number	The security's maturity date.				
<i>frequency</i>	number	The number of coupon payments per year. For annual payments, frequency is 1; for semiannual payments, frequency is 2; for quarterly payments, frequency is 4. <i>frequency</i> is truncated to an integer.				
<i>basis</i>	number	<div>The truncated integer type of day count basis to use, as follows:<table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30</td></tr></table></div>	Value	Day Count Basis	0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30
Value	Day Count Basis					
0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30					

Name	Type	Description	
			days as long as the first date was not 28 or 29 February, in which case it does not change.
		1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.
		2	Actual/360. Similar to Basis 1, but only has 360 days per year.
		3	Actual/365. Similar to Basis 1, but always has 365 days per year.
		4	<p>European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</p> <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months with 31 days, all dates with a day value of 31 are changed to

Name	Type	Description	
			day 30, including situations where the first date is 28 or 29 February.

Time information in the date arguments is ignored.

Return Type and Value: number – The number of days from the beginning of the coupon period to the settlement date.

However, if

- *settlement* or *maturity* is out of range for the current date system, #NUM! is returned.
- *settlement* \geq *maturity*, #NUM! is returned.
- *frequency* is any number other than 1, 2, or 4, #NUM! is returned.
- *basis* < 0 or *basis* > 4 , #NUM! is returned.

[Example:

COUPDAYBS (DATE (2007, 1, 25), DATE (2008, 11, 15), 2, 1) results in 71

COUPDAYBS (DATE (2007, 1, 25), DATE (2008, 11, 15), 2) results in 70

end example]

18.17.7.58 COUPDAYS

Syntax:

COUPDAYS (*settlement* , *maturity* , *frequency* [, [*basis*]])

Description: Computes the number of days in the coupon period that contains the settlement date.

Arguments:

Name	Type	Description
<i>settlement</i>	number	The security's settlement date.
<i>maturity</i>	number	The security's maturity date.
<i>frequency</i>	number	The number of coupon payments per year. For annual payments, frequency is 1; for semiannual payments, frequency is 2; for quarterly payments, frequency is 4.

Name	Type	Description								
		<i>frequency</i> is truncated to an integer.								
<i>basis</i>	number	The truncated integer type of day count basis to use, as follows:								
		<table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">• If the date is 28 or 29 February, it is adjusted to 30 February.• For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.</td></tr><tr><td>1</td><td>Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.</td></tr><tr><td>2</td><td>Actual/360. Similar to</td></tr></table>	Value	Day Count Basis	0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">• If the date is 28 or 29 February, it is adjusted to 30 February.• For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.	1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.	2	Actual/360. Similar to
		Value	Day Count Basis							
		0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">• If the date is 28 or 29 February, it is adjusted to 30 February.• For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.							
1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.									
2	Actual/360. Similar to									

Name	Type	Description	
			Basis 1, but only has 360 days per year.
		3	Actual/365. Similar to Basis 1, but always has 365 days per year.
		4	European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.

Time information in the date arguments is ignored.

Return Type and Value: number – The number of days in the coupon period that contains the settlement date.

However, if

- *settlement* or *maturity* is out of range for the current date system, #NUM! is returned.
- *settlement* \geq *maturity*, #NUM! is returned.

- *frequency* is any number other than 1, 2, or 4, #NUM! is returned.
- *basis* < 0 or *basis* > 4, #NUM! is returned.

[Example:

COUPDAYS (DATE (2007,1,25),DATE (2008,11,15),2,1) results in 181

COUPDAYS (DATE (2007,1,25),DATE (2008,11,15),2) results in 180

end example]

18.17.7.59 COUPDAYSNC

Syntax:

COUPDAYSNC (*settlement* , *maturity* , *frequency* [, [*basis*]])

Description: Computes the number of days from the settlement date to the next coupon date.

Arguments:

Name	Type	Description				
<i>settlement</i>	number	The security's settlement date.				
<i>maturity</i>	number	The security's maturity date.				
<i>frequency</i>	number	The number of coupon payments per year. For annual payments, frequency is 1; for semiannual payments, frequency is 2; for quarterly payments, frequency is 4. <i>frequency</i> is truncated to an integer.				
<i>basis</i>	number	<div>The truncated integer type of day count basis to use, as follows:<table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value</td></tr></table></div>	Value	Day Count Basis	0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value
Value	Day Count Basis					
0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value					

Name	Type	Description	
			of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.
		1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.
		2	Actual/360
		3	Actual/365. Similar to Basis 1, but always has 365 days per year.
		4	European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months with

Name	Type	Description	
			31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.

Time information in the date arguments is ignored.

Return Type and Value: number – The number of days from the settlement date to the next coupon date.

However, if

- *settlement* or *maturity* is out of range for the current date system, #NUM! is returned.
- *settlement* \geq *maturity*, #NUM! is returned.
- *frequency* is any number other than 1, 2, or 4, #NUM! is returned.
- *basis* < 0 or *basis* > 4 , #NUM! is returned.

[Example:

COUPDAYSNC (DATE (2007,1,25),DATE (2008,11,15),2,1) results in 110

COUPDAYSNC (DATE (2007,1,25),DATE (2008,11,15),2) results in 110

end example]

18.17.7.60 COUPNCD

COUPNCD (*settlement* , *maturity* , *frequency* [, [*basis*]])

Description: Computes the next coupon date after the settlement date.

Arguments:

Name	Type	Description
<i>settlement</i>	number	The security's settlement date.
<i>maturity</i>	number	The security's maturity date.
<i>frequency</i>	number	The number of coupon payments per year. For annual

Name	Type	Description						
		payments, frequency is 1; for semiannual payments, frequency is 2; for quarterly payments, frequency is 4. <i>frequency</i> is truncated to an integer.						
<i>basis</i>	number	<p>The truncated integer type of day count basis to use, as follows:</p> <table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">• If the date is 28 or 29 February, it is adjusted to 30 February.• For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.</td></tr><tr><td>1</td><td>Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365</td></tr></table>	Value	Day Count Basis	0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">• If the date is 28 or 29 February, it is adjusted to 30 February.• For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.	1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365
Value	Day Count Basis							
0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">• If the date is 28 or 29 February, it is adjusted to 30 February.• For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.							
1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365							

Name	Type	Description	
			days.
		2	Actual/360. Similar to Basis 1, but only has 360 days per year.
		3	Actual/365. Similar to Basis 1, but always has 365 days per year.
		4	<p>European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</p> <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.

Time information in the date arguments is ignored.

Return Type and Value: number – The next coupon date after the settlement date, as a date.

However, if

- *settlement* or *maturity* is out of range for the current date system, #NUM! is returned.
- *settlement* \geq *maturity*, #NUM! is returned.
- *frequency* is any number other than 1, 2, or 4, #NUM! is returned.
- *basis* < 0 or *basis* > 4, #NUM! is returned.

[Example:

COUPNCD(DATE(2007,1,25),DATE(2008,11,15),2,1) results in 15-May-2007

end example]

18.17.7.61 COUPNUM

COUPNUM (*settlement* , *maturity* , *frequency* [, [*basis*]])

Description: Computes the number of coupons payable between the settlement date and maturity date, rounded up to the nearest whole number.

Arguments:

Name	Type	Description				
<i>settlement</i>	number	The security's settlement date.				
<i>maturity</i>	number	The security's maturity date.				
<i>frequency</i>	number	The number of coupon payments per year. For annual payments, frequency is 1; for semiannual payments, frequency is 2; for quarterly payments, frequency is 4. <i>frequency</i> is truncated to an integer.				
<i>basis</i>	number	<div>The truncated integer type of day count basis to use, as follows:<table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date</td></tr></table></div>	Value	Day Count Basis	0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date
Value	Day Count Basis					
0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date					

Name	Type	Description	
			has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.
		1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.
		2	Actual/360. Similar to Basis 1, but only has 360 days per year.
		3	Actual/365. Similar to Basis 1, but always has 365 days per year.
		4	European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30

Name	Type	Description		
				February. <ul style="list-style-type: none">For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.

Time information in the date arguments is ignored.

Return Type and Value: number – The number of coupons payable between the settlement date and maturity date, rounded up to the nearest whole coupon.

However, if

- settlement* or *maturity* is out of range for the current date system, #NUM! is returned.
- settlement* ≥ *maturity*, #NUM! is returned.
- frequency* is any number other than 1, 2, or 4, #NUM! is returned.
- basis* < 0 or *basis* > 4, #NUM! is returned.

[Example:

COUPNUM(DATE(2007,1,25),DATE(2008,11,15),2,1) results in 4

end example]

18.17.7.62 COUPPCD

COUPPCD (*settlement* , *maturity* , *frequency* [, [*basis*]])

Description: Computes the previous coupon date before the settlement date.

Arguments:

Name	Type	Description						
<i>settlement</i>	number	The security's settlement date.						
<i>maturity</i>	number	The security's maturity date.						
<i>frequency</i>	number	The number of coupon payments per year. For annual payments, frequency is 1; for semiannual payments, frequency is 2; for quarterly payments, frequency is 4. <i>frequency</i> is truncated to an integer.						
<i>basis</i>	number	<div>The truncated integer type of day count basis to use, as follows:<table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.</td></tr><tr><td>1</td><td>Actual/actual. The actual number of days between the two dates are counted. If the date range includes the</td></tr></table></div>	Value	Day Count Basis	0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.	1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the
Value	Day Count Basis							
0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.							
1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the							

Name	Type	Description	
			date 29 February, the year is 366 days; otherwise it is 365 days.
		2	Actual/360. Similar to Basis 1, but only has 360 days per year.
		3	Actual/365. Similar to Basis 1, but always has 365 days per year.
		4	<p>European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</p> <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.

Time information in the date arguments is ignored.

Return Type and Value: number – The previous coupon date before the settlement date, as a date.

However, if

- *settlement* or *maturity* is out of range for the current date system, #NUM! is returned.
- *settlement* \geq *maturity*, #NUM! is returned.
- *frequency* is any number other than 1, 2, or 4, #NUM! is returned.
- *basis* < 0 or *basis* > 4, #NUM! is returned.

[Example:

COUPPCD(DATE(2007,1,25),DATE(2008,11,15),2,1) results in 15-Nov-2006

end example]

18.17.7.63 COVAR

Syntax:

COVAR (*array-1* , *array-2*)

Description: Computes covariance; that is, the average of the products of deviations for each data point pair in the two cell ranges designated by *array-1* and *array-2*.

Mathematical Formula:

The covariance is:

$$\text{Cov}(X, Y) = \frac{\sum (x - \bar{x})(y - \bar{y})}{n}$$

where

- n = the sample size
- x = a sample value
- \bar{x} = the sample mean AVERAGE(*array-1*)
- y = a sample value
- \bar{y} = the sample mean AVERAGE(*array-2*)

Arguments:

Name	Type	Description
<i>array-1</i>	number, name, array, reference to number	If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.
<i>array-2</i>		

Return Type and Value: number – The covariance.

However, if

- *array-1* and *array-2* have a different number of data points, the return value is unspecified.
- *array-1* or *array-2* is empty, the return value is unspecified.

[Example:

COVAR({2.532,5.621;2.1,3.4},{5.32,2.765;5.2,6.7}) results in -1.375374

end example]

18.17.7.64 CRITBINOM

Syntax:

CRITBINOM (*number-trials* , *success-probability* , *alpha*)

Description: Computes the smallest value for which the cumulative binomial distribution is greater than or equal to a criterion value.

Arguments:

Name	Type	Description
<i>number-trials</i>	number	The number of Bernoulli trials.
<i>success-probability</i>	number	The probability of success on each trial.
<i>alpha</i>	number	The criterion value.

Return Type and Value: number – The smallest value for which the cumulative binomial distribution is greater than or equal to a criterion value.

However, if

- *number-trials* < 0, #NUM! is returned.
- *success-probability* is < 0 or *success-probability* > 1, #NUM! is returned.
- *alpha* < 0 or *alpha* > 1, #NUM! is returned.

[Example:

CRITBINOM(6,0.5,0.75) results in 4

CRITBINOM(12,0.3,0.95) results in 6

end example]

18.17.7.65 CUBEKPIMEMBER

Syntax:

CUBEKPIMEMBER (*connection* , *kpi-name* , *kpi-property* [, [*caption*]])

Description: Fetches from the OLAP cube on the OLAP server designated by *connection*, a Key Performance Indicator (KPI) name, property, and measure, and displays the name and property in the cell. A KPI is a quantifiable measurement, such as monthly gross profit or quarterly employee turnover, used to monitor an organization's performance.

Arguments:

Name	Type	Description														
connection	text	The name of the connection to the cube.														
kpi-name	text	The name of the KPI in the cube.														
kpi-property	number	<div>The KPI component to be returned, truncated to integer; it shall be one of the following:<table><tr><th>Value</th><th>Description</th></tr><tr><td>1</td><td>The actual value, at the time the function is executed.</td></tr><tr><td>2</td><td>A target value of the KPI, which can be compared to the actual value in order to determine if the underlying indicator is meeting its goal.</td></tr><tr><td>3</td><td>The state of the KPI at a specific moment in time</td></tr><tr><td>4</td><td>A measure of the value over time</td></tr><tr><td>5</td><td>The relative importance assigned to the KPI on the server. If this KPI is assigned a parent KPI, then this number can be used on the server to proportionally adjust the results of this KPI value when calculating the value of the parent KPI. While this number can be shown in the spreadsheet application, it is assumed that it is used by the server for any calculations affecting the KPI.</td></tr><tr><td>6</td><td>The unique name of the member in the time dimension that defines the timeframe of the KPI.</td></tr></table></div>	Value	Description	1	The actual value, at the time the function is executed.	2	A target value of the KPI, which can be compared to the actual value in order to determine if the underlying indicator is meeting its goal.	3	The state of the KPI at a specific moment in time	4	A measure of the value over time	5	The relative importance assigned to the KPI on the server. If this KPI is assigned a parent KPI, then this number can be used on the server to proportionally adjust the results of this KPI value when calculating the value of the parent KPI. While this number can be shown in the spreadsheet application, it is assumed that it is used by the server for any calculations affecting the KPI.	6	The unique name of the member in the time dimension that defines the timeframe of the KPI.
Value	Description															
1	The actual value, at the time the function is executed.															
2	A target value of the KPI, which can be compared to the actual value in order to determine if the underlying indicator is meeting its goal.															
3	The state of the KPI at a specific moment in time															
4	A measure of the value over time															
5	The relative importance assigned to the KPI on the server. If this KPI is assigned a parent KPI, then this number can be used on the server to proportionally adjust the results of this KPI value when calculating the value of the parent KPI. While this number can be shown in the spreadsheet application, it is assumed that it is used by the server for any calculations affecting the KPI.															
6	The unique name of the member in the time dimension that defines the timeframe of the KPI.															

Name	Type	Description	
			[<i>Example</i> : A KPI could be associated with the first quarter of the year 2007. <i>end example</i>]
		If 1 is specified, only <i>kpi-name</i> is displayed in the cell.	
<i>caption</i>	text	An alternative string whose value is displayed in the cell instead of <i>kpi-name</i> and <i>kpi-property</i> .	

Return Type and Value: any – The selected key performance indicator.

However, if

- *kpi-name* is not the name of a KPI in the cube, the return value is unspecified.
- *kpi-property* is outside the range 1–6, #N/A is returned.
- The *connection* name is not a workbook connection stored in the workbook, the return value is unspecified.
- The OLAP server is not running, not available, or returns an error message, the return value is unspecified.

[*Example*:

```
CUBEKPIMEMBER("Sales","MySalesKPI",1)
CUBEKPIMEMBER("Sales","MySalesKPI",2,"Sales KPI Goal")
```

end example]

18.17.7.66 CUBEMEMBER

Syntax:

```
CUBEMEMBER ( connection , member-expression , [ , [ caption ] ] )
```

Description: Fetches from the OLAP cube on the OLAP server designated by *connection*, the member or tuple defined by *member-expression*. [*Note*: This function is used to ensure that the member or tuple exists in the cube. *end note*]

When a call to CUBEMEMBER is used as an argument to another CUBExxx function, the MDX expression that identifies the member or tuple is used by that CUBExxx function, rather than the displayed value in the cell of the CUBEMEMBER function.

Arguments:

Name	Type	Description
<i>connection</i>	text	The name of the connection to the cube.
<i>member-expression</i>	text, reference, array	A multidimensional expression (MDX) that evaluates to a unique member in the cube. Alternatively, <i>member-expression</i> can be a tuple, specified as a cell range or an array constant. [Note: MDX is a standard query language for OLAP cubes. <i>end note</i>]
<i>caption</i>	text	The string displayed in the cell instead of the caption from the cube (assuming it defines such a caption). When a tuple is returned, the caption used is the one for the last member in the tuple.

Return Type and Value: any – A member or tuple in a cube hierarchy.

However, if

- The connection name is not a workbook connection stored in the workbook, the return value is unspecified.
- The OLAP server is not running, not available, or returns an error message, the return value is unspecified.
- At least one element within the tuple is invalid, the return value is unspecified.
- The syntax of *member-expression* is incorrect, the return value is unspecified.
- The member specified by *member-expression* doesn't exist in the cube, the return value is unspecified.
- The tuple is invalid because there is no intersection for the specified values, the return value is unspecified.
- The set contains at least one member with a different dimension than the other members, the return value is unspecified.

[Example:

```

CUBEMEMBER("Sales","[Time].[Fiscal].[2004]")
CUBEMEMBER($A$1,D$12)
CUBEMEMBER("Sales",(B4,C6,D5),"SalesFor2004")
CUBEMEMBER("Sales",{[Products].[Food];[Time].[Fiscal].[2004]})
CUBEMEMBER($A$1,C$12:D$12)

```

end example]

18.17.7.67 CUBEMEMBERPROPERTY

Syntax:

```
CUBEMEMBERPROPERTY ( connection , member-expression , property )
```

Description: Fetches a property of a member in the OLAP cube on an OLAP server. [*Note: Use this function to ensure that a member name exists within the cube and to return the specified property for this member. end note*]

Arguments:

Name	Type	Description
<i>connection</i>	text	The name of the connection to the cube.
<i>member-expression</i>	text	A multidimensional expression (MDX) that evaluates to a unique member in the cube. [<i>Note: MDX is a standard query language for OLAP cubes. end note</i>]
<i>property</i>	text	The name of the property returned or a reference to a cell that contains the name of the property.

Return Type and Value: any – A property of a member in the OLAP cube.

However, if

- The connection name is not a workbook connection stored in the workbook, the return value is unspecified.
- The OLAP server is not running, not available, or returns an error message, the return value is unspecified.
- The syntax of *member-expression* is incorrect, the return value is unspecified.
- The member specified by *member-expression* doesn't exist in the cube, the return value is unspecified.

[*Example:*

```
CUBEMEMBERPROPERTY("Sales","[Time].[Fiscal].[2004]",$A$3)
CUBEMEMBERPROPERTY("Sales","[Store].[MyFavoriteStore]",
"[Store].[Store Name].[Store Sqft]")
```

end example]

18.17.7.68 CUBERANKEDMEMBER

Syntax:

CUBERANKEDMEMBER (*connection* , *set-expression* , *rank* [, *caption*])

Description: Fetches the n^{th} , or ranked, member in a set.

Arguments:

Name	Type	Description
<i>connection</i>	text	The name of the connection to the cube.

Name	Type	Description
<i>set-expression</i>	text	A set expression, such as "[{Item1}.children]".
<i>rank</i>	number	Specifies the top value to return, truncated to integer. If 1, the top value is returned; if 2, the second-most top value is returned; and so on.
<i>caption</i>	text	The text displayed in the cell instead of the caption from the cube (assuming it defines such a caption).

Return Type and Value: any – The n^{th} member in the set.

However, if

- The connection name is not a workbook connection stored in the workbook, the return value is unspecified.
- The OLAP server is not running, not available, or returns an error message, the return value is unspecified. , the return value is unspecified.
- The syntax of *member-expression* is incorrect, the return value is unspecified.
- The set contains at least one member with a different dimension than the other members, the return value is unspecified.

[Example:

```
CUBERANKEDMEMBER("Sales",$D$4,1,"Top Month")
CUBERANKEDMEMBER("Sales",CUBESET("Sales","Summer","[2004].[June]",
"[2004].[July]","[2004].[August]"),3,"Top Month")
```

end example]

18.17.7.69 CUBESET

Syntax:

```
CUBESET ( connection , set-expression [ , [ caption ] [ , [ sort-order ]
[ , [ sort-by ] ] ] ] )
```

Description: Fetches from the OLAP cube on the OLAP server designated by *connection* the set of members or tuples that is defined by *set-expression*. [Note: Use this function to build dynamic reports that aggregate and filter data, by using the return value as a slicer in the CUBEVALUE function, the CUBERANKEDMEMBER function to choose specific members from the calculated set, and the CUBESETCOUNT function to control the size of the set. end note]

Arguments:

Name	Type	Description																								
<i>connection</i>	text	The name of the connection to the cube.																								
<i>set-expression</i>	text, reference	A set expression that results in a set of members or tuples. <i>set-expression</i> can also be a cell reference to range that contains one or more members, tuples, or sets included in the set.																								
<i>caption</i>	text	The text displayed in the cell instead of the caption from the cube (assuming it defines such a caption).																								
<i>sort-order</i>	text	<p>The type of sort, if any, to perform; it can be one of the following:</p> <table data-bbox="766 640 1357 1453"> <tr> <th>Value</th><th>Description</th><th><i>sort-by</i> argument</th></tr> <tr> <td>0 or default</td><td>Leaves the set in existing order</td><td>Ignored</td></tr> <tr> <td>1</td><td>Sorts set in ascending order by <i>sort_by</i></td><td>Required</td></tr> <tr> <td>2</td><td>Sorts set in descending order by <i>sort_by</i></td><td>Required</td></tr> <tr> <td>3</td><td>Sorts set in alphabetic ascending order</td><td>Ignored</td></tr> <tr> <td>4</td><td>Sorts set in alphabetic descending order</td><td>Ignored</td></tr> <tr> <td>5</td><td>Sorts set in natural ascending order</td><td>Ignored</td></tr> <tr> <td>6</td><td>Sorts set in natural descending order</td><td>Ignored</td></tr> </table> <p>An alphabetic sort for a set of tuples sorts on the last element in each tuple.</p>	Value	Description	<i>sort-by</i> argument	0 or default	Leaves the set in existing order	Ignored	1	Sorts set in ascending order by <i>sort_by</i>	Required	2	Sorts set in descending order by <i>sort_by</i>	Required	3	Sorts set in alphabetic ascending order	Ignored	4	Sorts set in alphabetic descending order	Ignored	5	Sorts set in natural ascending order	Ignored	6	Sorts set in natural descending order	Ignored
Value	Description	<i>sort-by</i> argument																								
0 or default	Leaves the set in existing order	Ignored																								
1	Sorts set in ascending order by <i>sort_by</i>	Required																								
2	Sorts set in descending order by <i>sort_by</i>	Required																								
3	Sorts set in alphabetic ascending order	Ignored																								
4	Sorts set in alphabetic descending order	Ignored																								
5	Sorts set in natural ascending order	Ignored																								
6	Sorts set in natural descending order	Ignored																								
<i>sort-by</i>	text	The value by which to sort. [Example: To get the city with the highest sales, set-expression would be a set of cities, and sort-by would be the sales measure. To get the city with the highest population, set-expression would be a set of cities, and sort-by would be the population measure. end example]																								

Return Type and Value: any – The set of members or tuples.

However, if

- The connection name is not a workbook connection stored in the workbook, the return value is unspecified.
- The OLAP server is not running, not available, or returns an error message, the return value is unspecified.
- The syntax of *member-expression* is incorrect, the return value is unspecified.
- The set contains at least one member with a different dimension than the other members, the return value is unspecified.
- *sort-order* is outside the range 0–6, #N/A is returned.
- *sort-order* requires *sort-by*, but *sort-by* is omitted, #VALUE! is returned.

[Example:

```
CUBESet("Finance", "Order([Product].[Product].[Product Category]
.Members,[Measures].[Unit Sales],ASC)", "Products")
```

```
CUBESet("Sales", "[Product].[All Products].Children",
"Products", 1, "[Measures].[Sales Amount]")
```

end example]

18.17.7.70 CUBESetCOUNT

Syntax:

```
CUBESetCOUNT ( set )
```

Description: Computes the number of items in a set.

Arguments:

Name	Type	Description
<i>set</i>	text	An expression that evaluates to a set defined by the CUBESet function.

Return Type and Value: number – The number of items in a set.

[Example:

```
CUBESetCOUNT(A3)
```

```
CUBESetCOUNT(CUBESet("Sales", "[Product].[All Products].Children",
"Products", 1, "[Measures].[Sales Amount]"))
```

end example]

18.17.7.71 CUBEVALUE

Syntax:

CUBEVALUE (*connection* , *argument-list*)

Description: Fetches from the OLAP cube on the OLAP server designated by *connection*, the aggregated value defined by a series of member-expression *arguments* in *argument-list*.

Arguments:

Name	Type	Description
<i>connection</i>	text	The name of the connection to the cube.
<i>argument-list</i>	text, reference	Each <i>argument</i> in <i>argument-list</i> is text containing a multidimensional expression (MDX) that evaluates to a member or tuple within the cube. Alternatively, an <i>argument</i> can be a set defined with the CUBESET function. Use any <i>argument</i> as a slicer to define the portion of the cube for which the aggregated value is returned. If no measure is specified in an <i>argument</i> , the default measure for that cube is used. If a cell reference is used for an <i>argument</i> , and that cell reference contains a CUBE function, then that <i>argument</i> uses the MDX expression for the item in the referenced cell, and not the value displayed in that referenced cell. [Note: MDX is a standard query language for OLAP cubes. end note]

Return Type and Value: any – The aggregated value.

However, if

- The connection name is not a workbook connection stored in the workbook, the return value is unspecified.
- The OLAP server is not running, not available, or returns an error message, the return value is unspecified.
- At least one element within the tuple is invalid, the return value is unspecified.
- The syntax of *member-expression* is incorrect, the return value is unspecified.
- The member specified by an *argument* doesn't exist in the cube, the return value is unspecified.
- The tuple is invalid because there is no intersection for the specified values, the return value is unspecified. (This can occur with multiple elements from the same hierarchy.)
- The set contains at least one member with a different dimension than the other members, the return value is unspecified.

[Example:

```

CUBEVALUE("Sales", "[Measures].[Profit]", "[Time].[2004]",
  "[All Product].[Beverages]")
CUBEVALUE($A$1, "[Measures].[Profit]", D$12, $A23)
CUBEVALUE("Sales", $B$7, D$12, $A23)

```

end example]

18.17.7.72 CUMIPMT

Syntax:

CUMIPMT (*rate* , *nper* , *pv* , *start-period* , *end-period* , *type*)

Description: Computes the cumulative interest paid on a loan between *start-period* and *end-period*.

Arguments:

Name	Type	Description						
<i>rate</i>	number	The interest rate.						
<i>nper</i>	number	The total number of payment periods, truncated to integer.						
<i>pv</i>	number	The present value.						
<i>start-period</i>	number	The first period in the calculation. (Payment periods are numbered beginning with 1.)						
<i>end-period</i>	number	The last period in the calculation.						
<i>type</i>	number	<div>The timing of the payment, truncated to integer, as follows:<table><tr><th>Value</th><th>Timing</th></tr><tr><td>0</td><td>Payment at the end of the period</td></tr><tr><td>1</td><td>Payment at the beginning of the period</td></tr></table></div>	Value	Timing	0	Payment at the end of the period	1	Payment at the beginning of the period
Value	Timing							
0	Payment at the end of the period							
1	Payment at the beginning of the period							

Time information in the date arguments is ignored.

Return Type and Value: number – The cumulative interest paid on a loan.

However, if

- *rate*, *nper*, or *pv* ≤ 0 , #NUM! is returned.
- *start-period* < 1 or *end-period* < 1 , or *start-period* $> end_period$, #NUM! is returned.
- *type* is any number other than 0 or 1, #NUM! is returned.

[Example:

CUMIPMT(0.09/12, 30*12, 125000, 13, 24, 0) results in -11135.23

CUMIPMT(0.09/12, 30*12, 125000, 1, 1, 0) results in -937.50

end example]

18.17.7.73 CUMPRINC

Syntax:

CUMPRINC (*rate* , *nper* , *pv* , *start-period* , *end-period* , *type*)

Description: Computes the cumulative principal paid on a loan between *start-period* and *end-period*.

Arguments:

Name	Type	Description						
<i>rate</i>	number	The interest rate.						
<i>nper</i>	number	The total number of payment periods, truncated to integer.						
<i>pv</i>	number	The present value.						
<i>start-period</i>	number	The first period in the calculation. (Payment periods are numbered beginning with 1.)						
<i>end-period</i>	number	The last period in the calculation.						
<i>type</i>	number	The timing of the payment, truncated to integer, as follows: <table><tr><th>Value</th><th>Timing</th></tr><tr><td>0</td><td>Payment at the end of the period</td></tr><tr><td>1</td><td>Payment at the beginning of the period</td></tr></table>	Value	Timing	0	Payment at the end of the period	1	Payment at the beginning of the period
Value	Timing							
0	Payment at the end of the period							
1	Payment at the beginning of the period							

Time information in the date arguments is ignored.

Return Type and Value: number – The cumulative principal paid on a loan.

However, if

- *rate*, *nper*, or *pv* ≤ 0, #NUM! is returned.
- *start-period* < 1 or *end-period* < 1, or *start-period* > *end-period*, #NUM! is returned.
- *type* is any number other than 0 or 1, #NUM! is returned.

[Example:

CUMPRINC(0.09/12,30*12,125000,13,24,0) results in -934.11

CUMPRINC(0.09/12,30*12,125000,1,1,0) results in -68.28

end example]

18.17.7.74 DATE

Syntax:

DATE (*year* , *month* , *day*)

Description: Computes the serial date-time for the given date.

Arguments:

Name	Type	Description
<i>year</i>	number	<p>A positive number, truncated to an integer representing the year, that together with <i>month</i> and <i>day</i> specifies the date whose serial date-time is to be computed.</p> <p>For the 1900 date system:</p> <ul style="list-style-type: none"> If <i>year</i> is in the range 0–99, inclusive, the year shall be interpreted as <i>year</i> + 1900. If <i>year</i> is in the range 100–9999, inclusive, the year shall be interpreted as <i>year</i>. <p>For the 1904 date system:</p> <ul style="list-style-type: none"> If <i>year</i> is in the range 0–1899, inclusive, the year shall be interpreted as <i>year</i> + 1900. If <i>year</i> is in the range 1900–9999, inclusive, the year shall be interpreted as <i>year</i>.
<i>month</i>	number	<p>A month, truncated to integer, that together with <i>year</i> and <i>day</i> specifies the date whose serial date-time is to be computed.</p> <p><i>month</i> shall be interpreted as the number of months relative to the final month of the year prior to the specified year.</p>
<i>day</i>	number	<p>A day, truncated to integer, that together with <i>month</i> and <i>year</i> specifies the date whose serial date-time is to be computed.</p> <p><i>day</i> shall be interpreted as the number of days relative to the last day of the month (and its associated year) prior to the month (and its associated year) as determined from <i>month</i> and <i>year</i> (see below).</p>

The value of *month* or *day* in a *year-month-day* argument triplet can be out of range. *month* is simply an instance of counting a given number of months, minus one, relative to January of the year specified, using the Gregorian calendar [ISO 8601]. This calendar defines that there are 12 months in a year, and that when counting forward, the month following December of one year is January of the following year, and when counting backward, the month preceding January of one year is December of the previous year. Likewise, *day* is simply an instance of counting a given number of days, minus one, relative to the first day of the adjusted month, using the Gregorian calendar. This calendar defines the number of days in each month, and that when counting forward, the day following the final day of one month is the first day of the following month, and when counting backward, the day preceding the first day of one month is the final day of the previous month. [Example: The *year-month-day* argument triplets (2007, 12,32), (2007,13,1), and (2008,1,1) all result in the same serial date. end example]

[Note: One way to handle out-of-range values for *month* or *day* is as follows:

Compute $\text{yearAdjust} = \text{INT}((\text{month} - 1)/12)$

Compute $\text{adjustedMonth} = \text{month} - (\text{yearAdjust} * 12)$

Compute $\text{adjustedYear} = \text{year} + \text{yearAdjust}$.

A *serialDateBase* can now be computed for the first day of the *adjustedYear* and *adjustedMonth*. Finally, compute the serial date for the full triplet by adding (*day*-1) to this *serialDateBase*. end note]

Return Type and Value: number – The serial date-time for the given date.

However, if *year* is outside the acceptable range for the date system currently in use, #NUM! is returned.

[Example: For the 1900 backward compatibility date-base date system:

DATE(0,1,1) results in a serial date-time of 1

DATE(1899,1,1) results in a serial date-time of 693598

DATE(1900,1,1) results in a serial date-time of 1

DATE(9999,12,31) results in a serial date-time of 2958465

For the 1904 date system:

DATE(4,1,1) results in a serial date-time of 0

DATE(1899,1,1) results in a serial date-time of 692136

DATE(1904,1,1) results in a serial date-time of 0

DATE(9999,12,31) results in a serial date-time of 2957003

end example]

18.17.7.75 DATEDIF

Syntax:

DATEDIF (*start-date* , *end-date* , *unit*)

Description: Calculates the number of days, months, or years between two dates.

Arguments:

Name	Type	Description														
<i>start-date</i>	number	The first date in the period, truncated to integer.														
<i>end-date</i>	number	The last date in the period, truncated to integer.														
<i>unit</i>	text	<div>The count to be returned, as follows:<table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>"Y"</td><td>The number of complete years in the period.</td></tr><tr><td>"M"</td><td>The number of complete months in the period.</td></tr><tr><td>"D"</td><td>The number of days in the period.</td></tr><tr><td>"MD"</td><td>The difference between the days in <i>start-date</i> and <i>end-date</i>. The months and years of the dates are ignored.</td></tr><tr><td>"YM"</td><td>The difference between the months in <i>start-date</i> and <i>end-date</i>. The days and years of the dates are ignored.</td></tr><tr><td>"YD"</td><td>The difference between the days of <i>start-date</i> and <i>end-date</i>. The years of the dates are ignored.</td></tr></table></div>	Value	Day Count Basis	"Y"	The number of complete years in the period.	"M"	The number of complete months in the period.	"D"	The number of days in the period.	"MD"	The difference between the days in <i>start-date</i> and <i>end-date</i> . The months and years of the dates are ignored.	"YM"	The difference between the months in <i>start-date</i> and <i>end-date</i> . The days and years of the dates are ignored.	"YD"	The difference between the days of <i>start-date</i> and <i>end-date</i> . The years of the dates are ignored.
Value	Day Count Basis															
"Y"	The number of complete years in the period.															
"M"	The number of complete months in the period.															
"D"	The number of days in the period.															
"MD"	The difference between the days in <i>start-date</i> and <i>end-date</i> . The months and years of the dates are ignored.															
"YM"	The difference between the months in <i>start-date</i> and <i>end-date</i> . The days and years of the dates are ignored.															
"YD"	The difference between the days of <i>start-date</i> and <i>end-date</i> . The years of the dates are ignored.															

Return Type and Value: number – The number of days, months, or years between two dates, depending on the value of *unit*.

However, if

- *start-date* or *end-date* is out of range for the current date system, #NUM! is returned.
- *start-date* ≥ *end-date* #NUM! is returned.
- *unit* is any value other than those shown in the table above, #NUM! is returned.

[Example:

DATEDIF (DATE(2001,1,1),DATE(2003,1,1),"Y") results in 2 complete years

DATEDIF (DATE (2001,6,1),DATE (2002,8,15) ,"D") results in 440 days
DATEDIF (DATE (2001,6,1),DATE (2002,8,15) ,"YD") results in 75 days
DATEDIF (DATE (2001,6,1),DATE (2002,8,15) ,"MD") results in 14 days

end example]

18.17.7.76 DATEVALUE

Syntax:

DATEVALUE (*date-time-string*)

Description: Computes the serial date-time of the date represented by the string *date-time-string*, taking into account the current date system.

Arguments:

Name	Type	Description
<i>date-time-string</i>	text	The date and/or time whose serial date-time is to be computed. <i>date-time-string</i> can have any supported date and/or time format. If the year portion of <i>date-time-string</i> is omitted, the current year is used. Any time information in <i>date-time-string</i> shall be ignored. When <i>date-time-string</i> contains both a date and time part, times in <i>date-time-string</i> are truncated. Time-only values for <i>date-time-string</i> are special cased to return 0 so that when they are used in date addition and subtraction, time-only strings are ignored.

Return Type and Value: number – The serial date-time of the date represented by the string *date-time-string*.

However, if

- *date-time-string* is out of range for the current date system, #VALUE! is returned.
- *date-time-string* does not represent a date, #VALUE! is returned.
- *date-time-string* contains only a time, 0 is returned so that when it used in date addition and subtraction, time-only strings are ignored.

[Example: When the current year is 2006,

DATEVALUE ("2/1/2006")
DATEVALUE ("01-Feb-2006 10:06 AM")
DATEVALUE ("2006/2/1")
DATEVALUE ("2006-2-1")
DATEVALUE ("1-Feb")

all result in 38749 for the 1900 date system, or 37287 for the 1904 date system. *end example*]

18.17.7.77 DAVERAGE

Syntax:

DAVERAGE (*database* , *field* , *criteria*)

Description: Averages the values in a column of a list or database that match the specified criteria.

In order to perform an operation on an entire column in a database, a blank line shall be entered below the column labels in the criteria range.

Arguments:

Name	Type	Description
<i>database</i>	reference	The range of cells that makes up the list or database, which shall be a list of related data in which rows of related information are records, and columns of data are fields. The first row of the list shall contain labels for each column.
<i>field</i>	text, number	Indicates the column to which <i>criteria</i> shall be applied. It can either be a string containing the column's label, or the column's position number, where columns are numbered starting at 1. [Example: If column 3's label is "Age" then either 3 or "Age" can be used. <i>end example</i>]
<i>criteria</i>	reference	The range of cells that contains the specified conditions. Each cell in that range that contains a condition shall have a value that is the form of a number, an expression, a cell reference, or text that defines which cells are selected. In the case of text, <i>criteria</i> can include one or more wildcard characters, question mark (?) and asterisk (*). A question mark matches any single character; an asterisk matches any sequence of characters. To search for a question mark, asterisk, or tilde character, prefix that character with a tilde (~). A text <i>criteria</i> can also consist of any comparison operator followed by the operand against which each cell's value is to be compared. If the text does not begin with a comparison operator, the criteria matches any string starting with that text, as though the criteria were suffixed by an asterisk (*). [Example: A criteria of "Pea" can result in Pea, Pear, and Peach's being matched, whereas a criteria of "=Pea" only matches Pea. <i>end example</i>] Comparison operators do not require a prefix if used in the string, however it is not possible to specifically search for a string which begins with a comparison operator.

Name	Type	Description
		<p>The range shall include at least one column label and at least one cell below the column label in which a condition for the column is specified. [Example: If the range G1:G2 contains the column label Income in G1 and the amount 10,000 in G2, one could define the range as MatchIncome and use that name as <i>criteria</i>. end example] The value of <i>criteria</i> shall not overlap the range specified by <i>database</i>.</p> <p>To find rows that meet multiple criteria for a single column, all of the criteria shall be specified directly below one another in separate rows of the <i>criteria</i> range.</p> <p>To find rows that meet multiple criteria for multiple columns, all of the criteria shall be specified in the same row of the <i>criteria</i> range.</p> <p>To find rows that meet multiple criteria for multiple columns, where any criteria can be true, each of the criteria shall be specified in a different row of the <i>criteria</i> range.</p> <p>To find rows that meet multiple sets of criteria, where each set includes criteria for multiple columns, each set of criteria shall be specified in a separate row of the <i>criteria</i> range.</p> <p>To find rows that meet multiple sets of criteria, where each set includes criteria for one column, multiple columns with the same column heading shall be included in the <i>criteria</i> range.</p>

Return Type and Value: number – The average of the values of the cells that correspond to the specified criteria.

[Example: Given the following data:

	A	B	C	D	E	F
1	Tree	Height	Age	Yield	Profit	Height
2	=Apple	>10				<16
3	=Pear					
4	Tree	Height	Age	Yield	Profit	
5	Apple	18	20	14	105.00	
6	Pear	12	12	10	96.00	
7	Cherry	13	14	9	105.00	
8	Apple	14	15	10	75.00	
9	Pear	9	8	8	76.80	

	A	B	C	D	E	F
10	Apple	8	9	6	45.00	

the average yield of apple trees over 10 feet in height is computed by `DAVERAGE(A4:E10,"Yield",A1:B2)`, which results in 12

The average age of all trees is computed by `DAVERAGE(A4:E10,3,A4:E10)`, which results in 13

end example]

18.17.7.78 DAY

Syntax:

`DAY (date-value)`

Description: Computes the numeric day of the month in the Gregorian calendar [ISO 8601 §3.2.1] for the date and/or time having the given *date-value*, taking into account the current date system.

Arguments:

Name	Type	Description
<i>date-value</i>	number, text	The date and/or time whose day is to be computed. That date and/or time shall be expressed either as a serial date-time, in which case, its fractional part is ignored, or as a <i>string-constant</i> having any date and/or time format, in which case, any time information shall be ignored.

Return Type and Value: number – The day of the month in the Gregorian calendar [ISO 8601 §3.2.1] for the date and/or time having the given *date-value*. The returned value shall be in the range 1–31.

However, if *date-value* is out of range for the current date system, `#NUM!` is returned.

[Example:

`DAY(DATE(2006,1,2))` results in 2

`DAY(DATE(2006,0,2))` results in 31

`DAY("2006/1/2 10:45 AM")` results in 2

`DAY(30000)` results in 18 for the 1900 date system, or 19 for the 1904 date system

end example]

18.17.7.79 DAYS360

Syntax:

DAYS360 (*start-date* , *end-date* [, *method-flag*])

Description: Computes the signed number of days between two dates based on a 360-day year (twelve 30-day months).

Arguments:

Name	Type	Description						
<i>start-date</i>	number	<i>start-date</i> and <i>end-date</i> are the dates for which the difference is to be computed. <i>start-date</i> can be earlier than, the same as, or later than <i>end-date</i> .						
<i>start-date</i>	number							
<i>method-flag</i>	logical	Specifies whether to use the U.S. or European method in the calculation, as follows: <table><tr><th>Value</th><th>Meaning</th></tr><tr><td>FALSE or omitted</td><td>U.S. (NASD) method: If the <i>start-date</i> is the 31st day of a month, it is changed to the 30th day of that same month. If the <i>end-date</i> is the 31st day of a month and the <i>start-date</i> is earlier than the 30th day of a month, the <i>end-date</i> is changed to the 1st day of the following month; otherwise the <i>end-date</i> is changed to the 30th day of the same month.</td></tr><tr><td>TRUE</td><td>European method: <i>start-dates</i> and <i>end-dates</i> that occur on the 31st day of a month are changed to the 30th day of the same month.</td></tr></table>	Value	Meaning	FALSE or omitted	U.S. (NASD) method: If the <i>start-date</i> is the 31st day of a month, it is changed to the 30th day of that same month. If the <i>end-date</i> is the 31st day of a month and the <i>start-date</i> is earlier than the 30th day of a month, the <i>end-date</i> is changed to the 1st day of the following month; otherwise the <i>end-date</i> is changed to the 30th day of the same month.	TRUE	European method: <i>start-dates</i> and <i>end-dates</i> that occur on the 31st day of a month are changed to the 30th day of the same month.
Value	Meaning							
FALSE or omitted	U.S. (NASD) method: If the <i>start-date</i> is the 31st day of a month, it is changed to the 30th day of that same month. If the <i>end-date</i> is the 31st day of a month and the <i>start-date</i> is earlier than the 30th day of a month, the <i>end-date</i> is changed to the 1st day of the following month; otherwise the <i>end-date</i> is changed to the 30th day of the same month.							
TRUE	European method: <i>start-dates</i> and <i>end-dates</i> that occur on the 31st day of a month are changed to the 30th day of the same month.							

Return Type and Value: number – The signed number of days between two dates based on a 360-day year (12 30-day months). If *start-date* is later than *end-date*, the return value shall be negative, and the magnitude shall be the difference in days.

However, if *start-date* or *end-date* is out of range for the current date system, #NUM! is returned.

[Example:

DAYS360(DATE(2002,2,3),DATE(2005,5,31)) results in 1198

DAYS360(DATE(2005,5,31),DATE(2002,2,3)) results in -1197

DAYS360(DATE(2002,2,3),DATE(2005,5,31),FALSE) results in 1198

DAYS360(DATE(2002,2,3),DATE(2005,5,31),TRUE) results in 1197

| end example]

18.17.7.80 DB

Syntax:

DB (*cost* , *salvage* , *life* , *period* [, [*month*]])

Description: Computes the depreciation of an asset for a specified period using the fixed-declining balance method.

Mathematical Formula:

The fixed-declining balance method computes depreciation at a fixed rate. DB uses the following formulas to calculate depreciation for a period:

$$(cost - total\ depreciation\ from\ prior\ periods) \times rate$$

where:

$$rate = 1 - \left(\frac{salvage}{cost} \right)^{\frac{1}{life}}, \text{ rounded to three decimal places}$$

Depreciation for the first and last periods is a special case. If argument *month* is omitted, depreciation for the first period is calculated using the formula $cost \times rate$.

If month argument is entered, use the following formulas:

For the first period, DB uses this formula:

$$\frac{cost \times rate \times month}{12}$$

For the last period, DB uses this formula:

$$\frac{(cost - total\ depreciation\ from\ prior\ periods) \times rate \times (12 - month)}{12}$$

where:

- *cost* = argument *cost*
- *life* = argument *life*
- *rate* = $1 - (salvage / cost)^{(1 / life)}$, rounded to three decimals
- *salvage* = argument *salvage*

- *total depreciation from prior periods* = DB(cost, salvage, life, 1, [month]) + DB(cost, salvage, life, 2, [month]) + ... + DB(cost, salvage, life, period-1, [month]), where period > 1

Arguments:

Name	Type	Description
<i>cost</i>	number	The initial cost of the asset.
<i>salvage</i>	number	The value at the end of the depreciation. (This is sometimes called the salvage value of the asset.)
<i>life</i>	number	The number of periods over which the asset is being depreciated. (This is sometimes called the useful life of the asset.)
<i>period</i>	number	The period for which the depreciation is to be calculated. (<i>period</i> shall use the same units as <i>life</i> .)
<i>month</i>	number	The number of months in the first year. If omitted, a value of 12 is used.

Return Type and Value: number – The depreciation of an asset for a specified period using the fixed-declining balance method.

However, if

- *cost*, *salvage*, *life*, or *period* < 0, #NUM! is returned.
- *month* is outside the range 1–12, #NUM! is returned.

[Example:

DB(1000000,100000,6,1,7) results in 186,083.33
 DB(1000000,100000,6,2,7) results in 259,639.42
 DB(1000000,100000,6,3,7) results in 176,814.44
 DB(1000000,100000,6,4,7) results in 120,410.64
 DB(1000000,100000,6,5,7) results in 81,999.64
 DB(1000000,100000,6,6,7) results in 55,841.76
 DB(1000000,100000,6,7,7) results in 15,845.10

end example]

18.17.7.81 DCOUNT

Syntax:

DCOUNT (*database* , *field* , *criteria*)

Description: Counts the number of values in a column of a list or database that match the specified criteria. (See the DAVERAGE function §18.17.7.77.)

Arguments:

Name	Type	Description
<i>database</i>	reference	The range of cells that makes up the list or database.
<i>field</i>	text, number	The column to which <i>criteria</i> shall be applied.
<i>criteria</i>	reference	The range of cells that contains the specified conditions.

For a detailed description of each argument, see the DAVERAGE function §18.17.7.77.

Return Type and Value: number – The count of the values of the cells that correspond to the specified criteria.

[*Example:* Using the data in the example in the DAVERAGE function §18.17.7.77:

For all the apple trees having a height between 10 and 16, the number of Age fields that contain numbers is computed by DCOUNT(A4:E10, "Age", A1:F2), which results in 1.

end example]

18.17.7.82 DCOUNTA

Syntax:

DCOUNTA (*database* , *field* , *criteria*)

Description: Counts the number of non-blank cells in a column of a list or database that match the specified criteria. (See the DAVERAGE function §18.17.7.77.)

Arguments:

Name	Type	Description
<i>database</i>	reference	The range of cells that makes up the list or database.
<i>field</i>	text, number	The column to which <i>criteria</i> shall be applied.
<i>criteria</i>	reference	The range of cells that contains the specified conditions.

For a detailed description of each argument, see the DAVERAGE function §18.17.7.77.)

Return Type and Value: number – The count of the non-blank cells that correspond to the specified criteria.

[*Example:* Using the data in the example in the DAVERAGE function §18.17.7.77:

For all the apple trees having a height between 10 and 16, the number of Profit fields that are not blank is

computed by DCOUNTA(A4:E10, "Profit", A1:F2), which results in 1.

end example]

18.17.7.83 DDB

Syntax:

DDB (*cost* , *salvage* , *life* , *period* [, *factor*])

Description: Computes the depreciation of an asset for a specified period using the double-declining balance or some other specified method. [Note: Use VDB (§18.17.7.341) for a straight-line depreciation method when depreciation is greater than the declining balance calculation. *end note*]

Mathematical Formula:

$$\text{MIN}((\text{cost} - \text{total depreciation from prior periods}) \times \left(\frac{\text{factor}}{\text{life}}\right), (\text{cost} - \text{salvage} - \text{total depreciation from prior periods}))$$

where:

cost = argument *cost*

factor = argument *factor*

life = argument *life*

salvage = argument *salvage*

total depreciation from prior periods = DDB(*cost*, *salvage*, *life*, 1, [*factor*]) + DDB(*cost*, *salvage*, *life*, 2, [*factor*]) + ... + DDB(*cost*, *salvage*, *life*, *period*-1, [*factor*]), where *period* > 1. Depreciation for period = 1 can be calculated by using *cost* × *factor*/*life*.

Arguments:

Name	Type	Description
<i>cost</i>	number	The initial cost of the asset.
<i>salvage</i>	number	The value at the end of the depreciation. (This is sometimes called the salvage value of the asset.)
<i>life</i>	number	The number of periods over which the asset is being depreciated. (This is sometimes called the useful life of the asset.)
<i>period</i>	number	The period for which the depreciation is to be calculated. (<i>period</i> shall use the same units as <i>life</i> .)

Name	Type	Description
<i>factor</i>	number	The rate at which the balance declines. If omitted, it is assumed to be 2 (the double-declining balance method).

Return Type and Value: number – The depreciation of an asset for a specified period.

However, if

- salvage < 0 #NUM! is returned.
- cost life <= 0, #NUM! is returned.
- life <= 0 #NUM! is returned.
- period <= 0, #NUM! is returned.
- factor <= 0, #NUM! is returned.

[Example:

DDB(2400,300,10*365,1) results in 1.32

DDB(2400,300,10*12,1,2) results in 40.00

DDB(2400,300,10,1,2) results in 480.00

DDB(2400,300,10,2,1.5) results in 306.00

DDB(2400,300,10,10) results in 22.12

end example]

18.17.7.84 DEC2BIN

Syntax:

DEC2BIN (*number* [, *num-bin-digits*])

Description: Makes the binary equivalent of *number*, with the result having *num-bin-digits* digits.

Arguments:

Name	Type	Description
<i>number</i>	number	The decimal number that is to be converted to a binary string.
<i>num-bin-digits</i>	number	The number of digits in the result, with leading zeros added as necessary. However, if <i>number</i> is negative, <i>num-bin-digits</i> is ignored and the result has 10 digits. If omitted, the minimum number of digits is used in the result. <i>num-bin-digits</i> is truncated to an integer.

Return Type and Value: text – The binary equivalent of *number* using twos-complement representation with the left-most bit (10th bit from the right) representing the sign bit.

However, if

- *number* is outside the range -512 (1000000000 binary) to 511 (0111111111 binary), inclusive, #NUM! is returned.
- *number* needs more digits than *num-bin-digits*, #NUM! is returned.
- *num-bin-digits* ≤ 0 or > 10, #NUM! is returned.

[Example:

DEC2BIN(23) results in 10111

DEC2BIN(-256) results in 1100000000

DEC2BIN(18,7) results in 0010010

end example]

18.17.7.85 DEC2HEX

Syntax:

DEC2HEX (*number* [, *num-hex-digits*])

Description: Makes the hexadecimal equivalent of *number*, with the result having *num-hex-digits* digits.

Arguments:

Name	Type	Description
<i>number</i>	number	The decimal number that is to be converted to a hexadecimal string.
<i>num-bin-digits</i>	number	<i>num-hex-digits</i> is the number of digits in the result, with leading zeros added as necessary. However, if <i>number</i> is negative, <i>num-hex-digits</i> is ignored and the result has 10 digits. If <i>num-hex-digits</i> is omitted, the minimum number of digits is used in the result. <i>num-hex-digits</i> is truncated to an integer.

Return Type and Value: text – The hexadecimal equivalent of *number* using twos-complement representation with the left-most bit (40th bit from the right) representing the sign bit.

However, if

- *number* is outside the range -549,755,813,888 (8000000000 hex) to 549,755,813,887 (7FFFFFFF hex), inclusive, #NUM! is returned.
- *number* needs more digits than *num-hex-digits*, #NUM! is returned.

- *num-hex-digits* ≤ 0 or > 10, #NUM! is returned.

[Example:

DEC2HEX(23) results in 17

DEC2HEX(-256) results in FFFFFFFF00

DEC2HEX(18,7) results in 0000012

end example]

18.17.7.86 DEC2OCT

Syntax:

DEC2OCT (*number* [, *num-oct-digits*])

Description: Makes the octal equivalent of *number*, with the result having *num-oct-digits* digits.

Arguments:

Name	Type	Description
<i>number</i>	number	The decimal number that is to be converted to an octal string.
<i>num-bin-digits</i>	number	The number of digits in the result, with leading zeros added as necessary. However, if <i>number</i> is negative, <i>num-oct-digits</i> is ignored and the result has 10 digits. If <i>num-oct-digits</i> is omitted, the minimum number of digits is used in the result. <i>num-oct-digits</i> is truncated to an integer.

Return Type and Value: text – The octal equivalent of *number* using twos-complement representation with the left-most bit (30th bit from the right) representing the sign bit.

However, if

- *number* is outside the range -536,870,912 (4000000000 octal) to 536,870,911 (3777777777 octal), inclusive, #NUM! is returned.
- *number* needs more digits than *num-oct-digits*, #NUM! is returned.
- *num-oct-digits* ≤ 0 or > 10, #NUM! is returned.

[Example:

DEC2OCT(23) results in 27

DEC2OCT(-256) results in 7777777400

DEC2OCT(18,7) results in 0000022

end example]

18.17.7.87 DEGREES

Syntax:

DEGREES (*angle*)

Description: Converts *angle* in radians into degrees.

Arguments:

Name	Type	Description
<i>angle</i>	number	The number of radians that is to be converted into degrees.

Return Type and Value: number – *angle* in degrees.

[*Example:*

DEGREES(2 * PI()) results in 360

DEGREES(PI()) results in 180

DEGREES(PI()/2) results in 90

DEGREES(8.5) results in 487.0141259

end example]

18.17.7.88 DELTA

Syntax:

DELTA (*number-1* [, *number-2*])

Description: Compares two numbers for equality.

Arguments:

Name	Type	Description
<i>number-1</i>	number	The numbers that are to be compared for equality. If <i>number-2</i> is omitted, it is assumed to be zero.
<i>number-2</i>	number	

Return Type and Value: number – 1 if *number-1* equals *number-2*; otherwise, 0.

[*Example:*

DELTA(10.5,10.5) results in 1

DELTA(10.5,10.6) results in 0

DELTA(10.5) results in 0

DELTA(0) results in 1

end example]

18.17.7.89 DEVSQ

Syntax:

DEVSQ (*argument-list*)

Description: Computes the sum of squares of deviations of data points from their sample mean.

Mathematical Formula:

$$DEVSQ = \sum (x - \bar{x})^2$$

where:

- x = each element in *argument-list*
- \bar{x} = the mean of the elements in *argument-list*

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number, name, array, or reference to a number. Argument list can be a single argument that is an array or a reference to an array.	The <i>arguments</i> in <i>argument-list</i> designate the values for which the sum of squared deviations is to be calculated. Logical values and text representations of numbers occurring directly in the list of arguments are included. If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.

Return Type and Value: number – The sum of squares of deviations of data points from their sample mean.

[*Example:*

DEVSQ(5.6,8.2,9.2) results in 6.906666667

DEVSQ({5.6,8.2,9.2}) results in 6.906666667

end example]

18.17.7.90 DGET

Syntax:

DGET (*database* , *field* , *criteria*)

Description: Extracts a single value from a column of a list that matches the specified criteria. (See the DAVERAGE function §18.17.7.77.)

Arguments:

Name	Type	Description
<i>database</i>	reference	The range of cells that makes up the list or database.
<i>field</i>	text, number	The column to which <i>criteria</i> shall be applied.
<i>criteria</i>	reference	The range of cells that contains the specified conditions.

For a detailed description of each argument, see the DAVERAGE function §18.17.7.77.

Return Type and Value: number – The value of the cell that corresponds to the specified criteria.

However, if

- No record matches the criteria, #VALUE! is returned.
- More than one record matches the criteria, #NUM! is returned.

[Example: Using the data in the example in the DAVERAGE function §18.17.7.77:

For all the apple trees having a height between 10 and 16, the number of Profit fields that are not blank is computed by DGET(A4:E7,"Yield",A1:A2), which results in 14.

end example]

18.17.7.91 DISC

Syntax:

DISC (*settlement* , *maturity* , *pr* , *redemption* [, [*basis*]])

Description: Computes the discount rate for a security.

Mathematical Formula:

$$DISC = \frac{\text{redemption} - \text{par}}{\text{par}} \times \frac{B}{SM}$$

where:

- *B* = number of days in a year, depending on the year basis.

- DSM = number of days between settlement and maturity.
- par = argument pr
- $redemption$ = argument $redemption$

Arguments:

Name	Type	Description				
<i>settlement</i>	number	The security's settlement date.				
<i>maturity</i>	number	The security's maturity date.				
<i>pr</i>	number	The security's price per 100 currency units face value.				
<i>redemption</i>	number	The security's redemption value per 100 currency units face value.				
<i>basis</i>	number	<div>The truncated integer type of day count basis to use, as follows:<table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">• If the date is 28 or 29 February, it is adjusted to 30 February.• For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.</td></tr></table></div>	Value	Day Count Basis	0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">• If the date is 28 or 29 February, it is adjusted to 30 February.• For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.
Value	Day Count Basis					
0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">• If the date is 28 or 29 February, it is adjusted to 30 February.• For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.					

Name	Type	Description	
		1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.
		2	Actual/360. Similar to Basis 1, but only has 360 days per year.
		3	Actual/365. Similar to Basis 1, but always has 365 days per year.
		4	<p>European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</p> <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 Februar

Name	Type	Description	
			y.

Time information in the date arguments is ignored.

The currency units of *pr* and *redemption* are assumed to be the same currency.

Return Type and Value: number – The discount rate for a security.

However, if

- *settlement* or *maturity* is out of range for the current date system, #NUM! is returned.
- *settlement* \geq *maturity*, #NUM! is returned.
- *pr* or *redemption* \leq 0, #NUM! is returned.
- *basis* $<$ 0 or *basis* $>$ 4, #NUM! is returned.

[Example:

DISC(DATE(2007,1,25),DATE(2007,6,15),97.975,100,1) results in 5.2420%

end example]

18.17.7.92 DMAX

Syntax:

DMAX (*database* , *field* , *criteria*)

Description: Computes the maximum value of the cells in a column of a list or database that match the specified criteria. (See the DAVERAGE function §18.17.7.77.)

Arguments:

Name	Type	Description
<i>database</i>	reference	The range of cells that makes up the list or database.
<i>field</i>	text, number	The column to which <i>criteria</i> shall be applied.
<i>criteria</i>	reference	The range of cells that contains the specified conditions.

For a detailed description of each argument, see the DAVERAGE function §18.17.7.77.

Return Type and Value: number – The maximum of the values of the cells that correspond to the specified criteria.

[*Example:* Using the data in the example in the DAVERAGE function §18.17.7.77:

The maximum profit of apple and pear trees is computed by DMAX(A4:E10, "Profit", A1:A3), which results in 105.

end example]

18.17.7.93 DMIN

Syntax:

DMIN (*database* , *field* , *criteria*)

Description: Computes the minimum value of the cells in a column of a list or database that match the specified criteria. (See the DAVERAGE function §18.17.7.77.)

Arguments:

Name	Type	Description
<i>database</i>	reference	The range of cells that makes up the list or database.
<i>field</i>	text, number	The column to which <i>criteria</i> shall be applied.
<i>criteria</i>	reference	The range of cells that contains the specified conditions.

For a detailed description of each argument, see the DAVERAGE function §18.17.7.77.

Return Type and Value: number – The minimum of the values of the cells that correspond to the specified criteria.

[*Example:* Using the data in the example in the DAVERAGE function §18.17.7.77:

The minimum profit of apple trees over 10 in height is computed by DMIN(A4:E10, "Profit", A1:B2), which results in 75.

end example]

18.17.7.94 DOLLAR

Syntax:

DOLLAR (*number* [, *num-decimal*])

Description: Produces a string containing *number* rounded to *num-decimal* decimal places. The formatting applied to the string for the thousands separator, radix point, and currency symbol are implementation-specific.

Arguments:

Name	Type	Description
<i>number</i>	number	The number that is to be formatted.
<i>num-decimal</i>	number	Designate the number of decimal places to be used in the resulting string; it is truncated to an integer. If <i>num-decimal</i> is negative, <i>number</i> is rounded to the left of the decimal point. If omitted, a value of 2 shall be assumed.

Return Type and Value: text – The string containing *number* rounded to *num-decimal* decimal places, and have a currency symbol and thousands separators.

[*Example:* When the spreadsheet application defines the currency symbol to be “\$”, the thousands separator to be “,” and the radix to be “.”:

DOLLAR(1234.567) results in \$1,234.57

DOLLAR(1234.567, -2) results in \$1,200

DOLLAR(-1234.567, 4) results in (\$1,234.5670)

When the spreadsheet application defines the currency symbol to be “€”, the thousands separator to be “ ” and the radix to be “,”:

DOLLAR(1234.567) results in 1 234,57 €

DOLLAR(1234.567, -2) results in 1 200 €

DOLLAR(-1234.567, 4) results in -1 234,5670 €

When the spreadsheet application defines the currency symbol to be “SFr.”, the thousands separator to be “'” and the radix to be “.”:

DOLLAR(1234.567) results in SFr. 1'234.57

DOLLAR(1234.567, -2) results in SFr. 1'200

DOLLAR(-1234.567, 4) results in SFr. -1'234.5670

When the spreadsheet application defines the currency symbol to be “kr”, the thousands separator to be “ ” and the radix to be “,”:

DOLLAR(1234.567) results in kr 1 234,57

DOLLAR(1234.567, -2) results in kr 1 200

DOLLAR(-1234.567, 4) results in kr -1 234,5670

end example]

18.17.7.95 DOLLARDE

Syntax:

DOLLARDE (*fractional-dollar* , *fraction*)

Description: Converts a fractional dollar price into a dollar price expressed as a decimal number. [Note: Fractional dollar numbers are sometimes used for securities prices. *end note*] The fractional part of *fractional-dollar* is scaled to match the magnitude of *fraction* by moving the decimal place right by the number of digits in *fraction*. The *fractional-dollar* m.n is computed into a decimal dollar value as $m + i$, where i is an intermediate result equal to $((0.n) * (10^x)) / \text{fraction}$, and x is the base 10 log of *fraction*, rounded up to the nearest whole number.

[Example: Given a *fractional-dollar* value of 1.02 and a *fraction* value of 16, the fractional part of *fractional-dollar* is multiplied by 100, giving a value of 2 to be divided by *fraction* before being added to the integral part of *fractional-dollar*, yielding a decimal price of 1.125. *end example*]

Arguments:

Name	Type	Description
<i>fractional-dollar</i>	number	The number to be interpreted as a fractional dollar price.
<i>fraction</i>	number	The integer to use in the denominator of the fraction.

Return Type and Value: number – The dollar price expressed as a decimal number.

However, if

- *fraction* < 0, #NUM! is returned.
- *fraction* = 0, #DIV/0! is returned.

[Example:

DOLLARDE(1.02,16) results in 1.125

DOLLARDE(1.1,32) results in 1.3125

end example]

18.17.7.96 DOLLARFR

Syntax:

DOLLARFR (*decimal-dollar* , *fraction*)

Description: Converts a dollar price expressed as a decimal into a dollar price expressed as a fraction. This function is used to convert decimal dollar numbers, such as securities prices, to fractional numbers.

Arguments:

Name	Type	Description
<i>decimal-</i>	number	The number expressed as a decimal.

Name	Type	Description
<i>dollar</i>		
<i>fraction</i>	number	The integer to use in the denominator of the fraction.

Return Type and Value: number – The dollar price expressed as a fractional number. [Example: A result of $m.n$ means $m + n/fraction$ dollars. end example] The fractional part of the return value is scaled to have the same number of digits after the decimal point, as there are digits in *fraction*. [Example: DOLLARFR(1.125, 16) has a two-digit *fraction* value and so returns the two-digit fractional number 1.02 end example] If an exact numerator cannot be found, the function returns the lowest numerator that could be used with *fraction*, multiplied by a power of ten. [Example: DOLLARFR(1.5,3) returns 1.15, as there is no exact fraction which satisfies $n/3 = 0.5$, and $15/30$ represents the lowest power of ten *fraction* can be multiplied by to obtain an exact value. end example]

However, if

- *fraction* < 0, #NUM! is returned.
- *fraction* = 0, #DIV/0! is returned.

[Example:

DOLLARFR(1.125,16) results in 1.02

DOLLARFR(1.125,32) results in 1.04

end example]

18.17.7.97 DPRODUCT

Syntax:

DPRODUCT (*database* , *field* , *criteria*)

Description: Computes the product of the values of the cells in a column of a list or database that match the specified criteria. (See the DAVERAGE function §18.17.7.77.)

Arguments:

Name	Type	Description
<i>database</i>	reference	The range of cells that makes up the list or database.
<i>field</i>	text, number	The column to which <i>criteria</i> shall be applied.
<i>criteria</i>	reference	The range of cells that contains the specified conditions.

For a detailed description of each argument, see the DAVERAGE function §18.17.7.77.

Return Type and Value: number – The product of the values of the cells that correspond to the specified criteria.

[*Example:* Using the data in the example in the DAVERAGE function §18.17.7.77:

The product of the yields from apple trees with a height greater than 10 is computed by DPRODUCT(A4:E10, "Yield", A1:B2), which results in 140.

end example]

18.17.7.98 DSTDEV

Syntax:

DSTDEV (*database* , *field* , *criteria*)

Description: Estimates the standard deviation of a population based on a sample by using the numbers in a column of a list or database that match the specified criteria. (See the DAVERAGE function §18.17.7.77.)

Arguments:

Name	Type	Description
<i>database</i>	reference	The range of cells that makes up the list or database.
<i>field</i>	text, number	The column to which <i>criteria</i> shall be applied.
<i>criteria</i>	reference	The range of cells that contains the specified conditions.

For a detailed description of each argument, see the DAVERAGE function §18.17.7.77.

Return Type and Value: number – An estimate of the standard deviation of a population based on the cells that correspond to the specified criteria.

[*Example:* Using the data in the example in the DAVERAGE function §18.17.7.77:

The estimated standard deviation in the yield of apple and pear trees if the data in the database is only a sample of the total orchard population is computed by DSTDEV(A4:E10, "Yield", A1:A3), which results in 2.97.

end example]

18.17.7.99 DSTDEVP

Syntax:

DSTDEVP (*database* , *field* , *criteria*)

Description: Computes the standard deviation of a population based on the entire population by using the numbers in a column of a list or database that match the specified criteria. (See the DAVERAGE function §18.17.7.77.)

Arguments:

Name	Type	Description
<i>database</i>	reference	The range of cells that makes up the list or database.
<i>field</i>	text, number	The column to which <i>criteria</i> shall be applied.
<i>criteria</i>	reference	The range of cells that contains the specified conditions.

For a detailed description of each argument, see the DAVERAGE function §18.17.7.77.

Return Type and Value: number – The standard deviation of a population based on the cells that correspond to the specified criteria.

[*Example:* Using the data in the example in the DAVERAGE function §18.17.7.77:

The true standard deviation in the yield of apple and pear trees if the data in the database is the entire population is computed by DSTDEVP(A4:E10, "Yield", A1:A3), which results in 2.65.

end example]

18.17.7.100 DSUM

Syntax:

DSUM (*database* , *field* , *criteria*)

Description: Computes the sum of the values in a column of a list or database that match the specified criteria. (See the DAVERAGE function §18.17.7.77.)

Arguments:

Name	Type	Description
<i>database</i>	reference	The range of cells that makes up the list or database.
<i>field</i>	text, number	The column to which <i>criteria</i> shall be applied.
<i>criteria</i>	reference	The range of cells that contains the specified conditions.

For a detailed description of each argument, see the DAVERAGE function §18.17.7.77.

Return Type and Value: number – The sum of the values of the cells that correspond to the specified criteria.

[*Example:* Using the data in the example in the DAVERAGE function §18.17.7.77:

The total profit from apple trees is computed by DSUM(A4:E10, "Profit", A1:A2), which results in 225.

The total profit from apple trees with a height between 10 and 16 is computed by DSUM(A4:E10, "Profit", A1:F2), which results in 75.

end example]

18.17.7.101 DURATION

Syntax:

DURATION (*settlement* , *maturity* , *coupon* , *yld* , *frequency* [, [*basis*]])

Description: Computes the Macaulay duration for an assumed par value of 100. Duration is defined as the weighted average term to maturity of the cash flows from a bond. The weight of each cash flow is determined by dividing the present value of the cash flow by the price.

Arguments:

Name	Type	Description				
<i>settlement</i>	number	The security's settlement date.				
<i>maturity</i>	number	The security's maturity date.				
<i>coupon</i>	number	The security's annual coupon rate.				
<i>yld</i>	number	The security's annual yield.				
<i>frequency</i>	number	The number of coupon payments per year. For annual payments, frequency is 1; for semiannual payments, frequency is 2; for quarterly payments, frequency is 4. <i>frequency</i> is truncated to an integer.				
<i>basis</i>	number	<div>The truncated integer type of day count basis to use, as follows:<table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the</td></tr></table></div>	Value	Day Count Basis	0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the
Value	Day Count Basis					
0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the					

Name	Type	Description	
			second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.
		1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.
		2	Actual/360. Similar to Basis 1, but only has 360 days per year.
		3	Actual/365. Similar to Basis 1, but always has 365 days per year.
		4	European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months with 31 days, all

Name	Type	Description	
			dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.

Time information in the date arguments is ignored.

Return Type and Value: number – The Macaulay duration for an assumed par value of 100.

However, if

- *settlement* or *maturity* is out of range for the current date system, #NUM! is returned.
- *settlement* \geq *maturity*, #NUM! is returned.
- *coupon* or *yld* < 0 , #NUM! is returned.
- *frequency* is any number other than 1, 2, or 4, #NUM! is returned.
- *basis* < 0 or *basis* > 4 , #NUM! is returned.

[Example:

DURATION (DATE (2008,1,1),DATE (2016,1,1),0.08,0.09,2,1) results in 5.993774956

end example]

18.17.7.102 DVAR

Syntax:

DVAR (*database* , *field* , *criteria*)

Description: Estimates the variance of a population based on a sample by using the numbers in a column of a list or database that match the specified criteria. (See the DAVERAGE function §18.17.7.77.)

Arguments:

Name	Type	Description
<i>database</i>	reference	The range of cells that makes up the list or database.

Name	Type	Description
<i>field</i>	text, number	The column to which <i>criteria</i> shall be applied.
<i>criteria</i>	reference	The range of cells that contains the specified conditions.

For a detailed description of each argument, see the DAVERAGE function §18.17.7.77.

Return Type and Value: number – An estimate of the variance of a population based on the cells that correspond to the specified criteria.

[*Example:* Using the data in the example in the DAVERAGE function §18.17.7.77:

The estimated variance in the yield of apple and pear trees if the data in the database is only a sample of the total orchard population is computed by DVAR(A4:E10, "Yield", A1:A3), which results in 8.8.

end example]

18.17.7.103 DVARP

Syntax:

DVARP (*database* , *field* , *criteria*)

Description: Calculates the variance of a population based on the entire population by using the numbers in a column of a list or database that match the specified criteria. (See the DAVERAGE function §18.17.7.77.)

Arguments:

Name	Type	Description
<i>database</i>	reference	The range of cells that makes up the list or database.
<i>field</i>	text, number	The column to which <i>criteria</i> shall be applied.
<i>criteria</i>	reference	The range of cells that contains the specified conditions.

For a detailed description of each argument, see the DAVERAGE function §18.17.7.77.

Return Type and Value: number – The variance of a population based on the entire population using the cells that correspond to the specified criteria.

[*Example:* Using the data in the example in the DAVERAGE function §18.17.7.77:

The true variance in the yield of apple and pear trees if the data in the database is the entire orchard population is computed by DVARP(A4:E10, "Yield", A1:A3), which results in 7.04.

end example]

18.17.7.104 ECMA.CEILING

Syntax:

ECMA.CEILING (*x* , *significance*)

Description: Computes a value that is *x* rounded-up, away from zero, to the nearest multiple of *significance*. Regardless of the sign of *x*, a value is rounded up when adjusted away from zero.

Arguments:

Name	Type	Description
<i>x</i>	number	The value to be rounded
<i>significance</i>	number	The multiple to which <i>x</i> is to be rounded. If <i>x</i> is negative, and <i>significance</i> is negative, then the value is rounded down (away from zero). If <i>x</i> is negative, and <i>significance</i> is positive, then the value is rounded up, towards zero.

Return Type and Value: number – The rounded-up value of *x*.

However, if

- *x* is positive and *significance* is negative, #NUM! is returned.
- *x* and/or *significance* is zero, zero is returned.

[Example:

ECMA.CEILING(4.3,2) rounds 4.3 up to nearest multiple of 2; that is, to 6

ECMA.CEILING(4.3,-2) rounds 4.3 up to nearest multiple of -2; that is, to #NUM!

ECMA.CEILING(-4.3,2) rounds -4.3 up to the nearest multiple of 2; that is, to -4

ECMA.CEILING(-4.3,-2) rounds -4.3 up to the nearest multiple of -2; that is, to -6

end example]

18.17.7.105 EDATE

Syntax:

EDATE (*start-date* , *month-offset*)

Description: Computes the serial date-time of the date that is *month-offset* months from the date specified by the date *date-string*, taking into account the current date system.

Arguments:

Name	Type	Description
<i>start-date</i>	number	The start date.
<i>month-offset</i>	number	The number of months before or after <i>start-date</i> , truncated to integer. A positive value yields a future date; a negative value yields a past date; a zero value yields the date <i>start-date</i> .

Return Type and Value: number – The serial date-time of the date that is *month-offset* months from the date specified by the date *date-string*, as a whole number.

However, if

- *start-value* is out of range for the current date system, #NUM! is returned.
- *start-value* plus *month-offset* is out of range for the current date system, #NUM! is returned.

[Example: For the 1900 date system:

EDATE(DATE(2006,1,31),5) results in a serial date-time of 38898
 EDATE(DATE(2004,2,29),12) results in a serial date-time of 38411
 EDATE(DATE(2004,2,28),12) results in a serial date-time of 38411
 EDATE(DATE(2004,1,15),-23) results in a serial date-time of 37302

For the 1904 date system:

EDATE(DATE(2006,1,31),5) results in a serial date-time of 37436
 EDATE(DATE(2004,2,29),12) results in a serial date-time of 36949
 EDATE(DATE(2004,2,28),12) results in a serial date-time of 36949
 EDATE(DATE(2004,1,15),-23) results in a serial date-time of 35840

end example]

18.17.7.106 EFFECT

Syntax:

EFFECT (*nominal-rate* , *npery*)

Description: Computes the effective annual interest rate, given the nominal annual interest rate and the number of compounding periods per year.

Mathematical Formula:

$$EFFECT = \left(1 + \frac{Nominal_rate}{Npery} \right)^{Npery} - 1$$

where:

- *Nominal_rate* = argument *nominal-rate*
- *Npery* = argument *npery*

Arguments:

Name	Type	Description
<i>nominal-rate</i>	number	The nominal interest rate.
<i>npery</i>	number	The number of compounding periods per year, truncated to integer.

Return Type and Value: number – The effective annual interest rate.

However, if

- *nominal-rate* ≤ 0 , #NUM! is returned.
- *npery* < 1 , #NUM! is returned.

[Example:

EFFECT(0.0525,4) results in 5.3543%

end example]

18.17.7.107 EOMONTH

Syntax:

EOMONTH (*start-date* , *month-offset*)

Description: Computes the serial date-time of the last day of the month for the date that is *month-offset* months from the date specified by the date *start-date*, taking into account the current date system.

Arguments:

Name	Type	Description
<i>start-date</i>	number	The start date.
<i>month-offset</i>	number	The number of months before or after <i>start-date</i> , truncated to integer. A positive value yields a future date; a negative value yields a past date; a zero value yields the date <i>start-date</i> .

Return Type and Value: number – The serial date-time of the last day of the month for the date that is *month-offset* months from the date specified by the date *start-date*, as a whole number.

However, if

- *start-date* is not a date, #NUM! is returned.
- *start-date* plus *month-offset* does not yield a date, #NUM! is returned.

[Example: For the 1900 date system:

EOMONTH(DATE(2006,1,31),5) results in a serial date-time of 38898
 EOMONTH(DATE(2004,2,29),12) results in a serial date-time of 38411
 EOMONTH(DATE(2004,2,28),12) results in a serial date-time of 38411
 EOMONTH(DATE(2004,1,15),-23) results in a serial date-time of 37315

For the 1904 date system:

EOMONTH(DATE(2006,1,31),5) results in a serial date-time of 37436
 EOMONTH(DATE(2004,2,29),12) results in a serial date-time of 36949
 EOMONTH(DATE(2004,2,28),12) results in a serial date-time of 36949
 EOMONTH(DATE(2004,1,15),-23) results in a serial date-time of 35853

end example]

18.17.7.108 ERF

Syntax:

ERF (*lower-bound* [, *upper-bound*])

Description: Computes the error function integrated between *lower-bound* and *upper-bound*.

Mathematical Formula:

If *upper-bound* is omitted:

$$ERF(z) = \frac{2}{\sqrt{\pi}} \int_0^z e^{-t^2} dt$$

where:

- *z* = argument *lower-bound*

If *upper-bound* is present:

$$ERF(a,b) = \frac{2}{\sqrt{\pi}} \int_a^b e^{-t^2} dt = ERF(b) - ERF(a)$$

where:

- b = argument *upper-bound*
- a = argument *lower-bound*

Arguments:

Name	Type	Description
<i>lower-bound</i>	number	The lower bound for integrating ERF.
<i>upper-bound</i>	number	The upper bound for integrating ERF. If omitted, the value of the upper bound is <i>lower-bound</i> , and the lower bound becomes zero.

Return Type and Value: number – The error function integrated between *lower-bound* and *upper-bound*.

However, if

- *lower-bound* is negative, #NUM! is returned.
- *upper-bound* is negative, #NUM! is returned.

[Example:

ERF(1.234,4.5432) results in 0.08096060

ERF(0,1.345) results in 0.94284416

ERF(0,1.345) results in 0.94284416

end example]

18.17.7.109 ERFC

Syntax:

ERFC (*lower-bound*)

Description: Computes the complementary error function integrated between *lower-bound* and ∞ .

Mathematical Formula:

$$ERFC(x) = \frac{2}{\sqrt{\pi}} \int_x^{\infty} e^{-t^2} dt = 1 - ERF(x)$$

where:

- x = argument *lower-bound*

Arguments:

Name	Type	Description
<i>lower-bound</i>	number	The lower bound for integrating ERFC.

Return Type and Value: number – The complementary error function integrated between *lower-bound* and ∞ .

However, if *lower-bound* is negative

lower-bound or *upper-bound* is negative, #NUM! is returned.

[Example:

ERFC(1.234) results in 0.08096060

ERFC(0) results in 1.00000000

end example]

18.17.7.110 ERROR.TYPE

Syntax:

ERROR.TYPE (*value*)

Description: Determines the kind of the error value designated by *value*.

Arguments:

Name	Type	Description
<i>value</i>	any	A value whose type is to be determined. No conversion shall take place on the argument passed to this function.

Return Type and Value: number – The kind of the error value designated by *value*, as follows:

<i>value</i>	Return Value
#NULL!	1
#DIV/0!	2
#VALUE!	3
#REF!	4
#NAME?	5
#NUM!	6
#N/A	7
#GETTING_DATA	8

<i>value</i>	Return Value
Anything else	#N/A

[Example:

ERROR.TYPE(A1) results in 2 if A1 evaluates to #DIV/0!
ERROR.TYPE(A1) results in 4 if A1 evaluates to #REF/0!
ERROR.TYPE(A1) results in 7 if A1 evaluates to #N/A
ERROR.TYPE(A1) results in #N/A if A1 evaluates to a non-error value, such as a number or text

end example]

18.17.7.111 EVEN

Syntax:

EVEN (*x*)

Description: Computes *x* rounded to the nearest even integer, away from zero. Regardless of the sign of *x*, a value is rounded up when adjusted away from zero.

Arguments:

Name	Type	Description
<i>x</i>	number	The value to be rounded.

Return Type and Value: number – The rounded value of *x*. If *x* is zero, the result is zero.

[Example:

EVEN(1.5) rounds 1.5 up to the nearest even integer; that is, to 2.
EVEN(3) rounds 3 up to the nearest even integer; that is, to 4.
EVEN(2) rounds 2 up to the nearest even integer; that is, to 2.
EVEN(-1) rounds -1 up to the nearest even integer; that is, to -2.

end example]

18.17.7.112 EXACT

Syntax:

EXACT (*string-1* , *string-2*)

Description: Performs a case-sensitive, character-by-character, lexical comparison of *string-1* and *string-2*.

Arguments:

Name	Type	Description
<i>string-1</i>	text	The two strings to be compared.
<i>string-2</i>	text	

Return Type and Value: logical – TRUE if *string-1* and *string-2* have the exact same length and contents; otherwise, FALSE.

[Example:

EXACT("ABC", "ABC") results in TRUE

EXACT("ABC", "ABCD") results in FALSE

EXACT("Abc", "aBC") results in FALSE

EXACT("", "") results in TRUE

end example]

18.17.7.113 EXP

Syntax:

EXP (*x*)

Description: Computes e^x , where the constant e is the base of the natural logarithm.

Arguments:

Name	Type	Description
<i>x</i>	number	The exponent to which e is to be raised.

Return Type and Value: number – e^x .

However, if x is too large for the result to be representable, #NUM! is returned.

[Example:

EXP(-1) results in 0.367879441

EXP(0) results in 1

EXP(1) results in 2.718281828

EXP(2) results in 7.389056099

end example]

18.17.7.114 EXPONDIST

Syntax:

EXPONDIST (*x* , *lambda* , *cumulative-flag*)

Description: Computes the exponential distribution.

Mathematical Formula:

The equation for the probability density function is:

$$f(x, \lambda) = \lambda e^{-\lambda x}$$

The equation for the cumulative distribution function is:

$$F(x, \lambda) = 1 - e^{-\lambda x}$$

where:

- x = argument *x*
- λ = argument *lambda*

Arguments:

Name	Type	Description
<i>x</i>	number	The value at which the function is evaluated.
<i>lambda</i>	number	The inverse of the mean.
<i>cumulative-flag</i>	logical	Determines the form of the function. If TRUE, EXPONDIST returns the cumulative distribution function; if FALSE, EXPONDIST returns the probability density function.

Return Type and Value: number – The exponential distribution.

However, if

- $x < 0$, #NUM! is returned.
- $lambda \leq 0$, #NUM! is returned.

[Example:

EXPONDIST(0.2,10,FALSE) results in 1.353352832

EXPONDIST(2.3,1.5,TRUE) results in 0.968254364

end example]

18.17.7.115 FACT

Syntax:

$$\text{FACT} (x)$$

Description: Computes the factorial of x .

Arguments:

Name	Type	Description
x	number	The non-negative value whose factorial is to be computed. x is truncated to an integer.

Return Type and Value: number – The factorial of x .

However, if

- x is negative, #NUM! is returned.
- x is too large for the result to be representable, #NUM! is returned.

[Example:

FACT(5) results in 120

FACT(3.5) results in 6

FACT(0) results in 1

end example]

18.17.7.116 FACTDOUBLE

Syntax:

$$\text{FACTDOUBLE} (n)$$

Description: Computes the double factorial of n .

Mathematical Formula:

If n is even:

$$n!! = n(n-2)(n-4) \dots (4)(2)$$

If n is odd:

$$n!! = n(n-2)(n-4) \dots (3)(1)$$

where:

- n = argument n

Arguments:

Name	Type	Description
n	number	The non-negative value whose double factorial is to be computed. n is truncated to an integer.

Return Type and Value: number – The double factorial of n .

However, if

- n is negative, #NUM! is returned.
- n is too large for the result to be representable, #NUM! is returned.

[Example:

FACTDOUBLE(5) results in 15

FACTDOUBLE (3.5) results in 3

FACTDOUBLE (0) results in 1

end example]

18.17.7.117 FALSE

Syntax:

FALSE ()

Description: Computes the value FALSE. (A call to function FALSE is equivalent to using the *logical-constant* FALSE.)

Arguments: None.

Return Type and Value: logical – The value FALSE.

[Example:

FALSE() results in FALSE

end example]

18.17.7.118 FDIST

Syntax:

FDIST (x , *degrees-freedom-1* , *degrees-freedom-2*)

Description: Computes the F probability distribution.

Mathematical Formula:

$$FDIST = P(F > x)$$

where:

- F is a random variable that has an F distribution with degrees of freedom *degrees-freedom-1* and *degrees-freedom-2*
- x is argument x

Arguments:

Name	Type	Description
x	number	The value at which the function is to be evaluated.
<i>degrees-freedom-1</i>	number	The number of degrees of freedom for the numerator, truncated to an integer.
<i>degrees-freedom-2</i>	number	The number of degrees of freedom for the denominator, truncated to an integer.

Return Type and Value: number – The F probability distribution.

However, if

- x is negative, #NUM! is returned.
- $\text{degrees-freedom-1} < 1$ or $\text{degrees-freedom-1} \geq 10^{10}$, #NUM! is returned.
- $\text{degrees-freedom-2} < 1$ or $\text{degrees-freedom-2} \geq 10^{10}$, #NUM! is returned.

[Example:

FDIST(12.345,3,4) results in 0.017226183

end example]

18.17.7.119 FIND

Syntax:

FIND (*string-1* , *string-2* [, *start-pos*])

Description: Performs a case-sensitive search using a lexical comparison for the first occurrence of *string-1* in *string-2*, starting at character position *start-pos* within *string-2*. (FIND is intended for use with languages that

use the single-byte character set (SBCS), whereas FINDB (§18.17.7.120) is intended for use with languages that use the double-byte character set (DBCS).)

Arguments:

Name	Type	Description
<i>string-1</i>	text	Designate the string to be searched for within the string designated by <i>string-2</i> .
<i>string-2</i>	text	
<i>start-pos</i>	number	The number of the start position within <i>string-2</i> for which <i>string-1</i> is to be searched. The start position of the first character is 1. If omitted, a position of 1 shall be assumed. <i>start-pos</i> shall be at least 0.

Return Type and Value: number – The start position of the first occurrence of *string-1* in *string-2*, starting at character position *start-pos* within *string-2*. If *string-1* is an empty string, it shall always be found in any *string-2* at position *start-pos*, or at position 1 if *start-pos* is omitted.

However, if

- *string-1* is not found within *string-2*, #VALUE! is returned.
- *start-pos* designates a position outside *string-2*, #VALUE! is returned.

[Example:

FIND("de", "abcdef") results in 4

FIND(A10, B10) results in 4, when A10 contains de, and B10 contains abcdef

end example]

18.17.7.120 FINDB

Syntax:

FINDB (*string-1* , *string-2* , [*start-pos*])

Description: Performs a case-sensitive search using a lexical comparison for the first occurrence of *string-1* in *string-2*, starting at byte position *start-pos* within *string-2*. (FINDB is intended for use with languages that use the double-byte character set (DBCS), whereas FIND (§18.17.7.119) is intended for use with languages that use the single-byte character set (SBCS).)

Arguments:

Name	Type	Description
<i>string-1</i>	text	Designate the string to be searched for within the string

Name	Type	Description
<i>string-2</i>	text	designated by <i>string-2</i> .
<i>start-pos</i>	number	The number of the start position within <i>string-2</i> for which <i>string-1</i> is to be searched. The start position of the first byte is 1. If omitted, a position of 1 shall be assumed. <i>start-pos</i> shall be at least 0.

Return Type and Value: number – The start position of the first occurrence of *string-1* in *string-2*, starting at character position *start-pos* within *string-2*. If *string-1* is an empty string, it shall always be found in any *string-2* at position *start-pos*, or at position 1 if *start-pos* is omitted.

However, if

- *string-1* is not found within *string-2*, #VALUE! is returned.
- *start-pos* designates a position outside *string-2*, #VALUE! is returned.

[Example: Assuming 1-byte characters

FINDB("de", "abcdef") results in 4

FINDB(A10, B10) results in 4, when A10 contains de, and B10 contains abcdef

end example]

18.17.7.121 FINV

Syntax:

FINV (*probability* , *degrees-freedom-1* , *degrees-freedom-2*)

Description: Computes the inverse of the F probability distribution. Given a value for *probability*, FINV seeks that value *x* such that $\text{FDIST}(x, \text{degrees-freedom-1}, \text{degrees-freedom-2}) = \text{probability}$. Thus, precision of FINV depends on precision of FDIST.

Arguments:

Name	Type	Description
<i>probability</i>	number	A probability associated with the F cumulative distribution.
<i>degrees-freedom-1</i>	number	The number of degrees of freedom for the numerator, truncated to an integer.
<i>degrees-freedom-2</i>	number	The number of degrees of freedom for the denominator, truncated to an integer.

Return Type and Value: number – The inverse of the F probability distribution.

However, if

- *probability* < 0 or *probability* > 1, #NUM! is returned.
- *degrees-freedom-1* < 1 or *degrees-freedom-1* ≥ 10¹⁰, #NUM! is returned.
- *degrees-freedom-2* < 1 or *degrees-freedom-2* ≥ 10¹⁰, #NUM! is returned.
- the implementation determines that a return value cannot be computed, #N/A is returned

[Example:

FINV(0.5,3,4) results in 0.940534076

end example]

18.17.7.122 FISHER

Syntax:

FISHER (*x*)

Description: Computes the Fisher transformation at *x*.

Mathematical Formula:

$$z' = \frac{1}{2} \ln \left(\frac{1+x}{1-x} \right)$$

where:

- *x* = argument *x*

Arguments:

Name	Type	Description
<i>x</i>	number	The number for which the transformation is wanted.

Return Type and Value: number – The Fisher transformation at *x*.

However, if

- $x \leq -1$, #NUM! is returned.
- $x \geq 1$, #NUM! is returned.

[Example:

FISHER(-0.43) results in -0.459896681

FISHER(0.578) results in 0.659454094

end example]

18.17.7.123 FISHERINV

Syntax:

FISHERINV (*y*)

Description: Computes the inverse of the Fisher transformation.

Mathematical Formula:

$$x = \frac{e^{2y} - 1}{e^{2y} + 1}$$

where:

- *y* = argument *y*

Arguments:

Name	Type	Description
<i>y</i>	number	The number for which the inverse of the transformation is wanted.

Return Type and Value: number – The inverse of the Fisher transformation.

[*Example:*

FISHERINV(-0.43) results in 0.405321309

FISHERINV(0.578) results in 0.521210269

end example]

18.17.7.124 FIXED

Syntax:

FIXED (*number* [, [*num-decimal*] [, *suppress-commas-flag*]])

Description: Produces a string containing *number* rounded to *num-decimal* decimal places, using the same rounding algorithm as ROUND (§18.17.7.278). Thousands separator commas are included as determined by *suppress-commas-flag*.

Arguments:

Name	Type	Description
<i>number</i>	number	Designate the number that is to be formatted, truncated to integer.
<i>num-decimal</i>	number	Designate the number of decimal places to be used in the resulting string. If negative, <i>number</i> is rounded to the left of the decimal point. If omitted, a value of 2 shall be assumed.
<i>suppress-commas-flag</i>	logical	If TRUE, commas are not included; if FALSE or omitted, commas are included.

Return Type and Value: text – The string containing *number* rounded to *num-decimal* decimal places.

[Example:

FIXED(1234567) results in 1,234,567.00

FIXED(1234567.555555,4,TRUE) results in 1234567.5556

FIXED(.555555,10) results in 0.5555550000

FIXED(1234567, -3) results in 1,235,000

end example]

18.17.7.125 FLOOR

Syntax:

FLOOR (*x* , *significance*)

Description: Computes *x* rounded down, toward zero, to the nearest multiple of *significance*. Regardless of the sign of *x*, a value is rounded down when adjusted away from zero.

Arguments:

Name	Type	Description
<i>x</i>	number	The value to be rounded,
<i>significance</i>	number	The multiple to which <i>x</i> is to be rounded.

Return Type and Value: number – The rounded-down value of *x*.

However, if *x* and *significance* have different signs, #NUM! is returned.

[Example:

FLOOR(2.5,1) rounds 2.5 down to nearest multiple of 1; that is, to 2

FLOOR(-2.5, -2) rounds -2.5 down to nearest multiple of -2; that is, to -2

FLOOR(1.5,0.1) rounds 1.5 down to the nearest multiple of 0.1; that is, to 1.5

FLOOR(0.234,0.01) rounds 0.234 down to the nearest multiple of 0.01; that is, to 0.23

end example]

18.17.7.126 FORECAST

Syntax:

FORECAST (*x* , *known-ys* , *known-xs*)

Description: Calculates, or predicts, a future value by using existing values. The predicted value is a y-value for a given x-value. The known values are existing x-values and y-values, and the new value is predicted by using linear regression.

Mathematical Formula:

FORECAST=a+bx, where:

$$a = \bar{y} - b\bar{x}$$

and:

$$b = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sum(x - \bar{x})^2}$$

where:

- *x* = a sample value
- \bar{x} is the sample mean AVERAGE (known - xs)
- *y* = a sample value
- \bar{y} is the sample mean AVERAGE (known - ys)

Arguments:

Name	Type	Description
<i>x</i>	number	The data point for which a value is to be predicted.
<i>known-xs</i>	array, reference	The independent data.
<i>known-ys</i>	array, reference	The dependent data.

Return Type and Value: number – The future value.

However, if

- *known-xs* and *known-ys* are empty or contain a different number of data points, the return value is unspecified.

- The variance of *known-xs* equals zero, the return value is unspecified.

[Example:

FORECAST(30,{6,7,9,15,21},{20,28,31,38,40}) results in 10.60725309

end example]

18.17.7.127 FREQUENCY

Syntax:

FREQUENCY (*data-array* , *bins-array*)

Description: Calculates how often values occur within a range of values. A call to FREQUENCY shall be an array formula.

Arguments:

Name	Type	Description
<i>data-array</i>	array, reference to number	Set of values for which frequencies are to be computed. If <i>data-array</i> contains no values, FREQUENCY returns an array of zeros. Cells containing text or that are empty are ignored.
<i>bins-array</i>	array, reference	Set of intervals into which the values in <i>data-array</i> are to be grouped. If <i>bins-array</i> contains no values, FREQUENCY returns the number of elements in <i>data-array</i> .

Return Type and Value: vertical array of numbers – The frequency at which values occur within a range of values. The number of elements in the returned array is one more than the number of elements in *bins-array*. The extra element contains the count of any values above the highest interval.

[Example:

If the cells A2:A10 contain 79, 85, 78, 85, 50, 81, 95, 88, and 97, and the cells B2:B4 contain 70, 79, and 89, FREQUENCY(A2:A10,B2:B4) results in a vertical array containing 1 (50), 2 (79, 78), 4 (85, 85, 81, 88), and 2 (95, 97).

end example]

18.17.7.128 FTEST

Syntax:

FTEST (*array-1* , *array-2*)

Description: Computes the result of an F-test.

Arguments:

Name	Type	Description
<i>array-1</i>	number, name, array, reference to number	If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.
<i>array-2</i>		

Return Type and Value: number – The two-tailed probability that the variances in *array-1* and *array-2* are not significantly different.

However, if

- The number of data points in *array-1* or *array-2* is less than 2, the return value is unspecified.
- The variance of *array-1* or *array-2* is zero, the return value is unspecified.

[Example:

If the cells D6:D10 contain 6, 7, 9, 15, and 21, and the cells E6:E10 contain 20, 28, 31, 38, and 40, FTEST(D6:D10, E6:E10) results in 0.648317847

end example]

18.17.7.129 FV

Syntax:

FV (*rate* , *nper* , *pmt* [, [*pv*] [, [*type*]]])

Description: Computes the future value of an investment based on periodic, constant payments and a constant interest rate.

Arguments:

Name	Type	Description
<i>rate</i>	number	The interest rate.
<i>nper</i>	number	The total number of payment periods, truncated to integer.
<i>pmt</i>	number	The payment made each period; it cannot change over the life of the annuity. [Note: Typically, <i>pmt</i> contains principal and interest, but no other fees or taxes. end note] If omitted, <i>pv</i> shall be provided.
<i>pv</i>	number	The the present value, or the lump-sum amount that a series of future payments is worth right now. If omitted, it is assumed to be 0, and <i>pmt</i> shall be provided.
<i>type</i>	number	The timing of the payment, truncated to integer, as

Name	Type	Description						
		follows: <table><tr><th>Value</th><th>Timing</th></tr><tr><td>0</td><td>Payment at the end of the period</td></tr><tr><td>1</td><td>Payment at the beginning of the period</td></tr></table>	Value	Timing	0	Payment at the end of the period	1	Payment at the beginning of the period
Value	Timing							
0	Payment at the end of the period							
1	Payment at the beginning of the period							

Arguments representing cash paid by investor shall be expressed as negative numbers; arguments representing cash received by the investor shall be expressed as positive numbers.

Return Type and Value: number – The future value of an investment based on periodic, constant payments and a constant interest rate.

However, if *type* is any number other than 0 or 1, #NUM! is returned.

[Example:

$FV(0.06/12, 10, -200, -500, 1)$ 2,581.40

$FV(0.12/12, 12, -1000)$ results in 12,682.50

$FV(0.11/12, 35, -2000, , 1)$ results in 82,846.25

$FV(0.06/12, 12, -100, -1000, 1)$ results in 2,301.40

end example]

18.17.7.130 FVSCHEDULE

Syntax:

FVSCHEDULE (*principal* , *schedule*)

Description: Computes the future value of an initial principal after applying a series of compound interest rates.

[Note: This function can be used to calculate the future value of an investment with a variable or adjustable rate.

end note]

Arguments:

Name	Type	Description
<i>principal</i>	number	The present value.
<i>schedule</i>	array	Set of interest rates to apply. The values in this array can be numbers or blank cells. Blank cells are taken as zeros (i.e., no interest).

Return Type and Value: number – The future value of an initial principal after applying a series of compound interest rates.

However, if any element of the array *schedule* is not a number and not blank, #VALUE! is returned.

[Example:

FVSCHEDULE(1,{0.09,0.11,0.1}) results in 1.33089

end example]

18.17.7.131 GAMMADIST

Syntax:

GAMMADIST (*x* , *alpha* , *beta* , *cumulative-flag*)

Description: Computes the gamma distribution.

Mathematical Formula:

The equation for the gamma probability density function is:

$$f(x, \alpha, \beta) = \frac{1}{\beta^\alpha \Gamma(\alpha)} x^{\alpha-1} e^{-\frac{x}{\beta}}$$

$$f(x, \alpha, \beta) = \frac{1}{\beta^\alpha \Gamma(\alpha)} x^{\alpha-1} e^{-\frac{x}{\beta}}$$

The standard gamma probability density function is:

$$f(x, \alpha) = \frac{x^{\alpha-1} e^{-x}}{\Gamma(\alpha)}$$

When *alpha* = 1, GAMMADIST returns the exponential distribution with:

$$\lambda = \frac{1}{\beta}$$

where:

- α = argument *alpha*
- β = argument *beta*
- x = argument *x*

For a positive integer *n*, when *alpha* = *n*/2, *beta* = 2, and *cumulative* = TRUE, GAMMADIST returns (1-CHIDIST(*x*)) with *n* degrees of freedom.

When *alpha* is a positive integer, GAMMADIST is also known as the Erlang distribution.

Arguments:

Name	Type	Description
x	number	The value at which the distribution is to be evaluated.
α	number	A parameter of the distribution.
β	number	A parameter of the distribution. If $\beta = 1$, GAMMADIST returns the standard gamma distribution.
<i>cumulative-flag</i>	logical	Determines the form of the function. If TRUE, GAMMADIST returns the cumulative distribution function; if FALSE, it returns the probability density function.

Return Type and Value: number – The gamma distribution.

However, if

- $x < 0$, #NUM! is returned.
- $\alpha \leq 0$ or $\beta \leq 0$, #NUM! is returned.

[Example:

GAMMADIST(10,9,2,FALSE) results in 0.03263902

GAMMADIST(10,9,2,TRUE) results in 0.068093631

end example]

18.17.7.132 GAMMAINV

Syntax:

GAMMAINV (*probability* , α , β)

Description: Computes the inverse of the gamma distribution. Given a value for *probability*, GAMMAINV seeks that value x such that $\text{GAMMADIST}(x, \alpha, \beta, \text{TRUE}) = \text{probability}$. Thus, the precision of GAMMAINV depends on the precision of GAMMADIST.

Arguments:

Name	Type	Description
<i>probability</i>	number	The probability associated with the gamma distribution.
α	number	A parameter of the distribution.
β	number	A parameter of the distribution. If $\beta = 1$, GAMMAINV returns the standard gamma distribution.

Return Type and Value: number – The inverse of the gamma distribution.

However, if

- *probability* < 0 or *probability* > 1, #NUM! is returned.
- *alpha* ≤ 0 or *beta* ≤ 0, #NUM! is returned.
- the implementation determines that a return value cannot be computed, #N/A is returned.

[Example:

GAMMAINV(0.068,9,2) results in 9.997130086

end example]

18.17.7.133 GAMMALN

Syntax:

GAMMALN (*x*)

Description: Computes the natural logarithm of the gamma function.

Mathematical Formula:

$$GAMMALN = LN(\Gamma(x))$$

where:

$$\Gamma(x) = \int_0^{\infty} e^{-u} u^{x-1} du$$

where:

- *x* = argument *x*

Arguments:

Name	Type	Description
<i>x</i>	number	The value for which the gamma function is to be calculated.

Return Type and Value: number – The natural logarithm of the gamma function.

However, if *x* ≤ 0, #NUM! is returned.

[Example:

GAMMALN(4.5) results in 2.453736571

end example]

18.17.7.134 GCD

Syntax:

GCD (*argument-list*)

Description: Computes the greatest common divisor of the one or more numbers, designated by *arguments* in *argument-list*.

Arguments:

Name	Type	Description
<i>argument-list</i>	numbers	The <i>arguments</i> in <i>argument-list</i> designate the values. Each argument is truncated to an integer.

Return Type and Value: number – The greatest common divisor of one or more numbers.

However, if any *argument* is negative, #NUM! is returned.

[Example:

GCD(5) results in 5

GCD(5,2) results in 1

GCD(100,50,28) results in 2

GCD(24.5,36.3) results in 12

GCD(7,1) results in 1

GCD(5,0) results in 5

end example]

18.17.7.135 GEOMEAN

Syntax:

GEOMEAN (*argument-list*)

Description: Computes the geometric mean of an array or range of positive data.

Mathematical Formula:

$$GM_{\bar{y}} = \sqrt[n]{y_1 y_2 y_3 \dots y_n}$$

where:

- n is the number of elements in *argument-list*.
- $y_1, y_2, y_3, \dots, y_n$ are the values of the n -th element in *argument-list*.

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number, name, array, or reference to number.	The <i>arguments</i> in <i>argument-list</i> designate the values to be averaged. Logical values and text representations of numbers that entered directly into the list of arguments are included. If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.

Return Type and Value: number – The geometric mean of an array or range of positive data.

However, if the value of any data point ≤ 0 , #NUM! is returned.

[Example:

GEOMEAN(10.5,5.3,2.9) results in 5.444454702

GEOMEAN(10.5,{5.3,2.9},"12") results in 6.633780588

end example]

18.17.7.136 GESTEP

Syntax:

GESTEP (*number* [, *step*])

Description: Tests if the value of *number* is greater than or equal to that of *step*.

Arguments:

Name	Type	Description
<i>number</i>	number	<i>number</i> is the value to test against <i>step</i> . If <i>step</i> is omitted, zero is used.
<i>step</i>	number	

Return Type and Value: number – 1 if *number* \geq *step*; otherwise, 0.

[Example:

GESTEP(5.6, -4.3) results in 1

GESTEP(5.6, 5.6) results in 1

GESTEP(-5.6) results in 0

end example]

18.17.7.137 GETPIVOTDATA

Syntax:

```
GETPIVOTDATA ( data-field , pivot-table , field-1 , item-1
[ , field-2 , item-2 [ , ... ] ] )
```

Description: Retrieves data stored in a PivotTable report. Calculated fields or items and custom calculations are included in GETPIVOTDATA calculations.

Arguments:

Name	Type	Description
<i>data-field</i>	text	The name of the data field that contains the data to be retrieved.
<i>pivot-table</i>	reference to any cell, range of cells, or named range of cells in a PivotTable report	This information is used to determine which PivotTable report contains the data to be retrieved. If <i>pivot-table</i> is a range that includes two or more PivotTable reports, data shall be retrieved from whichever report was created most recently in the range.
<i>field-1</i> through <i>field-n</i>	text	Argument pairs <i>field-1</i> and <i>item-1</i> , <i>field-2</i> and <i>item-2</i> through <i>field-n</i> and <i>item-n</i> are field names and item names that describe the data to be retrieved. The pairs can be in any order. Field names and names for items other than dates/times (which shall be expressed as numbers) and numbers shall be enclosed in quotation marks. For OLAP PivotTable reports, items can contain the source name of the dimension as well as the source name of the item. [Example: A field and item pair for an OLAP PivotTable might look like this: "[Product]", "[Product].[All Products].[Foods].[Baked Goods]" end example] If the field and item arguments describe a single cell, the value of that cell is returned regardless of its value.
<i>item-1</i> through <i>item-n</i>	text	

Return Type and Value: any – The data stored in a PivotTable report.

However, if

- *pivot-table* is not a range in which a PivotTable report is found, the return value is unspecified.
- The arguments do not describe a visible field, the return value is unspecified.
- The arguments include a page field that is not displayed, the return value is unspecified.

[Example: Given the following data:

	A	B	C	D	E
2	Region	North			
3					
4	Sum of Sales		Product		
5	Month	Salesperson	Beverages	Produce	Grand Total
6	March	Buchanan	\$ 3,522	\$ 10,201	\$ 13,723
7		Davolio	\$ 8,725	\$ 7,889	\$ 16,614
8	March Total		\$ 12,247	\$ 18,090	\$ 30,337
9	April	Buchanan	\$ 5,594	\$ 7,265	\$ 12,859
10		Davolio	\$ 5,461	\$ 668	\$ 6,129
11	April Total		\$ 11,055	\$ 7,933	\$ 18,988
12	Grand Total		\$ 23,302	\$ 26,023	\$ 49,325

GETPIVOTDATA("Sales", \$A\$4) returns the grand total of the Sales field, \$49,325.

GETPIVOTDATA("Sum of Sales", \$A\$4) also returns the grand total of the Sales field, \$49,325; the field name can be entered exactly as it looks on the sheet, or as its root (without "Sum of," "Count of," and so forth).

GETPIVOTDATA("Sales", \$A\$4, "Month", "March") returns the grand total for March, \$30,337.

GETPIVOTDATA("Sales", \$A\$4, "Month", "March", "Product", "Produce", "Salesperson", "Buchanan") returns \$10,201.

GETPIVOTDATA("Sales", \$A\$4, "Region", "South") is unspecified because the South region data is not visible.

GETPIVOTDATA("Sales", \$A\$4, "Product", "Beverages", "Salesperson", "Davolio") is unspecified because there is no total value of beverage sales for Davolio.

end example]

18.17.7.138 GROWTH

Syntax:

GROWTH (*known-ys* [, [*known-xs*] [, [*new-xs*] [, *const-flag*]])

Description: Computes predicted exponential growth by using existing data. GROWTH can also fit an exponential curve to existing x-values and y-values.

Arguments:

Name	Type	Description
<i>known-ys</i>	array	Set of y-values already known in the relationship $y=b*m^x$. If the array <i>known-ys</i> is a single column, then each column of <i>known-xs</i> is interpreted as a separate variable. If the array <i>known-ys</i> is a single row, then each row of <i>known-xs</i> is interpreted as a separate variable.
<i>known-xs</i>	array	Set of x-values that might already be know in the relationship $y=b*m^x$. The array <i>known-xs</i> can include one or more sets of variables. If only one variable is used, <i>known-ys</i> and <i>known-xs</i> can be ranges of any shape, as long as they have equal dimensions. If more than one variable is used, <i>known-ys</i> shall be a vector (that is, a <i>known-ys</i> with a height of one row or a width of one column). If <i>known-xs</i> is omitted, it is assumed to be the array {1,2,3,...} that is the same size as <i>known-ys</i> .
<i>new-xs</i>	array	A set of new x-values for which GROWTH is to return corresponding y-values. <i>new-xs</i> shall include a column (or row) for each independent variable, just as <i>known-xs</i> does. So, if <i>known-ys</i> is in a single column, <i>known-xs</i> and <i>new-xs</i> shall have the same number of columns. If <i>known-ys</i> is in a single row, <i>known-xs</i> and <i>new-xs</i> shall have the same number of rows. If <i>new-xs</i> are omitted, it is assumed to be the array {1,2,3,...} that is the same size as <i>known-ys</i> .
<i>const-flag</i>	logical	Specifies whether to force the constant b to equal 1. If TRUE or omitted, <i>b</i> is calculated normally. If FALSE, <i>b</i> is set equal to 1 and the m-values are adjusted so that $y=m^x$.

Return Type and Value: array – The y-values for a series of new x-values.

However, if any of the numbers in *known-ys* are zero or negative, #NUM! is returned.

[Example: Given the following data:

	A	B	C
1	Month	Units	Formula (corresponding units)
2	11	33,100	32618.20377
3	12	47,300	47729.42261
4	13	69,000	69841.30086
5	14	102,000	102197.0734
6	15	150,000	149542.4867

	A	B	C
7	16	220,000	218821.8762
8	Month	Formula (Predicted Units)	
9	17	320,196.72	
10	18	468,536.05	

When GROWTH(A2:B4,A6:B8) is an array formula spanning cells C2:C7, those cells take on the results shown. When GROWTH(A2:B4,A6:B8,A9:A10) is an array formula spanning cells B9:B10, those cells take on the results shown.

end example]

18.17.7.139 HARMEAN

Syntax:

HARMEAN (*argument-list*)

Description: Computes the harmonic mean of a data set.

Mathematical Formula:

$$\frac{1}{H} = \frac{1}{n} \sum \frac{1}{Y_i}$$

where:

- n = number of elements in *argument-list*
- Y_i = each element in *argument-list*

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, text, number, name, array, or reference to number.	The <i>arguments</i> in <i>argument-list</i> designate the values to be averaged. Argument values can be numbers, or names, arrays, or references that contain numbers. Logical values and text representations of numbers entered directly into the list of arguments are included. If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.

Return Type and Value: number – The harmonic mean of a data set.

However, if the value of any data point ≤ 0 , #NUM! is returned.

[Example:

HARMEAN(4.6,5.8,8.3,7) results in 6.124222

HARMMEAN(10.5,{5.3,2.9},"12") results in 5.617360

end example]

18.17.7.140 HEX2BIN

Syntax:

HEX2BIN (*number* [, *num-bin-digits*])

Description: Makes the binary equivalent of *number*, with the result having *num-bin-digits* digits.

Arguments:

Name	Type	Description
<i>number</i>	text	A 10-digit hexadecimal number in a string that is to be converted to a binary string. <i>number</i> is not case-sensitive. If <i>number</i> has less than 10 digits, leading zero digits are implied until it has exactly 10 digits. The 10 digits use twos-complement representation with the left-most bit (40th bit from the right) representing the sign bit.
<i>num-bin-digits</i>	number	The number of digits in the result, with leading zeros added as necessary. However, if <i>number</i> is negative, <i>num-bin-digits</i> is ignored and the result has 10 digits. If <i>num-bin-digits</i> is omitted, the minimum number of digits is used in the result. <i>num-bin-digits</i> is truncated to an integer.

Return Type and Value: text – The binary equivalent of *number*.

However, if

- *number* is outside the range "FFFFFFE00" (11111111111111111111111111111000000000 binary, - 512 decimal) to "1FF" (0000000000000000000000000000000011111111 binary, 511 decimal), inclusive, #NUM! is returned.
- *number* contains one or more non-hexadecimal digits, #NUM! is returned.
- *number* contains more than 10 hexadecimal digits, #NUM! is returned.
- *number* needs more digits than *num-bin-digits*, #NUM! is returned.
- *num-bin-digits* is negative or > 10, #NUM! is returned.

[Example:

HEX2BIN("fE") results in 11111110
 HEX2BIN("FFFFFFFFFE") results in 1111111110
 HEX2BIN("2") results in 10
 HEX2BIN("F",6) results in 001111

end example]

18.17.7.141 HEX2DEC

Syntax:

HEX2DEC (*number*)

Description: Makes the decimal equivalent of *number*.

Arguments:

Name	Type	Description
<i>number</i>	string	A 10-digit hexadecimal number in a string that is to be converted to a decimal number. <i>number</i> is not case-sensitive. If <i>number</i> has less than 10 digits, leading zero digits are implied until it has exactly 10 digits. The 10 digits use twos-complement representation with the left-most bit (40th bit from the right) representing the sign bit.

Return Type and Value: number – The decimal equivalent of *number*.

However, if

- number* contains one or more non-hexadecimal digits, #NUM! is returned.
- number* contains more than 10 hexadecimal digits; that is, *number* is outside the range "8000000000" (-548,755,813,888 decimal) to "7FFFFFFFFF" (548,755,813,887 decimal), inclusive, #NUM! is returned.

[Example:

HEX2DEC("fE") results in 254
 HEX2DEC("FFFFFFFFFE") results in -2
 HEX2DEC("F000000000") results in -68719476736

end example]

18.17.7.142 HEX2OCT

Syntax:

HEX2OCT (*number* [, *num-oct-digits*])

Description: Makes the octal equivalent of *number*, with the result having *num-oct-digits* digits.

Arguments:

Name	Type	Description
<i>number</i>	text	A 10-digit hexadecimal number in a string that is to be converted to an octal string. <i>number</i> is not case-sensitive. If <i>number</i> has less than 10 digits, leading zero digits are implied until it has exactly 10 digits. The 10 digits use twos-complement representation with the left-most bit (40th bit from the right) representing the sign bit.
<i>num-oct-digits</i>	number	The number of digits in the result, with leading zeros added as necessary. However, if <i>number</i> is negative, <i>num-oct-digits</i> is ignored and the result has 10 digits. If <i>num-oct-digits</i> is omitted, the minimum number of digits is used in the result. <i>num-oct-digits</i> is truncated to an integer.

Return Type and Value: text – The octal equivalent of *number*.

However, if

- *number* is outside the range "FFE0000000" (17774000000000 octal, -536,870,912 decimal) to "1FFFFFFF" (00003777777777 octal, 536,870,911 decimal), inclusive, #NUM! is returned.
- *number* contains one or more non-hexadecimal digits, #NUM! is returned.
- *number* contains more than 10 hexadecimal digits, #NUM! is returned.
- *number* needs more digits than *num-oct-digits*, #NUM! is returned.
- *num-oct-digits* is negative or > 10, #NUM! is returned.

[Example:

HEX2OCT("fE") results in 376

HEX2OCT("FFFFFFFFFE") results in 7777777776

HEX2OCT("2") results in 2

HEX2OCT("F",6) results in 000017

end example]

18.17.7.143 HLOOKUP

Syntax:

HLOOKUP (*lookup-value* , *table-array* , *row-index-num* [, [*range-lookup-flag*]])

Description: Performs a horizontal search for a value in the top row of a table or an array, noting the column in which the matching value is found. From that column, the value from a given row is returned.

Arguments:

Name	Type	Description
<i>lookup-value</i>	value or reference.	The value to be located in the first row of the table. If <i>range-lookup</i> is FALSE and <i>lookup-value</i> is a string, the wildcard characters, question mark (?) and asterisk (*), can be included in <i>lookup-value</i> . A question mark matches any single character; an asterisk matches any sequence of characters. To find a question mark or asterisk, use a tilde (~) before the character.
<i>table-array</i>	array, reference, name	Designates the table of information to be searched. The values in the first row of <i>table-array</i> can be text, numbers, or logical values. If <i>range-lookup-flag</i> is TRUE, the values in the first row of <i>table-array</i> shall be placed in "ascending order", as follows: ..., -2, -1, 0, 1, 2, ..., A–Z, FALSE, TRUE. If <i>range-lookup-flag</i> is FALSE, <i>table-array</i> 's values need not be sorted. Uppercase and lowercase text is treated as equivalent.
<i>row-index-num</i>	number	The row number in <i>table-array</i> from which the matching value is to be returned. (A <i>row-index-num</i> of 1 returns the first row value in <i>table-array</i> , a <i>row-index-num</i> of 2 returns the second row value in <i>table-array</i> , and so on.)
<i>range-lookup-flag</i>	logical	Specifies whether HLOOKUP is to find an exact or approximate match. If TRUE or omitted, an approximate match is returned. That is, if an exact match is not found, the next largest value that is less than <i>lookup-value</i> is returned. If FALSE, an exact match is performed.

Return Type and Value: any – The value from a given row number, where the column is determined by a search of the top row looking for a match with a given value.

However, if

- An exact match is performed, but no match is found, #N/A is returned.
- *row-index-num* is less than 1, #VALUE! is returned.
- *row-index-num* is greater than the number of rows in *table-array*, #REF! is returned.
- *lookup-value* is smaller than the smallest value in the first row of *table-array*, #N/A is returned.

[Example: Given the following data:

	A	B	C
1	Axles	Bearings	Bolts
2	4	6	9
3	5	7	10
4	6	8	11

HLOOKUP("Axles",A1:C4,2,TRUE) results in 4
HLOOKUP("Bearings",A1:C4,3,FALSE) results in 7
HLOOKUP("B",A1:C4,3,TRUE) results in 5
HLOOKUP("Bolts",A1:C4,4) results in 11
HLOOKUP(3,{1,2,3;"a","b","c";"d","e","f"},2,TRUE) results in c

end example]

18.17.7.144 HOUR

Syntax:

HOUR (*time-value*)

Description: Computes the hour for the date and/or time having the given *time-value*.

Arguments:

Name	Type	Description
<i>time-value</i>	number	The date and/or time whose hour is to be computed. That date and/or time shall be expressed either as a serial date-time, in which case, its integer part is ignored, or as a <i>string-constant</i> having any date and/or time format, in which case, any date information shall be ignored.

Return Type and Value: number – The hour for the date and/or time having the given *time-value*. The returned value shall be in the range 0–23.

However, if *time-value* is out of range for the current date system, #NUM! is returned.

[Example:

HOUR(DATE(2006,2,26)+TIME(2,10,20)) results in 2
HOUR(TIME(22,56,34)) results in 22
HOUR(0) results in 0, since serial date-time 0 represents 00:00:00
HOUR(10.5) results in 12, since serial date-time .5 represents 12:00:00

HOUR("22-Oct-2001 10:53:12") results in 10

HOUR("10:53:12 pm") results in 22

HOUR("22:53:12") results in 22

end example]

18.17.7.145 HYPERLINK

Syntax:

HYPERLINK (*link-location* [, [*friendly-name*]])

Description: Creates a shortcut that opens a document stored on a network server, an intranet, or the Internet. When the cell that contains the HYPERLINK function call is clicked, the file stored at *link-location* is opened.

Arguments:

Name	Type	Description
<i>link-location</i>	text	The location to be opened as text. <i>link-location</i> can refer to a place in a document—such as a specific cell or named range in a SpreadsheetML worksheet or workbook, or to a bookmark in a WordprocessingML document. The <i>link-location</i> can be to a location on a local hard disk drive, the path to a location on a server or a Uniform Resource Locator (URL) to a location on the Internet or an intranet. [Note: Using a URL is the preferred way of specifying <i>link-location</i> . end note] If the location specified in <i>link-location</i> does not exist or cannot be navigated, an unspecified error is produced when the cell is clicked. <i>link-location</i> can be a string or a reference to a cell containing a string.
<i>friendly-name</i>	text, number, name	The value that is displayed in the cell. If omitted, the cell displays <i>link-location</i> . <i>friendly-name</i> can be a value, a text string, a name, or a cell that contains the jump text or value. If the evaluation of <i>friendly-name</i> results in an error value, the cell displays that error value rather than the jump text.

Return Type and Value: text – The value of *friendly-name*, if it is specified; otherwise, the value of *link-location*.

[Example:

HYPERLINK("http://example.openxmlformats.org/report/budget report.xls", "Click for report"), which opens a worksheet named "budget report.xls" that is stored on the Internet at the location example.openxmlformats.org/report, and displays the text "Click for report".

HYPERLINK("D:\FINANCE\1stqtr.xls",H10), which opens the file 1stqtr.xls that is stored in a directory named Finance on drive D, and displays the numeric value stored in cell H10.

end example]

18.17.7.146 HYPGEOMDIST

Syntax:

HYPGEOMDIST (*sample-successes* , *number-sample* , *population-successes* , *number-population*)

Description: Computes the hypergeometric distribution; that is, the probability of a given number of sample successes, given the sample size, population successes, and population size.

Mathematical Formula:

$$P(X = x) = h(x, n, M, N) = \frac{\binom{M}{x} \binom{N - M}{n - x}}{\binom{N}{n}}$$

where:

- *M* = *population-successes* argument
- *N* = *number-population* argument
- *x* = *sample-successes* argument
- *n* = *number-sample* argument

Arguments:

Name	Type	Description
<i>sample-successes</i>	number	The number of successes in the sample, truncated to integer.
<i>number-sample</i>	number	The size of the sample, truncated to integer.
<i>population-successes</i>	number	The number of successes in the population, truncated to integer.
<i>number-population</i>	number	The population size, truncated to integer.

Return Type and Value: number – The hypergeometric distribution.

However, if

- *sample-successes* < 0 or *sample-successes* is greater than the lesser of *number-sample* and *population-successes*, #NUM! is returned.

- *sample-successes* is less than the larger of 0 or (*number-sample* - *number-population* + *population-successes*), #NUM! is returned.
- *number-sample* ≤ 0 or *number-sample* > *number-population*, #NUM! is returned.
- *population-successes* ≤ 0 or *population-successes* > *number-population*, #NUM! is returned.
- *number-population* ≤ 0, #NUM! is returned.

[Example:

HYPGEOMDIST(1,4,8,20) results in 0.363261

end example]

18.17.7.147 IF

Syntax:

IF (*logical-value* , [*value-if-true*] [, [*value-if-false*]])

Description: Tests *logical-value*, and if it is TRUE, *value-if-true* is evaluated and returned; otherwise, *value-if-false* is evaluated and returned.

Arguments:

Name	Type	Description
<i>logical-value</i>	logical	The value to be tested.
<i>value-if-true</i>	any	The value returned if <i>logical-value</i> is TRUE. If <i>logical-value</i> is TRUE and <i>value-if-true</i> is omitted, this argument evaluates to 0. <i>value-if-true</i> can contain up to seven levels of nested IF function calls. [Note: <i>value-if-true</i> and <i>value-if-false</i> need not evaluate to results of the same type. end note]
<i>value-if-false</i>	any	The value returned if <i>logical-value</i> is FALSE. If <i>logical-value</i> is FALSE and <i>value-if-false</i> and its preceding comma is omitted, this argument evaluates to FALSE. If <i>logical-value</i> is FALSE and <i>value-if-false</i> is omitted, but its preceding comma is present, this argument evaluates to 0. <i>value-if-false</i> can contain at least seven levels of nested IF function calls. [Note: <i>value-if-true</i> and <i>value-if-false</i> need not evaluate to results of the same type. end note]

If any argument is an array, every element of that array shall be evaluated when that argument is evaluated.

Return Type and Value: any – *value-if-true*, if *logical-value* is TRUE; otherwise, *value-if-false*.

[Example:

IF(10>5, "Yes", "No") results in Yes
IF(10>5, "Yes") results in Yes
IF(10>5, "Yes",) results in Yes
IF(10<5, "Yes") results in FALSE
IF(10<5, "Yes",) results in 0

IF(10>5, , "No") results in 0
IF(10>5, ,) results in 0
IF(10>5, "Yes", 20) results in Yes
IF(10<5, "Yes", 20) results in 20

end example]

18.17.7.148 IFERROR

Syntax:

IFERROR (*value* , *value-if-error*)

Description: Provides a simpler and more efficient way of trapping and handling errors. It allows the generation of user-defined error text for a function call that can result in an error.

Arguments:

Name	Type	Description
<i>value</i>	any	The value that is checked for an error (i.e., any of the following: #N/A, #VALUE!, #REF!, #DIV/0!, #NUM!, #NAME?, or #NULL!). If <i>value</i> is an empty cell, it is treated as an empty string.
<i>value-if-error</i>	any	The value to return if <i>value</i> evaluates to an error. If <i>value-if-error</i> is an empty cell, it is treated as an empty string.

Return Type and Value: any – *value*, if *value* is not an error; otherwise, *value-if-error*. If *value* is an array formula, an array of results for each cell in the range specified in *value*, is returned.

[Example: Consider the case in which A3 contains 55, and B3 contains 0:

A3/B3 results in #DIV/0

IFERROR(A3/B3, "Error in calculation") results in Error in calculation

end example]

18.17.7.149 IMABS

Syntax:

IMABS (*complex-number*)

Description: Computes the absolute value of *complex-number*.

Mathematical Formula:

$$IMABS(z) = |z| = \sqrt{x^2 + y^2}$$

where:

- z = argument *complex-number*, expressed in the form $x + yi$

Arguments:

Name	Type	Description
<i>complex-number</i>	text	The complex number for which the absolute value is being computed. <i>complex-number</i> shall be in $x + yi$ or $x + yj$ text format.

Return Type and Value: number – The absolute value of *complex-number*.

However, if *complex-number* is ill-formed, #NUM! is returned.

[Example:

IMABS("3+4i") results in 5

IMABS("-2.5-34.6j") results in 34.69020035

end example]

18.17.7.150 IMAGINARY

Syntax:

IMAGINARY (*complex-number*)

Description: Computes the imaginary coefficient of *complex-number*.

Arguments:

Name	Type	Description
<i>complex-number</i>	text	The complex number for which the imaginary coefficient is being computed. <i>complex-number</i> shall be in $x + yi$ or $x + yj$ text format.

Return Type and Value: number – The imaginary coefficient of *complex-number*.

However, if *complex-number* is ill-formed, #NUM! is returned.

[Example:

IMAGINARY("3+4i") results in 4

IMAGINARY("-2.5-34.6j") results in 34.6

end example]

18.17.7.151 IMARGUMENT

Syntax:

IMARGUMENT (*complex-number*)

Description: Computes the argument θ , an angle expressed in radians, such that for a complex number *complex-number* having the form $x+yi$:

$$x + yi = |x + yi| \times e^{i\theta} = |x + yi| (\cos \theta + i \sin \theta)$$

Mathematical Formula:

$$\text{IMARGUMENT}(z) = \tan^{-1} \left(\frac{y}{x} \right) = \theta$$

where:

- $\theta \in (-\pi; \pi]$
- z = argument *complex-number*, expressed in the form $x + yi$

Arguments:

Name	Type	Description
<i>complex-number</i>	text	The complex number in $x + yi$ or $x + yj$ text format.

Return Type and Value: number – The angle θ , expressed in radians.

However, if *complex-number* is ill-formed, #NUM! is returned.

[Example:

IMARGUMENT("13+4i") results in 0.298498932

IMARGUMENT("-2.5-5j") results in -2.034443936

end example]

18.17.7.152 IMCONJUGATE

Syntax:

IMCONJUGATE (*complex-number*)

Description: Computes the complex conjugate of the complex number *complex-number*.

Mathematical Formula:

$$IMCONJUGATE(x + yi) = \bar{z} = (x - yi)$$

where:

- \bar{z} = conjugate of the argument *complex-number*, expressed in the form $x + yi$

Arguments:

Name	Type	Description
<i>complex-number</i>	text	The complex number for which the complex conjugate is being computed. <i>complex-number</i> shall be in $x + yi$ or $x + yj$ text format.

Return Type and Value: text – A string containing the complex conjugate of *complex-number*, in $x+yi$ or $x+yj$ text format.

However, if *complex-number* is ill-formed, #NUM! is returned.

[Example:

IMCONJUGATE("2.3+4.5i") results in 2.3-4.5i

IMCONJUGATE("-1-4j") results in -1+4j

end example]

18.17.7.153 IMCOS

Syntax:

IMCOS (*complex-number*)

Description: Computes the cosine of the complex number *complex-number*.

Mathematical Formula:

$$\cos(x + yi) = \cos(x) \cosh(y) - \sin(x) \sinh(y)i$$

where:

- the argument *complex-number* is expressed in the form $x + yi$

Arguments:

Name	Type	Description
<i>complex-number</i>	text	The complex number for which the cosine is being computed. <i>complex-number</i> shall be in $x + yi$ or $x + yj$ text format.

Return Type and Value: text – A string containing the cosine of *complex-number*, in $x+yi$ or $x+yj$ text format.

However, if *complex-number* is ill-formed, #NUM! is returned.

[Example:

IMCOS("2.3+4.5i") results in -29.9918288739746-33.5589799796873i

IMCOS("-1-4j") results in 14.7547011704838-22.963673499193j

end example]

18.17.7.154 IMDIV

Syntax:

IMDIV (*complex-number-1* , *complex-number-2*)

Description: Computes the quotient from dividing two complex numbers.

Mathematical Formula:

$$IMDIV(z_1, z_2) = \frac{(a + bi)}{(c + di)} = \frac{(ac + bd) + (bc - ad)i}{c^2 + d^2}$$

where:

- z_1 = argument *complex-number-1* expressed in the form of $a + bi$
- z_2 = argument *complex-number-2* expressed in the form of $c + di$

Arguments:

Name	Type	Description
<i>complex-number-1</i>	text	Complex numbers in $x + yi$ or $x + yj$ text format; they designate the dividend and divisor, respectively.
<i>complex-number-2</i>	text	

Return Type and Value: text – A string containing the quotient from *number-1* / *number-2*, in *x+yi* or *x+yj* text format.

However, if *complex-number-1* or *complex-number-2* is ill-formed, #NUM! is returned.

[Example:

IMDIV("13+4i", "5+3i") results in 2.26470588235294-0.558823529411765i

IMDIV("-3-3.5i", "5+3i") results in -0.75-0.25i

end example]

18.17.7.155 IMEXP

Syntax:

IMEXP (*complex-number*)

Description: Computes the exponential of the complex number *complex-number*.

Mathematical Formula:

$$\text{IMEXP}(z) = e^{(x+yi)} = e^x e^{yi} = e^x (\cos y + i \sin y)$$

where:

- *z* = the argument *complex-number*, expressed in the form *x + yi*

Arguments:

Name	Type	Description
<i>complex-number</i>	text	The complex number for which the exponential is being computed. <i>complex-number</i> shall be in <i>x + yi</i> or <i>x + yj</i> text format.

Return Type and Value: text – A string containing the exponential of *complex-number*, in *x+yi* or *x+yj* text format.

However, if *complex-number* is ill-formed, #NUM! is returned.

[Example:

IMEXP("2.3+4.5i") results in -2.10251576423113-9.75006374866818i

IMEXP("-1-4j") results in -0.240462049968584+0.278412079051034j

end example]

18.17.7.156 IMLN

Syntax:

IMLN (*complex-number*)

Description: Computes the natural logarithm of *complex-number*.

Mathematical Formula:

$$\ln(x + yi) = \ln \sqrt{x^2 + y^2} + i \tan^{-1} \left(\frac{y}{x} \right)$$

where:

- the argument *complex-number* is expressed in the form $x + yi$

Arguments:

Name	Type	Description
<i>complex-number</i>	text	The complex number for which the natural logarithm is being computed. <i>complex-number</i> shall be in $x + yi$ or $x + yj$ text format.

Return Type and Value: text – The natural logarithm of *complex-number*, in $x+yi$ or $x+yj$ text format.

However, if *complex-number* is ill-formed, #NUM! is returned.

[Example:

IMLN("3+4i") results in 1.6094379124341+0.927295218001612i

IMLN("-2.5-34.6j") results in 3.54645723627033-1.64292531532225j

end example]

18.17.7.157 IMLOG10

Syntax:

IMLOG10 (*complex-number*)

Description: Computes the base-10 logarithm of *complex-number*.

Mathematical Formula:

The common logarithm of a complex number can be calculated from the natural logarithm as follows:

$$\log_{10}(x + yi) = (\log_{10} e) \ln(x + yi)$$

where:

- the argument *complex-number* is expressed in the form $x + yi$

Arguments:

Name	Type	Description
<i>complex-number</i>	text	The complex number for which the base-10 logarithm is being computed. <i>complex-number</i> shall be in $x + yi$ or $x + yj$ text format.

Return Type and Value: text – The base-10 logarithm of *complex-number*, in $x+yi$ or $x+yj$ text format.

However, if *complex-number* is ill-formed, #NUM! is returned.

[Example:

IMLOG10("3+4i") results in 10.698970004336019+0.402719196273373i

IMLOG10("-2.5-34.6j") results in 11.54020680801806-0.713513398623614j

end example]

18.17.7.158 IMLOG2

Syntax:

IMLOG2 (*complex-number*)

Description: Computes the base-2 logarithm of *complex-number*.

Mathematical Formula:

The base-2 logarithm of a complex number can be calculated from the natural logarithm as follows:

$$\log_2(x + yi) = (\log_2 e) \ln(x + yi)$$

where:

- the argument *complex-number* is expressed in the form $x + yi$

Arguments:

Name	Type	Description
<i>complex-number</i>	text	The complex number for which the base-2 logarithm is being computed. <i>complex-number</i> shall be in $x + yi$ or $x + yj$ text format.

Name	Type	Description
		$x + yj$ text format.

Return Type and Value: text – The base-2 logarithm of *complex-number*, in $x+yi$ or $x+yj$ text format.

However, if *complex-number* is ill-formed, #NUM! is returned.

[Example:

IMLOG2("3+4i") results in 2.32192809506607+1.33780421255394i

IMLOG2("-2.5-34.6j") results in 5.11645626788577-2.37024020514877j

end example]

18.17.7.159 IMPOWER

Syntax:

IMPOWER (*complex-number* , y)

Description: Computes the complex number *complex-number* raised to the power y .

Mathematical Formula:

$$(x + yi)^n = r^n e^{in\theta} = r^n \cos \theta + ir^n \sin \theta$$

where:

$$r = \sqrt{x^2 + y^2}$$

and:

$$\theta = \tan^{-1} \left(\frac{y}{x} \right)$$

and:

$$\theta \in (-\pi; \pi]$$

where:

- argument *complex-number* is expressed in the form $x + yi$
- n = argument y

Arguments:

Name	Type	Description
<i>complex-number</i>	text	The complex number in $x + yi$ or $x + yj$ text format.
<i>y</i>	number	The exponent to which <i>complex-number</i> is to be raised.

Return Type and Value: text – A string containing *complex-number*^y, in $x+yi$ or $x+yj$ text format.

However, if *complex-number* is ill-formed, #NUM! is returned.

[Example:

IMPOWER("2.3+4.5i",2.5) results in -52.9752689709953+22.138528463954i

IMPOWER("-1-4j",-3.56) results in 6.34818926783845E-003+1.16156377299512E-003j

end example]

18.17.7.160 IMPRODUCT

Syntax:

IMPRODUCT (*argument-list*)

Description: Multiplies the values of its complex number arguments.

Mathematical Formula:

$$(a + bi)(c + di) = (ac - bd) + (ad + bc)i$$

where:

- Each element of *argument-list* is a complex number expressed in the form $x + yi$

Arguments:

Name	Type	Description
<i>argument-list</i>	text	Each <i>argument</i> in <i>argument-list</i> is a complex number string in $x + yi$ or $x + yj$ text format.

Return Type and Value: text – A string containing the product of the values of its arguments, in $x+yi$ or $x+yj$ text format.

However, if any *argument* in *argument-list* is ill-formed, #NUM! is returned.

[Example:

IMPRODUCT("13+4i") results in 13+4i

IMPRODUCT("-3-3.5i","5+3i") results in -4.5-26.5i

IMPRODUCT("1.3-2j","-3.4+3j","2.3-6j") results in 67.834+15.13j

end example]

18.17.7.161 IMREAL

Syntax:

IMREAL (*complex-number*)

Description: Computes the real coefficient of *complex-number*.

where:

- argument *complex-number* is expressed in the form $x + yi$

Arguments:

Name	Type	Description
<i>complex-number</i>	text	The complex number for which the real coefficient is being computed. <i>complex-number</i> shall be in $x + yi$ or $x + yj$ text format.

Return Type and Value: number – The real coefficient of *complex-number*.

However, if *complex-number* is ill-formed, #NUM! is returned.

[Example:

IMREAL("3+4i") results in 3

IMREAL("-2.5-34.6j") results in -2.5

end example]

18.17.7.162 IMSIN

Syntax:

IMSIN (*complex-number*)

Description: Computes the sine of the complex number *complex-number*.

Mathematical Formula:

$$\sin(x + yi) = \sin(x) \cosh(y) - \cos(x) \sinh(y)i$$

where:

- argument *complex-number* is expressed in the form $x + yi$

Arguments:

Name	Type	Description
<i>complex-number</i>	text	The complex number for which the sine is being computed. <i>complex-number</i> shall be in $x + yi$ or $x + yj$ text format.

Return Type and Value: text – A string containing the sine of *complex-number*, in $x+yi$ or $x+yj$ text format.

However, if *complex-number* is ill-formed, #NUM! is returned.

[Example:

IMSIN("2.3+4.5i") results in 33.567264016308-29.9844272159606i

IMSIN("-1-4j") results in -22.9790855778861-14.7448051885587j

end example]

18.17.7.163 IMSQRT

Syntax:

IMSQRT (*complex-number*)

Description: Computes the square root of the complex number *complex-number*.

Mathematical Formula:

$$\sqrt{x + yi} = \sqrt{r} \cos\left(\frac{\theta}{2}\right) + i\sqrt{r} \sin\left(\frac{\theta}{2}\right)$$

where:

$$r = \sqrt{x^2 + y^2}$$

and:

$$\theta = \tan^{-1}\left(\frac{y}{x}\right)$$

and:

$$\theta \in (-\pi; \pi]$$

where:

- argument *complex-number* is expressed in the form $x + yi$

Arguments:

Name	Type	Description
<i>complex-number</i>	text	The complex number for which the square root is being computed. <i>complex-number</i> shall be in $x + yi$ or $x + yj$ text format.

Return Type and Value: text – A string containing the square root of *complex-number*, in $x+yi$ or $x+yj$ text format.

However, if *complex-number* is ill-formed, #NUM! is returned.

[Example:

IMSQR("2.3+4.5i") results in 1.91751290835255+1.17339496918073i

IMSQR("-1-4j") results in 1.24962106768765-1.60048518044024j

end example]

18.17.7.164 IMSUB

Syntax:

IMSUB (*complex-number-1* , *complex-number-2*)

Description: Computes the difference of two complex numbers.

Mathematical Formula:

$$(a + bi) - (c + di) = (a - c) + (b - d)i$$

$$(a + bi) - (c + di) = (a - c) + (b - d)i$$

where:

- argument *complex-number-1* is expressed in the form $a + bi$
- argument *complex-number-2* is expressed in the form $c + di$

Arguments:

Name	Type	Description
<i>complex-number-1</i>	text	Complex numbers in $x + yi$ or $x + yj$ text format; they designate the minuend and subtrahend, respectively.
<i>complex-</i>	text	

Name	Type	Description
<i>number-2</i>		

Return Type and Value: text – A string containing *number-1* - *number-2*, in $x+yi$ or $x+yj$ text format.

However, if *complex-number-1* or *complex-number-2* is ill-formed, #NUM! is returned.

[Example:

IMSUB("13+4i", "5+3i") results in 8+i

IMSUB("-3-3.5i", "5+3i") results in -8-6.5i

end example]

18.17.7.165 IMSUM

Syntax:

IMSUM (*argument-list*)

Description: Adds the values of its arguments.

Mathematical Formula:

$$(a + bi) + (c + di) = (a + c) + (b + d)i$$

where:

- Each element of *argument-list* is a complex number expressed in the form $x + yi$

Arguments:

Name	Type	Description
<i>argument-list</i>	text	Each <i>argument</i> in <i>argument-list</i> is a complex number string in $x + yi$ or $x + yj$ text format.

Return Type and Value: text – The sum of the values of its arguments, in $x+yi$ or $x+yj$ text format.

However, if any *argument* in *argument-list* is ill-formed, #NUM! is returned.

[Example:

IMSUM("3+4i") results in 3+4i

IMSUM("3+4i", "5-3i") results in 8+i

end example]

18.17.7.166 INDEX

Syntax:

array form: INDEX (*array* , [*row-number*][, [*column-number*]])

reference form: INDEX (*reference* [, [*row-number*][, [*column-number*]
[, [*area-number*]]])

Description: Locates a value or the reference to a value from within a table or range. There are two forms of the INDEX function: the array form and the reference form.

Arguments:

Name	Type	Description
<i>array</i>	array, reference	Table or range to be searched. If <i>array</i> contains only one row, the corresponding <i>row-number</i> argument is optional. If <i>array</i> contains only one column, the corresponding <i>column-number</i> argument is optional.
<i>reference</i>	reference	A reference to one or more cell ranges. If each area (§18.17.2.3) in <i>reference</i> contains only one row, <i>row-number</i> is optional. If each area contains only one column, <i>column-number</i> is optional.
<i>row-number</i>	number	<i>row-number</i> indicates the row in <i>array</i> (or <i>reference</i>) from which to return a value (or reference). If <i>row-number</i> is omitted, <i>column-number</i> shall be present. <i>column-number</i> indicates the column in <i>array</i> (or <i>reference</i>) from which to return a value (or reference). If <i>column-number</i> is omitted, <i>row-number</i> shall be present. If both the <i>row-number</i> and <i>column-number</i> arguments are used, INDEX returns the value (or reference) in the cell at the intersection of <i>row-number</i> and <i>column-number</i> . If <i>array</i> has more than one row and more than one column, and only <i>row-number</i> or <i>column-number</i> is used, INDEX returns an array of the entire row or column in array. If <i>row-number</i> or <i>column-number</i> , but not both, is 0, INDEX returns the array of values for the entire column or row, respectively. In the reference form, if <i>row-number</i> and <i>column-number</i> are both omitted, INDEX returns the area in reference specified by <i>area-number</i> .
<i>column-number</i>	number	
<i>area-number</i>	number	Indicates a range in <i>reference</i> from which to return the intersection of <i>row-number</i> and <i>column-number</i> . The first area selected or entered is numbered 1, the second 2, and so on. If <i>area-number</i> is omitted, 1 is assumed.

Name	Type	Description
		[<i>Example: If reference describes the cells (A1:B4, D1:E4, G1:H4), then area-number 1 is the range A1:B4, area-number 2 is the range D1:E4, and area-number 3 is the range G1:H4. end example</i>]

Return Type and Value: various – For the array form, returns a single value, a whole row, or a whole column from a table or an array, depending on the presence and values of the row and column number indexes.

For the reference form, returns a single reference, a whole row, or a whole column from a reference, depending on the presence and values of the row and column number indexes, and the area number.

However, for the array form

- *row-number* is outside the bounds of *array*, #REF! is returned.
- *column-number* is outside the bounds of *array*, #REF! is returned.

For the reference form

- *row-number* is outside the bounds of *reference*, #REF! is returned.
- *column-number* is outside the bounds of *reference*, #REF! is returned.
- *area-number* is outside the bounds of *reference*, #REF! is returned.

[*Example:*

INDEX({"Apples", "Lemons"; "Bananas", "Pears"}, 2, 2) results in Pears

INDEX({"Apples", "Lemons"; "Bananas", "Pears"}, 2, 1) results in Bananas

INDEX({"Apples", "Lemons"}, , 2) results in Lemons

INDEX({"Apples"; "Bananas"}, 1) results in Apples

Given the following data:

	A	B	C
1	Fruit	Price	Count
2	Apples	0.69	40
3	Bananas	0.34	38
4	Lemons	0.55	15
5	Oranges	0.25	25
6	Pears	0.59	40
7	Almonds	2.8	10

INDEX(A2:C7,2,3) results in 38
INDEX((A2:C4,A6:C7),2,2,2) results in 2.8
INDEX((A2:C4,A6:C7),2,2,1) results in 0.34

end example]

18.17.7.167 INDIRECT

Syntax:

INDIRECT (*ref-text* [, [*A1-ref-style-flag*]])

Description: Locates the reference specified by *ref-text* and evaluates that reference to get to its underlying value. [Note: This function should be used when the reference to a cell within a formula is to be changed without changing the formula itself. *end note*]

Arguments:

Name	Type	Description
<i>ref-text</i>	An A1-style reference, an R1C1-style reference, a name defined as a reference, or a reference to a cell as a string.	If <i>ref-text</i> refers to another workbook (i.e., it's an external reference), that other workbook shall be open.
<i>A1-ref-style-flag</i>	logical	Specifies the kind of reference that is contained in the cell <i>ref-text</i> . If TRUE or omitted, <i>ref-text</i> is interpreted as an A1-style reference (§18.17.2.3.1); otherwise, <i>ref-text</i> is interpreted as an R1C1-style reference (§18.17.2.3.2).

Return Type and Value: any – The underlying value of the location referred to by *ref-text*.

However, if

- *ref-text* is not a cell reference, #REF! is returned.
- *ref-text* refers to another workbook yet that other workbook is not currently open, the return value is unspecified.
- *ref-text* is a name, then the content of the named expression can have implementation-defined constraints.

[Example:

Given the following data:

	A	B
1	Data	Data
2	B2	1.333
3	B3	45
4	George	10
5	5	62

where A2 contains a reference to B2, A3 contains a reference to B3, A4 contains the defined name George that refers to B4, and A5 contains the row number of B5:

INDIRECT(\$A\$2) results in 1.333

INDIRECT(\$A\$3) results in 45

INDIRECT(\$A\$4) results in 10

INDIRECT("B"&\$A\$5) results in 62

INDIRECT("R[-1]C", FALSE) uses the cell in the previous row and current column.
end example]

18.17.7.168 INFO

Syntax:

INFO (*category*)

Description: Retrieves the operating environment value that corresponds to *category*.

Arguments:

Name	Type	Description
<i>category</i>	text	The string designated by <i>category</i> is not case-sensitive. The permitted strings are shown in the table below.

<i>category</i>	Meaning	Result Type
"directory"	Path of the current directory or folder.	text
"memavail"	Amount of memory available, in bytes.	number
"memused"	Amount of memory being used for data.	number
"numfile"	Number of active worksheets in the open workbooks.	number
"origin"	The absolute cell reference of the top and leftmost cell visible in the window, based on the current scrolling position, prefixed with "\$A:". [Example: Using cell D9 as an example, the return value would be \$A:\$D\$9. <i>end example]</i>	text

<i>category</i>	Meaning	Result Type
"osversion"	Current operating system version.	text
"recalc"	Current recalculation mode: "Automatic" or "Manual"	text
"release"	Version of the implementation.	text
"system"	Name of the operating environment.	text
"totmem"	Total memory available, including memory already in use, in bytes.	number

Return Type and Value: text – The operating environment value that corresponds to *category*.

However, if *category* is not one of the values defined above, #VALUE! is returned.

[Example:

INFO("directory") might result in e:\My Documents\

INFO(A10) might result in e:\My Documents\, where A10 contains directory

INFO("memavail") might result in 1048576

INFO("memused") might result in 1474464

INFO("numfile") might result in 5

INFO("origin") might result in \$A:\$C\$536

INFO("osversion") might result in Windows (32-bit) NT 5.01

INFO("recalc") might result in Automatic

INFO("release") might result in 11.0

INFO("system") might result in pcdos

INFO("totmem") might result in 2523040

end example]

18.17.7.169 INT

Syntax:

INT (*x*)

Description: Computes *x* rounded down to an integer.

Arguments:

Name	Type	Description
<i>x</i>	number	The value to be rounded down.

Return Type and Value: number – The rounded-down value of x .

[Example:

INT(8.9) results in 8

INT(-8.9) results in -9

end example]

18.17.7.170 INTERCEPT

Syntax:

INTERCEPT (*known-ys* , *known-xs*)

Description: Computes the point at which a line intersects the y-axis by using existing x-values and y-values. The intercept point is based on a best-fit regression line plotted through the known x-values and known y-values.

Mathematical Formula:

The equation for the intercept of the regression line, a , is:

$$a = \bar{y} - b\bar{x}$$

where the slope, b , is calculated as:

$$b = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sum(x - \bar{x})^2}$$

where:

- x = a sample value
- \bar{x} = the sample mean AVERAGE(*known-xs*)
- y = a sample value
- \bar{y} = the sample mean AVERAGE(*known-ys*)

Arguments:

Name	Type	Description
<i>known-ys</i>	number, name, array, reference to number	The dependent set of observations or data. If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.
<i>known-xs</i>	number, name, array, reference to number	The independent set of observations or data. If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.

Return Type and Value: number – The point at which a line intersects the y-axis by using existing x-values and y-values.

However, if

- *known-ys* and *known-xs* contain a different number of data points, the return value is unspecified.
- *known-ys* or *known-xs* contain no data points, the return value is unspecified.

[Example:

INTERCEPT({2,3,9,1,8},{6,5,11,7,5}) results in 0.048387097

end example]

18.17.7.171 INTRATE

Syntax:

INTRATE (*settlement* , *maturity* , *investment* , *redemption* [, [*basis*]])

Description: Computes the interest rate for a fully invested security.

Mathematical Formula:

$$INTRATE = \frac{redemption - nvestment}{investment} \times \frac{B}{DIM}$$

where:

- *B* = number of days in a year, depending on the year basis
- *DIM* = number of days from settlement to maturity.
- *investment* = argument *investment*
- *redemption* = argument *redemption*

Arguments:

Name	Type	Description
<i>settlement</i>	number	The security's settlement date.
<i>maturity</i>	number	The security's maturity date.
<i>investment</i>	number	The amount invested in the security.
<i>redemption</i>	number	The amount to be received at maturity.he security's annual yield.
<i>basis</i>	number	The truncated integer type of day count basis to use, as follows: <div> <div>Value</div> <div>Day Count Basis</div> </div>

Name	Type	Description	
		Ø or omitted	<p>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</p> <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.
		1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.
		2	Actual/360. Similar to Basis 1, but only has 360 days per year.
		3	Actual/365. Similar to Basis 1, but always has 365 days per year.

Name	Type	Description	
		4	<p>European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</p> <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.

Time information in the date arguments is ignored.

Return Type and Value: number – The interest rate for a fully invested security.

However, if

- *settlement* or *maturity* is out of range for the current date system, #NUM! is returned.
- *settlement* \geq *maturity*, #NUM! is returned.
- *investment* or *redemption* \leq 0, #NUM! is returned.
- *basis* $<$ 0 or *basis* $>$ 4, #NUM! is returned.

[Example:

INTRATE(DATE(2008,2,15),DATE(2008,5,15),1000000,1014420,2) results in 5.7680%

end example]

18.17.7.172 IPMT

Syntax:

IPMT (*rate* , *per* , *nper* , *pv* , [*fv*] [, [*type*]])

Description: Computes the interest payment for a given period for an investment based on periodic, constant payments and a constant interest rate.

Arguments:

Name	Type	Description						
<i>rate</i>	number	The interest rate.						
<i>per</i>	number	The period for which the interest is to be found, and shall be in the range 1– <i>nper</i> .						
<i>nper</i>	number	The total number of payment periods in an annuity.						
<i>pv</i>	number	The present value, or the lump-sum amount that a series of future payments is worth right now.						
<i>fv</i>	number	The future value, or a cash balance to be attained after the last payment is made. If omitted, it is assumed to be 0 (i.e., the future value of a loan, for example, is 0).						
<i>type</i>	number	The timing of the payment, truncated to integer, as follows: <table><tr><th>Value</th><th>Timing</th></tr><tr><td>0</td><td>Payment at the end of the period</td></tr><tr><td>1</td><td>Payment at the beginning of the period</td></tr></table>	Value	Timing	0	Payment at the end of the period	1	Payment at the beginning of the period
Value	Timing							
0	Payment at the end of the period							
1	Payment at the beginning of the period							

Arguments representing cash paid by investor shall be expressed as negative numbers; arguments representing cash received by the investor shall be expressed as positive numbers.

Return Type and Value: number – The interest payment for a given period for an investment based on periodic, constant payments and a constant interest rate.

However, if *type* is any number other than 0 or 1, #NUM! is returned.

[Example:

IPMT(0.1/12,1*3,3,8000) results in -22.41

IPMT(0.1,3,3,8000) results in -292.45

end example]

18.17.7.173 IRR

IRR (*values* [, [*guess*]])

Description: Computes the internal rate of return for a series of cash flows represented by the numbers in *values*. (These cash flows do not have to be even, as they would be for an annuity. However, the cash flows shall occur at regular intervals, such as monthly or annually. The internal rate of return is the interest rate received for an investment consisting of payments (negative values) and income (positive values) that occur at regular periods.)

Arguments:

Name	Type	Description
<i>values</i>	array, reference, text, logical	The set of numbers for which the internal rate of return is to be calculated. <i>values</i> shall contain at least one positive value and one negative value to calculate the internal rate of return. The order of numbers in <i>values</i> is significant, so be sure payment and income numbers are in the desired sequence. If <i>values</i> contains elements that are text, logical values, or empty cells, those elements are ignored.
<i>guess</i>	number	An estimate of the result of IRR. If omitted, it is assumed to be 0.1 (i.e., 10 percent).

Return Type and Value: number – The internal rate of return for a series of cash flows.

However, if the implementation determines that a return value cannot be computed, #NUM! is returned.

[Example:

IRR({-70000,12000,15000,18000,21000}) results in -2.1245%

IRR({-70000,12000,15000,18000,21000,26000}) results in 8.6631%

IRR({-70000,12000,15000},-0.1) results in -44.3507%

end example]

18.17.7.174 ISBLANK

Syntax:

ISBLANK (*value*)

Description: Determines if *value* refers to an empty cell.

Arguments:

Name	Type	Description
<i>value</i>	any	The value to be tested. No conversion shall take place on an argument passed to this function.

Return Type and Value: logical – TRUE if *value* refers to an empty cell; otherwise, FALSE.

[Example:

ISBLANK(A10) results in TRUE, when A10 is empty

ISBLANK(A10) results in FALSE, when A10 contains 123

end example]

18.17.7.175 ISERR

Syntax:

ISERR (*value*)

Description: Determines if *value* is any of the error values other than #N/A.

Arguments:

Name	Type	Description
<i>value</i>	any	The value to be tested. No conversion shall take place on an argument passed to this function.

Return Type and Value: logical – TRUE if *value* is one of the error values, excluding #N/A; otherwise, FALSE.

[Example:

ISERR(A1) results in TRUE if A1 evaluates to #DIV/0!, for example

ISERR(B1) results in FALSE if B1 evaluates to #N/A

end example]

18.17.7.176 ISERROR

Syntax:

ISERROR (*value*)

Description: Determines if *value* is any of the error values.

Arguments:

Name	Type	Description
<i>value</i>	any	The value to be tested. No conversion shall take place on an argument passed to this function.

Return Type and Value: logical – TRUE if *value* is one of the error values; otherwise, FALSE.

[Example:

ISERROR(A1) results in TRUE if A1 evaluates to #DIV/0!, for example

end example]

18.17.7.177 ISEVEN

Syntax:

ISEVEN (*value*)

Description: Determines if *value* is an even number or refers to a cell containing an even number.

Arguments:

Name	Type	Description
<i>value</i>	number	The value to be tested. It is truncated to an integer.

Return Type and Value: logical – TRUE if *value* is an even number or refers to a cell containing an even number; otherwise, FALSE.

[Example:

ISEVEN(12.456) results in TRUE

ISEVEN(A10) results in FALSE, when A10 contains -15

end example]

18.17.7.178 ISLOGICAL

Syntax:

ISLOGICAL (*value*)

Description: Determines if *value* contains a logical value or refers to a cell containing a logical value.

Arguments:

Name	Type	Description
<i>value</i>	any	The value to be tested. No conversion shall take place on an argument passed to this function.

Return Type and Value: logical – TRUE if *value* contains a logical value or refers to a cell containing a logical value; otherwise, FALSE.

[Example:

ISLOGICAL(TRUE) results in TRUE

ISLOGICAL(A10) results in FALSE, when A10 contains 123

ISLOGICAL({TRUE, 2}) results in TRUE

ISLOGICAL({2, TRUE}) results in FALSE

end example]

18.17.7.179 ISNA

Syntax:

ISNA (*value*)

Description: Determines if *value* is the error value #N/A.

Arguments:

Name	Type	Description
<i>value</i>	any	The value to be tested. No conversion shall take place on an argument passed to this function.

Return Type and Value: logical – TRUE if *value* is #N/A; otherwise, FALSE.

[Example:

ISERR(A1) results in TRUE if A1 evaluates to #N/A

ISERR(B1) results in TRUE if B1 evaluates to #DIV/0!, for example

end example]

18.17.7.180 ISNONTEXT

Syntax:

ISNONTEXT (*value*)

Description: Determines if *value* does not contain text or does not refer to a cell containing text. An empty cell is not text.

Arguments:

Name	Type	Description
<i>value</i>	any	The value to be tested. No conversion shall take place on an argument passed to this function.

Return Type and Value: logical – TRUE if *value* does not contain text or does not refer to a cell containing text; otherwise, FALSE.

[Example:

ISNONTEXT("ABC") results in FALSE

ISNONTEXT(A10) results in TRUE, when A10 contains 123

ISNONTEXT({1, "ABC"}) results in TRUE

ISNONTEXT({"ABC", 1}) results in FALSE

end example]

18.17.7.181 ISNUMBER

Syntax:

ISNUMBER (*value*)

Description: Determines if *value* contains a number or refers to a cell that contains a number.

Arguments:

Name	Type	Description
<i>value</i>	any	The value to be tested. No conversion shall take place on an argument passed to this function.

Return Type and Value: logical – TRUE if *value* contains a number or refers to a cell that contains a number; otherwise, FALSE.

[Example:

ISNUMBER(10.56) results in TRUE

ISNUMBER(A10) results in FALSE, when A10 contains ABC

ISNUMBER({1, "ABC"}) results in TRUE

ISNUMBER({"ABC",1}) results in FALSE

end example]

18.17.7.182 ISO.CEILING

Syntax:

ISO.CEILING (*x* , [*significance*])

Description: Computes a value that is *x* rounded-up, to the nearest multiple of *significance*. Regardless of the sign of *x*, a value is rounded up.

Arguments:

Name	Type	Description
<i>x</i>	number	The value to be rounded
<i>significance</i>	number	<p>The optional multiple to which <i>x</i> is to be rounded.</p> <p>If <i>significance</i> is omitted, its default value is 1.</p> <p>[Note: The absolute value of the multiple is used, so the CEILING function will return the mathematical ceiling irrespective of the signs of <i>x</i> and <i>significance</i>. <i>end note</i>]</p>

Return Type and Value: number – The rounded-up value of *x*.

However, if *x* and/or *significance* is zero, zero is returned.

[Example:

ISO.CEILING(4.3) rounds 4.3 up to nearest multiple of 1; that is, to 5

ISO.CEILING(-4.3) rounds -4.3 up to nearest multiple of 1; that is, to -4

ISO.CEILING(4.3, 2) rounds 4.3 up to the nearest multiple of 2; that is, to 6

ISO.CEILING(4.3, -2) rounds 4.3 up to the nearest multiple of -2; that is, to 6

ISO.CEILING(-4.3, 2) rounds -4.3 up to the nearest multiple of 2; that is, to -4

ISO.CEILING(-4.3, -2) rounds -4.3 up to the nearest multiple of -2; that is, to -4

end example]

18.17.7.183 ISODD

Syntax:

ISODD (*value*)

Description: Determines if *value* is an odd number or refers to a cell containing an odd number.

Arguments:

Name	Type	Description
<i>value</i>	number	The value to be tested. It is truncated to an integer.

Return Type and Value: logical – TRUE if *value* is an odd number or refers to a cell containing an odd number; otherwise, FALSE.

[Example:

ISODD(12.456) results in FALSE

ISODD(A10) results in TRUE, when A10 contains -15

end example]

18.17.7.184 ISPMT

Syntax:

ISPMT (*rate* , *per* , *nper* , *pv*)

Description: Computes the interest paid during a specific period of an investment.

Arguments:

Name	Type	Description
<i>rate</i>	number	The interest rate for the investment.
<i>per</i>	number	The period for which the interest is to be found, and shall be in the range 1– <i>nper</i> .
<i>nper</i>	number	The total number of payment periods for the investment.
<i>pv</i>	number	The present value the investment.

Arguments representing cash paid by investor shall be expressed as negative numbers; arguments representing cash received by the investor shall be expressed as positive numbers.

Return Type and Value: number – The interest paid during a specific period of an investment.

[Example:

ISPMT(0.1/12,1,3*12,8000000) results in -64814.81

ISPMT(0.1,1,3,8000000) results in -533333.33

end example]

18.17.7.185 ISREF

Syntax:ISREF (*value*)**Description:** Determines if *value* is a cell reference.**Arguments:**

Name	Type	Description
<i>value</i>	any	The value to be tested. No conversion shall take place on an argument passed to this function.

Return Type and Value: logical – TRUE if *value* is a cell reference; otherwise, FALSE.*[Example:*

ISREF("ABC") results in FALSE

ISREF(A10) results in TRUE

end example]

18.17.7.186 ISTEXT

Syntax:ISTEXT (*value*)**Description:** Determines if *value* contains text or refers to a cell containing text.**Arguments:**

Name	Type	Description
<i>value</i>	any	The value to be tested. No conversion shall take place on an argument passed to this function.

Return Type and Value: logical – TRUE if *value* contains text or refers to a cell containing text; otherwise, FALSE.*[Example:*

ISTEXT("ABC") results in TRUE

ISTEXT(A10) results in FALSE, when A10 contains 123

ISTEXT({1, "ABC"}) results in FALSE

ISTEXT({"ABC", 1}) results in TRUE

end example]

18.17.7.187 JIS

Syntax:

JIS (*string*)

Description: Creates a string that is the conversion of half-width (single-byte) letters within *string* to full-width (double-byte) characters.

Arguments:

Name	Type	Description
<i>string</i>	text	Designates the string to be converted. If <i>string</i> does not contain any half-width English letters or katakana, nothing in <i>string</i> is converted.

Return Type and Value: text – The string resulting from the conversion.

[*Example:*

JIS("ABC") results in ABC

JIS("エクセル") results in エクセル

end example]

18.17.7.188 KURT

Syntax:

KURT (*argument-list*)

Description: Computes the kurtosis of a data set. Kurtosis characterizes the relative peakedness or flatness of a distribution compared with the normal distribution. Positive kurtosis indicates a relatively peaked distribution. Negative kurtosis indicates a relatively flat distribution.

Mathematical Formula:

Kurtosis is defined as:

$$\left\{ \frac{n(n+1)}{(n-1)(n-2)(n-3)} \sum \left(\frac{x_i - \bar{x}}{s} \right)^4 \right\} - \frac{3(n-1)^2}{(n-2)(n-3)}$$

where:

n is the number of elements in *argument-list*.

x_j is the value of the j -th element in *argument-list*.

\bar{x} is the mean of the values in *argument-list*.

s is the standard deviation of the values in *argument-list*.

Arguments:

Name	Type	Description
<i>argument-list</i>	array reference to an array, number, name, or reference to number.	The <i>arguments</i> in <i>argument-list</i> are the values for which kurtosis is to be calculated. Any <i>argument</i> in <i>argument-list</i> can be an array or a reference to an array. Logical values and text representations of numbers that are directly entered into the list of arguments are included. If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.

Return Type and Value: number – The kurtosis of a data set.

However, if

- There are fewer than four data points, the return value is unspecified.
- The standard deviation of the sample equals zero, the return value is unspecified.

[Example:

KURT(10.5,12.4,19.4,23.2) results in -3.644621343

KURT(10.5,{12.4,19.4},23.2) results in -3.644621343

end example]

18.17.7.189 LARGE

Syntax:

LARGE (*array* , k)

Description: Computes the k^{th} largest value in a data set.

Arguments:

Name	Type	Description
<i>array</i>	array, reference	The set of numbers from which the k^{th} -largest value is to be determined.
k	number	The position (from the largest) in the array or cell range of data to return.

Return Type and Value: number – The k^{th} largest value in a data set.

However, if

- *array* is empty, the return value is unspecified.
- $k \leq 0$, #NUM! is returned.
- k is greater than the number of data points, #NUM! is returned.

[Example:

LARGE({3,5,3,5,4;4,2,4,6,7},3) results in 5

LARGE({3,5,3,5,4;4,2,4,6,7},7) results in 4

end example]

18.17.7.190 LCM

Syntax:

LCM (*argument-list*)

Description: Computes the least common multiple of the one or more *arguments* in *argument-list*.

Arguments:

Name	Type	Description
<i>argument-list</i>	number	<i>argument-list</i> specifies the <i>arguments</i> . Each argument is truncated to an integer.

Return Type and Value: number – The least common multiple of one or more numbers.

However, if any *argument* is negative, #NUM! is returned.

[Example:

LCM(5) results in 5

LCM(5,2) results in 10

LCM(24.99,36.45) results in 72

LCM(24,36,15) results in 360

end example]

18.17.7.191 LEFT

Syntax:

LEFT (*string* [, *number-chars*])

Description: Extracts the left-most *number-chars* characters from *string*. (LEFT is intended for use with languages that use the single-byte character set (SBCS), whereas LEFTB (§18.17.7.192) is intended for use with languages that use the double-byte character set (DBCS).)

Arguments:

Name	Type	Description
<i>string</i>	text	Designate the string from which a substring is to be extracted.
<i>number-chars</i>	number	The number of characters to be extracted. If omitted, a count of 1 shall be assumed. <i>number-chars</i> shall be at least 0. If <i>number-chars</i> exceeds the length of <i>string</i> , the whole of <i>string</i> shall be extracted.

Return Type and Value: text – A string containing the left-most *number-chars* characters from *string*.

However, if *number-chars* is negative, #VALUE! is returned.

[Example:

LEFT("abcdef",2) results in ab

LEFT(A10,4) results in xyz1, when A10 contains xyz123

end example]

18.17.7.192 LEFTB

Syntax:

LEFTB (*string* [, *number-bytes*])

Description: Extracts the left-most *number-bytes*-worth of characters from *string*. (LEFTB is intended for use with languages that use the double-byte character set (DBCS), whereas LEFT (§18.17.7.192) is intended for use with languages that use the single-byte character set (SBCS).)

Arguments:

Name	Type	Description
<i>string</i>	text	Designate the string from which a substring is to be extracted.
<i>number-bytes</i>	number	The number of bytes to be extracted. If omitted, a count of 1 shall be assumed. <i>number-bytes</i> shall be at least 0. If <i>number-bytes</i> exceeds the length of <i>string</i> , the whole of <i>string</i> shall be extracted.

Return Type and Value: text – A string containing the left-most *number-bytes*-worth of characters from *string*.

However, if *number-bytes* is negative, #VALUE! is returned.

[*Example:* Assuming 1-byte characters:

LEFTB("abcdef",2) results in ab

LEFTB(A10,4) results in xyz1, when A10 contains xyz123

end example]

18.17.7.193 LEN

Syntax:

LEN (*string*)

Description: Determines the number of characters in *string*. (LEN is intended for use with languages that use the single-byte character set (SBCS), whereas LENB (§18.17.7.194) is intended for use with languages that use the double-byte character set (DBCS).)

Arguments:

Name	Type	Description
<i>string</i>	text	Designates the string whose length is to be found.

Return Type and Value: number – The number of characters in *string*.

[*Example:*

LEN("abc") results in 3

LEN(A10) results in 3, when A1 contains abc

end example]

18.17.7.194 LENB

Syntax:

LENB (*string*)

Description: Determines the number of bytes in *string*. (LENB is intended for use with languages that use the double-byte character set (DBCS), whereas LEN (§18.17.7.193) is intended for use with languages that use the single-byte character set (SBCS).)

Arguments:

Name	Type	Description
<i>string</i>	text	Designates the string whose length is to be found.

Return Type and Value: number – The number of bytes in *string*.

[Example: Assuming 1-byte characters:

LENB("abc") results in 3

LENB(A10) results in 3, when A1 contains abc

end example]

18.17.7.195 LINEST

Syntax:

LINEST (*known-ys* [, [*known-xs*] [, [*const-flag*] [, *stats-flag*]])

Description: Calculates the statistics for a line by using the "least squares" method to calculate a straight line that best fits the data, and returns an array that describes the line.

Mathematical Formula:

The equation for the line is:

$$y = mx + b$$

or

...

$$y = m_1x_1 + m_2x_2 + \dots + b \text{ (if there are multiple ranges of x-values)}$$

where the dependent y-value is a function of the independent x-values. The m-values are coefficients corresponding to each x-value, and b is a constant value. y, x, and m can be vectors.

When there is only one independent x-variable, the slope and y-intercept values can be obtained directly by using the following formulas:

Slope: INDEX(LINEST(*known-ys*,*known-xs*),1)

Y-intercept: INDEX(LINEST(*known-ys*,*known-xs*),2)

The accuracy of the line calculated by LINEST depends on the degree of scatter in the data. The more linear the data, the more accurate the LINEST model. LINEST uses the method of least squares for determining the best

fit for the data. When there is only one independent x-variable, the calculations for m and b are based on the following formulas:

$$m = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sum(x - \bar{x})^2}$$

$$b = \bar{y} - m\bar{x}$$

where:

- x = a sample value
- \bar{x} = the sample mean `AVERAGE(known-xs)`
- y = a sample value
- \bar{y} = the sample mean `AVERAGE(known-ys)`

Arguments:

Name	Type	Description
<i>known-ys</i>	array	The set of y-values already known in the relationship $y=mx+b$. If the array <i>known-ys</i> is a single column, then each column of <i>known-xs</i> is interpreted as a separate variable. If the array <i>known-ys</i> is a single row, then each row of <i>known-xs</i> is interpreted as a separate variable.
<i>known-xs</i>	array	An optional set of x-values that might already be known in the relationship $y=mx+b$. The array <i>known-xs</i> can include one or more sets of variables. If only one variable is used, <i>known-ys</i> and <i>known-xs</i> can be ranges of any shape, as long as they have equal dimensions. If more than one variable is used, <i>known-ys</i> shall be a vector (that is, a range with a height of one row or a width of one column). If <i>known-xs</i> is omitted, it is assumed to be the array {1,2,3,...} that is the same size as <i>known-ys</i> .
<i>const-flag</i>	logical	Specifies whether to force the constant b to be zero. If TRUE or omitted, b is calculated normally. If FALSE, b is set to zero, and the m-values are adjusted to fit $y=mx$.
<i>stats-flag</i>	logical	Specifies whether to return additional regression statistics. If TRUE, LINEST returns the additional regression statistics (see table below), so the returned array is {mn, mn-1, ..., m1, b; sen, sen-1, ..., se1, seb; r2, sey; F, df; ssreg, ssresid}. If FALSE or omitted, LINEST returns only the m-coefficients and the constant b.

The additional regression statistics are as follows:

Statistic	Description
se1, se2, ..., sen	The standard error values for the coefficients m1, m2, ..., mn.
seb	The standard error value for the constant b.
r2	The coefficient of determination.
sey	The standard error for the y estimate.
F	The F statistic, or the F-observed value.
df	The degrees of freedom.
ssreg	The regression sum of squares.
ssresid	The residual sum of squares.

Return Type and Value: array – The array that describes the line, in the form {mn, mn-1, ..., m1, b}. The following illustration shows the order in which the additional regression statistics are returned.

[Example:

LINEST({1,9,5,7},{0,4,2,3},,FALSE) results in a slope of 2 and a y-intercept of 1

end example]

18.17.7.196 LN

Syntax:

LN (x)

Description: Computes the natural logarithm of x .

Arguments:

Name	Type	Description
x	number	The positive real number for which the natural logarithm is being computed.

Return Type and Value: number – The natural logarithm of x .

However, if x is zero or negative, #NUM! is returned.

[Example:

LN(86) results in 4.454347296

LN(2.7182818) results in 0.99999999

LN(EXP(3)) results in 3

end example]

18.17.7.197 LOG

Syntax:

LOG (x [, $base$])

Description: Computes the logarithm of x to the base $base$.

Arguments:

Name	Type	Description
x	number	The positive real number for which the logarithm is being computed.
$base$	number	The base of the logarithm. If omitted, base 10 is assumed.

Return Type and Value: number – The logarithm of x .

However, if

- x is zero or negative, #NUM! is returned.
- $base$ is zero or negative, #NUM! is returned.

[Example:

LOG(10) results in 1

LOG(8,2) results in 3

LOG(86,2.7182818) results in 4.454347343

end example]

18.17.7.198 LOG10

Syntax:

LOG10 (x)

Description: Computes the base-10 logarithm of x .

Arguments:

Name	Type	Description
x	number	The positive real number for which the logarithm is being computed.

Return Type and Value: number – The base-10 logarithm of x .

However, if x is zero or negative, #NUM! is returned.

[Example:

LOG10(86) results in 1.934498451

LOG10(10) results in 1

LOG10(1E5) results in 5

LOG10(10^5) results in 5

end example]

18.17.7.199 LOGEST

Syntax:

LOGEST (*known-ys* [, [*known-xs*] [, [*const-flag*] [, *stats-flag*]])

Description: Calculates an exponential curve that fits the data, and returns an array of values that describes the curve.

Mathematical Formula:

The equation for the curve is:

$$y = b \times m^x$$

or

$$y = b \times m_1^{x_1} \times m_2^{x_2} \dots \text{(if there are multiple x-values)}$$

where the dependent y-value is a function of the independent x-values. The m-values are bases corresponding to each exponent x-value, and b is a constant value. [Note: y, x, and m can be vectors. end note]

When there is only one independent x-variable, the y-intercept (b) values can be obtained directly by using the following formula:

Y-intercept (b): INDEX(LOGEST(*known-ys*,*known-xs*) , 2)

Arguments:

Name	Type	Description
<i>known-ys</i>	array	The set of y-values already known in the relationship

Name	Type	Description
		$y=b*m^x$. If the array <i>known-ys</i> is a single column, then each column of <i>known-xs</i> is interpreted as a separate variable. If the array <i>known-ys</i> is a single row, then each row of <i>known-xs</i> is interpreted as a separate variable.
<i>known-xs</i>	array	An optional set of x-values that might already be known in the relationship $y=b*m^x$. The array <i>known-xs</i> can include one or more sets of variables. If only one variable is used, <i>known-ys</i> and <i>known-xs</i> can be ranges of any shape, as long as they have equal dimensions. If more than one variable is used, <i>known-ys</i> shall be a vector (that is, a range with a height of one row or a width of one column). If <i>known-xs</i> is omitted, it is assumed to be the array {1,2,3,...} that is the same size as <i>known-ys</i> .
<i>const-flag</i>	logical	Specifies whether to force the constant <i>b</i> to be 1. If TRUE or omitted, <i>b</i> is calculated normally. If FALSE, <i>b</i> is set to 1, and the m-values are adjusted to fit $y=m^x$.
<i>stats-flag</i>	logical	Specifies whether to return additional regression statistics. If TRUE, LOGEST returns the additional regression statistics, so the returned array is {mn, mn-1, ..., m1, b; sen, sen-1, ..., se1, seb; r2, sey; F, df; ssreg, ssresid}. If FALSE or omitted, LOGEST returns only the m-coefficients and the constant b.

The additional regression statistics are described in §18.17.7.195.

Return Type and Value: array – The array that describes the line, in the form {mn, mn-1, ..., m1, b}. The order in which the additional regression statistics are returned is described in §18.17.7.195.

[Example: Given the following data:

	A	B
1	Month	Units
2	11	33,100
3	12	47,300
4	13	69,000
5	14	102,000
6	15	150,000
7	16	220,000
8	Formula	
9	1.463275628	495.3047702

When LOGEST(B2:B7,A2:A7,TRUE,FALSE) is an array formula spanning cells A9:B9, those cells take on the results shown.

end example]

18.17.7.200 LOGINV

Syntax:

LOGINV (*probability* , *mean* , *standard-dev*)

Description: Calculates the inverse of the lognormal cumulative distribution function of x, where ln(x) is normally distributed with parameters *mean* and *standard-dev*.

Mathematical Formula:

$$\text{LOGINV}(p, \mu, \sigma) = e^{\left[\mu + \sigma \times (\text{NORMSINV}(p))\right]}$$

where:

- p = argument *probability*
- μ = argument *mean*
- σ = argument *standard-dev*

Arguments:

Name	Type	Description
<i>probability</i>	number	A probability associated with the lognormal distribution.
<i>mean</i>	number	The mean of ln(x).
<i>standard-dev</i>	number	The standard deviation of ln(x).

Return Type and Value: number – The inverse of the lognormal cumulative distribution function of x.

However, if

- *probability* < 0 or *probability* > 1, #NUM! is returned.
- *standard-dev* ≤ 0, #NUM! is returned.

[Example:

LOGINV(0.039084,3.5,1.2) results in 4.000025219

end example]

18.17.7.201 LOGNORMDIST

Syntax:

LOGNORMDIST (*x* , *mean* , *standard-dev*)

Description: Calculates the cumulative lognormal distribution of *x*, where $\ln(x)$ is normally distributed with parameters *mean* and *standard-dev*.

Mathematical Formula:

$$\text{LOGNORMDIST}(x, \mu, \sigma) = \text{NORMSDIST}\left(\frac{\ln(x) - \mu}{\sigma}\right)$$

where:

- *x* = argument *x*
- μ = argument *mean*
- σ = argument *standard-dev*

Arguments:

Name	Type	Description
<i>x</i>	number	The value at which to evaluate the function.
<i>mean</i>	number	The mean of $\ln(x)$.
<i>standard-dev</i>	number	The standard deviation of $\ln(x)$.

Return Type and Value: number – The inverse of the lognormal cumulative distribution function of *x*.

However, if

- $x \leq 0$, #NUM! is returned.
- $\text{standard-dev} \leq 0$, #NUM! is returned.

[Example:

LOGNORMDIST(4, 3.5, 1.2) results in 0.039083556

end example]

18.17.7.202 LOOKUP

Syntax:

vector form: LOOKUP (*lookup-value* , *lookup-vector* , *result-vector*)

array form: LOOKUP (*lookup-value* , *array*)

Description: The vector form looks in a vector for a value, and returns a value from the same position in a second vector. The array form looks in the first row or column of an array for the specified value and returns a value from the same position in the last row or column of that array.

Arguments:

Name	Type	Description
<i>lookup-value</i>	number, string, logical, name, reference	The value to search for in <i>lookup-vector</i> (or <i>array</i>).
<i>lookup-vector</i>	reference	A range that contains only one row or one column. The values in <i>lookup-vector</i> can be strings, numbers, or logical values. These values shall be placed in "ascending" order, as follows: ..., -2, -1, 0, 1, 2, ..., A–Z, FALSE, TRUE . Upper- and lowercase strings are equivalent. If LOOKUP can't find the <i>lookup-value</i> , it matches the largest value in <i>lookup-vector</i> (or <i>array</i>) that is less than or equal to <i>lookup-value</i> .
<i>result-vector</i>	reference	A range that contains only one row or column. It shall be the same size as <i>lookup-vector</i> .
<i>array</i>	text, number, logical	A range of cells whose values are to be compared with <i>lookup-value</i> . These values shall be placed in "ascending" order, as follows: ..., -2, -1, 0, 1, 2, ..., A–Z, FALSE, TRUE . Upper- and lowercase strings are equivalent. If <i>array</i> covers an area that has more columns than rows, <i>lookup-value</i> is searched for in the first row. If <i>array</i> is square or has more rows than columns, <i>lookup-value</i> is searched for in the first column.

Return Type and Value: any – The vector form looks in a vector for a value, and returns a value from the same position in a second vector. The array form looks in the first row or column of an array for the specified value and returns a value from the same position in the last row or column of that array.

However, if

- *lookup-value* is smaller than the smallest value in *lookup-vector* (or the first row or column of *array*), the return value is unspecified.
- The size of the range specified by *result-vector* is not the same as that specified by *lookup-vector*, the return value is unspecified.
- The values in *lookup-vector* (or *array*) are not in "ascending" order, the return value is unspecified.

[Example: Given the following data:

	A	B
1	Frequency	Color
2	4.14	red
3	4.19	orange
4	5.17	yellow
5	5.77	green
6	6.39	blue

LOOKUP(4.19,A2:A6,B2:B6) results in orange

LOOKUP(5,A2:A6,B2:B6) results in orange

LOOKUP(7.66,A2:A6,B2:B6) results in blue

LOOKUP("C",{ "a", "b", "c", "d";1,2,3,4}) results in 3

LOOKUP("bump",{ "a",1;"b",2;"c",3}) results in 2

end example]

18.17.7.203 LOWER

Syntax:

LOWER (*string*)

Description: Makes a lowercase version of *string* by doing a character-by-character conversion of *string* to lowercase, except as noted below. [*Note:* The conversion of characters in *string* is not dependent on position/context of the character within the string, except as noted below. *end note*]

Arguments:

Name	Type	Description
<i>string</i>	text	Designates the string to be converted.

Return Type and Value: text – The lowercase version of *string* after doing a character-by-character conversion to lowercase. However, there is one exception; when Σ (U+03A3) is found in a word-final position, it is converted to ς (U+03C2) instead of σ (U+03C3).

[*Example:*

LOWER("AbCd123#\$\$%^") results in abcd123#\$\$%^

LOWER(A10) results in 234frtqwc\$##, when A10 contains 234FRTqwc\$##

end example]

18.17.7.204 MATCH

Syntax:

MATCH (*lookup-value* , *lookup-array* [, [*match-type*]])

Description: Locates the relative position of an array item that matches a specified value in a specified order. MATCH shall not distinguish between uppercase and lowercase letters when matching strings.

Arguments:

Name	Type	Description								
<i>lookup-value</i>	number, string, logical, name, reference	The value to search for in <i>lookup-array</i> . If <i>match-type</i> is 0 and <i>lookup-value</i> is a string, the wildcard characters, question mark (?) and asterisk (*), can be used in <i>lookup-value</i> . A question mark matches any single character; an asterisk matches any sequence of characters. To locate a question mark or asterisk, precede that character with a tilde (~).								
<i>lookup-array</i>	array, reference	A contiguous range of cells containing possible lookup values.								
<i>match-type</i>	number	Specifies how <i>lookup-value</i> is matched with values in <i>lookup-array</i> , as follows: <table><tr><th>Value</th><th>Meaning</th></tr><tr><td>-1</td><td>Finds the smallest value that is greater than or equal to <i>lookup-value</i>. The values in <i>lookup-array</i> shall be placed in "descending" order: TRUE, FALSE, Z–A, ..., 2, 1, 0, -1, -2, ...</td></tr><tr><td>0</td><td>Finds the first value that is exactly equal to <i>lookup-value</i>. The values in <i>lookup-array</i> can be in any order.</td></tr><tr><td>1 or omitted</td><td>Finds the largest value that is less than or equal to <i>lookup-value</i>. The values in <i>lookup-array</i> shall be placed in "ascending" order: ..., -2, -1, 0, 1, 2, ..., A–Z, FALSE, TRUE.</td></tr></table>	Value	Meaning	-1	Finds the smallest value that is greater than or equal to <i>lookup-value</i> . The values in <i>lookup-array</i> shall be placed in "descending" order: TRUE, FALSE, Z–A, ..., 2, 1, 0, -1, -2, ...	0	Finds the first value that is exactly equal to <i>lookup-value</i> . The values in <i>lookup-array</i> can be in any order.	1 or omitted	Finds the largest value that is less than or equal to <i>lookup-value</i> . The values in <i>lookup-array</i> shall be placed in "ascending" order: ..., -2, -1, 0, 1, 2, ..., A–Z, FALSE, TRUE.
Value	Meaning									
-1	Finds the smallest value that is greater than or equal to <i>lookup-value</i> . The values in <i>lookup-array</i> shall be placed in "descending" order: TRUE, FALSE, Z–A, ..., 2, 1, 0, -1, -2, ...									
0	Finds the first value that is exactly equal to <i>lookup-value</i> . The values in <i>lookup-array</i> can be in any order.									
1 or omitted	Finds the largest value that is less than or equal to <i>lookup-value</i> . The values in <i>lookup-array</i> shall be placed in "ascending" order: ..., -2, -1, 0, 1, 2, ..., A–Z, FALSE, TRUE.									

Return Type and Value: number – The relative position of an array item that matches a specified value in a specified order.

However, if

- No match is found, #N/A is returned.
- *match-type*'s value is out-of-bounds, #NUM! is returned.

[Example:

MATCH(39,{25,38,40,41},1) results in 2

MATCH(41,{25,38,40,41},0) results in 4

end example]

18.17.7.205 MAX

Syntax:

MAX (*argument-list*)

Description: Computes the largest of a set of numbers.

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number, name, arrays, reference to number. Any <i>argument</i> can be an array or a reference to an array.	The <i>arguments</i> in <i>argument-list</i> designate the values for which the largest value is to be computed. Logical values and text representations of numbers occurring directly in the list of arguments are included. However, logical values and numbers in strings and are ignored inside references. [Note: To include these, use MAXA (§18.17.7.206). end note] If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.

Return Type and Value: number – The largest of a set of numbers; however, if the arguments contain no numbers, zero is returned.

[Example:

MAX(10.4,-3.5,12.6) results in 12.6

MAX(10.4,{-3.5,12.6}) results in 12.6

MAX({"ABC",TRUE}) results in 0

Consider the case in which cell B3 contains 0:

MAX(-10, -12, -15, B3) results in -10

MAXA(-10, -12, -15, B3) results in 0

end example]

18.17.7.206 MAXA

Syntax:

MAXA (*argument-list*)

Description: Computes the largest of a set of numbers.

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number, name, arrays, reference to number. Any <i>argument</i> can be an array or a reference to an array.	The <i>arguments</i> in <i>argument-list</i> designate the values for which the largest value is to be computed. Logical values and text representations of numbers occurring directly in the list of arguments are included. Logical values and numbers in strings inside references are also included. <i>[Note: To ignore these, use MAX (§18.17.7.205). end note]</i> If an array or reference argument contains non-numeric text or empty cells, those values are ignored; however, cells with the value 0 are included.

Return Type and Value: number – The largest of a set of numbers; however, if the arguments contain no numbers, zero is returned.

[Example:

MAXA(10.4, -3.5, 12.6) results in 12.6

MAXA(10.4, {-3.5, 12.6}) results in 12.6

MAXA({"ABC", TRUE}) results in 0

Consider the case in which cell B3 contains 0:

MAX(-10, -12, -15, B3) results in -10

MAXA(-10, -12, -15, B3) results in 0

end example]

18.17.7.207 MDETERM

Syntax:

MDETERM (*array*)

Description: Computes the determinant of the square matrix of numbers designated by *array*. The determinant is calculated with an accuracy of at least 15 digits, which can lead to a small numeric error when the calculation is not complete. [*Example:* The determinant of a singular matrix can differ from zero by 1E-16. *end example*]

Arguments:

Name	Type	Description
<i>array</i>	array, reference	Designate a square matrix of numbers.

Return Type and Value: number – The determinant of *array*. Some square matrices cannot be inverted. The determinant of a non-invertible matrix is 0.

However, if

- Any cells in *array* are empty or contain text, the return value is unspecified.
- The matrix designated by *array* is not square, #VALUE! is returned.

[*Example:*

MDETERM(A2:D5) results in the determinant of the 4x4 array designated by the cell range

MDETERM({3,6,1;1,1,0;3,10,2}) results in 1

MDETERM({3,6;1,1}) results in -3

end example]

18.17.7.208 MDURATION

Syntax:

MDURATION (*settlement* , *maturity* , *coupon* , *yld* , *frequency* [, [*basis*]])

Description: Computes the modified Macaulay duration for a security with an assumed par value of 100.

Mathematical Formula:

$$MDURATION = \frac{DURATION}{1 + \left(\frac{Market\ yield}{Coupon\ payments\ per\ yea} \right)}$$

where:

- *Coupon payments per year* = argument *frequency*
- *DURATION* = DURATION(*settlement*, *maturity*, *coupon*, *yld*, *frequency*, [*basis*])
- *Market yield* = argument *yld*

Arguments:

Name	Type	Description						
<i>settlement</i>	number	The security's settlement date.						
<i>maturity</i>	number	The security's maturity date.						
<i>coupon</i>	number	The security's annual coupon rate.						
<i>yld</i>	number	The security's annual yield.						
<i>frequency</i>	number	the number of coupon payments per year. (For annual payments, <i>frequency</i> is 1; for semiannual payments, <i>frequency</i> is 2; for quarterly payments, <i>frequency</i> is 4.) <i>frequency</i> is truncated to an integer.						
<i>basis</i>	number	<div>The truncated integer type of day count basis to use, as follows:<table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.</td></tr><tr><td>1</td><td>Actual/actual. The actual number of days</td></tr></table></div>	Value	Day Count Basis	0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.	1	Actual/actual. The actual number of days
Value	Day Count Basis							
0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.							
1	Actual/actual. The actual number of days							

Name	Type	Description	
			between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.
		2	Actual/360. Similar to Basis 1, but only has 360 days per year.
		3	Actual/365. Similar to Basis 1, but always has 365 days per year.
		4	<p>European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</p> <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.

Time information in the date arguments is ignored.

Return Type and Value: number – The modified Macaulay duration for a security with an assumed par value of 100.

However, if

- *settlement* or *maturity* is out of range for the current date system, #NUM! is returned.
- *settlement* \geq *maturity*, #NUM! is returned.
- *coupon* or *yld* < 0 , #NUM! is returned.
- *frequency* is any number other than 1, 2, or 4, #NUM! is returned.
- *basis* < 0 or *basis* > 4 , #NUM! is returned.

[Example:

MDURATION(DATE(2008,1,1),DATE(2016,1,1),0.08,0.09,2,1) results in 5.7357

end example]

18.17.7.209 MEDIAN

Syntax:

MEDIAN (*argument-list*)

Description: Computes the median of the numeric values of its arguments. The median of a set of values is the value for which half the numbers in the set are greater, and half the values are less. For sets with an odd number of values, the median is calculated by finding the value whose rank in the ordered set of all values is equal to half the number of items (n) in the set plus one half (i.e., $n/2 + 1/2$). If the number of values in the set is even, then the median is defined to be the average of the values of rank $n/2$ and $n/2 + 1$.

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number, name, arrays, reference to number.	The <i>arguments</i> in <i>argument-list</i> designate the values whose median is to be computed. Logical values and text representations of numbers entered directly into the list of arguments are included. If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.

Return Type and Value: number – The median of the values of its arguments.

[Example:

MEDIAN(10,20) results in 15

MEDIAN(-3.5,1.4,6.9,-4.5) results in -1.05

MEDIAN({-3.5,1.4,6.9},-4.5) results in -1.05

end example]

18.17.7.210 MID

Syntax:

MID (*string* , *start-pos* , *number-chars*)

Description: Extracts *number-chars* characters from *string*, starting at character position *start-pos*. (MID is intended for use with languages that use the single-byte character set (SBCS), whereas MIDB (§18.17.7.211) is intended for use with languages that use the double-byte character set (DBCS).)

Arguments:

Name	Type	Description
<i>string</i>	text	Designate the string from which a substring is to be extracted.
<i>number-chars</i>	number	The number of characters to be extracted. <i>number-chars</i> shall be at least 0.
<i>start-pos</i>	number	The starting position within <i>string</i> , where the first character is position 1. If <i>start-pos</i> is greater than the length of <i>string</i> , or if <i>start-pos</i> and <i>number-chars</i> combined exceeds the length of <i>string</i> , the whole of <i>string</i> shall be extracted.

Return Type and Value: text – A string containing *number-chars* characters from *string*, starting at character position *start-pos*.

However, if

- *start-pos* < 0, #VALUE! is returned.
- *number-chars* < 0, #VALUE! is returned.

[Example:

MID("abcdef",3,2) results in cd

MID(A10,4,1) results in 1, when A10 contains xyz123

MID("abcdef",4,5) results in def

end example]

18.17.7.211 MIDB

Syntax:

MIDB (*string* , *start-pos* , *number-bytes*)

Description: Extracts *number-bytes*-worth of characters from *string*, starting at character position *start-pos*. (MIDB is intended for use with languages that use the double-byte character set (DBCS), whereas MID (§18.17.7.210) is intended for use with languages that use the single-byte character set (SBCS).)

Arguments:

Name	Type	Description
<i>string</i>	text	Designate the string from which a substring is to be extracted.
<i>number-bytes</i>	number	The number of characters to be extracted. <i>number-bytes</i> shall be at least 0.
<i>start-pos</i>	number	The starting position within <i>string</i> , where the first byte is position 1. If <i>start-pos</i> is greater than the length of <i>string</i> , or if <i>start-pos</i> and <i>number-bytes</i> combined exceeds the length of <i>string</i> , the whole of <i>string</i> shall be extracted.

Return Type and Value: text – A string containing *number-bytes*-worth of characters from *string*, starting at character position *start-pos*.

However, if

- *start-pos* < 0, #VALUE! is returned.
- *number-bytes* < 0, #VALUE! is returned.

[Example: Assuming 1-byte characters:

MIDB("abcdef",3,2) results in cd

MIDB(A10,4,1) results in 1, when A10 contains xyz123

MIDB("abcdef",4,5) results in def

end example]

18.17.7.212 MIN

Syntax:

MIN (*argument-list*)

Description: Computes the smallest of a set of numbers.

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number, name, arrays, reference to number. Any <i>argument</i> can be an array or a reference to an array.	The <i>arguments</i> in <i>argument-list</i> designate the values for which the largest value is to be computed. Logical values and text representations of numbers occurring directly in the list of arguments are included. However, logical values and numbers in strings and are ignored inside references. [Note: To include these, use MINA (§18.17.7.213). <i>end note</i>] If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.

Return Type and Value: number – The smallest of a set of numbers; however, if the *arguments* contain no numbers, zero is returned.

[Example:

MIN(10.4, -3.5, 12.6) results in -3.5

MIN(10.4, {-3.5, 12.6}) results in -3.5

MIN({"ABC", TRUE}) results in 0

Consider the case in which cell B3 contains 0:

MIN(10, 12, 15, B3) results in 10

MINA(10, 12, 15, B3) results in 0

end example]

18.17.7.213 MINA

Syntax:

MINA (*argument-list*)

Description: Computes the smallest of a set of numbers.

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number, name, arrays, reference to number. Any <i>argument</i> can be an array or a reference to an array.	The <i>arguments</i> in <i>argument-list</i> designate the values for which the largest value is to be computed. Logical values and text representations of numbers occurring directly in the list of arguments are included. Logical values and numbers in strings inside references are also included. [Note: To ignore these, use MIN (§18.17.7.212). <i>end note</i>] If an array or reference argument contains non-numeric text or empty cells, those values are ignored; however,

Name	Type	Description
		cells with the value 0 are included.

Any *argument* in *argument-list* can be an array or a reference to an array.

Return Type and Value: number – The smallest of a set of numbers; however, if the *arguments* contain no numbers, zero is returned.

[Example:

MINA(10.4, -3.5, 12.6) results in -3.5

MINA(10.4, {-3.5, 12.6}) results in -3.5

MINA({"ABC", TRUE}) results in 0

Consider the case in which cell B3 contains 0:

MIN(10, 12, 15, B3) results in 10

MINA(10, 12, 15, B3) results in 0

end example]

18.17.7.214 MINUTE

Syntax:

MINUTE (*time-value*)

Description: Computes the minute for the date and/or time having the given *time-value*.

Arguments:

Name	Type	Description
<i>time-value</i>	number	The date and/or time whose minute is to be computed. That date and/or time shall be expressed either as a serial date-time, in which case, its integer part is ignored, or as a <i>string-constant</i> having any date and/or time format, in which case, any date information shall be ignored.

Return Type and Value: number – The minute for the date and/or time having the given *time-value*. The returned value shall be in the range 0–59.

However, if *time-value* is out of range for the current date system, #NUM! is returned.

[Example:

MINUTE (DATE (2006, 2, 26) + TIME (2, 10, 20)) results in 10
MINUTE (TIME (22, 56, 34)) results in 56
MINUTE (0) results in 0, since serial date-time 0 represents 00:00:00
MINUTE (10.5) results in 0, since serial date-time .5 represents 12:00:00
MINUTE ("22-Oct-2001 10:53:12") results in 53
MINUTE ("10:53:12 pm") results in 53
MINUTE ("22:53:12") results in 53

end example]

18.17.7.215 MINVERSE

Syntax:

MINVERSE (*array*)

Description: Computes the inverse of the square matrix of numbers designated by *array*. The inverse matrix is calculated with an accuracy of at least 15 digits, which can lead to a small numeric error when the cancellation is not complete.

Arguments:

Name	Type	Description
<i>array</i>	array, reference	Designate a square matrix of numbers.

Return Type and Value: number – The inverse of the square matrix designated by *array*.

However, if

- Any cells in *array* are empty or contain text, the return value is unspecified.
- The matrix designated by *array* is not square, #VALUE! is returned.
- The matrix cannot be inverted, the return value is unspecified.

[*Example:*

MINVERSE ({3,6,1;1,1,0;3,10,2}) results in 2
MINVERSE ({3,6;1,1}) results in -0.333333333

end example]

18.17.7.216 MIRR

MIRR (*values* , *finance-rate* , *reinvest-rate*)

Description: Computes the modified internal rate of return for a series of periodic cash flows. (Both the cost of the investment and the interest received on reinvestment of cash are considered.)

Mathematical Formula:

The formula for MIRR is:

$$\left(\frac{-NPV(rrate, values[positive]) * (1 + rrate)^n}{NPV(frate, values[negative]) * (1 + frate)} \right)^{\frac{1}{n-1}} - 1$$

where:

- *frate* = argument *finance-rate*
- *n* = number of cash flows in argument *values*
- *rrate* = argument *reinvest-rate*
- *values* = argument *values*

Arguments:

Name	Type	Description
<i>values</i>	array, reference	Designates a set of numbers for which the rate of return is to be calculated. <i>values</i> shall contain at least one positive value and one negative value to calculate the internal rate of return. The order of numbers in <i>values</i> is significant, so be sure payment and income numbers are in the desired sequence. If <i>values</i> contains elements that are text, logical values, or empty cells, those elements are ignored.
<i>finance-rate</i>	number	The interest rate paid pay on the money used in the cash flows.
<i>reinvest-rate</i>	number	The interest rate received on the cash flows as they are reinvested.

Return Type and Value: number – The modified internal rate of return for a series of periodic cash flows.

However, if *values* does not contain at least one positive value and one negative value, #DIV/0! is returned.

[Example:

MIRR({-120000, 39000, 30000, 21000, 37000, 46000}, 0.1, 0.12) results in 12.6094%

MIRR({-120000, 39000, 30000, 21000}, 0.1, 0.12) results in -4.8045%

MIRR({-120000, 39000, 30000, 21000, 37000, 46000}, 0.1, 0.14) results in 13.4759%

end example]

18.17.7.217 MMULT

Syntax:

MMULT (*array-1* , *array-2*)

Description: Computes the product of the matrices of numbers designated by *array-1* and *array-2*.

Mathematical Formula:

The matrix product array *a* of two arrays *b* and *c* is:

$$a_{ij} = \sum_{k=1}^n b_{ik} c_{kj}$$

Where:

- b_{ik} = the element in the *i*-th row and *k*-th column in argument *array-1*
- c_{kj} = the element in the *k*-th row and *j*-th column in argument *array-2*
- *i* = the row number
- *j* = the column number

Arguments:

Name	Type	Description
<i>array-1</i>	array, reference, name	Designate the matrices of numbers to be multiplied.
<i>array-2</i>		

Return Type and Value: number – The product of the matrices of numbers designated by *array-1* and *array-2*.

However, if

- Any cells in *array-1* or *array-2* are empty or contain text, the return value is unspecified.
- The number of columns in *array-1* is different from the number of rows in *array-2*, #VALUE! is returned.

[Example:

MMULT({3,6,1;1,1,0},{5,7;4,6;2,5}) results in 41

end example]

18.17.7.218 MOD

Syntax:

MOD (*x* , *y*)

Description: Computes the remainder when *x* is divided by *y*. The result has the same sign as *y*.

Arguments:

Name	Type	Description
x	number	The number for which the remainder is being sought.
y	number	The number by which x is to be divided.

Return Type and Value: number – The remainder when x is divided by y . The result has the same sign as y . If y is 0, the return value is unspecified.

[Example:

MOD(3, 2) results in 1

MOD(-3, 2) results in 1

MOD(3, -2) results in -1

MOD(-3, -2) results in -1

end example]

18.17.7.219 MODE

Syntax:

MODE (*argument-list*)

Description: Computes the most frequently occurring of the numeric values of its arguments. If the set of values contains more than one most-frequent value, the first occurrence of any most-frequent value in the list is used as the result.

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number, name, arrays, reference to number. Any <i>argument</i> can be an array or a reference to an array.	The <i>arguments</i> in <i>argument-list</i> designate the values whose mode is to be computed. If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.

Return Type and Value: number – The most frequently occurring of the values of its arguments.

However, if the data set contains no duplicate data points, #N/A is returned.

[Example:

MODE(9,1,5,1,9,5,6,6) results in 9
MODE(1,9,5,1,9,5,6,6) results in 1
MODE(5,1,9,5,1,9,6,6) results in 5

end example]

18.17.7.220 MONTH

Syntax:

MONTH (*date-value*)

Description: Computes the numeric month in the Gregorian calendar [ISO 8601 §3.2.1] for the date and/or time having the given *date-value*, taking into account the current date system. That date and/or time shall be expressed either as a serial date-time, in which case, its fractional part is ignored, or as a *string-constant* having any date and/or time format, in which case, any time information shall be ignored.

Arguments:

Name	Type	Description
<i>date-value</i>	number, text	The date and/or time whose month is to be computed. That date and/or time shall be expressed either as a serial date-time, in which case, its fractional part is ignored, or as a <i>string-constant</i> having any date and/or time format, in which case, any time information shall be ignored.

Return Type and Value: number – The month in the Gregorian calendar [ISO 8601 §3.2.1] for the date and/or time having the given *date-value*, in the range 1–12.

However, if *date-value* is out of range for the current date system, #NUM! is returned.

[*Example:*

MONTH(DATE(2006,1,2)) results in 1
MONTH(DATE(2006,0,2)) results in 12
MONTH("2006/1/2 10:45 AM") results in 1
MONTH(30000) results in 2 for both the 1900 and 1904 date systems

end example]

18.17.7.221 MROUND

Syntax:

MROUND (*x* , *multiple*)

Description: Computes x rounded to *multiple*, away from zero. It rounds up if the remainder of dividing x by *multiple* is greater than or equal to half the value of *multiple*; otherwise, it rounds down.

Arguments:

Name	Type	Description
x	number	The value to round.
<i>multiple</i>	number	The multiple to which x is to be rounded.

Return Type and Value: number – x rounded to *multiple*.

However, if x and *multiple* have different signs, #NUM! is returned.

[Example:

MROUND(10, 3) rounds 10 to a nearest multiple of 3; that is, to 9

MROUND(-10, -3) rounds -10 to a nearest multiple of -3; that is, to -9

MROUND(1.3, 0.2) rounds 1.3 to a nearest multiple of 0.2; that is, to 1.4

end example]

18.17.7.222 MULTINOMIAL

Syntax:

MULTINOMIAL (*argument-list*)

Description: Computes the ratio of the factorial of the sum of the values in *argument-list* to the product of the factorials.

Mathematical Formula:

The multinomial is:

$$MULTINOMIAL(a, b, c) = \frac{(a + b + c)!}{a! b! c!}$$

where:

- a, b, c, \dots = the elements in *argument-list*

Arguments:

Name	Type	Description
<i>argument-list</i>	number	The <i>arguments</i> in <i>argument-list</i> designate the numerical values for which the multinomial is desired.

Return Type and Value: number – The ratio of the factorial of the sum of the values in *argument-list* to the product of the factorials.

However, if any *argument* is less than zero, #NUM! is returned.

[Example:

MULTINOMIAL(2) results in 1

MULTINOMIAL(2,3) results in 10

MULTINOMIAL(2,3,4) results in 1260

end example]

18.17.7.223 N

Syntax:

N (*value*)

Description: Converts *value* to a number or, if *value* is a reference to a single cell, converts the value of that cell to a number.

Arguments:

Name	Type	Description
<i>value</i>	any	Value to be converted.

Return Type and Value: number or error – An integer that is the converted value of *value*, or, if *value* is a reference to a single cell, the converted value of that cell, as follows:

<i>value</i>	Value Returned
number	That number
TRUE	1
FALSE	0
error value	That error value
Anything else (including array and text)	0

[Example:

N(10.5) results in 10.5

N(A10) results in -1234, when A10 contains the number -1234
 N("ABC") results in 0
 N(A10) results in 0, when A10 contains the string ABC
 N(TRUE) results in 1
 N(A10) results in 0, when A10 contains FALSE
 N(A10) results in #N/A, when A10 contains #N/A
 N({12.5, 13.6, 56.9}) results in 12.50
 N(A10:A11) results in 0, when A10 contains FALSE, and A11 contains 321

end example]

18.17.7.224 NA

Syntax:

NA ()

Description: Gets the error value #N/A. (The error value #N/A can be used instead of a call to this function; the result is the same.)

Arguments: None.

Return Type and Value: error – The error value #N/A.

[Example:

NA() results in #N/A
 IF(ISNA(NA()), "T", "F") results in T

end example]

18.17.7.225 NEGBINOMDIST

Syntax:

NEGBINOMDIST (*number-failures* , *number-successes* , *success-probability*)

Description: Computes the negative binomial distribution. NEGBINOMDIST returns the probability that there are *number-failures* failures before the *number-successes*th success, when the constant probability of a success is *success-probability*.

Mathematical Formula:

$$nb(x, r, p) = \binom{x + r - 1}{r - 1} p^r (1 - p)^x$$

where:

- p = the argument *success-probability*.

- r = the argument *number-successes*
- x = the argument *number-failures*

Arguments:

Name	Type	Description
<i>number-failures</i>	number	The number of failures, truncated to integer.
<i>number-successes</i>	number	The threshold number of successes, truncated to integer.
<i>success-probability</i>	number	The probability of a success.

Return Type and Value: number – The negative binomial distribution.

However, if

- *number-failures* < 0 or *number-successes* < 1, #NUM! is returned.
- *success-probability* < 0 or *success-probability* > 1, #NUM! is returned.

[Example:

NEGBINOMDIST(6,10,0.5) results in 0.076370239

end example]

18.17.7.226 NETWORKDAYS

Syntax:

NETWORKDAYS (*start-date* , *end-date* [, *holidays*])

Description: Computes the number of whole working days between *start-date* and *end-date*. Weekend days (Saturday, Sunday) and any holidays specified by *holidays* are not considered as working days.

Arguments:

Name	Type	Description
<i>start-date</i>	number	The dates for which the difference is to be computed. <i>start-date</i> can be earlier than, the same as, or later than <i>end-date</i> .
<i>end-date</i>	number	
<i>holidays</i>	reference, array	An optional set of one or more dates that are to be excluded from the working day calendar. <i>holidays</i> shall be a range of cells that contain the dates, or an array constant of the serial date-times that represent those

Name	Type	Description
		dates. The ordering of dates or serial date-times in <i>holidays</i> can be arbitrary.

Return Type and Value: number – The number of whole working days between *start-date* and *end-date*, excluding the specified holidays. If *start-date* is later than *end-date*, the return value shall be negative, and the magnitude shall be the number of whole working days.

However, if

- *start-date* is out of range for the current date system, #NUM! is returned.
- *end-date* is out of range for the current date system, #NUM! is returned.

[Example:

NETWORKDAYS(DATE(2006,1,1),DATE(2006,1,31)) results in 23

NETWORKDAYS(DATE(2006,1,31),DATE(2006,1,1)) results in -23

NETWORKDAYS(DATE(2006,1,1),DATE(2006,2,1),{"2006/1/2","2006/1/16"}) results in 21

end example]

18.17.7.227 NETWORKDAYS.INTL

Syntax:

Number form: NETWORKDAYS.INTL (*start-date* , *end-date* [, [*weekend-number*][, *holidays*]])

String form: NETWORKDAYS.INTL (*start-date* , *end-date* [, [*weekend-string*][, *holidays*]])

Description: Computes the number of whole working days between *start-date* and *end-date*. Weekend days and any holidays specified by *holidays* are not considered as working days.

Arguments:

Name	Type	Description
<i>start-date</i>	Number	The dates for which the difference is to be computed. <i>start-date</i> can be earlier than, the same as, or later than <i>end-date</i> .
<i>end-date</i>	Number	
<i>weekend-number</i>	Number	Indicates the days of the week that are weekend days and are not included in the number of whole working days between <i>start-date</i> and <i>end-date</i> . Values are shown in the table below.
<i>weekend-string</i>	String	Indicates the days of the week that are weekend days and are not included in the number of whole working days between <i>start-date</i> and <i>end-date</i> .

Name	Type	Description
		Values of <i>weekend-string</i> are seven characters long and each character in the string represents a day of the week, beginning with Monday. [Example: “0000011” would result in a weekend that is Saturday and Sunday. <i>end example</i>]
<i>holidays</i>	reference, array	An optional set of one or more dates that are to be excluded from the working day calendar. <i>holidays</i> shall be a range of cells that contain the dates, or an array constant of the serial date-times that represent those dates. The ordering of dates or serial date-times in <i>holidays</i> can be arbitrary.

<i>weekend-number</i>	Weekend days
1 or omitted	Saturday, Sunday
2	Sunday, Monday
3	Monday, Tuesday
4	Tuesday, Wednesday
5	Wednesday, Thursday
6	Thursday, Friday
7	Friday, Saturday
11	Sunday only
12	Monday only
13	Tuesday only
14	Wednesday only
15	Thursday only
16	Friday only
17	Saturday only

Return Type and Value: number – The number of whole working days between *start-date* and *end-date*, excluding the specified weekend days and holidays. If *start-date* is later than *end-date*, the return value shall be negative, and the magnitude shall be the number of whole working days.

However, if

- *start-date* is out of range for the current date system, #NUM! is returned.
- *end-date* is out of range for the current date system, #NUM! is returned.

[Example:

NETWORKDAYS.INTL (DATE (2006,1,1),DATE (2006,1,31)) results in 23

NETWORKDAYS.INTL (DATE (2006,1,31),DATE (2006,1,1)) results in -23

NETWORKDAYS.INTL (DATE (2006,1,1),DATE (2006,2,1),7,{"2006/1/2","2006/1/16"}) results in 21

NETWORKDAYS.INTL (DATE (2006,1,1),DATE (2006,2,1),"0000110",{"2006/1/2","2006/1/16"}) results in 21

end example]

18.17.7.228 NOMINAL

NOMINAL (*effect-rate* , *npery*)

Description: Computes the nominal annual interest rate, given the effective rate and the number of compounding periods per year.

Mathematical Formula:

NOMINAL is related to EFFECT:

$$EFFECT = \left(1 + \frac{Nominal_rate}{Npery} \right)^{Npery} - 1$$

where:

- *Nominal_rate* = argument *effect-rate*
- *Npery* = argument *npery*

Arguments:

Name	Type	Description
<i>effect-rate</i>	number	The effective interest rate.
<i>npery</i>	number	The number of compounding periods per year, truncated to integer.

Return Type and Value: **number** – The nominal annual interest rate.

However, if

- *effect-rate* ≤ 0, #NUM! is returned.
- *npery* < 1, #NUM! is returned.

[Example:

NOMINAL(0.053543,4) results in 5.2500%

end example]

18.17.7.229 NORMDIST

Syntax:

NORMDIST (*x* , *mean* , *standard-deviation* , *cumulative-flag*)

Description: Computes the normal distribution for the specified mean and standard deviation.

Mathematical Formula:

The equation for the normal density function (*cumulative-flag* = FALSE) is:

$$f(x, \mu, \sigma) = \frac{1}{\sqrt{2\pi}\sigma} e^{-\left(\frac{(x-\mu)^2}{2\sigma^2}\right)}$$

When *cumulative-flag* = TRUE, the formula is the integral from negative infinity to *x* of the given formula.

where:

- *x* = argument *x*
- μ = argument *mean*
- σ = argument *standard-dev*

Arguments:

Name	Type	Description
<i>x</i>	number	The value for which the distribution is to be computed.
<i>mean</i>	number	The arithmetic mean of the distribution.
<i>standard-deviation</i>	number	The standard deviation of the distribution.
<i>cumulative-flag</i>	logical	Determines the form of the function. If TRUE, then the cumulative distribution function is returned; if FALSE, the probability mass function is returned.

Return Type and Value: number – The normal distribution for the specified mean and standard deviation.

However, if *standard-deviation* ≤ 0, #NUM! is returned.

[Example:

NORMDIST(42,40,1.5,TRUE) results in 0.90878878

NORMDIST(42,40,1.5,FALSE) results in 0.10934005

end example]

18.17.7.230 NORMINV

Syntax:

NORMINV (*probability* , *mean* , *standard-deviation*)

Description: Computes the inverse of the normal distribution for the specified mean and standard deviation.**Arguments:**

Name	Type	Description
<i>probability</i>	number	The probability corresponding to the normal distribution.
<i>mean</i>	number	The arithmetic mean of the distribution.
<i>standard-deviation</i>	number	The standard deviation of the distribution.

Return Type and Value: number – The inverse of the normal distribution for the specified mean and standard deviation.

However, if

- *probability* < 0 or if *probability* > 1, #NUM! is returned.
- *standard-deviation* ≤ 0, #NUM! is returned.
- the implementation determines that a return value cannot be computed, #N/A is returned.

[Example:

NORMINV(0.908789,40,1.5) results in 42.00000201

end example]

18.17.7.231 NORMSDIST

Syntax:

NORMSDIST (*z*)

Description: Computes the standard normal distribution for the specified mean and standard deviation.

Mathematical Formula:

$$f(z) = \frac{1}{\sqrt{2\pi}} e^{-\frac{z^2}{2}}$$

where:

- z = argument z

Arguments:

Name	Type	Description
z	number	The value for which the distribution is to be computed.

Return Type and Value: number – The standard normal distribution for the specified mean and standard deviation.

[Example:

NORMSDIST(1.333333) results in 0.90878873

NORMSDIST(-1.5) results in 0.06680720

end example]

18.17.7.232 NORMSINV

Syntax:

NORMSINV (*probability*)

Description: Computes the inverse of the standard normal distribution. The distribution has a mean of zero and a standard deviation of 1.

Arguments:

Name	Type	Description
<i>probability</i>	number	The probability corresponding to the normal distribution.

Return Type and Value: number – The inverse of the standard normal distribution.

However, if

- *probability* < 0 or if *probability* > 1, #NUM! is returned.
- the implementation determines that a return value cannot be computed, #N/A is returned.

[Example:

NORMSINV(0.945) results in 1.59819314

NORMSINV(0.13) results in -1.12639113

end example]

18.17.7.233 NOT

Syntax:

NOT (*logical-value*)

Description: Computes the logical negation of *logical-value*.

Arguments:

Name	Type	Description
<i>logical-value</i>	logical	The value to be negated.

Return Type and Value: logical – The logical negation of *logical-value*; that is, it returns TRUE if *logical-value* is FALSE, and FALSE if *logical-value* is TRUE.

[Example:

NOT(TRUE) results in FALSE

NOT(FALSE) results in TRUE

NOT(10>5) results in FALSE

NOT(16.567) results in FALSE

end example]

18.17.7.234 NOW

Syntax:

NOW ()

Description: Computes the serial date-time of the current date and time, taking into account the current date system.

Arguments: None.

Return Type and Value: number – The serial date-time of the current date and time.

[Example: On February 26, 2006, between 23:01 and 23:02, NOW() resulted in 38774.95958611110 for the 1900 date system. On February 26, 2006, between 23:02 and 23:03, NOW() resulted in 37312.95982569440 for the 1904 date system. end example]

18.17.7.235 NPER

Syntax:

NPER (*rate* , *pmt* , *pv* [, [*fv*] [, [*type*]]])

Description: Computes the number of periods for an investment based on periodic, constant payments and a constant interest rate.

Arguments:

Name	Type	Description						
<i>rate</i>	number	The interest rate per period.						
<i>pmt</i>	number	The payment made each period; it cannot change over the life of the annuity. Typically, <i>pmt</i> contains principal and interest but no other fees or taxes.						
<i>pv</i>	number	The present value, or the lump-sum amount that a series of future payments is worth right now.						
<i>fv</i>	number	The future value, or a cash balance to be attained after the last payment is made. If <i>fv</i> is omitted, it is assumed to be 0 (i.e., the future value of a loan, for example, is 0).						
<i>type</i>	number	The timing of the payment, truncated to integer, as follows: <table><tr><th>Value</th><th>Timing</th></tr><tr><td>0</td><td>Payment at the end of the period</td></tr><tr><td>1</td><td>Payment at the beginning of the period</td></tr></table>	Value	Timing	0	Payment at the end of the period	1	Payment at the beginning of the period
Value	Timing							
0	Payment at the end of the period							
1	Payment at the beginning of the period							

Return Type and Value: number – The number of periods for an investment based on periodic, constant payments and a constant interest rate.

However, if *type* is any number other than 0 or 1, #NUM! is returned.

[Example:

NPV(0.12/12, -100, -1000, 10000, 1) results in 59.67

NPV(0.12/12, -100, -1000) results in -9.58

end example]

18.17.7.236 NPV

Syntax:

NPV (*rate* , *argument-list*)

Description: Calculates the net present value of an investment by using a discount rate and a series of future payments and income.

The NPV investment begins one period before the date of the first *argument* cash flow and ends with the last cash flow in the list. The calculation is based on future cash flows. If the first cash flow occurs at the beginning of the first period, the first value shall be added to the NPV result, not included in *argument-list*.

Mathematical Formula:

If n is the number of cash flows in the list of values:

$$NPV = \sum_{i=1}^n \frac{values_i}{(1 + rate)^i}$$

where:

n is the number of elements in *argument-list*.

$values_i$ is the value of the i -th element in *argument-list*.

$rate$ is the *rate* argument.

Arguments:

Name	Type	Description
<i>rate</i>	number	The rate of discount over the length of one period.
<i>argument-list</i>	number	The <i>arguments</i> in <i>argument-list</i> designate the series of future payments (negative values) and income (positive values). <i>arguments</i> shall be equally spaced in time and occur at the end of each period. The order of <i>arguments</i> is significant. <i>arguments</i> that are numbers, empty cells, logical values, or text representations of numbers are included; <i>arguments</i> that are error values or text that cannot be translated into numbers are ignored. If an <i>argument</i> is an array or reference, only numbers in that array or reference are included. Empty cells, logical values, text, or error values in the array or reference are ignored.

Return Type and Value: number – Net present value of an investment by using a discount rate and a series of future payments and income.

[Example:

NPV(0.1, -10000, 3000, 4200, 6800) results in 1188.44

end example]

18.17.7.237 OCT2BIN

Syntax:

OCT2BIN (*number* [, *num-bin-digits*])

Description: Makes the binary equivalent of *number*, with the result having *num-bin-digits* digits.

Arguments:

Name	Type	Description
<i>number</i>	text	A 10-digit octal number in a string that is to be converted to a binary string. If <i>number</i> has less than 10 digits, leading zero digits are implied until it has exactly 10 digits. The 10 digits use twos-complement representation with the left-most bit (30th bit from the right) representing the sign bit.
<i>num-bin - digits</i>	number	The number of digits in the result, with leading zeros added as necessary. However, if <i>number</i> is negative, <i>num-bin-digits</i> is ignored and the result has 10 digits. If <i>num-bin-digits</i> is omitted, the minimum number of digits is used in the result. <i>num-bin-digits</i> is truncated to an integer.

Return Type and Value: text – The binary equivalent of *number*.

However, if

- *number* is outside the range "77777777000" (11111111111111111111000000000 binary, -512 decimal) to "777" (000000000000000000000111111111 binary, 511 decimal), inclusive, #NUM! is returned.
- *number* contains one or more non-octal digits, #NUM! is returned.
- *number* contains more than 10 octal digits, #NUM! is returned.
- *number* needs more digits than *num-bin-digits*, #NUM! is returned.
- *num-bin-digits* ≤ 0 or > 10, #NUM! is returned.

[Example:

OCT2BIN("67") results in 110111

OCT2BIN("7777777776") results in 1111111110

OCT2BIN("7",5) results in 00111

end example]

18.17.7.238 OCT2DEC

Syntax:

OCT2DEC (*number*)

Description: Makes the decimal equivalent of *number*.

Arguments:

Name	Type	Description
<i>number</i>	number	A 10-digit octal number in a string that is to be converted to a decimal number. If <i>number</i> has less than 10 digits, leading zero digits are implied until it has exactly 10 digits. The 10 digits use twos-complement representation with the left-most bit (30th bit from the right) representing the sign bit.

Return Type and Value: number – The decimal equivalent of *number*.

However, if

- *number* contains one or more non-octal digits, #NUM! is returned.
- *number* contains more than 10 octal digits; that is, *number* is outside the range "4000000000" (-536,870,912 decimal) to "3777777777" (536,870,911 decimal), inclusive, #NUM! is returned.

[Example:

OCT2DEC("67") results in 55

OCT2DEC("7777777776") results in -2

OCT2DEC("7000000000") results in -134217728

end example]

18.17.7.239 OCT2HEX

Syntax:

OCT2HEX (*number* [, *num-hex-digits*])

Description: Makes the hexadecimal equivalent of *number*, with the result having *num-hex-digits* digits.

Arguments:

Name	Type	Description
<i>number</i>	text	A 10-digit octal number in a string that is to be converted to a hexadecimal string. If <i>number</i> has less than 10 digits,

Name	Type	Description
		leading zero digits are implied until it has exactly 10 digits. The 10 digits use twos-complement representation with the left-most bit (30th bit from the right) representing the sign bit.
<i>num-hex-digits</i>	number	<i>num-hex-digits</i> is the number of digits in the result, with leading zeros added as necessary. However, if <i>number</i> is negative, <i>num-hex-digits</i> is ignored and the result has 10 digits. If <i>num-hex-digits</i> is omitted, the minimum number of digits is used in the result. <i>num-hex-digits</i> is truncated to an integer.

Return Type and Value: text – The hexadecimal equivalent of *number*.

However, if

- *number* contains one or more non-octal digits, #NUM! is returned.
- *number* contains more than 10 octal digits; that is, *number* is outside the range "4000000000" (20000000 hex, -536,870,912 decimal) to "3777777777" (1FFFFFFF hex, 536,870,911 decimal), inclusive, #NUM! is returned.
- *number* needs more digits than *num-hex-digits*, #NUM! is returned.
- *num-hex-digits* ≤ 0 or > 10, #NUM! is returned.

[Example:

OCT2HEX("777") results in 1FF

OCT2HEX("7777777776") results in FFFFFFFFEE

OCT2HEX("7",5) results in 00007

end example]

18.17.7.240 ODD

Syntax:

ODD (*x*)

Description: Computes *x* rounded to the nearest odd integer, away from zero. Regardless of the sign of *x*, a value is rounded up when adjusted away from zero.

Arguments:

Name	Type	Description
<i>x</i>	number	The value to be rounded.

Return Type and Value: number – The rounded value of x .

[Example:

ODD(1.5) rounds 1.5 up to the nearest odd integer; that is, to 3

ODD(3) rounds 3 up to the nearest odd integer; that is, to 3

ODD(2) rounds 2 up to the nearest odd integer; that is, to 3

ODD(-1) rounds -1 up to the nearest odd integer; that is, to -1

ODD(-2) rounds -2 up to the nearest odd integer; that is, to -3

end example]

18.17.7.241 ODDFPRICE

Syntax:

ODDFPRICE (*settlement* , *maturity* , *issue* , *first-coupon* , *rate* , *yld* , *redemption* , *frequency* [, [*basis*]])

Description: Computes the price per \$100 face value of a security having an odd (short or long) first period.

Mathematical Formula:

Odd short first coupon:

$$\begin{aligned}
 ODDFPRICE = & \left[\frac{\text{redemption}}{\left(1 + \frac{\text{yld}}{\text{frequency}}\right)^{\left(N-1+\frac{DSC}{E}\right)}} \right] + \left[\frac{100 \times \frac{\text{rate}}{\text{frequency}} \times \frac{DFC}{E}}{\left(1 + \frac{\text{yld}}{\text{frequency}}\right)^{\frac{DSC}{E}}} \right] \\
 & + \left[\sum_{k=2} \frac{100 \times \frac{\text{rate}}{\text{frequency}}}{\left(1 + \frac{\text{yld}}{\text{frequency}}\right)^{\left(k-1+\frac{DSC}{E}\right)}} \right] - \left[100 \times \frac{\text{rate}}{\text{frequency}} \times \frac{A}{E} \right]
 \end{aligned}$$

where:

- A = number of days from the beginning of the coupon period to the settlement date (accrued days).
- DFC = number of days from the beginning of the odd first coupon to the first coupon date.
- DSC = number of days from the settlement to the next coupon date.
- E = number of days in the coupon period.
- frequency = argument *frequency*
- N = number of coupons payable between the settlement date and the redemption date. (If this number contains a fraction, it is raised to the next whole number.)
- rate = argument *rate*
- redemption = argument *redemption*

- yld = argument yld

Odd long first coupon:

$$\text{ODDFPRICE} = \left[\frac{\text{redemption}}{\left(1 + \frac{yld}{\text{frequency}}\right)^{\left(N + N_q + \frac{DSC}{E}\right)}} \right] + \left[\frac{100 \times \frac{\text{rate}}{\text{frequency}} \times \left[\sum_{i=1}^{NC} \frac{DC_i}{NL_i} \right]}{\left(1 + \frac{yld}{\text{frequency}}\right)^{N_q + \frac{DSC}{E}}} \right] \\ + \left[\sum_{k=1}^N \frac{100 \times \frac{\text{rate}}{\text{frequency}}}{\left(1 + \frac{yld}{\text{frequency}}\right)^{\left(k - N_q + \frac{DSC}{E}\right)}} \right] - \left[100 \times \frac{\text{rate}}{\text{frequency}} \times \sum_{i=1}^{NC} \frac{A_i}{NL_i} \right]$$

where:

- A_i = number of days from the beginning of the i th, or last, quasi-coupon period within odd period.
- DC_i = number of days from dated date (or issue date) to first quasi-coupon ($i = 1$) or number of days in quasi-coupon ($i = 2, \dots, i = NC$).
- DSC = number of days from settlement to next coupon date.
- E = number of days in coupon period.
- frequency = argument frequency
- N = number of coupons payable between the first real coupon date and redemption date. (If this number contains a fraction, it is raised to the next whole number.)
- NC = number of quasi-coupon periods that fit in odd period. (If this number contains a fraction, it is raised to the next whole number.)
- NL_i = normal length in days of the full i th, or last, quasi-coupon period within odd period.
- N_q = number of whole quasi-coupon periods between settlement date and first coupon.
- rate = argument rate
- redemption = argument redemption
- yld = argument yld

...Arguments:

Name	Type	Description
<i>settlement</i>	number	The security's settlement date.
<i>maturity</i>	number	The security's maturity date.
<i>issue</i>	number	The security's issue date.
<i>first-coupon</i>	number	The security's first coupon date.
<i>rate</i>	number	The security's interest rate.
<i>yld</i>	number	The security's annual yield.

Name	Type	Description						
<i>redemption</i>	number	The security's redemption value per \$100 face value.						
<i>frequency</i>	number	the number of coupon payments per year. (For annual payments, <i>frequency</i> is 1; for semiannual payments, <i>frequency</i> is 2; for quarterly payments, <i>frequency</i> is 4.)						
<i>basis</i>	number	<div>The truncated integer type of day count basis to use, as follows:<table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.</td></tr><tr><td>1</td><td>Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days;</td></tr></table></div>	Value	Day Count Basis	0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.	1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days;
Value	Day Count Basis							
0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.							
1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days;							

Name	Type	Description	
			otherwise it is 365 days.
		2	Actual/360. Similar to Basis 1, but only has 360 days per year.
		3	Actual/365. Similar to Basis 1, but always has 365 days per year.
		4	<p>European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</p> <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February..

Time information in the date arguments is ignored.

Return Type and Value: number – The price per \$100 face value of a security having an odd (short or long) first period.

However, if

- *settlement*, *maturity*, *issue*, or *first-coupon* is out of range for the current date system, #NUM! is returned.
- The following is not true: *maturity* is later than *first-coupon*, which is later than *settlement*, which is later than *issue*, so #NUM! is returned.
- *rate* or *yld* < 0, #NUM! is returned.
- *frequency* is any number other than 1, 2, or 4, #NUM! is returned.
- *basis* < 0 or *basis* > 4, #NUM! is returned.

[Example:

ODDFPRICE (DATE (2008, 11, 11), DATE (2021, 3, 1), DATE (2008, 10, 15), DATE (2009, 3, 1),
0.0785, 0.0625, 100, 2, 1) results in 113.5977

end example]

18.17.7.242 ODDFYIELD

Syntax:

ODDFYIELD (*settlement* , *maturity* , *issue* , *first-coupon* , *rate* , *pr* , *redemption* ,
frequency [, [*basis*]])

Description: Computes the yield of a security that has an odd (short or long) first period.

Arguments:

Name	Type	Description				
<i>settlement</i>	number	The security's settlement date.				
<i>maturity</i>	number	The security's maturity date.				
<i>issue</i>	number	The security's issue date.				
<i>first-coupon</i>	number	The security's first coupon date.				
<i>rate</i>	number	The security's interest rate.				
<i>pr</i>	number	The security's price.				
<i>redemption</i>	number	The security's redemption value per \$100 face value.				
<i>frequency</i>	number	the number of coupon payments per year. (For annual payments, <i>frequency</i> is 1; for semiannual payments, <i>frequency</i> is 2; for quarterly payments, <i>frequency</i> is 4.)				
<i>basis</i>	number	The truncated integer type of day count basis to use, as follows: <table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td>US (NASD) 30/360. Assumes that each</td></tr></table>	Value	Day Count Basis	0 or omitted	US (NASD) 30/360. Assumes that each
Value	Day Count Basis					
0 or omitted	US (NASD) 30/360. Assumes that each					

Name	Type	Description	
			<p>month has 30 days and the total number of days in the year is 360 by making the following adjustments:</p> <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.
			<p>1 Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.</p>
			<p>2 Actual/360. Similar to Basis 1, but only has 360 days per year.</p>
			<p>3 Actual/365. Similar to Basis 1, but always has 365 days per year.</p>
			<p>4 European 30/360. The European method for</p>

Name	Type	Description	
			<p>adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</p> <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.

Time information in the date arguments is ignored.

Return Type and Value: number – The yield of a security that has an odd (short or long) first period.

However, if

- *settlement*, *maturity*, *issue*, or *first-coupon* is out of range for the current date system, #NUM! is returned.
- The following is not true: *maturity* is later than *first-coupon*, which is later than *settlement*, which is later than *issue*, so #NUM! is returned.
- *rate* or *pr* < 0, #NUM! is returned.
- *frequency* is any number other than 1, 2, or 4, #NUM! is returned.
- *basis* < 0 or *basis* > 4, #NUM! is returned.

[Example:

ODDFYIELD(DATE(2008,11,11),DATE(2021,3,1),DATE(2008,10,15),DATE(2009,3,1),
0.0575,84.5,100,2,0) results in 7.7246%

end example]

18.17.7.243 ODDLPRICE

Syntax:

ODDLPRICE (*settlement* , *maturity* , *last-interest* , *rate* , *yld* , *redemption* ,
frequency [, [*basis*]])

Description: Computes the price per \$100 face value of a security having an odd (short or long) last coupon period.

Arguments:

Name	Type	Description				
<i>settlement</i>	number	The security's settlement date.				
<i>maturity</i>	number	The security's maturity date.				
<i>last-interest</i>	number	The security's last coupon date.				
<i>rate</i>	number	The security's interest rate.				
<i>yld</i>	number	The security's annual yield.				
<i>redemption</i>	number	The security's redemption value per \$100 face value.				
<i>frequency</i>	number	the number of coupon payments per year. (For annual payments, <i>frequency</i> is 1; for semiannual payments, <i>frequency</i> is 2; for quarterly payments, <i>frequency</i> is 4.)				
<i>basis</i>	number	<div>The truncated integer type of day count basis to use, as follows:<table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date</td></tr></table></div>	Value	Day Count Basis	0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date
Value	Day Count Basis					
0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date					

Name	Type	Description	
			has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.
		1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.
		2	Actual/360. Similar to Basis 1, but only has 360 days per year.
		3	Actual/365. Similar to Basis 1, but always has 365 days per year.
		4	European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30

Name	Type	Description		
				February. <ul style="list-style-type: none">For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.

Time information in the date arguments is ignored.

Return Type and Value: number – The price per \$100 face value of a security having an odd (short or long) last coupon period.

However, if

- settlement*, *maturity*, or *last-interest* is out of range for the current date system, #NUM! is returned.
- The following is not true: *maturity* is later than *settlement*, which is later than *last-interest*, so #NUM! is returned.
- rate* or *yld* < 0, #NUM! is returned.
- frequency* is any number other than 1, 2, or 4, #NUM! is returned.
- basis* < 0 or *basis* > 4, #NUM! is returned.

[Example:

ODDLPRICE (DATE (2008,11,11),DATE (2021,3,1),DATE (2008,10,15),
0.0785,0.0625,100,2,1) results in 99.8783

end example]

18.17.7.244 ODDLYIELD

Syntax:

ODDLYIELD (*settlement* , *maturity* , *last-interest* , *rate* , *pr* , *redemption* ,
frequency [, [*basis*]])

Description: Computes the yield of a security that has an odd (short or long) last period.

Mathematical Formula:

$$ODDLYIELD = \left[\frac{\left(redemption + \left(\left(\sum_{i=1}^{NC} \frac{DC_i}{NL_i} \right) \times \frac{100 \times rate}{frequency} \right) \right) - \left(par + \left(\left(\sum_{i=1}^{NC} \frac{A_i}{NL_i} \right) \times \frac{100 \times rate}{frequency} \right) \right)}{pr + \left(\left(\sum_{i=1}^{NC} \frac{A_i}{NL_i} \right) \times \frac{100 \times rate}{frequency} \right)} \right] \times \left[\frac{frequency}{\left(\sum_{i=1}^{NC} \frac{DSC_i}{NL_i} \right)} \right]$$

where:

- A_i = number of accrued days for the i^{th} , or last, quasi-coupon period within odd period counting forward from last interest date before redemption.
- DC_i = number of days counted in the i^{th} , or last, quasi-coupon period as delimited by the length of the actual coupon period.
- $frequency$ = argument *frequency*
- NC = number of quasi-coupon periods that fit in odd period; if this number contains a fraction it is raised to the next whole number.
- NL_i = normal length in days of the i^{th} , or last, quasi-coupon period within odd coupon period.
- par = argument *par*
- $rate$ = argument *rate*
- $redemption$ = argument *redemption*

•

Arguments:

Name	Type	Description
<i>settlement</i>	number	The security's settlement date.
<i>maturity</i>	number	The security's maturity date.
<i>last-interest</i>	number	The security's last coupon date.
<i>rate</i>	number	The security's interest rate.
<i>pr</i>	number	The security's price.
<i>redemption</i>	number	The security's redemption value per \$100 face value.
<i>frequency</i>	number	the number of coupon payments per year. (For annual payments, <i>frequency</i> is 1; for semiannual payments, <i>frequency</i> is 2; for quarterly payments, <i>frequency</i> is 4.)
<i>basis</i>	number	The truncated integer type of day count basis to use, as follows:

Name	Type	Description										
		<table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">• If the date is 28 or 29 February, it is adjusted to 30 February.• For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.</td></tr><tr><td>1</td><td>Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.</td></tr><tr><td>2</td><td>Actual/360. Similar to Basis 1, but only has 360 days per year.</td></tr><tr><td>3</td><td>Actual/365. Similar to</td></tr></table>	Value	Day Count Basis	0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">• If the date is 28 or 29 February, it is adjusted to 30 February.• For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.	1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.	2	Actual/360. Similar to Basis 1, but only has 360 days per year.	3	Actual/365. Similar to
Value	Day Count Basis											
0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">• If the date is 28 or 29 February, it is adjusted to 30 February.• For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.											
1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.											
2	Actual/360. Similar to Basis 1, but only has 360 days per year.											
3	Actual/365. Similar to											

Name	Type	Description	
			Basis 1, but always has 365 days per year.
		4	<p>European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</p> <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.

Time information in the date arguments is ignored.

Return Type and Value: number – The yield of a security that has an odd (short or long) last period.

However, if

- *settlement*, *maturity*, or *last-interest* is out of range for the current date system, #NUM! is returned.
- The following is not true: *maturity* is later than *settlement*, which is later than *last-interest*, so #NUM! is returned.
- *rate* or *pr* < 0, #NUM! is returned.
- *frequency* is any number other than 1, 2, or 4, #NUM! is returned.

- *basis* < 0 or *basis* > 4, #NUM! is returned.

[Example:

ODDLYIELD(DATE(2008,11,11),DATE(2021,3,1),DATE(2008,10,15),
0.0575,84.5,100,2,0) results in 4.5192%

end example]

18.17.7.245 OFFSET

Syntax:

OFFSET (*reference* , *rows* , *cols* [, [*height*] [, [*width*]]])

Description: Gets a reference to a range that is a specified number of rows and columns from a cell or range of cells. The reference that is returned can be a single cell or a range of cells. You can specify the number of rows and the number of columns to be returned.

Arguments:

Name	Type	Description
<i>reference</i>	reference	Designates the base. <i>reference</i> shall refer to a cell or range of adjacent cells.
<i>rows</i>	number	The number of rows, up or down, that indicates the upper-left cell of the result to refer to. A positive value means below the starting reference; a negative value means above the starting reference.
<i>cols</i>	number	The number of columns, to the left or right, that the upper-left cell of the result to refer to. A positive value means to the right of the starting reference; a negative value means to the left of the starting reference.
<i>height</i>	number	The height, in rows, of the set of cells referred to by the resulting reference. This height shall be positive. If omitted, it is the same as the height of <i>reference</i> .
<i>width</i>	number	The width, in columns, of the set of cells referred to by the resulting reference. The width shall be positive. If omitted, it is the same as the width of <i>reference</i> .

Return Type and Value: reference – A reference to a range that is a specified size and number of rows and columns from a cell or range of cells.

However, if

- *reference* does not refer to a cell or range of adjacent cells, #VALUE! is returned.

- The combination of *rows* and *cols* results outside the worksheet, #REF! is returned.

[Example:

OFFSET(C3,2,3,1,1) results in the value in cell F5

SUM(OFFSET(C3:E5,-1,0,3,3)) results in the sum of the range C2:E4

end example]

18.17.7.246 OR

Syntax:

OR (*argument-list*)

Description: Tests if any one or more *arguments* in *argument-list* are TRUE. The function evaluates all arguments prior to returning a value.

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, array, reference.	The <i>arguments</i> in <i>argument-list</i> designate the values to be tested. For an array or cell reference, a cell that contains text or is empty shall be ignored.

Return Type and Value: logical – TRUE if any one or more *arguments* in *argument-list* are TRUE; otherwise, FALSE.

However, if no logical values are found, the return value is unspecified.

[Example:

OR(TRUE) results in TRUE

OR(FALSE, FALSE) results in FALSE

OR(10=5, 3=1+2, 0) results in TRUE

OR({10,5,6,7}, TRUE, E6:F6) results in TRUE, when E6 contains FALSE and F6 contains 0

end example]

18.17.7.247 PEARSON

Syntax:

PEARSON (*array-1* , *array-2*)

Description: Computes the Pearson product moment correlation coefficient, a dimensionless index that ranges from -1.0 to 1.0, inclusive, and reflects the extent of a linear relationship between two data sets.

Mathematical Formula:

The formula for the Pearson product moment correlation coefficient, r , is:

$$r = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sqrt{\sum(x - \bar{x})^2 \sum(y - \bar{y})^2}}$$

where:

- x = a sample value
- \bar{x} = the sample mean `AVERAGE(array-1)`
- y = a sample value
- \bar{y} = the sample mean `AVERAGE(array-2)`

Arguments:

Name	Type	Description
<i>array-1</i>	number, name, array, reference to number	The set of independent numerical values. If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.
<i>array-2</i>	number, name, array, reference to number	The set of dependent numerical values. If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.

Return Type and Value: number – The Pearson product moment correlation coefficient.

However, if

- *array-1* and *array-2* have a different number of data points, the return value is unspecified.
- *array-1* or *array-2* is empty, the return value is unspecified.

[Example:

`PEARSON({9,7,5,3,1},{10,6,1,5,3})` results in 0.699378606

end example]

18.17.7.248 PERCENTILE

Syntax:

`PERCENTILE (array , k)`

Description: Computes the k^{th} percentile of a set of values in a range.

Arguments:

Name	Type	Description
<i>array</i>	array, reference	The set of numerical data that defines relative standing.
<i>k</i>	number	The percentile value in the range 0–1, inclusive. If <i>k</i> is not a multiple of $1/(n - 1)$, PERCENTILE interpolates to determine the value at the k^{th} percentile.

Return Type and Value: number – The k^{th} percentile of a set of values in a range.

However, if

- *array* is empty, the return value is unspecified.
- *k* is < 0 or *k* > 1, #NUM! is returned.

[Example:

PERCENTILE({1,3,2,4},0.3) results in 1.9

PERCENTILE({1,3,2,4},0.75) results in 3.25

end example]

18.17.7.249 PERCENTRANK

Syntax:

PERCENTRANK (*array* , *x* [, *significance*])

Description: Computes the rank of a value in a data set as a percentage of the data set.

Arguments:

Name	Type	Description
<i>array</i>	array, reference	<i>array</i> is the set of numerical data that defines relative standing.
<i>x</i>	number	The value for which the rank is to be computed. If <i>x</i> does not match one of the values in <i>array</i> , PERCENTRANK interpolates to return the correct percentage rank.
<i>significance</i>	number	The number of significant digits for the returned percentage value. If omitted, a value of 3 is used.

Return Type and Value: number – The rank of a value in a data set as a percentage of the data set.

However, if

- *array* is empty, the return value is unspecified.
- *significance* < 1, #NUM! is returned.

[Example:

PERCENTRANK({12,6,7,9,3,8},4) results in 0.066
PERCENTRANK({12,6,7,9,3,8},5) results in 0.133

end example]

18.17.7.250 PERMUT

Syntax:

PERMUT (*number* , *number-chosen*)

Description: Computes the number of permutations for *number-chosen* objects that can be selected from *number* objects. [Note: A permutation is any set or subset of objects or events where internal order is significant. Permutations are different from combinations, for which the internal order is not significant. Use this function for lottery-style probability calculations. end note]

Mathematical Formula:

$$P_{k,n} = \frac{n!}{(n - k)!}$$

where:

- *k* = argument *number-chosen*
- *n* = argument *number*

Arguments:

Name	Type	Description
<i>number</i>	number	The total number of items available, truncated to integer.
<i>number-chosen</i>	number	The number of items in each permutation, truncated to integer.

Return Type and Value: number – The number of different permutations of *number-chosen* in *number*.

However, if

- *number* < 0, #NUM! is returned.
- *number-chosen* < 0, #NUM! is returned.
- *number* < *number-chosen*, #NUM! is returned.

[Example:

PERMUT(8,2) results in 56

PERMUT(10,4) results in 5040

PERMUT(6,5) results in 720

end example]

18.17.7.251 PHONETIC

Syntax:

PHONETIC (*string*)

Description: Extracts the phonetic (furigana) characters from *string*. [Note: Furigana are aids used to indicate correct pronunciation of Japanese text. *end note*]

Arguments:

Name	Type	Description
<i>string</i>	text, reference	Designates a furigana string. If <i>string</i> is a cell range, the furigana string in the upper-left corner cell of that range is returned.

Return Type and Value: text – The phonetic (furigana) characters from *string*.

However, if *string* is a range of non-contiguous cells, #N/A is returned.

18.17.7.252 PI

Syntax:

PI ()

Description: Computes the value π .

Arguments: None.

Return Type and Value: number – The value π .

[Example: The following results are displayed using 10 significant digits

PI() results in 3.141592654

PI()/2 results in 1.570796327

PI()*(2.5^2) results in 19.63495408

end example]

18.17.7.253 PMT

Syntax:

PMT (*rate* , *nper* , *pv* [, [*fv*] [, [*type*]]])

Description: Computes the payment for a loan based on constant payments and a constant interest rate.

Arguments:

Name	Type	Description						
<i>rate</i>	number	The interest rate for the loan.						
<i>nper</i>	number	The total number of payment for the loan.						
<i>pv</i>	number	The present value, or the total amount that a series of future payments is worth now; also known as the principal.						
<i>fv</i>	number	The future value, or a cash balance to be attained after the last payment is made. If omitted, it is assumed to be 0 (i.e., the future value of a loan, for example, is 0).						
<i>type</i>	number	The timing of the payment, truncated to integer, as follows: <table><tr><th>Value</th><th>Timing</th></tr><tr><td>0</td><td>Payment at the end of the period</td></tr><tr><td>1</td><td>Payment at the beginning of the period</td></tr></table>	Value	Timing	0	Payment at the end of the period	1	Payment at the beginning of the period
Value	Timing							
0	Payment at the end of the period							
1	Payment at the beginning of the period							

Return Type and Value: number – The payment for a loan based on constant payments and a constant interest rate. (The payment returned by PMT includes principal and interest but no taxes, reserve payments, or fees sometimes associated with loans.)

However, if *type* is any number other than 0 or 1, #NUM! is returned.

[Example:

PMT(0.08/12,10,10000) results in -1,037.03

PMT(0.08/12,10,10000,0,1) results in -1,030.16

end example]

18.17.7.254 POISSON

Syntax:

POISSON (*x* , *mean* , *cumulative-flag*)

Description: Computes the Poisson distribution.

Mathematical Formula:

For *cumulative-flag* = FALSE:

$$POISSON = \frac{e^{-\lambda} \lambda^x}{x!}$$

For *cumulative-flag* = TRUE:

$$CUMPOISSON = \sum_{k=0}^x \frac{e^{-\lambda} \lambda^k}{k!}$$

where:

- x = argument *x*
- λ = argument *mean*

Arguments:

Name	Type	Description
<i>x</i>	number	The number of events, truncated to an integer.
<i>mean</i>	number	The expected numeric value.
<i>cumulative-flag</i>	logical	Determines the form of the function. If TRUE, POISSON returns the cumulative Poisson probability that the number of random events occurring are between zero and <i>x</i> , inclusive; if FALSE, it returns the Poisson probability mass function that the number of events occurring is exactly <i>x</i> .

Return Type and Value: number – The Poisson distribution.

However, if

- $x < 0$, #NUM! is returned.
- $mean \leq 0$, #NUM! is returned.

[Example:

POISSON(2,5,TRUE) results in 0.124652019

POISSON(2,5,FALSE) results in 0.084224337

end example]

18.17.7.255 POWER

Syntax:

POWER (x , y)

Description: Computes x raised to the power y .

Arguments:

Name	Type	Description
x	number	The base and the number y is the exponent to which that base is raised.
y	number	The exponent to which the base is raised.

Return Type and Value: number – x^y .

However, if

- The value of x is negative and y is not a whole number, #NUM! is returned.
- x is zero and y is less than or equal to zero, #DIV/0! is returned.
- The result cannot be represented as a number, #NUM! is returned.

[Example:

POWER(2,3) results in 8

POWER(2,0.5) results in 1.414213562

POWER(-1.234,5.0) results in -2.861381721

POWER(1.234,5.1) results in 2.922182358

end example]

18.17.7.256 PPMT

Syntax:

PPMT ($rate$, per , $nper$, p_v [, [f_v] [, [$type$]]])

Description: Computes the payment on the principal for a given period for an investment based on periodic, constant payments and a constant interest rate.

Arguments:

Name	Type	Description						
<i>rate</i>	number	The interest rate per period.						
<i>per</i>	number	The the period and shall be in the range 1– <i>nper</i> .						
<i>nper</i>	number	The total number of payment in an annuity.						
<i>pv</i>	number	The present value, or the total amount that a series of future payments is worth now.						
<i>fv</i>	number	The future value, or a cash balance to be attained after the last payment is made. If omitted, it is assumed to be 0 (i.e., the future value of a loan, for example, is 0).						
<i>type</i>	number	<div>The timing of the payment, truncated to integer, as follows:<table><tr><th>Value</th><th>Timing</th></tr><tr><td>0</td><td>Payment at the end of the period</td></tr><tr><td>1</td><td>Payment at the beginning of the period</td></tr></table></div>	Value	Timing	0	Payment at the end of the period	1	Payment at the beginning of the period
Value	Timing							
0	Payment at the end of the period							
1	Payment at the beginning of the period							

Return Type and Value: number – The payment on the principal for a given period for an investment based on periodic, constant payments and a constant interest rate.

However, if *type* is any number other than 0 or 1, #NUM! is returned.

[Example:

PPMT(0.1/12,1,2*12,2000) results in -75.62

PPMT(0.08,10,10,200000) results in -27,598.05

end example]

18.17.7.257 PRICE

Syntax:

PRICE (*settlement* , *maturity* , *rate* , *yld* , *redemption* , *frequency* [, [*basis*]])

Description: Computes the price per \$100 face value of a security that pays periodic interest.

Mathematical Formula:

$$PRICE = \left[\frac{redemption}{\left(1 + \frac{yld}{frequency}\right)^{\left(N-1+\frac{DSC}{E}\right)}} \right] + \left[\sum_{k=1}^N \frac{100 \times \frac{rate}{frequency}}{\left(1 + \frac{yld}{frequency}\right)^{\left(k-1+\frac{DSC}{E}\right)}} \right] - \left(100 \times \frac{rate}{frequency} \times \frac{A}{E} \right)$$

where:

- *A* = number of days from beginning of coupon period to settlement date.
- *DSC* = number of days from settlement to next coupon date.
- *E* = number of days in coupon period in which the settlement date falls.
- *frequency* = argument *frequency*
- *N* = number of coupons payable between settlement date and redemption date.
- *rate* = argument *rate*
- *redemption* = argument *redemption*
- *yld* = argument *yld*

Arguments:

Name	Type	Description				
<i>settlement</i>	number	The security's settlement date.				
<i>maturity</i>	number	The security's maturity date.				
<i>rate</i>	number	The security's interest rate.				
<i>yield</i>	number	The security's annual yield.				
<i>redemption</i>	number	The security's redemption value per \$100 face value.				
<i>frequency</i>	number	the number of coupon payments per year. (For annual payments, <i>frequency</i> is 1; for semiannual payments, <i>frequency</i> is 2; for quarterly payments, <i>frequency</i> is 4.) <i>frequency</i> is truncated to an integer.				
<i>basis</i>	number	<div>The truncated integer type of day count basis to use, as follows:<table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to</td></tr></table></div>	Value	Day Count Basis	0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to
Value	Day Count Basis					
0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to					

Name	Type	Description	
			<p>30 February.</p> <ul style="list-style-type: none"> For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.
		1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.
		2	Actual/360. Similar to Basis 1, but only has 360 days per year.
		3	Actual/365. Similar to Basis 1, but always has 365 days per year.
		4	<p>European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</p> <ul style="list-style-type: none"> If the date

Name	Type	Description		
				<p>is 28 or 29 February, it is adjusted to 30 February.</p> <ul style="list-style-type: none"> For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.

Time information in the date arguments is ignored.

Return Type and Value: number – The price per \$100 face value of a security that pays periodic interest.

However, if

- *settlement* or *maturity* is out of range for the current date system, #NUM! is returned.
- *settlement* \geq *maturity*, #NUM! is returned.
- *rate* or *yld* < 0 , #NUM! is returned.
- *redemption* ≤ 0 , #NUM! is returned.
- *frequency* is any number other than 1, 2, or 4, #NUM! is returned.
- *basis* < 0 or *basis* > 4 , #NUM! is returned.

[Example:

PRICE (DATE (2008, 2, 15), DATE (2017, 11, 15), 0.0575, 0.065, 100, 2, 0) results in 94.6344

end example]

18.17.7.258 PRICEDISC

Syntax:

PRICEDISC (*settlement* , *maturity* , *discount* , *redemption* [, [*basis*]])

Description: Computes the price per \$100 face value of a discounted security.

Mathematical Formula:

$$PRICEDISC = redemption - discount \times redemption \times \frac{DSM}{B}$$

where:

- B = number of days in year, depending on year basis.
- DSM = number of days from settlement to maturity.
- $discount$ = argument *discount*
- $redemption$ = argument *redemption*

Arguments:

Name	Type	Description				
<i>settlement</i>	number	The security's settlement date.				
<i>maturity</i>	number	The security's maturity date.				
<i>discount</i>	number	The security's discount rate.				
<i>redemption</i>	number	The security's redemption value per \$100 face value.				
<i>basis</i>	number	<div>The truncated integer type of day count basis to use, as follows:<table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td><div>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date</div></td></tr></table></div>	Value	Day Count Basis	0 or omitted	<div>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date</div>
Value	Day Count Basis					
0 or omitted	<div>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date</div>					

Name	Type	Description	
			has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.
		1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.
		2	Actual/360. Similar to Basis 1, but only has 360 days per year.
		3	Actual/365. Similar to Basis 1, but always has 365 days per year.
		4	<p>European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</p> <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months with 31 days, all dates with

Name	Type	Description		
				a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.

Time information in the date arguments is ignored.

Return Type and Value: number – The price per \$100 face value of a discounted security.

However, if

- *settlement* or *maturity* is out of range for the current date system, #NUM! is returned.
- *settlement* ≥ *maturity*, #NUM! is returned.
- *discount* or *redemption* ≤ 0, #NUM! is returned.
- *basis* < 0 or *basis* > 4, #NUM! is returned.

[Example:

PRICEDISC (DATE (2008, 2, 16), DATE (2008, 3, 1), 0.0525, 100, 2) results in 99.7958

end example]

18.17.7.259 PRICEMAT

Syntax:

PRICEMAT (*settlement* , *maturity* , *issue* , *rate* , *yld* [, [*basis*]])

Description: Computes the price per \$100 face value of a security that pays interest at maturity.

Mathematical Formula:

$$PRICEMAT = \frac{100 + \left(\frac{IM}{B} \times rate \times 100\right)}{1 + \left(\frac{DSM}{B} \times yld\right)} - \left(\frac{A}{B} \times rate \times 100\right)$$

where:

- A = number of days from issue to settlement.
- B = number of days in year, depending on year basis.
- DIM = number of days from issue to maturity.
- DSM = number of days from settlement to maturity.
- $rate$ = argument $rate$
- yld = argument yld

Arguments:

Name	Type	Description				
<i>settlement</i>	number	The security's settlement date.				
<i>maturity</i>	number	The security's maturity date.				
<i>issue</i>	number	The security's issue date.				
<i>rate</i>	number	The security's interest rate.				
<i>yld</i>	number	The security's annual yield.				
<i>basis</i>	number	<div>The truncated integer type of day count basis to use, as follows:<table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td><div>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or</div></td></tr></table></div>	Value	Day Count Basis	0 or omitted	<div>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or</div>
Value	Day Count Basis					
0 or omitted	<div>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or</div>					

Name	Type	Description	
			29 February, in which case it does not change.
		1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.
		2	Actual/360. Similar to Basis 1, but only has 360 days per year.
		3	Actual/365. Similar to Basis 1, but always has 365 days per year.
		4	<p>European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</p> <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations

Name	Type	Description	
			where the first date is 28 or 29 February.

Time information in the date arguments is ignored.

Return Type and Value: number – The price per \$100 face value of a security that pays interest at maturity.

However, if

- *settlement*, *maturity*, or *issue* is out of range for the current date system, #NUM! is returned.
- *settlement* \geq *maturity*, #NUM! is returned.
- *rate* or *yld* < 0 , #NUM! is returned.
- *basis* < 0 or *basis* > 4 , #NUM! is returned.

[Example:

PRICEMAT (DATE (2008,2,15),DATE (2008,4,13),DATE (2007,11,11),0.061,0.061,0)
results in 99.9845

end example]

18.17.7.260 PROB

Syntax:

PROB (*x-range* , *probability-range* , *lower-limit* [, *upper-limit*])

Description: Computes the probability that values in a range are between two limits.

Arguments:

Name	Type	Description
<i>x-range</i>	array, reference	The set of numeric values of <i>x</i> with which there are associated probabilities.
<i>probability-range</i>	array, reference	A set of numeric probabilities associated with the values in <i>x-range</i> .
<i>lower-limit</i>	number	The lower bound on the value for which the probability is to be computed.
<i>upper-limit</i>	number	The upper bound on the value for which the probability is to be computed. If omitted, the probability that values in <i>x-range</i> are equal to <i>lower-limit</i> is returned.

Return Type and Value: number – The probability that values in a range are between two limits.

However, if

- Any value in *probability-range* ≤ 0 or any value in *probability-range* > 1 , #NUM! is returned.
- The sum of the values in *probability-range* < 1 , #NUM! is returned.
- *x-range* and *probability-range* contain a different number of data points, the return value is unspecified.

[Example:

PROB({0,1,2,3},{0.2,0.3,0.1,0.4},2) results in 0.1

PROB({0,1,2,3},{0.2,0.3,0.1,0.4},1,4) results in 0.8

end example]

18.17.7.261 PRODUCT

Syntax:

PRODUCT (*argument-list*)

Description: Multiplies the numeric values of *arguments* in *argument-list*.

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number, text, array, reference	The <i>arguments</i> in <i>argument-list</i> designate the numbers to be multiplied. Arguments that are numbers, logical values, or text representations of numbers shall be counted. If an argument is an array or reference, only numbers in that array or reference shall be counted. Empty cells, logical values, and text in the array or reference shall be ignored.

Return Type and Value: number – The product of the values of its arguments.

[Example:

PRODUCT(1) results in 1

PRODUCT(1,2,3,4,5) results in 120

PRODUCT({1,2;3,4}) results in 24

PRODUCT({2,3},4,"5") results in 120

end example]

18.17.7.262 PROPER

Syntax:

PROPER (*string*)

Description: Makes a lowercase version of *string* except that the first letter in *string* and any other letters in *string* that immediately follow a character that is not a letter, are converted to uppercase.

Arguments:

Name	Type	Description
<i>string</i>	text, reference	Designates the string to be converted.

Return Type and Value: text – A version of *string* such that the first letter in *string* and any other letters in *string* that immediately follow a character that is not a letter, are converted to uppercase. All other letters are converted to lowercase, and all other non-letters are unchanged.

[Example:

PROPER("12aBC d123aD#\$\$%sd^") results in 12Abc D123Ad#\$\$%Sd^

PROPER(A10) results in 12Abc D123Ad#\$\$%Sd^, when A10 contains 12aBC d123aD#\$\$%sd^

end example]

18.17.7.263 PV

Syntax:

PV (*rate* , *nper* , *pmt* [, [*fv*] [, [*type*]]])

Description: Computes the present value of an investment. (The present value is the total amount that a series of future payments is worth now.)

Mathematical Formula:

If *rate* is not 0, then:

$$pv * (1 + rate)^{nper} + pmt(1 + rate * type) * \left(\frac{(1 + rate)^{nper} - 1}{rate} \right) + fv = 0$$

If *rate* is 0, then:

$$(pmt \times nper) + pv + fv = 0(pmt * nper) + pv + fv = 0$$

where:

- *fv* = *fv* argument

- *nper* = *nper* argument
- *pmt* = *pmt* argument
- *rate* = *rate* argument
- *type* = *type* argument

Arguments:

Name	Type	Description						
<i>rate</i>	number	The interest rate per period.						
<i>nper</i>	number	The total number of payment in an annuity.						
<i>pmt</i>	number	The payment made each period and cannot change over the life of the annuity. If is omitted, <i>fv</i> shall be provided. [Note: Typically, <i>pmt</i> includes principal and interest but no other fees or taxes. <i>end note</i>]						
<i>fv</i>	number	The future value, or a cash balance to be attained after the last payment is made. If omitted, <i>pmt</i> shall be provided.						
<i>type</i>	number	The timing of the payment, truncated to integer, as follows: <table><tr><th>Value</th><th>Timing</th></tr><tr><td>0</td><td>Payment at the end of the period</td></tr><tr><td>1</td><td>Payment at the beginning of the period</td></tr></table>	Value	Timing	0	Payment at the end of the period	1	Payment at the beginning of the period
Value	Timing							
0	Payment at the end of the period							
1	Payment at the beginning of the period							

Return Type and Value: number – The present value of an investment.

However, if *type* is any number other than 0 or 1, #NUM! is returned.

[Example:

PV(0.08/12,12*20,500,,0) results in -59,777.15

end example]

18.17.7.264 QUARTILE

Syntax:

QUARTILE (*array* , *result-category*)

Description: Computes the quartile of a data set.

Arguments:

Name	Type	Description												
<i>array</i>	array, reference	The set of numeric values for which the quartile value is to be computed.												
<i>result-category</i>	number	When truncated to an integer, specifies which value is to be returned, as follows: <table><tr><th>Value</th><th>Value Returned</th></tr><tr><td>0</td><td>Minimum value</td></tr><tr><td>1</td><td>First quartile (25th percentile)</td></tr><tr><td>2</td><td>Median value (50th percentile)</td></tr><tr><td>3</td><td>Third quartile (75th percentile)</td></tr><tr><td>4</td><td>Maximum value</td></tr></table>	Value	Value Returned	0	Minimum value	1	First quartile (25th percentile)	2	Median value (50th percentile)	3	Third quartile (75th percentile)	4	Maximum value
Value	Value Returned													
0	Minimum value													
1	First quartile (25th percentile)													
2	Median value (50th percentile)													
3	Third quartile (75th percentile)													
4	Maximum value													

Return Type and Value: number – The quartile of a data set.

However, if

- *array* is empty, the return value is unspecified.
- *result-category* < 0 or *result-category* > 4, #NUM! is returned.

[Example:

QUARTILE({1,2,4,7,8,9,10,12},1) results in 3.5

end example]

18.17.7.265 QUOTIENT

Syntax:

QUOTIENT (*dividend* , *divisor*)

Description: Computes the integer portion of the division of *dividend* by *divisor*.

Arguments:

Name	Type	Description
<i>dividend</i>	number	The dividend
<i>divisor</i>	number	The divisor.

Return Type and Value: number – The integer portion of the division of *dividend* by *divisor*.

[Example:

QUOTIENT(5,2) results in 2

QUOTIENT(4.5,3.1) results in 1

QUOTIENT(-10,3) results in -3

end example]

18.17.7.266 RADIANS

Syntax:

RADIANS (*angle*)

Description: Converts *angle* in degrees into radians.

Arguments:

Name	Type	Description
<i>angle</i>	number	The angle expressed in degrees that is to be converted into radians.

Return Type and Value: number – *angle* in radians.

[Example:

RADIANS(360) results in 6.283185307

RADIANS(270) results in 4.71238898

RADIANS(45) results in 0.785398163

RADIANS(8.5) results in 0.148352986

end example]

18.17.7.267 RAND

Syntax:

RAND ()

Description: Computes an evenly distributed random real number greater than or equal to 0 and less than 1. A new random real number is returned every time the cell's value is calculated.

Arguments: None.

Return Type and Value: number – An evenly distributed random real number greater than or equal to 0 and less than 1.

[Example:

RAND() results in 0.437337454

INT(RAND()*(6-1)+1) might result in 3

end example]

18.17.7.268 RANDBETWEEN

Syntax:

RANDBETWEEN (*lower-bound* , *upper-bound*)

Description: Computes a random integer number in the range *lower-bound*–*upper-bound*. A new random integer number is returned every time the cell's value is calculated.

Arguments:

Name	Type	Description
<i>lower-bound</i>	number	The smallest integer that is returned.
<i>upper-bound</i>	number	The largest integer that is returned.

Return Type and Value: number – A random integer number in the range specified.

However, if *lower-bound* is greater than *upper-bound*, #NUM! is returned.

[Example:

RANDBETWEEN(1,6) results in an integer between 1 and 6, inclusive

RANDBETWEEN(-10,10) results in an integer between -10 and 10, inclusive

end example]

18.17.7.269 RANK

Syntax:

RANK (*number* , *number-list* [, *order*])

Description: Computes the rank of a number in a list of numbers. RANK gives duplicate numbers the same rank. However, the presence of duplicate numbers affects the ranks of subsequent numbers.

Arguments:

Name	Type	Description
<i>number</i>	number	The number whose rank is to be found.

Name	Type	Description
<i>number-list</i>	reference	Designates the list of numbers. Non-numeric values in this list are ignored.
<i>order</i>	number	Specifies how <i>number</i> is to be ranked. If zero or omitted, <i>number</i> is ranked as if the list were sorted in descending order. If <i>order</i> is any non-zero value, <i>number</i> is ranked as if the list were sorted in ascending order.

Return Type and Value: number – The rank of a number in a list of numbers.

[Example:

When the cells E1:I1 contain 7, 3.5, 3.5, 1, and 2

RANK(E2,E1:I1,1) results in 3

RANK(E2,E1:I1,1,0) results in 2

RANK(E2,E1:I1,1) results in 2

RANK(E1,E1:I1,1) results in 5, as the two 3.5 values both have a rank of 3; no value has rank 4.

end example]

18.17.7.270 RATE

Syntax:

RATE (*nper* , *pmt* , *pv* [, [*fv*] [, [*type*] [, [*guess*]]]])

Description: Computes the interest rate per period of an annuity, using iteration, which can result in zero or more solutions.

Arguments:

Name	Type	Description
<i>nper</i>	number	The total number of payment periods.
<i>pmt</i>	number	The payment made each period and cannot change over the life of the annuity. (Typically, <i>pmt</i> includes principal and interest but no other fees or taxes.) If omitted, <i>fv</i> shall be present.
<i>pv</i>	number	The present value.
<i>fv</i>	number	The future value, or a cash balance to be attained after the last payment is made. If omitted, it is assumed to be 0 (i.e., the future value of a loan, for example, is 0).
<i>type</i>	number	The timing of the payment, truncated to integer, as follows:

Name	Type	Description						
settlement	number	The security's settlement date.						
maturity	number	The security's maturity date.						
investment	number	The amount invested in the security.						
discount	number	The security's discount rate.						
basis	number	<div>The truncated integer type of day count basis to use, as follows:<table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td><div>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.</div></td></tr><tr><td>1</td><td><div>Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the</div></td></tr></table></div>	Value	Day Count Basis	0 or omitted	<div>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.</div>	1	<div>Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the</div>
Value	Day Count Basis							
0 or omitted	<div>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.</div>							
1	<div>Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the</div>							

Name	Type	Description	
			year is 366 days; otherwise it is 365 days.
		2	Actual/360. Similar to Basis 1, but only has 360 days per year.
		3	Actual/365. Similar to Basis 1, but always has 365 days per year.
		4	<p>European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</p> <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.

Time information in the date arguments is ignored.

Return Type and Value: number – The amount received at maturity for a fully invested security.

However, if

- *settlement* or *maturity* is out of range for the current date system, #NUM! is returned.
- *settlement* \geq *maturity*, #NUM! is returned.
- *investment* or *discount* \leq 0, #NUM! is returned.
- *basis* < 0 or *basis* > 4 , #NUM! is returned.

[Example:

RECEIVED(DATE(2008,2,15),DATE(2008,5,15),1000000,0.0575,2) results in 1014584.65

end example]

18.17.7.272 REPLACE

Syntax:

REPLACE (*string-1* , *start-pos* , *number-chars* , *string-2*)

Description: Produces a new string that is *string-1* with *number-chars* characters starting at position *start-pos*, replaced by *string-2*. (REPLACE is intended for use with languages that use the single-byte character set (SBCS), whereas REPLACEB (§18.17.7.273) is intended for use with languages that use the double-byte character set (DBCS).)

Arguments:

Name	Type	Description
<i>string-1</i>	text	Designates a string.
<i>start-pos</i>	number	The number of the start position within <i>string-1</i> from which characters in <i>string-1</i> are to be replaced. The start position of the first character is 1. <i>start-pos</i> shall be at least 0. If <i>start-pos</i> is beyond the end of <i>string-1</i> , the result is a new string that is <i>string-2</i> appended to <i>string-1</i> . If <i>start-pos</i> is within the bounds of <i>string-1</i> , but <i>number-chars</i> goes beyond the end of <i>string-1</i> , the characters starting at position <i>start-pos</i> through to the end of <i>string-1</i> shall be replaced by <i>string-2</i> .
<i>number-chars</i>	number	The number of characters within <i>string-1</i> that are to be replaced by the string designated by <i>string-2</i> .
<i>string-2</i>	text	Designates a string.

Return Type and Value: text – A copy of *string-1* with replacement characters from *string-2*.

However, if

- *start-pos* < 0, #VALUE! is returned.
- *number-chars* < 0, #VALUE! is returned.

[Example:

REPLACE("abcdefghijk",3,4,"XY") results in abXYghijk

REPLACE("abcdefghijk",3,1,"12345") results in ab12345defghijk

REPLACE("abcdefghijk",15,4,"XY") results in abcdefghijkXY

end example]

18.17.7.273 REPLACEB

Syntax:

REPLACEB (*string-1* , *start-pos* , *number-bytes* , *string-2*)

Description: Produces a new string that is *string-1* with *number-bytes* bytes starting at position *start-pos*, replaced by *string-2*. (REPLACEB is intended for use with languages that use the double-byte character set (DBCS), whereas REPLACE (§18.17.7.272) is intended for use with languages that use the single-byte character set (SBCS).)

Arguments:

Name	Type	Description
<i>string-1</i>	text	Designates a string.
<i>start-pos</i>	number	The number of the start position within <i>string-1</i> from which characters in <i>string-1</i> are to be replaced. The start position of the first character is 1. <i>start-pos</i> shall be at least 0. If <i>start-pos</i> is beyond the end of <i>string-1</i> , the result is a new string that is <i>string-2</i> appended to <i>string-1</i> . If <i>start-pos</i> is within the bounds of <i>string-1</i> , but <i>number-bytes</i> goes beyond the end of <i>string-1</i> , the characters starting at position <i>start-pos</i> through to the end of <i>string-1</i> shall be replaced by <i>string-2</i> .
<i>number-bytes</i>	number	The number of characters within <i>string-1</i> that are to be replaced by the string designated by <i>string-2</i> .
<i>string-2</i>	text	Designates a string.

Return Type and Value: text – A copy of *string-1* with replacement characters from *string-2*.

However, if

- *start-pos* < 0, #VALUE! is returned.
- *number-bytes* < 0, #VALUE! is returned.

[Example: Assuming 1-byte characters:

REPLACEB("abcdefghijk",3,4,"XY") results in abXYghijk

REPLACEB("abcdefghijk",3,1,"12345") results in ab12345defghijk

REPLACEB("abcdefghijk",15,4,"XY") results in abcdefghijkXY

end example]

18.17.7.274 REPT

Syntax:

REPT (*string* , *replication-count*)

Description: Creates a string that is *replication-count* number of occurrences of *string* concatenated together.

Arguments:

Name	Type	Description
<i>string</i>	text	Designate the string to be replicated.
<i>replication-count</i>	number	The number of times <i>string</i> is to be replicated, truncated to integer. If <i>replication-count</i> is 0, the resulting string is empty.

Return Type and Value: text – The final replicated string.

However, if *replication-count* < 0, #VALUE! is returned.

[Example:

REPT("ABC",3) results in ABCABCABC

LEN(REPT("ABC",0)) results in 0

end example]

18.17.7.275 RIGHT

Syntax:

RIGHT (*string* [, *number-chars*])

Description: Extracts the right-most *number-chars* characters from *string*. (RIGHT is intended for use with languages that use the single-byte character set (SBCS), whereas RIGHTB (§18.17.7.276) is intended for use with languages that use the double-byte character set (DBCS).)

Arguments:

Name	Type	Description
<i>string</i>	text	Designate the string from which a substring is to be extracted.
<i>number-chars</i>	number	The number of characters to be extracted. If omitted, a count of 1 shall be assumed. <i>number-chars</i> shall be at least 0. If <i>number-chars</i> exceeds the length of <i>string</i> , the whole of <i>string</i> shall be extracted.

Return Type and Value: text – A string containing the right-most *number-chars* characters from *string*.

However, if *number-chars* < 0, #VALUE! is returned.

[Example:

RIGHT("abcdef",2) results in ef

RIGHT(A10,4) results in z123, when A10 contains xyz123

end example]

18.17.7.276 RIGHTB

Syntax:

RIGHTB (*string* , [*number-bytes*])

Description: Extracts the right-most *number-bytes*-worth of characters from *string*. (RIGHTB is intended for use with languages that use the double-byte character set (DBCS), whereas RIGHT (§18.17.7.275) is intended for use with languages that use the single-byte character set (SBCS).)

Arguments:

Name	Type	Description
<i>string</i>	text	Designate the string from which a substring is to be extracted.
<i>number-bytes</i>	number	The number of bytes to be extracted. If omitted, a count of 1 shall be assumed. <i>number-bytes</i> shall be at least 0. If <i>number-bytes</i> exceeds the length of <i>string</i> , the whole of <i>string</i> shall be extracted.

Return Type and Value: text – A string containing the right-most *number-bytes*-worth of characters from *string*.

However, if *number-bytes* < 0, #VALUE! is returned.

[Example: Assuming 1-byte characters:

RIGHTB("abcdef",2) results in ef

RIGHTB(A10,4) results in z123, when A10 contains xyz123

end example]

18.17.7.277 ROMAN

Syntax:

ROMAN (*number* , *form*)

Description: Converts the Arabic number, *number*, to a Roman number according to *form*.

Arguments:

Name	Type	Description										
<i>number</i>	number	The Arabic number to be converted.										
<i>form</i>	number	<div>Specifies the type of Roman numeral to be produced. The Roman numeral style ranges from Classic to Simplified, becoming more concise as the value of <i>form</i> increases, as follows:</div> <table><tr><th>Value</th><th>Type</th></tr><tr><td>0, omitted, or TRUE</td><td>Classic. Only subtract powers of ten (but not L or V). Do not subtract a number from one that is more than 10 times greater. If another letter follows the larger one, it shall be smaller than the number preceding the larger one.</td></tr><tr><td>1</td><td>Concise. Allow subtractraction of L and V as well as powers of ten. Do not subtract a number from one that is more than 10 times greater. If another letter follows the larger one, it shall be smaller than the number preceding the larger one.</td></tr><tr><td>2</td><td>More concise. Allow subtractraction of L (but not V) as well as powers of ten. Allow subtraction of a number from one that is more than 10 times greater. If another letter follows the larger one, it shall be smaller than the number preceding the larger one.</td></tr><tr><td>3</td><td>Most concise. Allow subtractraction of L and V as well as powers of ten. Allow subtraction of a number from one that</td></tr></table>	Value	Type	0, omitted, or TRUE	Classic. Only subtract powers of ten (but not L or V). Do not subtract a number from one that is more than 10 times greater. If another letter follows the larger one, it shall be smaller than the number preceding the larger one.	1	Concise. Allow subtractraction of L and V as well as powers of ten. Do not subtract a number from one that is more than 10 times greater. If another letter follows the larger one, it shall be smaller than the number preceding the larger one.	2	More concise. Allow subtractraction of L (but not V) as well as powers of ten. Allow subtraction of a number from one that is more than 10 times greater. If another letter follows the larger one, it shall be smaller than the number preceding the larger one.	3	Most concise. Allow subtractraction of L and V as well as powers of ten. Allow subtraction of a number from one that
Value	Type											
0, omitted, or TRUE	Classic. Only subtract powers of ten (but not L or V). Do not subtract a number from one that is more than 10 times greater. If another letter follows the larger one, it shall be smaller than the number preceding the larger one.											
1	Concise. Allow subtractraction of L and V as well as powers of ten. Do not subtract a number from one that is more than 10 times greater. If another letter follows the larger one, it shall be smaller than the number preceding the larger one.											
2	More concise. Allow subtractraction of L (but not V) as well as powers of ten. Allow subtraction of a number from one that is more than 10 times greater. If another letter follows the larger one, it shall be smaller than the number preceding the larger one.											
3	Most concise. Allow subtractraction of L and V as well as powers of ten. Allow subtraction of a number from one that											

Name	Type	Description	
			is more than 10 times greater. If another letter follows the larger one, it shall be smaller than the number preceding the larger one.
		4 or FALSE	Simplified. Produce the fewest Roman digits.

Return Type and Value: text – The corresponding Roman number.

However, if

- *number* < 0 or > 3999, #VALUE! is returned.
- *form* is not one of the values listed above, #VALUE! is returned.

[Example:

ROMAN(499,0) results in CDXCIX, which is 100 less than 500, plus 10 less than 100, plus one less than 10.

ROMAN(499,1) results in LDVLIV, which is 50 less than 500, plus 5 less than 50, plus one less than 5.

ROMAN(499,2) results in XDIX, which is 10 less than 500, plus one less than 10.

ROMAN(499,3) results in VDIV, which is 5 less than 500, plus one less than 5.

ROMAN(499,4) results in ID, which is 1 less than 500.

ROMAN(2013,0) results in MMXIII, which is 2,000, plus 10, plus 3.

end example]

18.17.7.278 ROUND

Syntax:

ROUND (*x* , *number-digits*)

Description: Rounds *x* to the number of digits specified by *number-digits*.

Arguments:

Name	Type	Description
<i>x</i>	number	The value to be rounded.
<i>number-digits</i>	number	The number of digits to which <i>x</i> is to be rounded. If <i>number-digits</i> is greater than 0, <i>x</i> is rounded to the specified number of decimal places. If <i>number-digits</i> is 0, <i>x</i> is rounded to the nearest integer. If <i>number-digits</i> is less than 0, <i>x</i> is rounded to the left of the decimal point.

Return Type and Value: number – The rounded value of x . When rounding, digits 0–4 round down, while digits 5–9 round up.

[Example:

ROUND(2.15,1) results in 2.2

ROUND(2.149,1) results in 2.1

ROUND(-1.475,2) results in -1.48

ROUND(21.5,-1) results in 20

end example]

18.17.7.279 ROUNDDOWN

Syntax:

ROUNDDOWN (x , *number-digits*)

Description: Computes x rounded down, toward zero, to the number of digits specified by *number-digits*. [Note: ROUNDDOWN behaves like ROUND (§18.17.7.278), except that ROUNDDOWN always rounds a number down. end note]

Arguments:

Name	Type	Description
x	number	The value to be rounded down.
<i>number-digits</i>	number	The number of digits to which x is to be rounded. If <i>number-digits</i> is greater than 0, x is rounded to the specified number of decimal places. If <i>number-digits</i> is 0, x is rounded to the nearest integer. If <i>number-digits</i> is less than 0, x is rounded to the left of the decimal point.

Return Type and Value: number – The rounded-down value of x .

[Example:

ROUNDDOWN(3.2,0) rounds 3.2 down to zero decimal places; that is, to 3

ROUNDDOWN(76.9,0) rounds 76.9 down to zero decimal places; that is, to 76

ROUNDDOWN(3.14159,3) rounds 3.14159 down to three decimal places; that is, to 3.141

ROUNDDOWN(-3.14159,1) rounds -3.14159 down to one decimal place; that is, to -3.1

ROUNDDOWN(31415.92654,-2) rounds 31415.92654 down to two decimal places to the left of the decimal; that is, to 31400

end example]

18.17.7.280 ROUNDUP

Syntax:

ROUNDUP (*x* , *number-digits*)

Description: Computes *x* rounded up, away from zero, to the number of digits specified by *number-digits*. [Note: ROUNDUP behaves like ROUND (§18.17.7.278), except that ROUNDUP always rounds a number up. *end note*]

Arguments:

Name	Type	Description
<i>x</i>	number	The value to be rounded up.
<i>number-digits</i>	number	The number of digits to which <i>x</i> is to be rounded. If <i>number-digits</i> is greater than 0, <i>x</i> is rounded up to the specified number of decimal places. If <i>number-digits</i> is 0, <i>x</i> is rounded up to the nearest integer. If <i>number-digits</i> is less than 0, <i>x</i> is rounded up to the left of the decimal point.

Return Type and Value: number – The rounded-up value of *x*.

[Example:

ROUNDDOWN(3.2,0) rounds 3.2 down to zero decimal places; that is, to 3

ROUNDDOWN(76.9,0) rounds 76.9 down to zero decimal places; that is, to 76

ROUNDDOWN(3.14159,3) rounds 3.14159 down to three decimal places; that is, to 3.142

ROUNDDOWN(-3.14159,1) rounds -3.14159 down to one decimal place; that is, to -3.2

ROUNDDOWN(31415.92654,-2) rounds 31415.92654 down to two decimal places to the left of the decimal; that is, to 31500

end example]

18.17.7.281 ROW

Syntax:

ROW ([*reference*])

Description: Finds the number of the row(s) corresponding to *reference*.

Arguments:

Name	Type	Description
<i>reference</i>	reference to a single cell or to a range of	If omitted, the behavior is as if <i>reference</i> referred to the cell containing the formula.

Name	Type	Description
	contiguous cells	

Return Type and Value: number – If *reference* refers to a single cell or to a single row of cells, the corresponding row is returned. If *reference* refers to a range of cells involving multiple rows, a vertical array of the corresponding rows as numbers is returned.

However, if the range of cells referred to by *reference* is not contiguous, #REF! is returned.

[Example:

ROW() results in 16, when the cell containing the formula is in row 16

ROW(E17:G17) results in 17

ROW(E16:G17) results in a vertical array containing 16 and 17, respectively

end example]

18.17.7.282 ROWS

Syntax:

ROWS (*array*)

Description: Finds the number of rows corresponding to *array*.

Arguments:

Name	Type	Description
<i>array</i>	array, reference to a single cell, or a reference to a range of contiguous cells	A set of rows.

Return Type and Value: number – The number of rows corresponding to *array*.

However, if the range of cells referred to by *array* is not contiguous, #NULL! is returned.

[Example:

ROWS(E16:H16) results in 1

ROWS(E16:G18) results in 3

ROWS({1,2;3,4}) results in 2

end example]

18.17.7.283 RSQ

Syntax:

RSQ (*known-ys* , *known-xs*)

Description: Computes the square of the Pearson product moment correlation coefficient through data points in known ys and known xs.

Mathematical Formula:

The equation for the Pearson product moment correlation coefficient, *r*, is:

$$r = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sqrt{\sum(x - \bar{x})^2 \sum(y - \bar{y})^2}}$$

where:

- *x* = a sample value
- \bar{x} = the sample mean AVERAGE(*known-xs*)
- *y* = a sample value
- \bar{y} = the sample mean AVERAGE(*known-ys*)

Arguments:

Name	Type	Description
<i>known-xs</i>	number, name, array, or reference to number, text, logical	Designate a set of numeric data points. Logical values and text representations of numbers entered directly into the list of arguments are included. If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.
<i>known-ys</i>	number, name, array, or reference to number, text, logical	Designate a set of numeric data points. Logical values and text representations of numbers entered directly into the list of arguments are included. If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.

Return Type and Value: number – The square of the Pearson product moment correlation coefficient.

However, if

- *known-ys* and *known-xs* are empty or have a different number of data points, the return value is unspecified.
- *known-ys* and *known-xs* contain only one data point, the return value is unspecified.

[Example:

RSQ({2,3,9,1,8,7,5},{6,5,11,7,5,4,4}) results in 0.057950192

end example]

18.17.7.284 RTD

Syntax:

RTD (*progID* , [*rtd-server*] , *argument-list*)

Description: Retrieves data from a program in real-time. Periodically, this function returns new values and causes recalculation of the expression containing the call to it.

Arguments:

Name	Type	Description
<i>progID</i>	text	The name of the program from which the data is to be retrieved.
<i>rtd-server</i>	text	An optional string that is specific to the program with which RTD is communicating.
<i>argument list</i>	any	The presence and meaning of each <i>argument</i> in <i>argument-list</i> is specific to the program with which RTD is communicating.

Return Type and Value: array – The set of values returned by the program with which RTD is communicating.

[Example: Consider a stockprice program that is called as follows:

RTD("stockprice.rtd","NASD","MSFT")

The result it returns—the price of the stock MSFT according to NASD—changes over time, often every few seconds.

The *rtd-server* program could also be written to accept multiple arguments, allowing calls like the following::

RTD("stockprice.rtd","NASD","MSFT","GOOG","AMZN")

where three stock values are requested.

end example]

18.17.7.285 SEARCH

Syntax:

SEARCH (*string-1* , *string-2* [, *start-pos*])

Description: Performs a case-insensitive search, using a lexical comparison, for the first occurrence of *string-1* in *string-2*, starting at character position *start-pos* within *string-2*. (SEARCH is intended for use with languages that use the single-byte character set (SBCS), whereas SEARCHB (§18.17.7.286) is intended for use with languages that use the double-byte character set (DBCS).)

Arguments:

Name	Type	Description
<i>string-1</i>	text	Designate the string to be searched for within the string designated by <i>string-2</i> . <i>string-1</i> can contain the following wildcard characters: question mark (?) and asterisk (*). A question mark matches any single character; an asterisk matches any sequence of characters. To search for an actual question mark or asterisk, that character shall be preceded by a tilde (~).
<i>string-2</i>	text	
<i>start-pos</i>	number	The number of the start position within <i>string-2</i> for which <i>string-1</i> is to be searched. The start position of the first character is 1. If omitted, a position of 1 shall be assumed. <i>start-pos</i> shall be at least 0.

Return Type and Value: number – The start position of the first occurrence of *string-1* in *string-2*, starting at character position *start-pos* within *string-2*. If *string-1* is an empty string, it shall always be found in any *string-2* at position *start-pos*, or at position 1 if *start-pos* is omitted.

However, if

- *string-1* is not found within *string-2*, #VALUE! is returned.
- *start-pos* designates a position outside *string-2*, #VALUE! is returned.

[Example:

SEARCH("de", "abcdeF") results in 4

SEARCH("?c*e", "abcdeF") results in 2

end example]

18.17.7.286 SEARCHB

Syntax:

SEARCHB (*string-1* , *string-2* [, *start-pos*])

Description: Performs a case-insensitive search, using a lexical comparison, for the first occurrence of *string-1* in *string-2*, starting at byte position *start-pos* within *string-2*. (SEARCHB is intended for use with languages that use the double-byte character set (DBCS), whereas SEARCH (§18.17.7.285) is intended for use with languages that use the single-byte character set (SBCS).)

Arguments:

Name	Type	Description
<i>string-1</i>	text	Designate the string to be searched for within the string designated by <i>string-2</i> . <i>string-1</i> can contain the following wildcard characters: question mark (?) and asterisk (*). A question mark matches any single character; an asterisk matches any sequence of characters. To search for an actual question mark or asterisk, that character shall be preceded by a tilde (~).
<i>string-2</i>	text	
<i>start-pos</i>	number	The number of the start position within <i>string-2</i> for which <i>string-1</i> is to be searched. The start position of the first byte is 1. If omitted, a position of 1 shall be assumed. <i>start-pos</i> shall be at least 0.

Return Type and Value: number – The start position of the first occurrence of *string-1* in *string-2*, starting at character position *start-pos* within *string-2*. If *string-1* is an empty string, it shall always be found in any *string-2* at position *start-pos*, or at position 1 if *start-pos* is omitted.

However, if

- *string-1* is not found within *string-2*, #VALUE! is returned.
- *start-pos* designates a position outside *string-2*, #VALUE! is returned.

[Example: Assuming 1-byte characters

SEARCHB("de", "abcdeF") results in 4

SEARCHB("?c*e", "abcdeF") results in 2

end example]

18.17.7.287 SECOND

Syntax:

SECOND (*time-value*)

Description: Computes the second for the date and/or time having the given *time-value*.

Arguments:

Name	Type	Description
<i>time-value</i>	number	The date and/or time whose second is to be computed. That date and/or time shall be expressed either as a serial date-time, in which case, its integer part is ignored, or as a <i>string-constant</i> having any date and/or time format, in which case, any date information shall be ignored.

Return Type and Value: number – The second for the date and/or time having the given *time-value*.

However, if *time-value* is out of range for the current date system, #NUM! is returned.

[Example:

SECOND (DATE (2006, 2, 26) + TIME (2, 10, 20)) results in 20

SECOND (TIME (22, 56, 34)) results in 34

SECOND (0) results in 0, since serial date-time 0 represents 00:00:00

SECOND (10.5) results in 0, since serial date-time .5 represents 12:00:00

SECOND ("22-Oct-2001 10:53:12") results in 12

SECOND ("10:53:12 pm") results in 12

SECOND ("22:53:12") results in 12

end example]

18.17.7.288 **SERIESSUM**

Syntax:

SERIESSUM (*input-value* , *initial-power* , *step* , *coefficients*)

Description: Computes the sum of a power series.

Mathematical Formula:

The sum of a power series is based on the formula:

$$SERIES(x, n, m, a) = a_1 x^n + a_2 x^{(n+m)} + a_3 x^{(n+2m)} + \dots + a_i x^{(n+(i-1)m)}$$

where:

- *a* = argument *coefficients*
- *m* = argument *step*

- n = argument *initial-power*
- x = argument *input-value*

Arguments:

Name	Type	Description
<i>input-value</i>	number	The input value to the power series;
<i>initial-power</i>	number	The initial power to which <i>input-value</i> is to be raised.
<i>step</i>	number	The step by which to increase <i>initial-power</i> for each term in the series;
<i>coefficients</i>	reference	A set of coefficients by which each successive power of <i>input-value</i> is multiplied. The number of values in <i>coefficients</i> determines the number of terms in the power series.

Return Type and Value: number – The sum of a power series.

[Example: Given the following data:

	A
1	1
2	=-1/FACT(2)
3	=1/FACT(4)
4	=-1/FACT(6)

SERIESSUM(PI()/4,0,2,A1:A4) results in 0.707103, an approximation to the cosine of $\pi/4$ radians

end example]

18.17.7.289 SIGN

Syntax:

SIGN (x)

Description: Determines the sign of x .

Arguments:

Name	Type	Description
x	number	The number whose sign is to be determined.

Return Type and Value: number – 1 if x is positive, 0 if x is 0, and -1 if x is negative.

[Example:

SIGN(10.5) results in 1

SIGN(0) results in 0

SIGN(-5.4) results in -1

end example]

18.17.7.290 SIN

Syntax:

SIN (x)

Description: Computes the sine of x .

Arguments:

Name	Type	Description
x	number	The number, in radians, whose sine is to be computed.

Return Type and Value: number – The sine of x .

[Example:

SIN(-1) results in -0.841470985

SIN(0) results in 0

SIN(1) results in 0.841470985

end example]

18.17.7.291 SINH

Syntax:

SINH (x)

Description: Computes the hyperbolic sine of x .

Arguments:

Name	Type	Description
x	number	The number whose hyperbolic sine is to be computed.

Return Type and Value: number – The hyperbolic sine of x .

However, if the magnitude of x is too large for the result to be represented, #NUM! is returned.

[*Example:*

SINH(1) results in 1.175201194

SINH(10) results in 11013.23287

SINH(100) results in 1.34406E+43

end example]

18.17.7.292 SKEW

Syntax:

SKEW (*argument-list*)

Description: Computes the skewness of a distribution. [*Note:* Skewness characterizes the degree of asymmetry of a distribution around its mean. Positive skewness indicates a distribution with an asymmetric tail extending toward more positive values. Negative skewness indicates a distribution with an asymmetric tail extending toward more negative values. *end note*]

Mathematical Formula:

$$\frac{n}{(n-1)(n-2)} \sum \left(\frac{x_i - \bar{x}}{s} \right)^3$$

where:

- n = the number of elements in *argument-list*
- s = standard deviation of the values in *argument-list*
- x_i = value of each element in *argument-list*
- \bar{x} = mean of the values in *argument-list*

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number, name, text, array, reference	The <i>arguments</i> in <i>argument-list</i> designate the numbers for which the skewness is to be computed. Logical values and text representations of numbers that are entered directly into the list of arguments are included. If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.

Return Type and Value: number – The skewness of a distribution.

However, if

- There are fewer than three data points, the return value is unspecified.
- The sample standard deviation is zero, the return value is unspecified.

[Example:

SKEW(3,4,5,2,3,4,5,6,4,7) results in 0.359543071

end example]

18.17.7.293 SLN

SLN (*cost* , *salvage* , *life*)

Description: Computes the straight-line depreciation of an asset for one period.

Arguments:

Name	Type	Description
<i>cost</i>	number	The number <i>cost</i> is the initial cost of the asset.
<i>salvage</i>	number	The value at the end of the depreciation. (This is sometimes called the salvage value of the asset.)
<i>life</i>	number	The number of periods over which the asset is being depreciated. (This is sometimes called the useful life of the asset.)

Return Type and Value: number – The straight-line depreciation of an asset for one period.

[Example:

SLN(30000,7500,10) results in 2,250.00

end example]

18.17.7.294 SLOPE

Syntax:

SLOPE (*known-ys* , *known-xs*)

Description: Computes the slope of the linear regression line through data points in known ys and known xs. The slope is the vertical distance divided by the horizontal distance between any two points on the line, which is the rate of change along the regression line.

Mathematical Formula:

$$b = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sum(x - \bar{x})^2}$$

where:

- x = a sample value
- \bar{x} = the sample mean `AVERAGE(known-xs)`
- y = a sample value
- \bar{y} = the sample mean `AVERAGE(known-ys)`

Arguments:

Name	Type	Description
<i>known-xs</i>	number, name, array, or reference to number, text, logical	Designate a set of numeric dependent data points. Logical values and text representations of numbers entered directly into the list of arguments are included. If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.
<i>known-ys</i>	number, name, array, or reference to number, text, logical	Designate a set of numeric independent data points. Logical values and text representations of numbers entered directly into the list of arguments are included. If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.

Return Type and Value: number – The slope of the linear regression line through data points in known ys and known xs.

However, if

- *known-ys* and *known-xs* are empty, the return value is unspecified.
- *known-ys* and *known-xs* have a different number of data points, the return value is unspecified.

[Example:

`SLOPE({2,3,9,1,8,7,5},{6,5,11,7,5,4,4})` results in 0.305555556

end example]

18.17.7.295 SMALL

Syntax:

`SMALL (array , k)`

Description: Computes the k^{th} smallest value in a data set.

Arguments:

Name	Type	Description
<i>array</i>	array, reference	The set of numbers from which the k^{th} -smallest value is to be determined.
<i>k</i>	number	The position (from the smallest) in the array or cell range of data to return.

Return Type and Value: number – The k^{th} smallest value in a data set.

However, if

- *array* is empty, the return value is unspecified.
- $k \leq 0$ or k is greater than the number of data points, #NUM! is returned.

[Example:

SMALL({3,5,3,5,4;4,2,4,6,7},3) results in 3

SMALL({3,5,3,5,4;4,2,4,6,7},7) results in 5

end example]

18.17.7.296 SQRT

Syntax:

SQRT (*x*)

Description: Computes the positive square root of *x*.

Arguments:

Name	Type	Description
<i>x</i>	number	The number whose positive root is to be found.

Return Type and Value: number – The positive square root of *x*.

However, if *x* is negative, #NUM! is returned.

[Example:

SQRT(2) results in 1.414213562

SQRT(5) results in 2.236067977

end example]

18.17.7.297 SQRTPI

Syntax:

SQRTPI (x)

Description: Computes the positive square root of $x \times \pi$.

Arguments:

Name	Type	Description
x	number	The number, which when multiplied by π , whose positive root is to be found.

Return Type and Value: number – The positive square root of $x \times \pi$.

However, if x is negative, #NUM! is returned.

[*Example:*

SQRTPI(1) results in 1.772453851

SQRTPI(2) results in 2.506628275

end example]

18.17.7.298 STANDARDIZE

Syntax:

STANDARDIZE (x , *mean* , *standard-dev*)

Description: Computes a normalized value from a distribution characterized by *mean* and *standard-dev*.

Mathematical Formula:

$$Z = \frac{X - \mu}{\sigma}$$

where:

- X = argument x
- μ = argument *mean*
- σ = argument *standard-dev*

Arguments:

Name	Type	Description
x	number	The number whose value is to be normalized. Represented by X in the mathematical formula presented.
<i>mean</i>	number	The arithmetic mean of the distribution. Represented by μ (μ) in the mathematical formula presented.
<i>standard-dev</i>	number	The standard deviation of the distribution. Represented by σ (σ) in the mathematical formula presented.

Return Type and Value: number – A normalized value from a distribution.

However, if *standard-dev* ≤ 0 , #NUM! is returned.

[Example:

STANDARDIZE(42,40,1.5) results in 1.333333333

end example]

18.17.7.299 STDEV

Syntax:

STDEV (*argument-list*)

Description: Makes an estimate of the standard deviation based on a sample, using the "unbiased" or "n-1" method. [Note: STDEV assumes that its arguments are a sample of the population. If the data represents the entire population, STDEVP should be used instead. If logical values and text representations of numbers in a reference are to be included as part of the calculation, use STDEVA instead. end note]

Mathematical Formula:

$$\sqrt{\frac{\sum(x - \bar{x})^2}{(n - 1)}}$$

where:

- n = the sample size
- x = a sample value
- \bar{x} = the sample mean AVERAGE(*argument-1*, *argument-2*, ..., *argument-n*)

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number, name, text, array, reference	The <i>arguments</i> in <i>argument-list</i> designate the numbers that are samples of the population. <i>argument-list</i> can also be an array of numbers. Logical values and text representations of numbers that are entered directly into the list of arguments are included. If an argument is an array or reference, only numbers in that array or reference are included. Empty cells, logical values, text, or error values in the array or reference are ignored.

Return Type and Value: number – An estimate of the standard deviation based on a sample.

[Example:

STDEV(123,134,143,173,112,109) results in 23.72902583

end example]

18.17.7.300 STDEVA

Syntax:

STDEVA (*argument-list*)

Description: Makes an estimate of the standard deviation based on a sample, using the "unbiased" or "n-1" method. [Note: STDEVA assumes that its arguments are a sample of the population. If the data represents the entire population, STDEVP should be used instead. If logical values and text representations of numbers in a reference are to be excluded as part of the calculation, use STDEV instead. end note]

Mathematical Formula:

$$\sqrt{\frac{\sum(x - \bar{x})^2}{(n - 1)}}$$

where:

- n = the sample size
- x = a sample value
- \bar{x} = the sample mean AVERAGE(*argument-1*, *argument-2*, ..., *argument-n*)

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number,	The <i>arguments</i> in <i>argument-list</i> designate the numbers

Name	Type	Description
	name, text, array, reference. The argument list can also be an array of numbers.	that are samples of the population. Arguments that contain TRUE evaluate as 1; arguments that contain text or FALSE evaluate as zero. If an argument is an array or reference, only values in that array or reference are used. Empty cells and text values in the array or reference are ignored.

Return Type and Value: number – An estimate of the standard deviation based on a sample.

[Example:

STDEVA(123,134,143,173,112,109) results in 23.72902583

end example]

18.17.7.301 STDEVP

Syntax:

STDEVP (*argument-list*)

Description: Computes the standard deviation of an entire population, using the "biased" or "n" method. [Note: STDEVP assumes that its arguments are the total population. If the data represents a population sample only, STDEVA should be used instead. If logical values and text representations of numbers in a reference are to be included as part of the calculation, use STDEVPA instead. end note]

Mathematical Formula:

$$\sqrt{\frac{\sum(x - \bar{x})^2}{n}}$$

where:

- n = the sample size
- x = a sample value
- \bar{x} = the sample mean AVERAGE(*argument-1*, *argument-2*, ..., *argument-n*)

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number, name, text, array, reference.	The <i>arguments</i> in <i>argument-list</i> designate the numbers that are the members of the population. Logical values, and text representations of numbers that are entered

Name	Type	Description
	The argument list can also be an array of numbers.	directly into the list of arguments are included. If an argument is an array or reference, only numbers in that array or reference are included. Empty cells, logical values, text, or error values in the array or reference are ignored.

Return Type and Value: number – The standard deviation of an entire population.

[Example:

STDEVP(123,134,143,173,112,109) results in 21.66153785

end example]

18.17.7.302 STDEVPA

Syntax:

STDEVPA (*argument-list*)

Description: Computes the standard deviation of an entire population, using the "biased" or "n" method. [Note: STDEVPA assumes that its arguments are the total population. If the data represents a population sample only, STDEVA should be used instead. If logical values and text representations of numbers in a reference are to be excluded as part of the calculation, use STDEVP instead. end note]

Mathematical Formula:

$$\sqrt{\frac{\sum(x - \bar{x})^2}{n}}$$

where:

- n = the sample size
- x = a sample value
- \bar{x} = the sample mean AVERAGE(*argument-1*, *argument-2*, ..., *argument-n*)

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number, name, text, array, reference. The argument list can also be an	The <i>arguments</i> in <i>argument-list</i> designate the numbers that are the members of the population.

Name	Type	Description
	array of numbers.	

Return Type and Value: number – The standard deviation of an entire population.

Arguments can be numbers; names, arrays, or references that contain numbers; text representations of numbers; or logical values, in a reference. Text representations of numbers that are entered directly into the list of arguments are included. Arguments that contain TRUE evaluate as 1; arguments that contain text or FALSE evaluate as zero. If an argument is an array or reference, only values in that array or reference are used. Empty cells and text values in the array or reference are ignored.

[Example:

STDEVPA(123,134,143,173,112,109) results in 21.66153785

end example]

18.17.7.303 STEYX

Syntax:

STEYX (*known-ys* , *known-xs*)

Description: Computes the standard error of the predicted *y*-value for each *x* in the regression. The standard error is a measure of the amount of error in the prediction of *y* for an individual *x*.

Mathematical Formula:

$$\sqrt{\frac{1}{(n-2)} \left[\sum (y - \bar{y})^2 - \frac{[\sum (x - \bar{x})(y - \bar{y})]^2}{\sum (x - \bar{x})^2} \right]}$$

where:

- *x* = a sample value
- \bar{x} = the sample mean AVERAGE(*known-xs*)
- *y* = a sample value
- \bar{y} = the sample mean AVERAGE(*known-ys*)

Arguments:

Name	Type	Description
<i>known-xs</i>	number, name, array, or reference to	Designate a set of numeric dependent data points. Logical values and text representations of numbers entered directly into the list of arguments are included. If

Name	Type	Description
	number, text, logical	an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.
<i>known-ys</i>	number, name, array, or reference to number, text, logical	Designate a set of numeric independent data points. Logical values and text representations of numbers entered directly into the list of arguments are included. If an array or reference argument contains text, logical values, or empty cells, those values are ignored; however, cells with the value 0 are included.

Return Type and Value: number – The standard error of the predicted y -value for each x in the regression.

However, if

- *known-ys* and *known-xs* have a different number of data points, the return value is unspecified.
- *known-ys* and *known-xs* are empty or have less than three data points, the return value is unspecified.

[Example:

STEYX({2,3,9,1,8,7,5},{6,5,11,7,5,4,4}) results in 3.30571895

end example]

18.17.7.304 SUBSTITUTE

Syntax:

SUBSTITUTE (*string* , *old-string* , *new-string* [, *occurrence*])

Description: Produces a new string that is *string* with one or all occurrences of *old-string* replaced by *new-string*.

Arguments:

Name	Type	Description
<i>string</i>	text	Designates a string.
<i>old-string</i>	text	Designates a string.
<i>new string</i>	text	Designates a string.
<i>occurrence</i>	number	The occurrence number of the <i>old-string</i> characters within <i>string-1</i> that is to be replaced by the string designated by <i>new-string</i> . If omitted, all occurrences of <i>old-string</i> characters shall be replaced.

Return Type and Value: text – A string that is *string* with one or all occurrences of *old-string* replaced by *new-string*.

However, if *occurrence* < 0, #VALUE! is returned.

[Example:

SUBSTITUTE("abcaaabca", "a", "xx") results in xxbcxxxxxxbcxx

SUBSTITUTE("abcaaabca", "a", "", 10) results in bcbc

SUBSTITUTE("abcaaabca", "a", "xx", 3) results in abcaxxabca

end example]

18.17.7.305 SUBTOTAL

Syntax:

SUBTOTAL (*function-number* , *argument-list*)

Description: Computes a value using the function designated by *function-number*, using the *arguments* in *argument-list*.

Arguments:

Name	Type	Description
<i>function-number</i>	number	Indicates the function to be called, as shown in the table below.
<i>argument-list</i>	number	Each <i>argument</i> in <i>argument-list</i> is passed to the called function, in the order specified. That shall be no more than 254 <i>arguments</i> .

<i>function-number</i> (includes hidden values)	<i>function-number</i> (excludes hidden values)	Function
1	101	AVERAGE
2	102	COUNT
3	103	COUNTA
4	104	MAX
5	105	MIN
6	106	PRODUCT
7	107	STDEV
8	108	STDEVP
9	109	SUM

<i>function-number</i> (includes hidden values)	<i>function-number</i> (excludes hidden values)	Function
10	110	VAR
11	111	VARP

If any argument contains a SUBTOTAL function call, that call shall be ignored to avoid double counting.

For the *function-number* values 1–11, the values of hidden rows are included. For the *function-number* values 101–111, the values of hidden rows are excluded.

The SUBTOTAL function shall ignore any rows that are not included in the result of a filter, regardless of which *function-number* value is used.

The SUBTOTAL function is designed for columns of data, or vertical ranges. It is not designed for rows of data, or horizontal ranges. [Example: When a horizontal range is subtotaled using a *function-number* of 101 or greater, hiding a column does not affect the subtotal. However, hiding a row in a subtotal of a vertical range does affect the subtotal. end example]

Return Type and Value: number – The result from calling the function designated by *function-number*, using the *arguments* in *argument-list*.

However, if *function-number* does not have one of the values specified above, #NUM! is returned.

[Example:

SUBTOTAL (2, E5:E15) counts the number of values in the cell range E5:E15, including hidden values

SUBTOTAL (4, E5:E15) finds the maximum value of the values in the cell range E5: E15, including hidden values

SUBTOTAL (106, E5:E15) finds the product of the values in the cell range E5: E15, excluding hidden values

end example]

18.17.7.306 SUM

Syntax:

SUM (*argument-list*)

Description: Adds the numeric values of *arguments* in *argument-list*.

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number, name, text, array, reference.	The <i>arguments</i> in <i>argument-list</i> designate the numeric values to be added. Arguments that are numbers, logical values, or text representations of numbers shall be

Name	Type	Description
		counted. If an argument is an array or reference, only numbers in that array or reference shall be counted. Empty cells, logical values, and text in the array or reference shall be ignored.

Return Type and Value: number – The sum of the values of its arguments.

[Example:

SUM(1,2,3,4,5) results in 15

SUM({1,2;3,4}) results in 10

SUM({1,2,3,4,5},6,"7") results in 28

SUM({1,"2",TRUE,4}) results in 5, as the logical value and numeric text are ignored

end example]

18.17.7.307 SUMIF

Syntax:

SUMIF (*cell-range* , *selection-criteria* [, *sum-range*])

Description: Applies selection criteria on the values in one range of cells and sums the values of the cells in a corresponding range.

Arguments:

Name	Type	Description
<i>cell-range</i>	reference	Designates the range of cells to be inspected.
<i>selection-criteria</i>	number, expression, reference, text	Defines which cells are counted. In the case of text, <i>selection-criteria</i> can consist of any comparison operator followed by the operand against which each cell's value is to be compared. <i>selection-criteria</i> can include one or more wildcard characters, question mark (?) and asterisk (*). A question mark matches any single character; an asterisk matches any sequence of characters. To search for a question mark, asterisk, or tilde character, prefix that character with a tilde (~).
<i>sum-range</i>	reference	If present, <i>sum-range</i> designates the cells whose values are summed. In this case, <i>sum-range</i> does not have to have the same size and shape as <i>cell-range</i> . The actual cells that are added are determined by using the top, left cell in <i>sum-range</i> as the beginning cell, and then including cells that correspond in size and shape to <i>cell-range</i> . If

Name	Type	Description
		omitted, <i>cell-range</i> also designates the cells whose values are summed.

Return Type and Value: number – The sum of the cells corresponding to those selected.

[Example: Given that A1, B1, C1, and D1, respectively, contain the values 3, 10, 7, and 10

SUMIF(A1:D1, "=10") results in 20

SUMIF(A1:D1, ">5") results in 27

SUMIF(A1:D1, "<>10") results in 10

Given that A2, B2, C2, and D2, respectively, contain the values apples, melons, 10, and 15

SUMIF(A2:B2, "*es", C2:D2) results in 10

end example]

18.17.7.308 SUMIFS

Syntax:

SUMIFS (*sum-range* , *cell-range-1* , *selection-criteria-1*
[, *cell-range-2* , *selection-criteria-2* [, ...]])

Description: Adds the cells in a range that meet multiple criteria.

Arguments:

Name	Type	Description
<i>sum-range</i>	reference	Designates the cells whose values are summed. In this case, <i>sum-range</i> does not have to have the same size and shape as <i>cell-range-1</i> through <i>cell-range-n</i> . The actual cells that are added are determined by using the top, left cell in <i>sum-range</i> as the beginning cell, and then including cells that correspond in size and shape to <i>cell-range-1</i> through <i>cell-range-n</i> . Each cell in <i>sum-range</i> is summed only if all of the corresponding criteria specified are true for that cell. Cells in <i>sum-range</i> that contain TRUE evaluate to 1; cells in <i>sum-range</i> that contain FALSE evaluate to 0.
<i>cell-range-1</i>	reference	Designates the first range of cells to be inspected.
<i>selection-criteria-1</i>	number, expression, reference, text	Specifies the criteria for the first range of cells that is counted. In the case of text, <i>selection-criteria-1</i> can consist of any comparison operator followed by the operand against which each cell's value is to be

Name	Type	Description
		compared. <i>selection-criteria-1</i> can include one or more wildcard characters, question mark (?) and asterisk (*). A question mark matches any single character; an asterisk matches any sequence of characters. To search for a question mark, asterisk, or tilde character, prefix that character with a tilde (~).
<i>cell-range-n</i>	reference	The optional arguments <i>selection-criteria-2</i> through <i>selection-criteria-n</i> have corresponding arguments <i>cell-range-2</i> through <i>cell-range-n</i> , and have the same semantics as <i>selection-criteria-1</i> and <i>cell-range-1</i> , respectively.
<i>selection-criteria-n</i>	number, expression, reference, text	

Return Type and Value: number – The sum of the cells corresponding to those selected.

[Example: Given the following data:

	A	B	C	D
1	Sales Person	Tables	Chairs	Desks
2	Emilio	34	85	97
3	Julie	353	23	18
4	Hans	13	67	14
5	Frederique	0	98	0

SUMIFS(B2:C5,A2:A5,"=Julie") results in 353 (the sum of the number of tables and chairs sold by Julie)

SUMIFS(B2:B5,A2:A5,"=Julie",A2:A5,"=Hans") results in 0 (the sum of the number of tables sold by Julie and Hans)

SUMIFS(B2:B5,A3,"=Julie",A4,"=Hans") results in 34 (the sum of the the number of tables sold by Julie and Hans)

SUMIFS(B2:D5,A2:A5,"<>Emilio") results in 768 (the sum of the number of tables, chairs, and desks sold by all sales persons except Emilio)

end example]

18.17.7.309 SUMPRODUCT

Syntax:

SUMPRODUCT (*argument-list*)

Description: Multiplies the corresponding elements in the array *arguments* in *argument-list*, and returns the sum of those products. An array element that is not numeric is treated as if it contained 0.

Arguments:

Name	Type	Description
<i>argument-list</i>	array of numbers	The <i>arguments</i> in <i>argument-list</i> designate the numeric values to be multiplied.

Return Type and Value: number – The sum of the products of the corresponding elements in the *arguments* in *argument-list*.

However, if the array arguments do not have the same dimensions, #NUM! is returned.

[Example:

SUMPRODUCT({2,3}) results in 5

SUMPRODUCT({2,3},{4,5}) results in 23

SUMPRODUCT({2,3},{4,5},{2,2}) results in 46

SUMPRODUCT({2,3;4,5},{2,2;3,4}) results in 42

end example]

18.17.7.310 SUMSQ

Syntax:

SUMSQ (*argument-list*)

Description: Adds the squares of *arguments* in *argument-list*.

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number, name, text, array, reference	The <i>arguments</i> in <i>argument-list</i> designate the values whose squares are to be summed. Arguments that are numbers, logical values, or text representations of numbers shall be counted. If an argument is an array or reference, only numbers in that array or reference shall be counted. Empty cells, logical values, and text in the array or reference shall be ignored.

Return Type and Value: number – The sum of the squares of its arguments.

[Example:

SUMSQ(2) results in 4
SUMSQ(2.5, -3.6)) results in 19.21
SUMSQ({2.5, -3.6}), 2.4) results in 24.97

end example]

18.17.7.311 SUMX2MY2

Syntax:

SUMX2MY2 (array-1 , array-2)

Description: Computes the sum of the difference of squares of the corresponding numerical elements in two arrays designated by *array-1* and *array-2*.

Mathematical Formula:

$$SUMX2MY2 = \sum (x^2 - y^2)$$

where:

- *array-1* contains the *x* values
- *array-2* contains the *y* values

Arguments:

Name	Type	Description
<i>array-1</i>	array, reference	Designated the arrays to be operated on. If an argument contains text, logical values, or empty cells, those elements shall be ignored; however, cells with the value 0 shall be included.
<i>array-2</i>		

Return Type and Value: number – The sum of the difference of squares of the corresponding elements in two arrays designated by *array-1* and *array-2*.

However, if *array-1* and *array-2* have a different number of values, the return value is unspecified.

[Example:

SUMX2MY2({2,3,9,1,8,7,5},{6,5,11,7,5,4,4}) results in 55
SUMX2MY2({2,3,9;1,8,7},{6,5,11;7,5,4}) results in -64
end example]

18.17.7.312 SUMX2PY2

Syntax:

SUMX2PY2 (*array-1* , *array-2*)

Description: Computes the sum of the sum of the squares of the corresponding numerical elements in two arrays designated by *array-1* and *array-2*.

Mathematical Formula:

$$SUMX2PY2 = \sum (x^2 + y^2)$$

where:

- *array-1* contains the *x* values
- *array-2* contains the *y* values

Arguments:

Name	Type	Description
<i>array-1</i>	array, reference	Designated the arrays to be operated on. If an argument contains text, logical values, or empty cells, those elements shall be ignored; however, cells with the value 0 shall be included.
<i>array-2</i>		

Return Type and Value: number – The sum of the sum of the squares of the corresponding elements in two arrays designated by *array-1* and *array-2*.

However, if *array-1* and *array-2* have a different number of values, the return value is unspecified.

[Example:

SUMX2PY2({2,3,9,1,8,7,5},{6,5,11,7,5,4,4}) results in 521

SUMX2PY2({2,3,9;1,8,7},{6,5,11;7,5,4}) results in 480

end example]

18.17.7.313 SUMXMY2

Syntax:

SUMXMY2 (*array-1* , *array-2*)

Description: Computes the sum of the squares of the difference between corresponding numerical elements in two arrays designated by *array-1* and *array-2*.

Mathematical Formula:

$$SUMXMY2 = \sum (x - y)^2$$

where:

- *array-1* contains the *x* values
- *array-2* contains the *y* values

Arguments:

Name	Type	Description
<i>array-1</i>	array, reference	Designated the arrays to be operated on. If an argument contains text, logical values, or empty cells, those elements shall be ignored; however, cells with the value 0 shall be included.
<i>array-2</i>		

Return Type and Value: number – The sum of the squares of the difference between the corresponding elements in two arrays designated by *array-1* and *array-2*.

However, if *array-1* and *array-2* have a different number of values, the return value is unspecified.

[Example:

SUMXMY2({2,3,9,1,8,7,5},{6,5,11,7,5,4,4}) results in 79

SUMXMY2({2,3,9;1,8,7},{6,5,11;7,5,4}) results in 78

end example]

18.17.7.314 SYD

SYD (*cost* , *salvage* , *life* , *per*)

Description: Computes the sum-of-years' digits depreciation of an asset for a specified period.

Mathematical Formula:

$$SYD = \frac{(cost - salvage) * (life - per + 1) * 2}{(life)(life + 1)}$$

where:

- *cost* = argument *cost*
- *life* = argument *life*
- *per* = argument *per*
- *salvage* = argument *salvage*

Arguments:

Name	Type	Description
<i>cost</i>	number	The initial cost of the asset.
<i>salvage</i>	number	The value at the end of the depreciation. (This is sometimes called the salvage value of the asset.)
<i>life</i>	number	The number of periods over which the asset is being depreciated. (This is sometimes called the useful life of the asset.)
<i>per</i>	number	The period and shall have the same units as <i>life</i> .

Return Type and Value: number – The sum-of-years' digits depreciation of an asset for a specified period.

[Example:

SYD(30000,7500,10,1) results in 4,090.91

SYD(30000,7500,10,10) results in 409.09

end example]

18.17.7.315 T

Syntax:

T (*value*)

Description: Retrieves the text referenced by *value*.

Arguments:

Name	Type	Description
<i>value</i>	any	The value to be tested for text. No conversion to text shall take place on an argument passed to this function.

Return Type and Value: text – *value* if *value* designates text; otherwise, "". [Note: T cannot differentiate between text that is an empty string, and any *value* of non-text type. end note]

[Example:

T("Hello") results in Hello

T(123) results in an empty string

LEN(T(123)) results in 0

*end example]***18.17.7.316 TAN****Syntax:**TAN (x)**Description:** Computes the tangent of x .**Arguments:**

Name	Type	Description
x	number	The number, in radians, whose tangent is to be computed.

Return Type and Value: number – The tangent of x .*[Example:*

TAN(-1) results in -1.557407725

TAN(0) results in 0

TAN(1) results in 1.557407725

*end example]***18.17.7.317 TANH****Syntax:**TANH (x)**Description:** Computes the hyperbolic tangent of x .**Arguments:**

Name	Type	Description
x	number	The number whose hyperbolic tangent is to be computed.

Return Type and Value: number – The hyperbolic tangent of x *[Example:*

TANH(-1) results in -0.761594156

TANH(0) results in 0

TANH(1) results in 0.761594156

end example]

18.17.7.318 TBILLEQ

TBILLEQ (*settlement* , *maturity* , *discount*)

Description: Computes the bond-equivalent yield for a U.S. Treasury bill.

Arguments:

Name	Type	Description
<i>settlement</i>	number	The Treasury bill's settlement date. Any time information in the date is ignored.
<i>maturity</i>	number	The Treasury bill's maturity date. Any time information in the date is ignored.
<i>discount</i>	number	The Treasury bill's discount rate.

Return Type and Value: number – The bond-equivalent yield for a U.S. Treasury bill.

However, if

- *settlement* or *maturity* is out of range for the current date system, #NUM! is returned.
- *settlement* > *maturity*, #NUM! is returned.
- *maturity* is more than one year after *settlement*, #NUM! is returned.
- *discount* ≤ 0, #NUM! is returned.

[Example:

TBILLEQ(DATE(2008,3,31),DATE(2008,6,1),0.0914) results in 9.4151%

end example]

18.17.7.319 TBILLPRICE

TBILLPRICE (*settlement* , *maturity* , *discount*)

Description: Computes the price per \$100 face value for a U.S. Treasury bill.

Mathematical Formula:

$$TBILLPRICE = 100 \times \left(1 - \frac{discount \times DSM}{360} \right)$$

where:

- *discount* = argument *discount*
- *DSM* = number of days from settlement to maturity, excluding any maturity date that is more than one calendar year after the settlement date.

Arguments:

Name	Type	Description
<i>settlement</i>	number	The Treasury bill's settlement date. Any time information in the date is ignored.
<i>maturity</i>	number	The Treasury bill's maturity date. Any time information in the date is ignored.
<i>discount</i>	number	The Treasury bill's discount rate.

Return Type and Value: number – The price per \$100 face value for a U.S. Treasury bill.

However, if

- *settlement* or *maturity* is out of range for the current date system, #NUM! is returned.
- *settlement* > *maturity*, #NUM! is returned.
- *maturity* is more than one year after *settlement*, #NUM! is returned.
- *discount* ≤ 0, #NUM! is returned.

[Example:

TBILLPRICE (DATE (2008, 3, 31), DATE (2008, 6, 1), 0.09) results in 98.4500

end example]

18.17.7.320 TBILLYIELD

TBILLYIELD (*settlement* , *maturity* , *pr*)

Description: Computes the yield for a U.S. Treasury bill.

Mathematical Formula:

$$TBILLYIELD = \frac{100 - pr.}{pr.} \times \frac{360}{DSM}$$

where:

- *DSM* = number of days from settlement to maturity, excluding any maturity date that is more than one calendar year after the settlement date.
- *pr.* = argument *pr*

Arguments:

Name	Type	Description
<i>settlement</i>	number	The Treasury bill's settlement date. Any time information in the date is ignored.
<i>maturity</i>	number	The Treasury bill's maturity date. Any time information in the date is ignored.
<i>pr</i>	number	The Treasury bill's price per \$100 face value.

Return Type and Value: number – The yield for a U.S. Treasury bill.

However, if

- *settlement* or *maturity* is out of range for the current date system, #NUM! is returned.
- *settlement* > *maturity*, #NUM! is returned.
- *maturity* is more than one year after *settlement*, #NUM! is returned.
- $pr \leq 0$, #NUM! is returned.

[Example:

TBILLYIELD(DATE(2008,3,31),DATE(2008,6,1),98.45) results in 9.1417%

end example]

18.17.7.321 TDIST

Syntax:

TDIST (*x* , *degrees-freedom* , *distribution-tails*)

Description: Computes the Percentage Points (probability) for the Student t-distribution where a numeric value, *x*, is a calculated value of *t* for which the Percentage Points are to be computed.

Mathematical Formula:

If *distribution-tails* = 1, $TDIST = P(X > x)$, where *X* is a random variable that follows the t-distribution.

If *distribution-tails* = 2, $TDIST = P(|X| > x) = P(X > x \text{ or } X < -x)$

Arguments:

Name	Type	Description
<i>x</i>	number	The value at which to evaluate the distribution.
<i>degrees-freedom</i>	number	The number of degrees of freedom, truncated to an integer.
<i>distribution-tails</i>	number	The number of distribution tails to return, truncated to an integer. If 1, TDIST returns the one-tailed distribution.

Name	Type	Description
		If 2, TDIST returns the two-tailed distribution.

Return Type and Value: number – The Percentage Points (probability) for the Student t-distribution.

However, if

- *degrees-freedom* < 1, #NUM! is returned.
- *tails* has any value other than 1 or 2, #NUM! is returned.
- *x* < 0, #NUM! is returned.

[Example:

TDIST(1.959999998,60,1) results in 0.027322464

TDIST(1.959999998,60,2) results in 0.054644927

end example]

18.17.7.322 TEXT

Syntax:

TEXT (*value* , *format*)

Description: Produces a string containing *value* formatted according to *format*.

Arguments:

Name	Type	Description
<i>value</i>	number	The number that is to be formatted.
<i>format</i>	text	Designates the number, currency, date, or time format to be used. (See §18.8.31 for the set of formats.)

Return Type and Value: text – The string containing *number* formatted according to *format*.

[Example:

TEXT(1234.567,"\$0.00") results in \$1234.57

TEXT(.125,"\$0.0%") results in 12.5%

TEXT(1234.567,"YYYY-MM-DD HH:MM:SS") results in 1903-05-18 13:36:29 in the 1900 date system.

end example]

18.17.7.323 TIME

Syntax:

TIME (*hour* , *minute* , *second*)

Description: Computes the serial date-time for the given time.

Arguments:

Name	Type	Description
<i>hour</i>	number	A number in the range 0–32767, inclusive, truncated to integer, that represents the hour. Any value greater than 23 shall be divided by 24 and the remainder shall be treated as the hour value.
<i>minute</i>	number	A number in the range 0–32767, inclusive, truncated to integer, that represents the minute. Any value greater than 59 shall be converted to the corresponding number of hours and minutes.
<i>second</i>	number	A number in the range 0–32767, inclusive, truncated to integer, that represents the second. Any value greater than 59 shall be converted to the corresponding number of hours, minutes, and seconds.

Return Type and Value: number – The serial date-time for the given time, as a value greater than or equal to 0 and less than or equal to 1.

However, if *hour*, *minute*, or *second* are out of range, #NUM! is returned.

[Example: The following serial date-times are displayed with 16 decimal places.

TIME(0,0,0) results in a serial date-time of 0.0000000000000000

TIME(0,0,1) results in a serial date-time of 0.0000115740740741

TIME(0,0,2) results in a serial date-time of 0.0000231481481481

TIME(0,0,20) results in a serial date-time of 0.0002314814814815

TIME(2,3,20) results in a serial date-time of 0.0856481481481481

TIME(12,0,0) results in a serial date-time of 0.5000000000000000

TIME(23,59,59) results in a serial date-time of 0.9999884259259260

TIME(26,120,240) results in a serial date-time of 0.1694444444444450

end example]

18.17.7.324 TIMEVALUE

Syntax:

TIMEVALUE (*date-time-string*)

Description: Computes the serial date-time of the time represented by the string *date-time-string*.

Arguments:

Name	Type	Description
<i>date-time-string</i>	text	The date and/or time whose time component serial date-time is to be computed. <i>date-time-string</i> can have any date and/or time format. Any date information in <i>date-time-string</i> shall be ignored.

Return Type and Value: number – The serial date-time of the time represented by the string *date-time-string*, as a value greater than or equal to 0 and less than or equal to 1.

However, if *date-time-string* is ill-formed, #VALUE! is returned.

[Example: The following serial date-times are displayed with 16 decimal places.

TIMEVALUE("10:02:34 ") results in 0.4184490740740740

TIMEVALUE("01-Feb-2006 10:15:29 AM") results in 0.4274189814823330

TIMEVALUE("22:02") results in 0.9180555555555560

end example]

18.17.7.325 TINV

Syntax:

TINV (*probability* , *degrees-freedom*)

Description: Computes the t-value of the Student's t-distribution as a function of the probability and the degrees of freedom.

Arguments:

Name	Type	Description
<i>probability</i>	number	A probability associated with the two-tailed Student's t-distribution.
<i>degrees-freedom</i>	number	The number of degrees of freedom with which to characterize the distribution, truncated to an integer.

Return Type and Value: number – The t-value of the Student's t-distribution.

However, if

- *probability* < 0 or *probability* > 1, #NUM! is returned.
- *degrees-freedom* < 1, #NUM! is returned.

[Example:

TINV(0.054644927,60) results in 1.95999999

end example]

18.17.7.326 TODAY

Syntax:

TODAY ()

Description: Computes the serial date-time of the current date, taking into account the current date base system.

Arguments: None.

Return Type and Value: number – The serial date-time of the current date.

[Example:

On February 25, 2006, TODAY() results in 38773 for the 1900 date system, or 37311 for the 1904 date system

end example]

18.17.7.327 TRANSPOSE

Syntax:

TRANSPOSE (*array*)

Description: Creates a new array that is the transpose of an existing array, by copying the first row of the existing array to the first column of the new array, the second row of the existing array as the second column of the new array, and so on. The formula containing the call to TRANSPOSE shall be an array formula in a range that has the same number of rows and columns, respectively, as *array* has columns and rows.

Arguments:

Name	Type	Description
<i>array</i>	array, reference	The set of values to be transposed.

Return Type and Value: array – The new array.

[Example:

TRANSPOSE({10,20,30}) results in the array {10;20;30}

end example]

18.17.7.328 TREND

Syntax:

TREND (*known-ys* [, [*known-xs*] [, [*new-xs*] [, *const-flag*]])

Description: Computes values along a linear trend. Fits a straight line (using the method of least squares) to the arrays *known-ys* and *known-xs*. The y-values along that line for the array of *new-xs* specified.

Arguments:

Name	Type	Description
<i>known-ys</i>	array	The set of y-values already known in the relationship $y=mx+b$. If that array is in a single column, each column of <i>known-xs</i> is interpreted as a separate variable. If that array is in a single row, each row of <i>known-xs</i> is interpreted as a separate variable.
<i>known-xs</i>	array	An optional set of x-values that might already be known in the relationship $y=mx+b$. The array <i>known-xs</i> can include one or more sets of variables. If only one variable is used, <i>known-ys</i> and <i>known-xs</i> can be ranges of any shape, as long as they have equal dimensions. If more than one variable is used, <i>known-ys</i> shall be a vector. If <i>known-xs</i> is omitted, it is assumed to be the array {1,2,3,...} that is the same size as <i>known-ys</i> .
<i>new-xs</i>	array	New x-values for which TREND is to return corresponding y-values. <i>new-xs</i> shall include a column (or row) for each independent variable, just as <i>known-xs</i> does. So, if <i>known-ys</i> is in a single column, <i>known-xs</i> and <i>new-xs</i> shall have the same number of columns. If <i>known-ys</i> is in a single row, <i>known-xs</i> and <i>new-xs</i> shall have the same number of rows. If <i>new-xs</i> is omitted, it is assumed to be the same as <i>known-xs</i> . If both <i>known-xs</i> and <i>new-xs</i> are omitted, they are assumed to be the array {1,2,3,...} that is the same size as <i>known-ys</i> .
<i>const-flag</i>	logical	Specifies whether to force the constant b to equal 0. If TRUE or omitted, b is calculated normally. If FALSE, b is set equal to 0 and the m-values are adjusted so that $y=mx$.

Return Type and Value: array – The values along a linear trend, as an array of numbers.

18.17.7.329 TRIM

Syntax:

TRIM (*string*)

Description: Makes a string that is a copy of *string* with the leading and trailing space characters removed, and each sequence of embedded spaces reduced to a single space. The space character referred to here is character U+0020.

Arguments:

Name	Type	Description
<i>string</i>	text	Designates the string to be trimmed.

Return Type and Value: text – The trimmed copy of *string*.

[Example:

TRIM(" abc def ") results in abc def

end example]

18.17.7.330 TRIMMEAN

Syntax:

TRIMMEAN (*array* , *percent*)

Description: Computes the mean of the interior of a data set by excluding a percentage of data points from the top and bottom tails of a data set. TRIMMEAN rounds the number of excluded data points down to the nearest multiple of 2. For symmetry, TRIMMEAN excludes a single value from the top and bottom of the data set.

Arguments:

Name	Type	Description
<i>array</i>	array, reference	The numeric values to trim and average.
<i>percent</i>	number	The fractional number of data points to exclude from the calculation. [Example: If <i>percent</i> = 0.2, 4 points are trimmed from a data set of 20 points (20x0.2): 2 from the top and 2 from the bottom of the set. end example]

Return Type and Value: number – The mean of the interior of a data set.

However, if *percen* < 0 or *percen* > 1, #NUM! is returned.

[Example:

TRIMMEAN({4,6,2,5,7,8,9},0.2) results in 5.857142857

end example]

18.17.7.331 TRUE

Syntax:

TRUE ()

Description: Computes the value TRUE. (A call to function TRUE is equivalent to using the *logical-constant* TRUE.)

Arguments: None.

Return Type and Value: logical – The value TRUE.

[Example:

TRUE() results in TRUE

end example]

18.17.7.332 TRUNC

Syntax:

TRUNC (*x* [, *number-digits*])

Description: Truncates *x* to the number of fractional digits by *number-digits*.

Arguments:

Name	Type	Description
<i>x</i>	array, reference	The value to be rounded down.
<i>number-digits</i>	number	The number of fractional digits to which <i>x</i> is to be truncated. The default value for <i>number-digits</i> is 0.

Return Type and Value: number – The truncated value of *x*.

[Example:

TRUNC(PI()) results in 3

TRUNC(PI(),1) results in 3.1

TRUNC(PI(),3) results in 3.141

TRUNC(PI(),5) results in 3.14159

end example]

18.17.7.333 TTEST

Syntax:

TTEST (*array-1* , *array-2* , *distribution-tails* , *test-type*)

Description: Computes the probability associated with a Student's t-Test.

Arguments:

Name	Type	Description								
<i>array-1</i>	array, reference	The first numerical data set.								
<i>array-1</i>	array, reference	The first numerical data set.								
<i>distribution-tails</i>	number	Specifies the number of distribution tails, truncated to an integer. If 1, TTEST uses the one-tailed distribution. If 2, TTEST uses the two-tailed distribution.								
<i>test-type</i>	number	The truncated-to-integer kind of t-Test to perform, as follows: <table><tr><th>Value</th><th>Test Performed</th></tr><tr><td>1</td><td>Paired</td></tr><tr><td>2</td><td>Two-sample equal variance (homoscedastic)</td></tr><tr><td>3</td><td>Two-sample unequal variance (heteroscedastic)</td></tr></table>	Value	Test Performed	1	Paired	2	Two-sample equal variance (homoscedastic)	3	Two-sample unequal variance (heteroscedastic)
Value	Test Performed									
1	Paired									
2	Two-sample equal variance (homoscedastic)									
3	Two-sample unequal variance (heteroscedastic)									

Return Type and Value: number – The probability associated with a Student's t-Test.

However, if

- *array-1* and *array-2* have a different number of data points, and *test-type* is 1, the return value is unspecified.
- *distribution-tails* is any value other than 1 or 2, #NUM! is returned.

[Example: Given the following data:

	A	B
1	Data 1	Data 2

	A	B
2	3	6
3	4	19
4	5	3
5	8	2
6	9	14
7	1	4
8	2	5
9	4	17
10	5	1

TTEST(A2:A10,B2:B10,2,1) results in 0.196016

end example]

18.17.7.334 TYPE

Syntax:

TYPE (*value*)

Description: Computes the type of *value* or, if *value* is a reference to a single cell, the type of the value in that cell.

Arguments:

Name	Type	Description
<i>value</i>	any	The value whose type is to be determined. No conversion shall take place on an argument passed to this function.

Return Type and Value: number – An integer that indicates the type of *value* or, if *value* is a reference to a single cell, the type of the value in that cell, as follows:

Type of <i>value</i>	Value Returned
number	1
text	2
logical	4
error value	16
array of any kind	64

[Example:

TYPE(10.5) results in 1

TYPE(A10) results in 1, when A10 contains a number

TYPE("ABC") results in 2

TYPE(A10) results in 2, when A10 contains a string

TYPE(TRUE) results in 4

TYPE(A10) results in 4, when A10 contains a logical value

TYPE(5/0) results in 16

TYPE(A10) results in 16, when A10 contains any error value

TYPE({1,2,3}) results in 64

TYPE({TRUE,2.5,#N/A}) results in 64

TYPE(IF(10>5,"Yes",20)) results in 2

TYPE(IF(10<5,"Yes",20)) results in 1

end example]

18.17.7.335 UPPER

Syntax:

UPPER (*string*)

Description: Makes an uppercase version of *string*.

Arguments:

Name	Type	Description
<i>string</i>	text	Designates the string to be converted.

Return Type and Value: text – The uppercase version of *string*.

[Example:

UPPER("AbCd123#\$\$%^") results in ABCD123#\$\$%^

UPPER(A10) results in 234FRTQWC\$##, when A10 contains 234FRTqwc\$##

end example]

18.17.7.336 USDOLLAR

Syntax:

USDOLLAR (*number* [, *num-decimal*])

Description: Produces a string containing *number* rounded to *num-decimal* decimal places. The thousands separator is the comma, the radix point is the period, and the currency symbol is "\$". The format used is \$#,##0.00;(\$#,##0.00).

Arguments:

Name	Type	Description
<i>number</i>	number	The number that is to be formatted.
<i>num-decimal</i>	number	Designate the number of decimal places to be used in the resulting string; it is truncated to an integer. If <i>num-decimal</i> is negative, <i>number</i> is rounded to the left of the decimal point. If omitted, a value of 2 shall be assumed.

Return Type and Value: text – The string containing *number* rounded to *num-decimal* decimal places, and have a currency symbol and thousands separators.

[Example:

USDOLLAR(1234.567) results in \$1,234.57

USDOLLAR(1234.567, -2) results in \$1,200

USDOLLAR(-1234.567, 4) results in (\$1,234.5670)

end example]

18.17.7.337 VALUE

Syntax:

VALUE (*string*)

Description: Converts *string* to a number.

Arguments:

Name	Type	Description
<i>string</i>	text	Designates a string that contains a number formatted using any number, currency, date, or time format. (See §18.8.31 for the set of formats.) Date and time strings are converted to their equivalent serial date-time.

Return Type and Value: number – The number represented by *string*.

[Example:

VALUE("123.456") results in 123.456

VALUE("\$1,000") results in 1000

VALUE("23-Mar-2002") results in the corresponding serial date-time

VALUE("16:48:00")-VALUE("12:17:12") results in 0.188056

end example]

18.17.7.338 VAR

Syntax:

VAR (*argument-list*)

Description: Makes an estimate of the variance based on a sample. [*Note:* VAR assumes that its arguments are a sample of the population. If the data represents the entire population, VARP should be used instead. If logical values and text representations of numbers in a reference are to be included as part of the calculation, use VARA instead. *end note*]

Mathematical Formula:

$$\frac{\sum (x - \bar{x})^2}{(n - 1)}$$

where:

- n = the sample size
- x = a sample value
- \bar{x} = the sample mean AVERAGE(*argument-1*, *argument-1*, ..., *argument-n*)

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number, name, text, array, reference	The <i>arguments</i> in <i>argument-list</i> designate the numbers that are samples of the population. Logical values, and text representations of numbers that are entered directly into the list of arguments are included. If an argument is an array or reference, only numbers in that array or reference are included. Empty cells, logical values, text, or error values in the array or reference are ignored.

Return Type and Value: number – An estimate of the variance based on a sample.

[*Example:*

VAR(1202,1220,1323,1254,1302) results in 2683.2

end example]

18.17.7.339 VARA

Syntax:

VARA (*argument-list*)

Description: Makes an estimate of the variance based on a sample. [*Note:* VARA assumes that its arguments are a sample of the population. If the data represents the entire population, VARPA should be used instead. If logical values and text representations of numbers in a reference are to be excluded as part of the calculation, use VAR instead. *end note]*

Mathematical Formula:

$$\frac{\sum(x - \bar{x})^2}{(n - 1)}$$

where:

- n = the sample size
- x = a sample value
- \bar{x} = the sample mean AVERAGE(*argument-1*, *argument-1*, ..., *argument-n*)

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number, name, text, array, reference	The <i>arguments</i> in <i>argument-list</i> designate the numbers that are samples of the population. Logical values and text representations of numbers that are entered directly into the list of arguments are included. Arguments that contain TRUE evaluate as 1; arguments that contain text or FALSE evaluate as zero. If an argument is an array or reference, only values in that array or reference are used. Empty cells and text values in the array or reference are ignored.

Return Type and Value: number – An estimate of the variance based on a sample.

[*Example:*

VARA(1202,1220,1323,1254,1302) results in 2683.2

end example]

18.17.7.340 VARP

Syntax:

VARP (*argument-list*)

Description: Computes the variance of an entire population. [Note: VARP assumes that its arguments are the total population. If the data represents a population sample only, VAR should be used instead. If logical values and text representations of numbers in a reference are to be included as part of the calculation, use VARPA instead. *end note*]

Mathematical Formula:

$$\frac{\sum(-\bar{x})^2}{n}$$

where:

- n = the sample size
- x = a sample value
- \bar{x} = the sample mean AVERAGE(*argument-1*, *argument-1*, ..., *argument-n*)

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number, name, text, array, reference	The <i>arguments</i> in <i>argument-list</i> designate the numbers that are the members of the population. Logical values, and text representations of numbers that are entered directly into the list of arguments are included. If an argument is an array or reference, only numbers in that array or reference are included. Empty cells, logical values, text, or error values in the array or reference are ignored.

Return Type and Value: number – The variance of an entire population.

[Example:

VARP(1202,1220,1323,1254,1302) results in 2146.56

end example]

18.17.7.341 VARPA

Syntax:

VARPA (*argument-list*)

Description: Makes the variance of an entire population. [Note: VARPA assumes that its arguments are the total population. If the data represents a population sample only, VARA should be used instead. If logical values and text representations of numbers in a reference are to be excluded as part of the calculation, use VARP instead. end note]

Mathematical Formula:

$$\frac{\sum(x - \bar{x})^2}{n}$$

where:

- n = the sample size
- x = a sample value
- \bar{x} = the sample mean AVERAGE(*argument-1*, *argument-1*, ..., *argument-n*)

Arguments:

Name	Type	Description
<i>argument-list</i>	logical, number, name, text, array, reference	The <i>arguments</i> in <i>argument-list</i> designate the numbers that are the members of the population.

Return Type and Value: number – The variance of an entire population.

Arguments can be numbers; names, arrays, or references that contain numbers; text representations of numbers; or logical values, in a reference. Text representations of numbers that are entered directly into the list of arguments are included. Arguments that contain TRUE evaluate as 1; arguments that contain text or FALSE evaluate as zero. If an argument is an array or reference, only values in that array or reference are used. Empty cells and text values in the array or reference are ignored.

[Example:

VARPA(1202,1220,1323,1254,1302) results in 2146.56

end example]

18.17.7.342 VDB

VDB (*cost* , *salvage* , *life* , *start-period* , *end-period* [, [[*factor*]
[, [*no-switch-flag*]]]])

Description: Computes the depreciation of an asset for the period specified, including partial periods, using the double-declining balance or some other specified method.

Arguments:

Name	Type	Description
<i>cost</i>	number	The number <i>cost</i> is the initial cost of the asset.
<i>salvage</i>	number	The value at the end of the depreciation. (This is sometimes called the salvage value of the asset.) This value can be 0.
<i>life</i>	number	The number of periods over which the asset is being depreciated. (This is sometimes called the useful life of the asset.)
<i>start-period</i>	number	The starting period for which the depreciation is to be calculated. (<i>start-period</i> shall use the same units as <i>life</i> .)
<i>end-period</i>	number	The ending period for which the depreciation is to be calculated. (<i>end-period</i> shall use the same units as <i>life</i> .)
<i>factor</i>	number	The rate at which the balance declines. If omitted, it is assumed to be 2 (the double-declining balance method).
<i>no-switch-flag</i>	logical	Specifies whether to switch to straight-line depreciation when depreciation is greater than the declining balance calculation. If TRUE, straight-line depreciation is not used even when the depreciation is greater than the declining balance calculation. If FALSE or omitted, the straight-line depreciation is used when depreciation is greater than the declining balance calculation.

Return Type and Value: number – The depreciation of an asset for the period specified.

However, if any numerical argument value is non-positive, #NUM! is returned.

[Example:

VDB(2400,300,10*365,0,1) results in 1.32

VDB(2400,300,10*12,0,1) results in 40.00

VDB(2400,300,10*12,6,18) results in 396.31

end example]

18.17.7.343 VLOOKUP

Syntax:

VLOOKUP (*lookup-value* , *table-array* , *col-index-num* [, [*range-lookup-flag*]])

Description: Performs a vertical search for a value in the left-most column of a table or an array, noting the row in which the matching value is found. From that row, the value from a given column is returned.

Arguments:

Name	Type	Description
<i>lookup-value</i>	value of any type or a reference to a value of any type.	The value to be located in the left-most column of the table. If <i>range-lookup</i> is FALSE and <i>lookup-value</i> is a string, the wildcard characters, question mark (?) and asterisk (*), can be included in <i>lookup-value</i> . A question mark matches any single character; an asterisk matches any sequence of characters. To find a question mark or asterisk, use a tilde (~) before the character.
<i>table-array</i>	array, reference, name	Designates the table of information to be searched. The values in the left-most column of <i>table-array</i> can be text, numbers, or logical values. The values in the left-most column of <i>table-array</i> shall be placed in "ascending order", as follows: ..., -2, -1, 0, 1, 2, ..., A–Z, FALSE, TRUE. Uppercase and lowercase text is treated as equivalent.
<i>col-index-num</i>	number	The column number in <i>table-array</i> from which the matching value is to be returned. (A <i>col-index-num</i> of 1 returns the left-most column value in <i>table-array</i> , a <i>col-index-num</i> of 2 returns the next column in <i>table-array</i> , and so on.)
<i>range-lookup-flag</i>	logical	Specifies whether HLOOKUP is to find an exact or approximate match. If TRUE or omitted, an approximate match is returned. That is, if an exact match is not found, the next largest value that is less than <i>lookup-value</i> is returned. If FALSE, an exact match is performed, in which case, the values in the left-most column of <i>table-array</i> need not be sorted. If there are two or more values in the left-most column of <i>table-array</i> that match <i>lookup-value</i> , the top-most value found is used.

Return Type and Value: any – The value from a given row number, where the column is determined by a search of the top row looking for a match with a given value.

However, if

- An exact match is performed, but no match is found, #N/A is returned.
- *col-index-num* is less than 1, #VALUE! is returned.
- *col-index-num* is greater than the number of columns in *table-array*, #REF! is returned.
- *lookup-value* is smaller than the smallest value in the left-most column of *table-array*, #N/A is returned.

[Example: Given the following data:

	A	B	C
1	Density	Bearings	Bolts
2	0.457	3.55	500

	A	B	C
3	0.525	3.25	400
4	0.616	2.93	300
5	0.675	2.75	250
6	0.746	2.57	200
7	0.835	2.38	150
8	0.946	2.17	100
9	1.09	1.95	50
10	1.29	1.71	0

VLOOKUP(1,A2:C10,2) results in 2.17

VLOOKUP(1,A2:C10,3,TRUE) results in 100.00

VLOOKUP(2,A2:C10,2,TRUE) results in 1.71

end example]

18.17.7.344 WEEKDAY

Syntax:

WEEKDAY (*serial-value* [, *weekday-start-flag*])

Description: Computes the weekday number for the date having the given *serial-value*, taking into account the current date system and *weekday-start-flag*, if present. See §18.17.4.1 for special handling of certain days in 1900.

Arguments:

Name	Type	Description												
<i>serial-value</i>	number	The date whose weekday number is to be computed. The value of <i>serial-value</i> is truncated to an integer.												
<i>weekday-start-flag</i>	number	When truncated to integer, indicates the weekday numbering convention to be used, as follows: <table><tr><th>Value</th><th>Meaning</th></tr><tr><td>1 or omitted</td><td>1 (Sunday) through 7 (Saturday)</td></tr><tr><td>2</td><td>1 (Monday) through 7 (Sunday)</td></tr><tr><td>3</td><td>0 (Monday) through 6 (Sunday)</td></tr><tr><td>11</td><td>1 (Monday) through 7 (Sunday)</td></tr><tr><td>12</td><td>1 (Tuesday) through 7 (Monday)</td></tr></table>	Value	Meaning	1 or omitted	1 (Sunday) through 7 (Saturday)	2	1 (Monday) through 7 (Sunday)	3	0 (Monday) through 6 (Sunday)	11	1 (Monday) through 7 (Sunday)	12	1 (Tuesday) through 7 (Monday)
Value	Meaning													
1 or omitted	1 (Sunday) through 7 (Saturday)													
2	1 (Monday) through 7 (Sunday)													
3	0 (Monday) through 6 (Sunday)													
11	1 (Monday) through 7 (Sunday)													
12	1 (Tuesday) through 7 (Monday)													

Name	Type	Description		
			13	1 (Wednesday) through 7 (Tuesday)
			14	1 (Thursday) through 7 (Wednesday)
			15	1 (Friday) through 7 (Thursday)
			16	1 (Saturday) through 7 (Friday)
			17	1 (Sunday) through 7 (Saturday)

Return Type and Value: number – The weekday number for the date having the given serial date-time.

However, if

- *serial-value* is out of range for the current date system, #NUM! is returned.
- *weekday-start-flag* is out of the range specified in the table above, #NUM! is returned.

[Example:

WEEKDAY(DATE(2006,2,1)) results in 4 (Wednesday)

WEEKDAY(DATE(2006,2,1),11) results in 3 (Wednesday)

WEEKDAY(DATE(2006,2,1),12) results in 2 (Wednesday)

WEEKDAY(DATE(2006,2,1),3) results in 2 (Wednesday)

end example]

18.17.7.345 WEEKNUM

Syntax:

WEEKNUM (*serial-value* [, *weekday-start-flag*])

Description: Computes the week number of the date corresponding to *serial-value*. The function allows two number systems:

- System 1: The week containing January 1 is the first week of the year, and is numbered week 1.
- System 2: The week containing the first Thursday of the year is the first week of the year, and is numbered as week 1 [ISO 8601].

Arguments:

Name	Type	Description
<i>serial-value</i>	number	The date whose week number is to be computed. The value of <i>serial-value</i> is truncated to an integer.

Name	Type	Description																																	
<i>weekday-start-flag</i>	number	<p>When truncated to integer, indicates the weekday on which the week begins, as follows:</p> <table> <tr> <th><i>weekday-start-flag</i></th><th>Meaning</th><th>Number System</th></tr> <tr> <td>1 or omitted</td><td>Week begins on Sunday.</td><td>System 1</td></tr> <tr> <td>2</td><td>Week begins on Monday.</td><td>System 1</td></tr> <tr> <td>11</td><td>Week begins on Monday.</td><td>System 1</td></tr> <tr> <td>12</td><td>Week begins on Tuesday.</td><td>System 1</td></tr> <tr> <td>13</td><td>Week begins on Wednesday.</td><td>System 1</td></tr> <tr> <td>14</td><td>Week begins on Thursday.</td><td>System 1</td></tr> <tr> <td>15</td><td>Week begins on Friday.</td><td>System 1</td></tr> <tr> <td>16</td><td>Week begins on Saturday.</td><td>System 1</td></tr> <tr> <td>17</td><td>Week begins on Sunday.</td><td>System 1</td></tr> <tr> <td>21</td><td>Week begins on Monday.</td><td>System 2</td></tr> </table>	<i>weekday-start-flag</i>	Meaning	Number System	1 or omitted	Week begins on Sunday.	System 1	2	Week begins on Monday.	System 1	11	Week begins on Monday.	System 1	12	Week begins on Tuesday.	System 1	13	Week begins on Wednesday.	System 1	14	Week begins on Thursday.	System 1	15	Week begins on Friday.	System 1	16	Week begins on Saturday.	System 1	17	Week begins on Sunday.	System 1	21	Week begins on Monday.	System 2
<i>weekday-start-flag</i>	Meaning	Number System																																	
1 or omitted	Week begins on Sunday.	System 1																																	
2	Week begins on Monday.	System 1																																	
11	Week begins on Monday.	System 1																																	
12	Week begins on Tuesday.	System 1																																	
13	Week begins on Wednesday.	System 1																																	
14	Week begins on Thursday.	System 1																																	
15	Week begins on Friday.	System 1																																	
16	Week begins on Saturday.	System 1																																	
17	Week begins on Sunday.	System 1																																	
21	Week begins on Monday.	System 2																																	

Return Type and Value: number – The week number of the date corresponding to *serial-value*.

However, if

- *serial-value* is out of range for the current date system, #NUM! is returned.
- *weekday-start-flag* is out of the range specified in the table above, #NUM! is returned.

[Example:

WEEKNUM(DATE(2006,1,1) results in 1
WEEKNUM(DATE(2006,1,1),1) results in 1
WEEKNUM(DATE(2006,1,1),17) results in 1
WEEKNUM(DATE(2006,1,1),21) results in 1
WEEKNUM(DATE(2006,2,1),1) results in 5

WEEKNUM(DATE(2006,2,1),2) results in 6

WEEKNUM(DATE(2006,2,1),11) results in 6

end example]

18.17.7.346 WEIBULL

Syntax:

WEIBULL (*x* , *alpha* , *beta* , *cumulative-flag*)

Description: Computes the Weibull distribution.

Mathematical Formula:

The equation for the Weibull cumulative distribution function is:

$$F(x, \alpha, \beta) = 1 - e^{-(x/\beta)^\alpha}$$

The equation for the Weibull probability density function is:

$$f(x, \alpha, \beta) = \frac{1}{\beta^\alpha} x^{\alpha-1} e^{-(x/\beta)^\alpha}$$

When *alpha* = 1, WEIBULL returns the exponential distribution with:

$$\lambda = \frac{1}{\beta}$$

where:

- *x* = argument *x*
- *α* = argument *alpha*
- *β* = argument *beta*

Arguments:

Name	Type	Description
<i>x</i>	number	The value at which the distribution is to be evaluated.
<i>alpha</i>	number	A parameter of the distribution.
<i>beta</i>	number	A parameter of the distribution.
<i>cumulative-flag</i>	logical	Determines the form of the function. If TRUE, GAMMADIST returns the cumulative distribution function; if FALSE, it returns the probability density function.

Return Type and Value: number – The Weibull distribution.

However, if

- $x < 0$, #NUM! is returned.
- $\alpha \leq 0$, #NUM! is returned.
- $\beta \leq 0$, #NUM! is returned.

[Example:

WEIBULL(105,20,100,TRUE) results in 0.92958139

WEIBULL(105,20,100,FALSE) results in 0.035588864

end example]

18.17.7.347 WORKDAY

Syntax:

WORKDAY (*start-date* , *day-offset* [, *holidays*])

Description: Computes the serial date-time of the date that is *day-offset* working days offset from *start-date*. Weekend days (Saturday and Sunday) and any holidays specified by *holidays* are not considered as working days.

Arguments:

Name	Type	Description
<i>start-date</i>	number	The start date, truncated to integer.
<i>day-offset</i>	number	The number of working days before or after <i>start-date</i> . A positive value yields a future date; a negative value yields a past date; a zero value yields the date <i>start-date</i> . <i>day-offset</i> is truncated to an integer.
<i>holidays</i>	reference, array	An optional set of one or more dates that are to be excluded from the working day calendar. <i>holidays</i> shall be a range of cells that contain the dates, or an array constant of the serial date-times that represent those dates. The ordering of dates or serial date-times in <i>holidays</i> can be arbitrary.

Return Type and Value: number – The serial date-time of the date that is *day-offset* working days offset from *start-date*, excluding the specified holidays.

However, if

- *start-date* is out of range for the current date system, #NUM! is returned.
- Any date in *holidays* is out of range for the current date system, #NUM! is returned.

- *start-date* plus *day-offset* does not yield a date, #NUM! is returned.

[Example:

WORKDAY(DATE(2006,1,1),0) results in a serial date-time corresponding to 1-Jan-2006

WORKDAY(DATE(2006,1,1),10) results in a serial date-time corresponding to 13-Jan-2006

WORKDAY(DATE(2006,1,1),-10) results in a serial date-time corresponding to 19-Dec-2005

WORKDAY(DATE(2006,1,1),20,{"2006/1/2","2006/1/16"}) results in a serial date-time corresponding to 31-Jan-2006

end example]

18.17.7.348 WORKDAY.INTL

Syntax:

Number form: WORKDAY.INTL (*start-date* , *day-offset* [, *weekend-number*] [, *holidays*])

String form: WORKDAY.INTL (*start-date* , *day-offset* [, *weekend-string*] [, *holidays*])

Description: Computes the serial date-time of the date that is *day-offset* working days offset from *start-date*. Weekend days and any holidays specified by *holidays* are not considered as working days.

Arguments:

Name	Type	Description
<i>start-date</i>	number	The start date, truncated to integer.
<i>day-offset</i>	number	The number of working days before or after <i>start-date</i> . A positive value yields a future date; a negative value yields a past date; a zero value yields the date <i>start-date</i> . <i>day-offset</i> is truncated to an integer.
<i>weekend-number</i>	number	Indicates the days of the week that are weekend days and are not considered working days. Values are shown in the table below
<i>weekend-string</i>	string	Indicates the days of the week that are weekend days and are not considered working days. Values of <i>weekend-string</i> are seven characters long and each character in the string represents a day of the week, beginning with Monday. [Example: "0000011" would result in a weekend that is Saturday and Sunday. end example]
<i>holidays</i>	reference, array	An optional set of one or more dates that are to be excluded from the working day calendar. <i>holidays</i> shall be a range of cells that contain the dates, or an array constant of the serial date-times that represent those

Name	Type	Description
		dates. The ordering of dates or serial date-times in <i>holidays</i> can be arbitrary.

<i>weekend-number</i>	Weekend days
1 or omitted	Saturday, Sunday
2	Sunday, Monday
3	Monday, Tuesday
4	Tuesday, Wednesday
5	Wednesday, Thursday
6	Thursday, Friday
7	Friday, Saturday
11	Sunday only
12	Monday only
13	Tuesday only
14	Wednesday only
15	Thursday only
16	Friday only
17	Saturday only

Return Type and Value: number – The serial date-time of the date that is *day-offset* working days offset from *start-date*, excluding the specified weekend days and holidays.

However, if

- *start-date* is out of range for the current date system, #NUM! is returned.
- Any date in *holidays* is out of range for the current date system, #NUM! is returned.
- *start-date* plus *day-offset* does not yield a date, #NUM! is returned.

[Example:

WORKDAY.INTL (DATE (2006,1,1),0) results in a serial date-time corresponding to 1-Jan-2006

WORKDAY.INTL (DATE (2006,1,1),10) results in a serial date-time corresponding to 13-Jan-2006

WORKDAY.INTL (DATE (2006,1,1),10,7) results in a serial date-time corresponding to 13-Jan-2006

WORKDAY.INTL (DATE (2006,1,1),-10) results in a serial date-time corresponding to 19-Dec-2005

WORKDAY.INTL (DATE (2006,1,1),20,1,{"2006/1/2","2006/1/16"}) results in a serial date-time corresponding to 31-Jan-2006

WORKDAY.INTL (DATE (2006,1,1),20,"0000011",{"2006/1/2","2006/1/16"}) results in a serial date-

time corresponding to 31-Jan-2006

end example]

18.17.7.349 XIRR

XIRR (*values* , *dates* [, [*guess*]])

Description: Computes the internal rate of return for a schedule of cash flows that is not necessarily periodic. XIRR uses an iterative calculation technique that cycles through the calculation until the result is accurate within 0.000001 percent.

Mathematical Formula:

Using a changing rate (starting with *guess*), XIRR cycles through the calculation until the result is accurate within 0.000001 percent. The rate is changed until:

$$0 = \sum_{i=1}^N \frac{P_i}{(1 + \text{rate})^{\frac{(d_i - d_1)}{365}}}$$

where:

- d_i = the i^{th} , or last, payment date.
- d_1 = the 0^{th} payment date.
- P_i = the i^{th} , or last, payment.

Arguments:

Name	Type	Description
<i>values</i>	array, reference	A series of cash flows that corresponds to a schedule of payment dates specified in <i>dates</i> . The first payment is optional and corresponds to a cost or payment that occurs at the beginning of the investment. If the first value is a cost or payment, it shall have a negative value. All succeeding payments are discounted based on a 365-day year. The series of values shall contain at least one positive and one negative value.
<i>dates</i>	reference	A schedule of payment dates that corresponds to the cash flow payments in <i>values</i> . The first payment date indicates the beginning of the schedule of payments. All other dates shall be later than this date, but they can occur in any order. Time information in the date arguments is ignored.
<i>guess</i>	number	An estimate of the result of XIRR. If omitted, it is assumed to be 0.1 (i.e., 10 percent).

Return Type and Value: number – The internal rate of return for a schedule of cash flows that is not necessarily periodic.

However, if

- Any date in *dates* is out of range for the current date system, #NUM! is returned.
- Any date in *dates* precedes the starting date, #NUM! is returned.
- *values* and *dates* contain different numbers of values, #NUM! is returned.
- The calculation has not converged after an implementation-defined number of tries, #NUM! is returned.

[Example: When the cells F2397:J2397 contain the dates January 1, 2008; March 1, 2008; October 30, 2008; February 15, 2009, and April 1, 2009:

XIRR({-10000,2750,4250,3250,2750},F2397:J2397,0.1) results in 37.34%

end example]

18.17.7.350 XNPV

XNPV (*rate* , *values* , *dates*)

Description: Computes the net present value for a schedule of cash flows that is not necessarily periodic.

Mathematical Formula:

$$XNPV = \sum_{i=1}^N \frac{P_i}{(1 + rte)^{\frac{(d_i - d_1)}{365}}}$$

where:

- d_i = the i^{th} , or last, payment date.
- d_1 = the 0^{th} payment date.
- P_i = the i^{th} , or last, payment.

Arguments:

Name	Type	Description
<i>rate</i>	number	The discount rate to apply to the cash flows.
<i>values</i>	array, reference	A series of cash flows that corresponds to a schedule of payment dates specified in <i>dates</i> . The first payment is optional and corresponds to a cost or payment that occurs at the beginning of the investment. If the first value is a cost or payment, it shall have a negative value. All succeeding payments are discounted based on a 365-day year. The series of values shall contain at least one positive and one negative value.

Name	Type	Description
<i>dates</i>	reference	A schedule of payment dates that corresponds to the cash flow payments in <i>values</i> . The first payment date indicates the beginning of the schedule of payments. All other dates shall be later than this date, but they can occur in any order. Time information in the date arguments is ignored.

Return Type and Value: number – The net present value for a schedule of cash flows that is not necessarily periodic.

However, if

- Any date in *dates* is out of range for the current date system, #NUM! is returned.
- Any date in *dates* precedes the starting date, #NUM! is returned.
- *values* and *dates* contain different numbers of values, #NUM! is returned.

[*Example:* When the cells F2397:J2397 contain the dates January 1, 2008; March 1,2008; October 30, 2008; February 15, 2009, and April 1, 2009:

XNPV(0.09, {-10000, 2750, 4250, 3250, 2750}, F2397:J2397) results in 2086.65

end example]

18.17.7.351 YEAR

Syntax:

YEAR (*date-value*)

Description: Computes the numeric year in the Gregorian calendar [ISO 8601 §3.2.1] for the date and/or time having the given *date-value*, taking into account the current date system. That date and/or time shall be expressed either as a serial date-time, in which case, its fractional part is ignored, or as a *string-constant* having any date and/or time format, in which case, any time information shall be ignored.

Arguments:

Name	Type	Description
<i>date-value</i>	number, text	The date and/or time whose year is to be computed. That date and/or time shall be expressed either as a serial date-time, in which case, its fractional part is ignored, or as a <i>string-constant</i> having any date and/or time format, in which case, any time information shall be ignored.

Return Type and Value: number – The year in the Gregorian calendar [ISO 8601 §3.2.1] for the date and/or time having the given *date-value*. The range of return values is determined by the date system currently in use (§18.17.4).

However, if *date-value* is out of range for the current date system, #NUM! is returned.

[Example:

YEAR(DATE(2006,1,2)) results in 2006

YEAR(DATE(2006,0,2)) results in 2005

YEAR("2006/1/2 10:45 AM") results in 2006

YEAR(30000) results in 1982 for the 1900 date system, or 1986 for the 1904 date system

end example]

18.17.7.352 YEARFRAC

Syntax:

YEARFRAC (*start-date* , *end-date* [, *basis*])

Description: Computes the fractional number of years represented by the number of whole days between two dates, *start-date* and *end-date*., according to *basis*.

Arguments:

Name	Type	Description				
<i>start-date</i>	number	The period's starting date. <i>start-date</i> can be earlier than, the same as, or later than <i>end-date</i> .				
<i>end-date</i>	number	The period's ending date.				
<i>basis</i>	number	<div>The truncated integer type of day count basis to use, as follows:<table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td><div>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months</div></td></tr></table></div>	Value	Day Count Basis	0 or omitted	<div>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months</div>
Value	Day Count Basis					
0 or omitted	<div>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months</div>					

Name	Type	Description	
			with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.
		1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.
		2	Actual/360. Similar to Basis 1, but only has 360 days per year.
		3	Actual/365. Similar to Basis 1, but always has 365 days per year.
		4	European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none"> • If the date is 28 or 29 February, it

Name	Type	Description		
				<p>is adjusted to 30 February.</p> <ul style="list-style-type: none"> For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.

All arguments are truncated to integers.

Return Type and Value: number – The fractional number of years represented by the number of whole days between two dates, *start-date* and *end-date*., according to *basis*. If the Actual/actual basis is used, the year length used is the average length of the years that the range crosses, regardless of where *start-date* and *end-date* fall in their respective years.

However, if the value of *basis* is out of range, #NUM! is returned.

[Example:

YEARFRAC(DATE(2006,1,1),DATE(2006,3,26)) results in 0.236111111
 YEARFRAC(DATE(2006,3,26),DATE(2006,1,1)) results in 0.236111111
 YEARFRAC(DATE(2006,1,1),DATE(2006,7,1)) results in 0.5
 YEARFRAC(DATE(2006,1,1),DATE(2007,9,1)) results in 1.666666667
 YEARFRAC(DATE(2006,1,1),DATE(2006,7,1),0) results in 0.5
 YEARFRAC(DATE(2006,1,1),DATE(2006,7,1),1) results in 0.495890411
 YEARFRAC(DATE(2006,1,1),DATE(2006,7,1),2) results in 0.502777778
 YEARFRAC(DATE(2006,1,1),DATE(2006,7,1),3) results in 0.495890411
 YEARFRAC(DATE(2006,1,1),DATE(2006,7,1),4) results in 0.5
 YEARFRAC(DATE(2004,3,1),DATE(2006,3,1),1) results in 1.998175 (because 2004 is a leap year and Actual/actual basis is used, the average year length is 365.3333)

end example]

18.17.7.353 YIELD

Syntax:

YIELD (*settlement* , *maturity* , *rate* , *pr* , *redemption* , *frequency* [, [*basis*]])

Description: Computes the yield on a security that pays periodic interest.

Mathematical Formula:

If there is one coupon period or less until redemption, YIELD is calculated as follows:

$$YIELD = \frac{\left(\frac{redemption}{100} + \frac{rate}{frequency} \right) - \left(\frac{par}{100} + \left(\frac{A}{E} \times \frac{rate}{frequency} \right) \right)}{\frac{par}{100} + \left(\frac{A}{E} \times \frac{rate}{frequency} \right)} \times \frac{frequency \times E}{DSR}$$

where:

- *A* = number of days from the beginning of the coupon period to the settlement date (accrued days).
- *DSR* = number of days from the settlement date to the redemption date.
- *E* = number of days in the coupon period.
- *frequency* = argument *frequency*
- *par* = argument *pr*
- *rate* = argument *rate*
- *redemption* = argument *redemption*

If there is more than one coupon period until redemption, YIELD is calculated through some number of iterations. The resolution uses the Newton method, based on the formula used for the function PRICE. The yield is changed until the estimated price given the yield is close to price.

Arguments:

Name	Type	Description
<i>settlement</i>	number	The security's settlement date.
<i>maturity</i>	number	The security's maturity date.
<i>rate</i>	number	The security's interest rate.
<i>pr</i>	number	The security's price.
<i>redemption</i>	number	The security's redemption value per \$100 face value.
<i>frequency</i>	number	the number of coupon payments per year. (For annual payments, <i>frequency</i> is 1; for semiannual payments, <i>frequency</i> is 2; for quarterly payments, <i>frequency</i> is 4.) <i>frequency</i> is truncated to an integer.

Name	Type	Description								
<i>basis</i>	number	The truncated integer type of day count basis to use, as follows:								
		<table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">• If the date is 28 or 29 February, it is adjusted to 30 February.• For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.</td></tr><tr><td>1</td><td>Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.</td></tr><tr><td>2</td><td>Actual/360. Similar to Basis 1, but only has</td></tr></table>	Value	Day Count Basis	0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">• If the date is 28 or 29 February, it is adjusted to 30 February.• For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.	1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.	2	Actual/360. Similar to Basis 1, but only has
		Value	Day Count Basis							
		0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">• If the date is 28 or 29 February, it is adjusted to 30 February.• For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.							
1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.									
2	Actual/360. Similar to Basis 1, but only has									

Name	Type	Description	
			360 days per year.
			Actual/365. Similar to Basis 1, but always has 365 days per year.
		4	<p>European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</p> <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.

Time information in the date arguments is ignored.

Return Type and Value: number – The yield on a security that pays periodic interest.

However, if

- *settlement* or *maturity* is out of range for the current date system, #NUM! is returned.
- *settlement* \geq *maturity*, #NUM! is returned.
- *rate* < 0 , #NUM! is returned.

- *pr* or *redemption* ≤ 0 , #NUM! is returned.
- *frequency* is any number other than 1, 2, or 4, #NUM! is returned.
- *basis* < 0 or *basis* > 4 , #NUM! is returned.

[Example:

YIELD(DATE(2008,2,15),DATE(2016,11,15),0.0575,95.04287,100,2,0) results in 6.5000%

end example]

18.17.7.354 YIELDDISC

Syntax:

YIELDDISC (*settlement* , *maturity* , *pr* , *redemption* [, [*basis*]])

Description: Computes the annual yield for a discounted security.

Arguments:

Name	Type	Description				
<i>settlement</i>	number	The security's settlement date.				
<i>maturity</i>	number	The security's maturity date.				
<i>pr</i>	number	The security's price.				
<i>redemption</i>	number	The security's redemption value per \$100 face value.				
<i>basis</i>	number	<div>The truncated integer type of day count basis to use, as follows:<table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td><div>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date</div></td></tr></table></div>	Value	Day Count Basis	0 or omitted	<div>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date</div>
Value	Day Count Basis					
0 or omitted	<div>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date</div>					

Name	Type	Description	
			is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.
		1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the year is 366 days; otherwise it is 365 days.
		2	Actual/360. Similar to Basis 1, but only has 360 days per year.
		3	Actual/365. Similar to Basis 1, but always has 365 days per year.
		4	<p>European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</p> <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months

Name	Type	Description	
			with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.

Time information in the date arguments is ignored.

Return Type and Value: number – The annual yield for a discounted security.

However, if

- *settlement* or *maturity* is out of range for the current date system, #NUM! is returned.
- *settlement* \geq *maturity*, #NUM! is returned.
- *pr* or *redemption* \leq 0, #NUM! is returned.
- *basis* $<$ 0 or *basis* $>$ 4, #NUM! is returned.

[Example:

YIELDDISC (DATE (2008,2,16),DATE (2008,3,1),99.795,100,2) results in 5.2823%

end example]

18.17.7.355 YIELDMAT

Syntax:

YIELDMAT (*settlement* , *maturity* , *issue* , *rate* , *pr* [, [*basis*]])

Description: Computes the annual yield of a security that pays interest at maturity.

Arguments:

Name	Type	Description
<i>settlement</i>	number	The security's settlement date.

Name	Type	Description						
maturity	number	The security's maturity date.						
issue	number	The security's issue date.						
rate	number	The security's interest rate.						
pr	number	The security's price.						
basis	number	<div>The truncated integer type of day count basis to use, as follows:<table><tr><th>Value</th><th>Day Count Basis</th></tr><tr><td>0 or omitted</td><td>US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:<ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.</td></tr><tr><td>1</td><td>Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the</td></tr></table></div>	Value	Day Count Basis	0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.	1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the
Value	Day Count Basis							
0 or omitted	US (NASD) 30/360. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments: <ul style="list-style-type: none">If the date is 28 or 29 February, it is adjusted to 30 February.For months with 31 days, if the first date has a day value of 31, the date is converted to day 30. If the second date has a day value of 31, it is changed to 30 days as long as the first date was not 28 or 29 February, in which case it does not change.							
1	Actual/actual. The actual number of days between the two dates are counted. If the date range includes the date 29 February, the							

Name	Type	Description	
			year is 366 days; otherwise it is 365 days.
		2	Actual/360. Similar to Basis 1, but only has 360 days per year.
		3	Actual/365. Similar to Basis 1, but always has 365 days per year.
		4	<p>European 30/360. The European method for adjusting day counts. Assumes that each month has 30 days and the total number of days in the year is 360 by making the following adjustments:</p> <ul style="list-style-type: none"> • If the date is 28 or 29 February, it is adjusted to 30 February. • For months with 31 days, all dates with a day value of 31 are changed to day 30, including situations where the first date is 28 or 29 February.

Time information in the date arguments is ignored.

Return Type and Value: number – The annual yield of a security that pays interest at maturity.

However, if

- *settlement*, *maturity*, or *issue* is out of range for the current date system, #NUM! is returned.
- *settlement* \geq *maturity*, #NUM! is returned.
- *rate* or *pr* \leq 0, #NUM! is returned.
- *basis* $<$ 0 or *basis* $>$ 4, #NUM! is returned.

[Example:

YIELDMAT (DATE (2008, 3, 15), DATE (2008, 11, 3), DATE (2007, 11, 8), 0.0625, 100.0123, 0) results in 6.0954%

end example]

18.17.7.356 ZTEST

Syntax:

ZTEST (*array* , *test-value* [, *sigma*])

Description: Computes the one-tailed probability-value of a z-test. For a given hypothesized population mean, *test-value*, ZTEST returns the probability that the sample mean would be greater than the average of observations in the data set *array*; that is, the observed sample mean.

Mathematical Formula:

When *sigma* is present:

$$ZTEST(array, \mu_0) = 1 - NORMSDIST \left((\bar{x} - \mu_0) / (\sigma / \sqrt{n}) \right)$$

When *sigma* is omitted:

$$ZTEST(array, \mu_0) = 1 - NORMSDIST \left((\bar{x} - \mu_0) / (s / \sqrt{n}) \right)$$

where:

- *n* = the number of observations in the sample COUNT (*array*)
- *s* = the sample standard deviation STDEV (*array*)
- *x* = a sample value
- \bar{x} = the sample mean AVERAGE (*array*)
- μ_0 = the argument *test-value*

Arguments:

Name	Type	Description
<i>array</i>	array	The set of numerical data against which to test <i>test-value</i> .

Name	Type	Description
<i>test-value</i>	number	The number to test.
<i>sigma</i>	number	The number is the population (known) standard deviation. If omitted, the sample standard deviation is used.

Return Type and Value: number – The one-tailed probability-value of a z-test.

However, if *array* is empty, the return value is unspecified.

[Example:

ZTEST({3,6,7,8,6,5,4,2,1,9},4) results in 0.090574197

ZTEST({3,6,7,8,6,5,4,2,1,9},6) results in 0.863043389

end example]

18.18 Simple Types

This is the complete list of simple types dedicated to SpreadsheetML.

18.18.1 ST_Axis (PivotTable Axis)

This simple type defines the axes for a PivotTable selection.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
axisCol (Column Axis)	Column axis
axisPage (Include Count Filter)	Page axis
axisRow (Row Axis)	Row axis
axisValues (Values Axis)	Values axis

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Axis](#)) is located in §A.2. end note]

18.18.2 ST_BorderId (Border Id)

Zero-based index of the border record used by this cell format.

This simple type's contents are a restriction of the W3C XML Schema unsignedInt datatype.

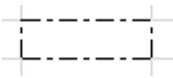
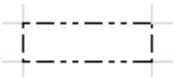
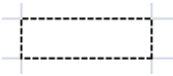
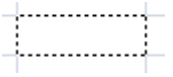
[Note: The W3C XML Schema definition of this simple type's content model ([ST_BorderId](#)) is located in §A.2. *end note*]

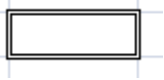
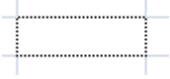
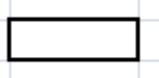
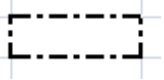
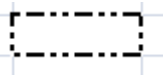
18.18.3 ST_BorderStyle (Border Line Styles)

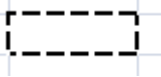

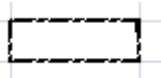
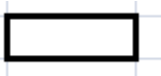
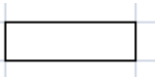
The line style of a border in a cell.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
dashDot (Dash Dot)	<div>The line style of a border is dash-dot.</div> <div>[Example:</div> <div></div> <div>end example]</div>
dashDotDot (Dash Dot Dot)	<div>The line style of a border is dash-dot-dot.</div> <div>[Example:</div> <div></div> <div>end example]</div>
dashed (Dashed)	<div>The line style of a border is dashed.</div> <div>[Example:</div> <div></div> <div>end example]</div>
dotted (Dotted)	<div>The line style of a border is dotted.</div> <div>[Example:</div> <div></div> <div>end example]</div>
double (Double Line)	<div>The line style of a border is double line.</div>

Enumeration Value	Description
	<p>[Example:</p>  <p>end example]</p>
hair (Hairline Border)	<p>The line style of a border is hairline.</p> <p>[Example:</p>  <p>end example]</p>
medium (Medium Border)	<p>The line style of a border is medium.</p> <p>[Example:</p>  <p>end example]</p>
mediumDashDot (Medium Dash Dot)	<p>The line style of a border is medium dash-dot.</p> <p>[Example:</p>  <p>end example]</p>
mediumDashDotDot (Medium Dash Dot Dot)	<p>The line style of a border is medium dash-dot-dot.</p> <p>[Example:</p>  <p>end example]</p>
mediumDashed (Medium Dashed)	<p>The line style of a border is medium dashed.</p> <p>[Example:</p>

Enumeration Value	Description
	 <i>end example]</i>
none (None)	The line style of a border is none (no border visible). [Example:  <i>end example]</i>
slantDashDot (Slant Dash Dot)	The line style of a border is slant-dash-dot. [Example:  <i>end example]</i>
thick (Thick Line Border)	The line style of a border is 'thick'. [Example:  <i>end example]</i>
thin (Thin Border)	The line style of a border is thin. [Example:  <i>end example]</i>

[Note: The W3C XML Schema definition of this simple type’s content model ([ST_BorderStyle](#)) is located in §A.2.
end note]

18.18.4 ST_CalcMode (Calculation Mode)

This simple type defines the supported modes for performing calculations on workbook data.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
auto (Automatic)	Indicates that calculations in the workbook are performed automatically when cell values change. The application recalculates those cells that are dependent on other cells that contain changed values. This mode of calculation helps to avoid unnecessary calculations.
autoNoTable (Automatic Calculation (No Tables))	Indicates tables be excluded during automatic calculation.
manual (Manual Calculation Mode)	Indicates that calculations in the workbook be triggered manually by the user. For example, the application might expose a command in the user interface.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_CalcMode](#)) is located in §A.2. *end note*]

18.18.5 ST_CellComments (Cell Comments)

These enumerations specify how cell comments shall be displayed for paper printing purposes.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
asDisplayed (Print Comments As Displayed)	Print cell comments as displayed.
atEnd (Print At End)	Print cell comments at end of document.
none (None)	Do not print cell comments.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_CellComments](#)) is located in §A.2. *end note*]

18.18.6 ST_CellFormulaType (Formula Type)

Indicates the type of formula in the cell.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
array (Array Formula)	Formula is an array formula.

Enumeration Value	Description
dataTable (Table Formula)	Formula is a data table formula.
normal (Normal)	Formula is a regular cell formula.
shared (Shared Formula)	Formula is part of a shared formula.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_CellFormulaType](#)) is located in §A.2. *end note*]

18.18.7 ST_CellRef (Cell Reference)

Represents a single cell reference in a SpreadsheetML document.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_CellRef](#)) is located in §A.2. *end note*]

18.18.8 ST_CellSpan (Cell Span Type)

A single cell span item.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_CellSpan](#)) is located in §A.2. *end note*]

18.18.9 ST_CellSpans (Cell Spans)

List of the cell spans of the item.

This simple type allows a list of items of the ST_CellSpan simple type (§18.18.8).

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_CellSpans](#)) is located in §A.2. *end note*]

18.18.10 ST_CellStyleXfId (Cell Style Format Id)

Used by xf records and cellStyle records to reference xf records defined in the cellStyleXfs collection.

This simple type's contents are a restriction of the W3C XML Schema unsignedInt datatype.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_CellStyleXfId](#)) is located in §A.2. *end note*]

18.18.11 ST_CellType (Cell Type)

Indicates the cell's data type.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
b (Boolean)	Cell containing a boolean.
d (Date)	Cell contains a date in the ISO 8601 format.
e (Error)	Cell containing an error.
inlineStr (Inline String)	Cell containing an (inline) rich string, i.e., one not in the shared string table. If this cell type is used, then the cell value is in the <code>is</code> element rather than the <code>v</code> element in the cell (<code>c</code> element).
n (Number)	Cell containing a number.
s (Shared String)	Cell containing a shared string.
str (String)	Cell containing a formula string.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_CellType](#)) is located in §A.2. *end note*]

18.18.12 ST_CfType (Conditional Format Type)

Conditional format rule type.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
aboveAverage (Above or Below Average)	This conditional formatting rule highlights cells that are above or below the average for all values in the range.
beginsWith (Begins With)	This conditional formatting rule highlights cells in the range that begin with the given text. Equivalent to using the <code>LEFT()</code> sheet function and comparing values.
cellIs (Cell Is)	This conditional formatting rule compares a cell value to a formula calculated result, using an operator.
colorScale (Color Scale)	This conditional formatting rule creates a graduated color scale on the cells.
containsBlanks (Contains Blanks)	This conditional formatting rule highlights cells that are completely blank. Equivalent of using <code>LEN(TRIM())</code> . This means that if the cell contains only characters that <code>TRIM()</code> would remove, then it is considered blank. An empty cell is also considered blank.

Enumeration Value	Description
containsErrors (Contains Errors)	This conditional formatting rule highlights cells with formula errors. Equivalent to using ISERROR() sheet function to determine if there is a formula error.
containsText (Contains Text)	This conditional formatting rule highlights cells containing given text. Equivalent to using the SEARCH() sheet function to determine whether the cell contains the text.
dataBar (Data Bar)	This conditional formatting rule displays a graduated data bar in the range of cells.
duplicateValues (Duplicate Values)	This conditional formatting rule highlights duplicated values.
endsWith (Ends With)	This conditional formatting rule highlights cells ending with given text. Equivalent to using the RIGHT() sheet function and comparing values.
expression (Expression)	This conditional formatting rule contains a formula to evaluate. When the formula result is true, the cell is highlighted.
iconSet (Icon Set)	This conditional formatting rule applies icons to cells according to their values.
notContainsBlanks (Contains No Blanks)	This conditional formatting rule highlights cells that are not blank. Equivalent of using LEN(TRIM()). This means that if the cell contains only characters that TRIM() would remove, then it is considered blank. An empty cell is also considered blank.
notContainsErrors (Contains No Errors)	This conditional formatting rule highlights cells without formula errors. Equivalent to using ISERROR() sheet function to determine if there is a formula error.
notContainsText (Does Not Contain Text)	This conditional formatting rule highlights cells that do not contain given text. Equivalent to using the SEARCH() sheet function.
timePeriod (Time Period)	This conditional formatting rule highlights cells containing dates in the specified time period. The underlying value of the cell is evaluated, therefore the cell does not need to be formatted as a date to be evaluated. For example, with a cell containing the value 38913 the conditional format shall be applied if the rule requires a value of 7/14/2006.
top10 (Top 10)	This conditional formatting rule highlights cells whose values fall in the top N or bottom N bracket, as specified.
uniqueValues (Unique Values)	This conditional formatting rule highlights unique values in the range.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_CfType](#)) is located in §A.2. *end note*]

18.18.13 ST_CfvoType (Conditional Format Value Object Type)

This simple type expresses the type of the conditional formatting value object (cfvo). In general the cfvo specifies one value used in the graduated scale (max, min, midpoint, etc).

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
formula (Formula)	The minimum/ midpoint / maximum value for the gradient is determined by a formula.
max (Maximum)	Indicates that the maximum value in the range shall be used as the maximum value for the gradient.
min (Minimum)	Indicates that the minimum value in the range shall be used as the minimum value for the gradient.
num (Number)	Indicates that the minimum / midpoint / maximum value for the gradient is specified by a constant numeric value.
percent (Percent)	Value indicates a percentage between the minimum and maximum values in the range shall be used as the minimum / midpoint / maximum value for the gradient.
percentile (Percentile)	Value indicates a percentile ranking in the range shall be used as the minimum / midpoint / maximum value for the gradient.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_CfvoType](#)) is located in §A.2. *end note*]

18.18.14 ST_Comments (Comment Display Types)

This simple type defines options for displaying comments in the user interface.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
commIndAndComment (Show Comment & Indicator)	Indicates that both the comment indicator and comment text be show in the user interface.

Enumeration Value	Description
commIndicator (Show Comment Indicator)	Indicates that only the comment indicator be shown in the user interface.
commNone (No Comments)	Indicates that comments not be shown in the user interface.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Comments](#)) is located in §A.2. *end note*]

18.18.15 ST_ConditionalFormattingOperator (Conditional Format Operators)

These conditional format operators are used for "Highlight Cells That Contain..." rules. For example, "highlight cells that begin with "M2" and contain "Mountain Gear"".

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
beginsWith (Begins With)	'Begins with' operator
between (Between)	'Between' operator
containsText (Contains)	'Contains' operator
endsWith (Ends With)	'Ends with' operator
equal (Equal)	'Equal to' operator
greaterThan (Greater Than)	'Greater than' operator
greaterThanOrEqual (Greater Than Or Equal)	'Greater than or equal to' operator
lessThan (Less Than)	'Less than' operator
lessThanOrEqual (Less Than Or Equal)	'Less than or equal to' operator
notBetween (Not Between)	'Not between' operator
notContains (Does Not Contain)	'Does not contain' operator
notEqual (Not Equal)	'Not equal to' operator

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ConditionalFormattingOperator](#)) is located in §A.2. *end note*]

18.18.16 ST_CredMethod (Credentials Method)

Credentials method used for server access.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
integrated (Integrated Authentication)	Integrated authentication.
none (No Credentials)	Use no credentials at all.
prompt (Prompt Credentials)	Prompt for credentials.
stored (Stored Credentials)	Use stored credentials.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_CredMethod](#)) is located in §A.2. *end note*]

18.18.17 ST_DataConsolidateFunction (Data Consolidation Functions)

Data consolidation functions specified by the user and used to consolidate ranges of data.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
average (Average)	The average of the values.
count (Count)	The number of data values. The Count consolidation function works the same as the COUNTA worksheet function.
countNums (CountNums)	The number of data values that are numbers. The Count Nums consolidation function works the same as the COUNT worksheet function.
max (Maximum)	The largest value.
min (Minimum)	The smallest value.
product (Product)	The product of the values.
stdDev (StdDev)	An estimate of the standard deviation of a population, where the sample is a subset of the entire population.
stdDevp (StdDevP)	The standard deviation of a population, where the population is all of the data to be summarized.
sum (Sum)	The sum of the values.
var (Variance)	An estimate of the variance of a population, where the sample is a subset of the entire population.
varp (VarP)	The variance of a population, where the population is all of the data to be summarized.




[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_DataConsolidateFunction](#)) is located in §A.2. *end note*]

18.18.18 ST_DataValidationErrorStyle (Data Validation Error Styles)

The style of data validation error alert.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
information (Information Icon)	<p>This data validation error style uses an information icon in the error alert.</p> 
stop (Stop Icon)	<p>This data validation error style uses a stop icon in the error alert.</p> 
warning (Warning Icon)	<p>This data validation error style uses a warning icon in the error alert.</p> 

[Note: The W3C XML Schema definition of this simple type's content model ([ST_DataValidationErrorStyle](#)) is located in §A.2. *end note*]

18.18.19 ST_DataValidationImeMode (Data Validation IME Mode)

These values specify that the IME (input method editor) mode is controlled by data validation.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
disabled (Disabled IME Mode)	IME mode is disabled. Forces the IME control to be disabled when this cell is selected.
fullAlpha (Full-Width Alpha-Numeric IME Mode)	Forces the IME control to be on and in full-width alphanumeric input mode when the cell is first selected.
fullHangul (Full Width Hangul)	Forces the IME control to be on and in full-width Hangul input mode when first selecting the cell. Applies when the application's language is Korean and

Enumeration Value	Description
	a Korean IME control is selected.
fullKatakana (Full Katakana IME Mode)	Forces the IME control to be on and in full-width Katakana input mode when first selecting the cell. Applies when the application's language is Japanese and a Japanese IME control is selected.
halfAlpha (Half Alpha IME)	Forces the IME control to be on and in half-width alphanumeric input mode when the cell is first selected.
halfHangul (Half-Width Hangul IME Mode)	Forces the IME control to be on and in half-width Hangul input mode when first selecting the cell. Applies when the application's language is Korean and a Korean IME control is selected.
halfKatakana (Half-Width Katakana)	Forces the IME control to be on and in half-width Katakana input mode when first selecting the cell. Applies when the application's language is Japanese and a Japanese IME control is selected.
hiragana (Hiragana IME Mode)	Forces the IME control to be on and in Hiragana input mode when first selecting the cell. Applies when the application's language is Japanese and a Japanese IME control is selected.
noControl (IME Mode Not Controlled)	Data validation does not control the IME control's mode.
off (IME Off)	Forces the IME control to be off when first selecting the cell (goes to direct cell input mode).
on (IME On)	Forces the IME control to be on when first selecting the cell.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_DataValidationImeMode](#)) is located in §A.2. *end note*]

18.18.20 ST_DataValidationOperator (Data Validation Operator)

The relational operator used in data validation.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
between (Between)	Data validation which checks if a value is between two other values.
equal (Equal)	Data validation which checks if a value is equal to a specified value.

Enumeration Value	Description
greaterThan (Greater Than)	Data validation which checks if a value is greater than a specified value.
greaterThanOrEqualTo (Greater Than Or Equal)	Data validation which checks if a value is greater than or equal to a specified value.
lessThan (Less Than)	Data validation which checks if a value is less than a specified value.
lessThanOrEqualTo (Less Than Or Equal)	Data validation which checks if a value is less than or equal to a specified value.
notBetween (Not Between)	Data validation which checks if a value is not between two other values.
notEqual (Not Equal)	Data validation which checks if a value is not equal to a specified value.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_DataValidationOperator](#)) is located in §A.2. *end note*]

18.18.21 ST_DataValidationType (Data Validation Type)

Specifies the type of data validation used to validate user input.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
custom (Custom)	Data validation which uses a custom formula to check the cell value.
date (Date)	Data validation which checks for date values satisfying the given condition.
decimal (Decimal)	Data validation which checks for decimal values satisfying the given condition.
list (List)	Data validation which checks for a value matching one of list of values.
none (None)	No data validation.
textLength (Text Length)	Data validation which checks for text values, whose length satisfies the given condition.
time (Time)	Data validation which checks for time values satisfying the given condition.
whole (Whole Number)	Data validation which checks for whole number values satisfying the given condition.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_DataValidationType](#)) is located in §A.2. *end note*]

18.18.22 ST_DateTimeGrouping (Date Time Grouping)

Specifies how to group dateTime values.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
day (Day)	Group by day
hour (Group by Hour)	Group by hour
minute (Group by Minute)	Group by minute
month (Month)	Group by month
second (Second)	Group by second
year (Group by Year)	Group by year

[Note: The W3C XML Schema definition of this simple type's content model ([ST_DateTimeGrouping](#)) is located in §A.2. *end note*]

18.18.23 ST_DdeValueType (DDE Value Types)

This simple type indicates the type of the DDE value.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
b (Boolean)	Indicates that the value is a boolean.
e (Error)	Indicates that the value is an error.
n (Real Number)	Indicates that the value is a real number.
nil (Nil)	Indicates that the value is nil.
str (String)	Indicates that the value is a string.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_DdeValueType](#)) is located in §A.2. *end note*]

18.18.24 ST_DvAspect (Data View Aspect Type)

Specifies the desired data or view aspect of the object when drawing or getting data.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
DVASPECT_CONTENT (Object Display Content)	Provides a representation of an object so it can be displayed as an embedded object inside of a container.
DVASPECT_ICON (Object Display Icon)	Provides an iconic representation of an object.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_DvAspect](#)) is located in §A.2. *end note*]

18.18.25 ST_DxfId (Format Id)

This simple type defines the identifier to CT_Dxfs in the styles part. This a zero-based index. See §18.8.30 in Style for more information on formats.

This simple type's contents are a restriction of the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_DxfId](#)) is located in §A.2. *end note*]

18.18.26 ST_DynamicFilterType (Dynamic Filter)

These are the dynamic filter types. A dynamic filter returns a result set which might vary due to a change in the data itself or a change in the date on which the filter is being applied. For example, for a set of data {1,1,2,3}, the aboveAverage filter would return or highlight the last two values in the set. If the data is refreshed or changed to {1,1,1,2}, then only the last value would be highlighted. Similarly, the meaning of "lastQuarter" shall be the same for the dates in January, February, and March, but shall change meaning once the date advances from March to April.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
aboveAverage (Above Average)	Shows values that are above average.
belowAverage (Below Average)	Shows values that are below average.
lastMonth (Last Month)	Shows last month's dates.
lastQuarter (Last Quarter)	Shows last calendar quarter's dates.
lastWeek (Last Week)	Shows last week's dates, using Sunday as the first weekday.
lastYear (Last Year)	Shows last year's dates.
M1 (1st Month)	Shows the dates that are in January, regardless of year.

Enumeration Value	Description
M10 (10th Month)	Shows the dates that are in October, regardless of year.
M11 (11th Month)	Shows the dates that are in November, regardless of year.
M12 (12th Month)	Shows the dates that are in December, regardless of year.
M2 (2nd Month)	Shows the dates that are in February, regardless of year.
M3 (3rd Month)	Shows the dates that are in March, regardless of year.
M4 (4th Month)	Shows the dates that are in April, regardless of year.
M5 (5th Month)	Shows the dates that are in May, regardless of year.
M6 (6th Month)	Shows the dates that are in June, regardless of year.
M7 (7th Month)	Shows the dates that are in July, regardless of year.
M8 (8th Month)	Shows the dates that are in August, regardless of year.
M9 (9th Month)	Shows the dates that are in September, regardless of year.
nextMonth (Next Month)	Shows next month's dates.
nextQuarter (Next Quarter)	Shows next calendar quarter's dates.
nextWeek (Next Week)	Shows next week's dates, using Sunday as the first weekday.
nextYear (Next Year)	Shows next year's dates.
null (Null)	Common filter type not available.
Q1 (1st Quarter)	Shows the dates that are in the 1st calendar quarter, regardless of year.
Q2 (2nd Quarter)	Shows the dates that are in the 2nd calendar quarter, regardless of year.
Q3 (3rd Quarter)	Shows the dates that are in the 3rd calendar quarter, regardless of year.
Q4 (4th Quarter)	Shows the dates that are in the 4th calendar quarter, regardless of year.
thisMonth (This Month)	Shows this month's dates.
thisQuarter (This Quarter)	Shows this calendar quarter's dates.
thisWeek (This Week)	Shows this week's dates, using Sunday as the first weekday.
thisYear (This Year)	Shows this year's dates.
today (Today)	Shows today's dates.
tomorrow (Tomorrow)	Shows tomorrow's dates.

Enumeration Value	Description
yearToDate (Year To Date)	Shows the dates between the beginning of the year and today, inclusive.
yesterday (Yesterday)	Shows yesterday's dates.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_DynamicFilterType](#)) is located in §A.2. *end note*]

18.18.27 ST_ExternalConnectionType (Text Field Datatype)

These are the possible data types to use when importing text into the SpreadsheetML document. Strings are converted to these data types in the worksheet.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
DMY (Day Month Year)	Field contains a date in the order: day, month, year.
DYM (Day Year Month)	Field contains a date in the order: day, year, month.
EMD (East Asian Year Month Day)	Field contains an East Asian date in the order: EA era year, month, day.
general (General)	The SpreadsheetML application decides the best fit data type based on the content.
MDY (Month Day Year)	Field contains a date in the order: month, day, year.
MYD (Month Day Year)	Field contains a date in the order: month, year, day.
skip (Skip Field)	Don't import this field at all.
text (Text)	Field contains text.
YDM (Year Day Month)	Field contains a date in the order: year, day, month.
YMD (Year Month Day)	Field contains a date in the order: year, month, day.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ExternalConnectionType](#)) is located in §A.2. *end note*]

18.18.28 ST_FieldSortType (Field Sort Type)

This simple type defines the sort orders that can be applied to fields in a PivotTable.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
ascending (Ascending)	Indicates the field is sorted in ascending order.
descending (Descending)	Indicates the field is sorted in descending order.
manual (Manual Sort)	Indicates the field is sorted manually.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_FieldSortType](#)) is located in §A.2. *end note*]

18.18.29 ST_FileType (File Type)

The file type being used for text import.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
dos (DOS)	DOS (PC-8).
lin (Linux)	Linux
mac (Macintosh)	Macintosh.
other (Other Non-Specified Values)	Other non-specified values at the time of writing.
win (Windows (ANSI))	Windows (ANSI).

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_FileType](#)) is located in §A.2. *end note*]

18.18.30 ST_FillId (Fill Id)

Zero-based index used to reference a fill record.

This simple type's contents are a restriction of the W3C XML Schema unsignedInt datatype.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_FillId](#)) is located in §A.2. *end note*]

18.18.31 ST_FilterOperator (Filter Operator)

Operator enumerations for filtering.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
equal (Equal)	Show results which are equal to criteria.
greaterThan (Greater Than)	Show results which are greater than criteria.
greaterThanOrEqualTo (Greater Than Or Equal)	Show results which are greater than or equal to criteria.
lessThan (Less Than)	Show results which are less than criteria.
lessThanOrEqualTo (Less Than Or Equal)	Show results which are less than or equal to criteria.
notEqual (Not Equal)	Show results which are not equal to criteria.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_FilterOperator](#)) is located in §A.2. *end note*]

18.18.32 ST_FontId (Font Id)

An integer that represents a zero based index into the collection in the style sheet.

This simple type's contents are a restriction of the W3C XML Schema unsignedInt datatype.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_FontId](#)) is located in §A.2. *end note*]

18.18.33 ST_FontScheme (Font scheme Styles)

Defines the font scheme, if any, to which this font belongs.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
major (Major Font)	This font is the major font for this theme.
minor (Minor Font)	This font is the minor font for this theme.
none (None)	This font is not a theme font.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_FontScheme](#)) is located in §A.2. *end note*]

18.18.34 ST_FormatAction (PivotTable Format Types)

This simple type defines the type of formats that can be applied to PivotTables.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
blank (Blank)	Indicates no format is applied to the PivotTable. This value is used when formatting is cleared from already formatted cells in the PivotTable.
drill (Drill Type)	Indicates the PivotTable has drill-through format.
formatting (Formatting)	Indicates the PivotTable has formatting.
formula (Formula Type)	Indicates the PivotTable has formulas.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_FormatAction](#)) is located in §A.2. *end note*]

18.18.35 ST_Formula (Formula)

A formula

This simple type's contents are a restriction of the ST_Xstring datatype (§22.9.2.19).

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_Formula](#)) is located in §A.2. *end note*]

18.18.36 ST_FormulaExpression (Formula Expression Type)

This simple type specifies an expression type that can comprise a formula.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
area (Area)	Reference to a range of cells.
areaError (Area Error)	Reference to a range of cells that now evaluates to an error.
computedArea (Computed Area)	Computed area reference.
ref (Reference)	Single cell reference.
refError (Reference Is Error)	Single cell reference that now evaluates to an error.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_FormulaExpression](#)) is located in §A.2. *end note*]

18.18.37 ST_GradientType (Gradient Type)

Type of gradient fill being used, either linear or path.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
linear (Linear Gradient)	This gradient fill is of linear gradient type. Linear gradient type means that the transition from one color to the next is along a line (e.g., horizontal, vertical, diagonal, etc.).
path (Path)	This gradient fill is of path gradient type. Path gradient type means the that the boundary of transition from one color to the next is a rectangle, defined by top, bottom, left, and right attributes on the gradientFill element.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_GradientType](#)) is located in §A.2. *end note*]

18.18.38 ST_GroupBy (Values Group By)

This simple type defines types of data grouping that can be performed on a PivotTable.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
days (Days)	Indicates a grouping on "days" for date values.
hours (Hours)	Indicates a grouping on "hours" for date values.
minutes (Minutes)	Indicates a grouping on "minutes" for date values.
months (Months)	Indicates a grouping on "months" for date values.
quarters (Quarters)	Indicates a grouping on "quarters" for date values.
range (Group By Numeric Ranges)	Indicates a grouping by numeric ranges for numeric values.
seconds (Seconds)	Indicates a grouping on "seconds" for date values.
years (Years)	Indicates a grouping on "years" for date values.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_GroupBy](#)) is located in §A.2. *end note*]

18.18.39 ST_GrowShrinkType (Grow Shrink Type)

This type enumerates behavior patterns for refreshing external data in a query table.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
insertClear (Insert & Clear On Refresh)	Insert entire rows for new data, clear unused cells.
insertDelete (Insert & Delete On Refresh)	Insert cells for new data, delete unused cells.
overwriteClear (Overwrite & Clear On Refresh)	Overwrite existing cells with new data, clear unused cells.

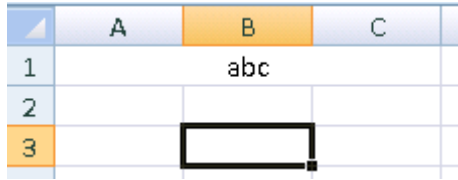
[Note: The W3C XML Schema definition of this simple type's content model ([ST_GrowShrinkType](#)) is located in §A.2. end note]

18.18.40 ST_HorizontalAlignment (Horizontal Alignment Type)

The enumeration value indicating the portion of Cell Alignment in a cell format (XF) that is horizontal alignment, i.e., whether it is aligned general, left, right, horizontally centered, filled (replicated), justified, centered across multiple cells, or distributed.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
center (Centered Horizontal Alignment)	The horizontal alignment is centered, meaning the text is centered across the cell.
centerContinuous (Center Continuous Horizontal Alignment)	<p>The horizontal alignment is centered across multiple cells. The information about how many cells to span is expressed in the Sheet Part, in the row of the cell in question. For each cell that is spanned in the alignment, a cell element needs to be written out, with the same style Id which references the centerContinuous alignment.</p> <p>[Example: This shows the value of A1 centered across A1:C1:</p>  <p>The XML from the Sheet Part:</p> <pre><row r="1" spans="1:3"></pre>

Enumeration Value	Description												
	<pre><c r="A1" s="1" t="s"> <v>0</v> </c> <c r="B1" s="1"/> <c r="C1" s="1"/> </row></pre> <p>The XML from the Styles Part:</p> <pre><cellXfs count="2"> <xf numFmtId="0" fontId="0" fillId="0" borderId="0" xfId="0"/> <xf numFmtId="0" fontId="0" fillId="0" borderId="0" xfId="0" applyAlignment="1"> <alignment horizontal="centerContinuous"/> </xf> </cellXfs></pre> <p><i>end example]</i></p>												
distributed (Distributed Horizontal Alignment)	<p>l/ndicates that each 'word' in each line of text inside the cell is evenly distributed across the width of the cell, with flush right and left margins.</p> <p>When there is also an indent value to apply, both the left and right side of the cell are padded by the indent value.</p> <p>A 'word' is a set of characters with no space character in them.</p> <p>Two lines inside a cell are separated by a carriage return.</p> <p>[<i>Example:</i> This shows three lines of text evenly distributed horizontally across the cell. The first line is "abc def ghi", the second line is blank, and the third line is "jkl mno".</p> <table><tr><td></td><td>A</td><td>B</td><td></td></tr><tr><td>1</td><td></td><td>abc def ghi</td><td></td></tr><tr><td></td><td></td><td>jkl mno</td><td></td></tr></table>		A	B		1		abc def ghi				jkl mno	
	A	B											
1		abc def ghi											
		jkl mno											

Enumeration Value	Description									
	<p>This shows the same example, with an indent value of 2:</p> <table><tr><td></td><td>A</td><td>B</td></tr><tr><td>1</td><td></td><td>abc def ghi</td></tr><tr><td>2</td><td></td><td>jkl mno</td></tr></table> <p>There is no vertical component to the alignment being shown here. The row has been manually adjusted to display the text. <i>end example]</i></p>		A	B	1		abc def ghi	2		jkl mno
	A	B								
1		abc def ghi								
2		jkl mno								
fill (Fill)	<p>Indicates that the value of the cell should be filled across the entire width of the cell. If blank cells to the right also have the fill alignment, they are also filled with the value, using a convention similar to centerContinuous.</p> <p>Additional rules:</p> <ul style="list-style-type: none">• Only whole values can be appended, not partial values.• The column will not be widened to 'best fit' the filled value• If appending an additional occurrence of the value exceeds the boundary of the cell left/right edge, don't append the additional occurrence of the value.• The display value of the cell is filled, not the underlying raw number. <p>[Example: This cell is filled with the value 1.2345 and has a width of 15 characters:</p> <table><tr><td></td><td>A</td><td>B</td></tr><tr><td>1</td><td></td><td></td></tr><tr><td>2</td><td></td><td>1.23451.2345</td></tr></table> <p>This cell is filled with the value abc and has width of 15 characters:</p>		A	B	1			2		1.23451.2345
	A	B								
1										
2		1.23451.2345								

Enumeration Value	Description									
	<table><tr><td></td><td>A</td><td>B</td></tr><tr><td>1</td><td></td><td></td></tr><tr><td>2</td><td></td><td>abcbabcbabcbabc</td></tr></table> <ul style="list-style-type: none">• <i>end example]</i>•		A	B	1			2		abcbabcbabcbabc
	A	B								
1										
2		abcbabcbabcbabc								
general (General Horizontal Alignment)	<p>The horizontal alignment is general-aligned. Text data is left-aligned. Numbers, dates, and times are right-aligned. Boolean types are centered. Changing the alignment does not change the type of data.</p> <p>[<i>Example:</i> These cells are general aligned:</p> <table><tr><td>1-Jan</td></tr><tr><td>45</td></tr><tr><td>abc</td></tr><tr><td>TRUE</td></tr></table> <p><i>end example]</i></p>	1-Jan	45	abc	TRUE					
1-Jan										
45										
abc										
TRUE										
justify (Justify)	<p>The horizontal alignment is justified (flush left and right). For each line of text, aligns each line of the wrapped text in a cell to the right and left (except the last line). If no single line of text wraps in the cell, then the text is not justified.</p> <p>[<i>Example:</i> There are two lines of text in this cell, and the cell's horizontal alignment is justify:</p> <table><tr><td>one two three four five six seven eight nine ten eleven twelve thirteen fourteen fifteen sixteen seventeen eighteen nineteen</td></tr><tr><td>six seven eight nine ten eleven twelve</td></tr></table> <p><i>end example]</i></p>	one two three four five six seven eight nine ten eleven twelve thirteen fourteen fifteen sixteen seventeen eighteen nineteen	six seven eight nine ten eleven twelve							
one two three four five six seven eight nine ten eleven twelve thirteen fourteen fifteen sixteen seventeen eighteen nineteen										
six seven eight nine ten eleven twelve										
left (Left Horizontal Alignment)	<p>The horizontal alignment is left-aligned, even in Right-</p>									

Enumeration Value	Description
	to-Left mode. Aligns contents at the left edge of the cell. If an indent amount is specified, the contents of the cell is indented from the left by the specified number of character spaces. The character spaces are based on the default font and font size for the workbook.
right (Right Horizontal Alignment)	The horizontal alignment is right-aligned, meaning that cell contents are aligned at the right edge of the cell, even in Right-to-Left mode.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_HorizontalAlignment](#)) is located in §A.2. *end note*]

18.18.41 ST_HtmlFmt (HTML Formatting Handling)

How to handle formatting from the HTML source.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
all (All)	Transfer all HTML formatting into the worksheet along with data.
none (No Formatting)	Bring data in as unformatted text (setting data types still occurs).
rtf (Honor Rich Text)	Translate HTML formatting to rich text formatting on the data brought into the worksheet.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_HtmlFmt](#)) is located in §A.2. *end note*]


18.18.42 ST_IconSetType (Icon Set Type)

Icon set type for conditional formatting. The threshold values for triggering the different icons within a set are configurable, and the icon order is reversible. See element `iconSet` for more information.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
3Arrows (3 Arrows)	3 arrows icon set.

Enumeration Value	Description
	
3ArrowsGray (3 Arrows (Gray))	3 gray arrows icon set. 
3Flags (3 Flags)	3 flags icon set. 
3Signs (3 Signs)	3 signs icon set. 
3Symbols (3 Symbols Circled)	3 symbols icon set. 
3Symbols2 (3 Symbols)	3 Symbols icon set. 
3TrafficLights1 (3 Traffic Lights)	3 traffic lights icon set (#1). 
3TrafficLights2 (3 Traffic Lights Black)	3 traffic lights icon set with thick black border. 
4Arrows (4 Arrows)	4 arrows icon set. 

Enumeration Value	Description
4ArrowsGray (4 Arrows (Gray))	4 gray arrows icon set. 
4Rating (4 Ratings)	4 ratings icon set. 
4RedToBlack (4 Red To Black)	4 'red to black' icon set. 
4TrafficLights (4 Traffic Lights)	4 traffic lights icon set. 
5Arrows (5 Arrows)	5 arrows icon set. 
5ArrowsGray (5 Arrows (Gray))	5 gray arrows icon set. 
5Quarters (5 Quarters)	5 quarters icon set. 
5Rating (5 Ratings Icon Set)	5 rating icon set. 

[Note: The W3C XML Schema definition of this simple type's content model ([ST_IconSetType](#)) is located in §A.2. end note]

18.18.43 ST_ItemType (PivotItem Type)

This simple type defines the pivot type for a pivotItem.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
avg (Average)	Indicates the pivot item represents an "average" aggregate function.
blank (Blank Pivot Item)	Indicates the pivot item represents a blank line.
count (Count)	Indicates the pivot item represents custom the "count" aggregate."
countA (CountA)	Indicates the pivot item represents the "count numbers" aggregate function.
data (Data)	Indicate the pivot item represents data.
default (Default)	Indicates the pivot item represents the default type for this PivotTable. The default pivot item type is the "total" aggregate function.
grand (Grand Total Item)	Indicates the pivot items represents the grand total line.
max (Max)	Indicates the pivot item represents the "maximum" aggregate function.
min (Min)	Indicates the pivot item represents the "minimum" aggregate function.
product (Product)	Indicates the pivot item represents the "product" function.
stdDev (stdDev)	Indicates the pivot item represents the "standard deviation" aggregate function.
stdDevP (StdDevP)	Indicates the pivot item represents the "standard deviation population" aggregate function.
sum (Sum)	Indicates the pivot item represents the "sum" aggregate value.
var (Var)	Indicates the pivot item represents the "variance" aggregate value.
varP (VarP)	Indicates the pivot item represents the "variance population" aggregate value.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ItemType](#)) is located in §A.2. *end note*]

18.18.44 ST_MdxFunctionType (MDX Function Type)

This simple type is an enumeration representing different MDX function types.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
c (Cube Set Count)	CUBESETCOUNT
k (Cube KPI Member)	CUBEKPIMEMBER
m (Cube Member)	CUBEMEMBER
p (Cube Member Property)	CUBEMEMBERPROPERTY
r (Cube Ranked Member)	CUBERANKEDMEMBER
s (Cube Set)	CUBESET
v (Cube Value)	CUBEVALUE

[Note: The W3C XML Schema definition of this simple type's content model ([ST_MdxFunctionType](#)) is located in §A.2. *end note*]

18.18.45 ST_MdxKPIProperty (MDX KPI Property)

An enumeration representing the different types of KPI properties.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
g (Goal)	Goal.
m (Current Time Member)	Current time member.
s (Status)	Status.
t (Trend)	Trend.
v (Value)	Value.
w (Weight)	Weight.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_MdxKPIProperty](#)) is located in §A.2. *end note*]

18.18.46 ST_MdxSetOrder (MDX Set Order)

This simple type represents an enumeration specifying an MDX set order.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
a (Ascending)	Sort ascending.
aa (Alpha Ascending Sort Order)	Sorted alphabetically in ascending order by the caption.
ad (Alpha Descending Sort Order)	Sort in descending order alphabetically by the caption.
d (Descending)	Sort descending.
na (Natural Ascending)	Sorted in ascending order by the natural order of the data - usually by the key. For instance if there is a list of accounts in a general ledger, this might be in order of account number.
nd (Natural Descending)	Sorted in descending order by the natural order of the data - usually by the key. For instance if there is a list of accounts in a general ledger, this might be in order of account number.
u (Unsorted)	Unsorted.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_MdxSetOrder](#)) is located in §A.2.
end note]

18.18.47 ST_NumFmtId (Number Format Id)

This simple type defines the identifier to a style sheet number format entry in CT_NumFmts. Number formats are written to the styles part. See §18.8.31 for more information on number formats.

This simple type's contents are a restriction of the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_NumFmtId](#)) is located in §A.2.
end note]

18.18.48 ST_Objects (Object Display Types)

This simple type defines how the application displays objects in this workbook. Objects might include charts, images, and other object data that the application supports.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
all (All)	Indicates that all objects be shown in the workbook.
none (None)	Indicates that all objects be hidden in the workbook.
placeholders (Show Placeholders)	Indicates that the application show placeholders for objects in the workbook.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Objects](#)) is located in §A.2. *end note*]

18.18.49 ST_OleUpdate (OLE Update Types)

Indicates whether the linked object updates the cached data for the linked object automatically or only when the container calls IOleObject::Update or IOleLink::Update methods.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
OLEUPDATE_ALWAYS (Always Update OLE)	Update the link object whenever possible, this option corresponds to the 'automatic update' option in the Links dialog box.
OLEUPDATE_ONCALL (Update OLE On Call)	Update the link object only when IOleObject::Update or IOleLink::Update is called, this option corresponds to the Manual update option in the Links dialog box.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_OleUpdate](#)) is located in §A.2. *end note*]

18.18.50 ST_Orientation (Orientation)

Print orientation for this sheet.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
default (Default)	Orientation not specified, use the default.
landscape (Landscape)	Landscape orientation.
portrait (Portrait)	Portrait orientation.

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_Orientation](#)) is located in §A.2. end note*]

18.18.51 ST_PageOrder (Page Order)

Specifies printed page order.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
downThenOver (Down Then Over)	Order pages vertically first, then move horizontally.
overThenDown (Over Then Down)	Order pages horizontally first, then move vertically

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_PageOrder](#)) is located in §A.2. end note*]

18.18.52 ST_Pane (Pane Types)

Defines the names of the four possible panes into which the view of a workbook in the application can be split.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
bottomLeft (Bottom Left Pane)	<p>Bottom left pane, when both vertical and horizontal splits are applied.</p> <p>This value is also used when only a horizontal split has been applied, dividing the pane into upper and lower regions. In that case, this value specifies the bottom pane.</p>
bottomRight (Bottom Right Pane)	<p>Bottom right pane, when both vertical and horizontal splits are applied.</p>
topLeft (Top Left Pane)	<p>Top left pane, when both vertical and horizontal splits are applied.</p> <p>This value is also used when only a horizontal split has been applied, dividing the pane into upper and lower regions. In that case, this value specifies the top pane.</p> <p>This value is also used when only a vertical split has been applied, dividing the pane into right and left regions. In that case, this value specifies the left pane</p>

Enumeration Value	Description
topRight (Top Right Pane)	<p>Top right pane, when both vertical and horizontal splits are applied.</p> <p>This value is also used when only a vertical split has been applied, dividing the pane into right and left regions. In that case, this value specifies the right pane.</p>

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Pane](#)) is located in §A.2. *end note*]

18.18.53 ST_PaneState (Pane State)

State of the sheet's pane.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
frozen (Frozen)	<p>Panes are frozen, but were not split being frozen. In this state, when the panes are unfrozen again, a single pane results, with no split.</p> <p>In this state, the split bars are not adjustable.</p>
frozenSplit (Frozen Split)	Panes are frozen and were split before being frozen. In this state, when the panes are unfrozen again, the split remains, but is adjustable.
split (Split)	Panes are split, but not frozen. In this state, the split bars are adjustable by the user.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_PaneState](#)) is located in §A.2. *end note*]

18.18.54 ST_ParameterType (Parameter Type)

Parameter Type.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
cell (Parameter From Cell)	Get the parameter value from a cell on each refresh.

Enumeration Value	Description
prompt (Prompt on Refresh)	Prompt the user on each refresh for a parameter value.
value (Value)	Use a constant value on each refresh for the parameter value.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ParameterType](#)) is located in §A.2. end note]


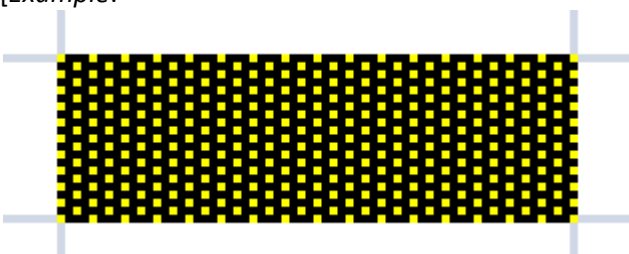
18.18.55 ST_PatternType (Pattern Type)


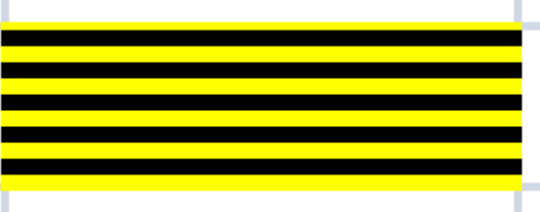
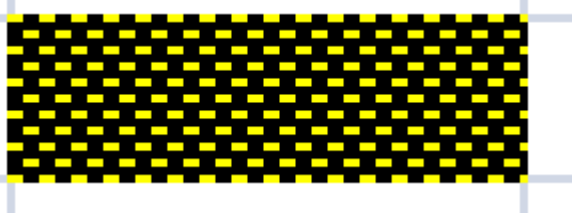

Indicates the style of fill pattern being used for a cell format.


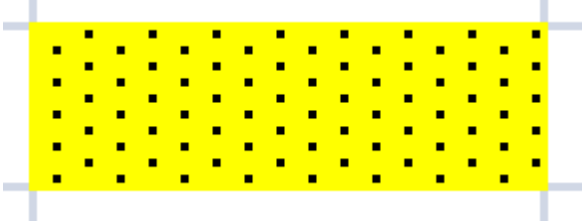
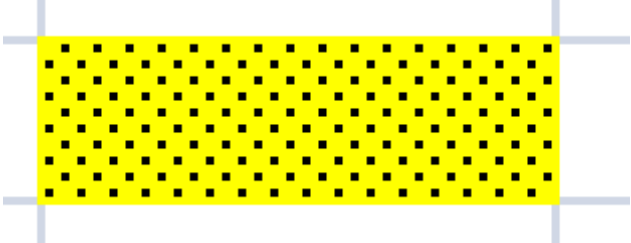

The examples below use yellow background and black foreground colors.

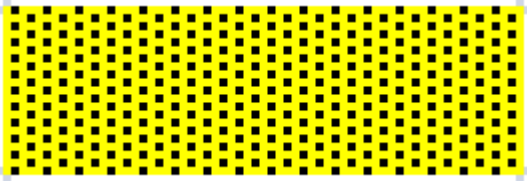
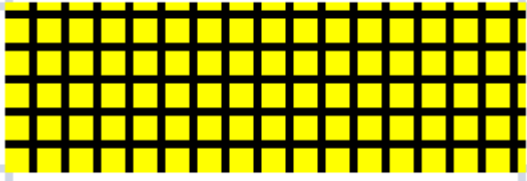

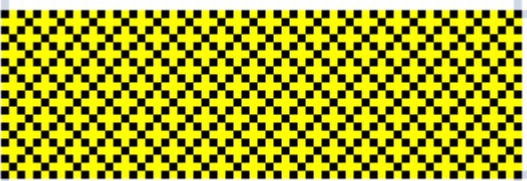
This simple type's contents are a restriction of the W3C XML Schema string datatype.




This simple type is restricted to the values listed in the following table:


Enumeration Value	Description
darkDown (Dark Down)	The fill style is 'dark down'. [Example:  end example]
darkGray (Dary Gray)	The fill style is 'dark gray'. [Example:  end example]
darkGrid (Dark Grid)	The fill style is 'dark grid'. [Example:

Enumeration Value	Description
	 <i>end example]</i>
darkHorizontal (Dark Horizontal)	The fill style is dark horizontal. [Example:  <i>end example]</i>
darkTrellis (Dark Trellis)	The fill style is 'dark trellis'. [Example:  <i>end example]</i>
darkUp (Dark Up)	The fill style is 'dark up'. [Example:  <i>end example]</i>
darkVertical (Dark Vertical)	The fill style is 'dark vertical'. [Example:

Enumeration Value	Description
	 <p><i>end example]</i></p>
gray0625 (Gray 0.0625)	<p>The fill style is grayscale of 0.0625 (1/16) value. [Example:</p>  <p><i>end example]</i></p>
gray125 (Gray 0.125)	<p>The fill style is grayscale of 0.125 (1/8) value. [Example:</p>  <p><i>end example]</i></p>
lightDown (Light Down)	<p>The fill style is 'light down'. [Example:</p>  <p><i>end example]</i></p>
lightGray (Light Gray)	<p>The fill style is light gray. [Example:</p>

Enumeration Value	Description
	 <i>end example]</i>
lightGrid (Light Grid)	The fill style is 'light grid'. [Example:  <i>end example]</i>
lightHorizontal (Light Horizontal)	The fill style is light horizontal. [Example:  <i>end example]</i>
lightTrellis (Light Trellis)	The fill style is 'light trellis'. [Example:  <i>end example]</i>
lightUp (Light Up)	The fill style is light up. [Example:

Enumeration Value	Description
	 <p><i>end example]</i></p>
lightVertical (Light Vertical)	The fill style is light vertical.
mediumGray (Medium Gray)	<p>The fill style is medium gray.</p> <p>[Example:</p>  <p><i>end example]</i></p>
none (None)	<p>The fill style is none (no fill). When foreground and/or background colors are specified, a pattern of 'none' overrides and means the cell has no fill.</p> <p>[Example:</p>  <p><i>end example]</i></p>
solid (Solid)	<p>The fill style is solid. When solid is specified, the foreground color (fgColor) is the only color rendered, even when a background color (bgColor) is also specified.</p> <p>[Example:</p>

Enumeration Value	Description
	 <i>end example]</i>

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_PatternType](#)) is located in §A.2. *end note*]

18.18.56 ST_PhoneticAlignment (Phonetic Alignment Types)

Phonetic alignment settings. These specify how to align the phonetic text, which represent the sounds, above the base text or base word.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
center (Center Alignment)	Center the phonetic characters over the base word, per word.
distributed (Distributed)	Each phonetic character is distributed above each base word character, per word.
left (Left Alignment)	Each phonetic character is left justified with respect to the base text., per word.
noControl (No Control)	Each phonetic character is left justified without respect to the base text (so it is not per word).

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_PhoneticAlignment](#)) is located in §A.2. *end note*]

18.18.57 ST_PhoneticType (Phonetic Type)

Represents the different East Asian character sets that shall be used for displaying phonetic hints.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
fullwidthKatakana (Full-Width Katakana)	Full-width Katakana is used

Enumeration Value	Description
halfwidthKatakana (Half-Width Katakana)	Half-width Katakana is used, this is the same Katakana character set, just half as wide so it takes up less space.
Hiragana (Hiragana)	Hiragana is used
noConversion (No Conversion)	Any characters are allowed. In this case the spreadsheet application shall leave the text as entered.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_PhoneticType](#)) is located in §A.2. *end note*]

18.18.58 ST_PivotAreaType (Rule Type)

Indicates the type of rule being used to describe an area or aspect of the PivotTable.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
all (All)	Refers to the whole PivotTable.
button (Field Button)	Refers to a field button.
data (Data)	Refers to something in the data area.
none (None)	Refers to no Pivot area.
normal (Normal)	Refers to a header or item.
origin (Origin)	Refers to the blank cells at the top-left of the PivotTable (top-left to LTR sheets, top-right for RTL sheets).
topEnd (Top End)	Refers to the blank cells at the top of the PivotTable, on its trailing edge (top-right for LTR sheets, top-left for RTL sheets).

[Note: The W3C XML Schema definition of this simple type's content model ([ST_PivotAreaType](#)) is located in §A.2. *end note*]

18.18.59 ST_PivotFilterType (Pivot Filter Types)

This simple type defines filters that can be applied to PivotTables.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
captionBeginsWith (Caption Begins With)	Indicates the "begins with" filter for field captions.
captionBetween (Caption Is Between)	Indicates the "is between" filter for field captions.
captionContains (Caption Contains)	Indicates the "contains" filter for field captions.
captionEndsWith (Caption Ends With)	Indicates the "ends with" filter for field captions.
captionEqual (Caption Equals)	Indicates the "equal" filter for field captions.
captionGreaterThan (Caption Is Greater Than)	Indicates the "is greater than" filter for field captions.
captionGreaterThanOrEqual (Caption Is Greater Than Or Equal To)	Indicates the "is greater than or equal to" filter for field captions.
captionLessThan (Caption Is Less Than)	Indicates the "is less than" filter for field captions.
captionLessThanOrEqual (Caption Is Less Than Or Equal To)	Indicates the "is less than or equal to" filter for field captions.
captionNotBeginsWith (Caption Does Not Begin With)	Indicates the "does not begin with" filter for field captions.
captionNotBetween (Caption Is Not Between)	Indicates the "is not between" filter for field captions.
captionNotContains (Caption Does Not Contain)	Indicates the "does not contain" filter for field captions.
captionNotEndsWith (Caption Does Not End With)	Indicates the "does not end with" filter for field captions.
captionNotEqual (Caption Not Equal)	Indicates the "not equal" filter for field captions.
count (Count)	Indicates the "count" filter.
dateBetween (Date Between)	Indicates the "between" filter for date values.
dateEqual (Date Equals)	Indicates the "equals" filter for date values.
dateNewerThan (Date Newer Than)	Indicates the "newer than" filter for date values.
dateNewerThanOrEqual (Date Newer Than or Equal To)	Indicates the "newer than or equal to" filter for date values.
dateNotBetween (Date Not Between)	Indicates the "not between" filter for date values.
dateNotEqual (Date Does Not Equal)	Indicates the "does not equal" filter for date values.
dateOlderThan (Date Older Than)	Indicates the "older than" filter for date values.
dateOlderThanOrEqual (Date Older Than Or Equal)	Indicates the "older than or equal to" filter for date values.
lastMonth (Last Month)	Indicates the "last month" filter for date values.
lastQuarter (Last Quarter)	Indicates the "last quarter" filter for date values.
lastWeek (Last Week)	Indicates the "last week" filter for date values.
lastYear (Last Year)	Indicates the "last year" filter for date values.
M1 (January)	Indicates the "January" filter for date values.

Enumeration Value	Description
M10 (Dates in October)	Indicates the "October" filter for date values.
M11 (Dates in November)	Indicates the "November" filter for date values.
M12 (Dates in December)	Indicates the "December" filter for date values.
M2 (Dates in February)	Indicates the "February" filter for date values.
M3 (Dates in March)	Indicates the "March" filter for date values.
M4 (Dates in April)	Indicates the "April" filter for date values.
M5 (Dates in May)	Indicates the "May" filter for date values.
M6 (Dates in June)	Indicates the "June" filter for date values.
M7 (Dates in July)	Indicates the "July" filter for date values.
M8 (Dates in August)	Indicates the "August" filter for date values.
M9 (Dates in September)	Indicates the "September" filter for date values.
nextMonth (Next Month)	Indicates the "next month" filter for date values.
nextQuarter (Next Quarter)	Indicates the "next quarter" for date values.
nextWeek (Next Week)	Indicates the "next week" for date values.
nextYear (Next Year)	Indicates the "next year" filter for date values.
percent (Percent)	Indicates the "percent" filter for numeric values.
Q1 (First Quarter)	Indicates the "first quarter" filter for date values.
Q2 (Second Quarter)	Indicates the "second quarter" filter for date values.
Q3 (Third Quarter)	Indicates the "third quarter" filter for date values.
Q4 (Fourth Quarter)	Indicates the "fourth quarter" filter for date values.
sum (Sum)	Indicates the "sum" filter for numeric values.
thisMonth (This Month)	Indicates the "this month" filter for date values.
thisQuarter (This Quarter)	Indicates the "this quarter" filter for date values.
thisWeek (This Week)	Indicates the "this week" filter for date values.
thisYear (This Year)	Indicate the "this year" filter for date values.
today (Today)	Indicates the "today" filter for date values.
tomorrow (Tomorrow)	Indicates the "tomorrow" filter for date values.
unknown (Unknown)	Indicates the PivotTable filter is unknown to the application.
valueBetween (Value Between)	Indicates the "Value between" filter for text and numeric values.
valueEqual (Value Equal)	Indicates the "value equal" filter for text and numeric values.
valueGreaterThan (Value Greater Than)	Indicates the "value greater than" filter for text and numeric values.

Enumeration Value	Description
valueGreaterThanOrEqual (Value Greater Than Or Equal To)	Indicates the "value greater than or equal to" filter for text and numeric values.
valueLessThan (Value Less Than)	Indicates the "value less than" filter for text and numeric values.
valueLessThanOrEqual (Value Less Than Or Equal To)	Indicates the "value less than or equal to" filter for text and numeric values
valueNotBetween (Value Not Between)	Indicates the "value not between" filter for text and numeric values.
valueNotEqual (Value Not Equal)	Indicates the "value not equal" filter for text and numeric values.
yearToDate (Year-To-Date)	Indicates the "year-to-date" filter for date values.
yesterday (Yesterday)	Indicates the "yesterday" filter for date values.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_PivotFilterType](#)) is located in §A.2. *end note*]

18.18.60 ST_PrintError (Print Errors)

This enumeration specifies how to display cells with errors when printing the worksheet.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
blank (Show Cell Errors As Blank)	Display cell errors as blank.
dash (Dash Cell Errors)	Display cell errors as dashes.
displayed (Display Cell Errors)	Display cell errors as displayed on screen.
NA (NA)	Display cell errors as #N/A.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_PrintError](#)) is located in §A.2. *end note*]

18.18.61 ST_Qualifier (Qualifier)

Qualifier to use to denote string data types in when text is imported from an external file.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
doubleQuote (Double Quote)	Quotation mark -- double quote (").
none (No Text Qualifier)	No text string qualifier used.
singleQuote (Single Quote)	Apostrophe mark -- single quote (').

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Qualifier](#)) is located in §A.2. *end note*]

18.18.62 ST_Ref (Cell References)

This simple type defines a reference to a range of cells within a sheet in the workbook. A reference identifies a cell or a range of cells on a worksheet and tells the application where to look for the values or data you want to use in a formula. With references, you can use data contained in different parts of a worksheet in one formula or use the value from one cell in several formulas. You can also refer to cells on other sheets in the same workbook, and to other workbooks. References to cells in other workbooks are called links.

SpreadsheetML defines two reference styles defined in the ST_RefMode simple type.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Ref](#)) is located in §A.2. *end note*]

18.18.63 ST_RefA (Single Cell Reference)

This simple type specifies a single cell reference that might be absolute.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_RefA](#)) is located in §A.2. *end note*]

18.18.64 ST_RefMode (Reference Mode)

This simple type defines the supported reference styles or modes for a workbook in SpreadsheetML.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
A1 (A1 Mode)	Indicates that the workbook uses A1 reference style. This is the default for SpreadsheetML. A1 reference style refers to columns with letters and refers to rows with numbers. For example, A1 refers to the cell at the intersection of column A and row 1.

Enumeration Value	Description
R1C1 (R1C1 Reference Mode)	Indicates that the workbook uses the R1C1 reference style. R1C1 reference style refers to both the rows and the columns on the worksheet with numbers. The location of a cell is indicated with an "R" followed by a row number and a "C" followed by a column number. For example, R1C1 refers to the cell at the intersection of row R1 and column C1.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_RefMode](#)) is located in §A.2. *end note*]

18.18.65 ST_RevisionAction (Revision Action Types)

Identifies what kind of action the user performed. Applies to Comment and Custom View revision record.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
add (Add)	Add action.
delete (Delete)	Delete action.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_RevisionAction](#)) is located in §A.2. *end note*]

18.18.66 ST_rwColActionType (Row Column Action Type)

Identifies what kind of an action was applied to a row or column.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
deleteCol (Delete Column)	Column delete revision.
deleteRow (Delete Row)	Row delete revision.
insertCol (Column Insert)	Column insert revision.
insertRow (Insert Row)	Row insert revision.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_rwColActionType](#)) is located in §A.2. *end note*]

18.18.67 ST_Scope (Conditional Formatting Scope)

This simple type defines the scope of conditional formatting applied in the PivotTable.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
data (Data Fields)	Indicates that conditional formatting is applied to the selected data fields.
field (Field Intersections)	Indicates that conditional formatting is applied to the selected PivotTable field intersections.
selection (Selection)	Indicates that conditional formatting is applied to the selected cells.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Scope](#)) is located in §A.2. *end note*]

18.18.68 ST_SheetState (Sheet Visibility Types)

This simple type defines the possible states for sheet visibility.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
hidden (Hidden)	Indicates the workbook window is hidden, but can be shown by the user via the user interface.
veryHidden (Very Hidden)	Indicates the sheet is hidden and cannot be shown in the user interface (UI). This state is only available programmatically.
visible (Visible)	Indicates the sheet is visible.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_SheetState](#)) is located in §A.2. *end note*]

18.18.69 ST_SheetViewType (Sheet View Type)

Defines the view setting of the sheet.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
normal (Normal View)	Normal view
pageBreakPreview (Page Break Preview)	Page break preview
pageLayout (Page Layout View)	Page Layout View

[Note: The W3C XML Schema definition of this simple type's content model ([ST_SheetViewType](#)) is located in §A.2. *end note*]

18.18.70 ST_ShowDataAs (Show Data As)

This simple type defines the data formats for a field in the PivotTable.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
difference (Difference)	Indicates the field is shown as the "difference from" a value.
index (Index)	Indicates the field is shown as the "index."
normal (Normal Data Type)	Indicates that the field is shown as its normal data type.
percent (Percentage Of)	Indicates the field is show as the "percentage of
percentDiff (Percentage Difference)	Indicates the field is shown as the "percentage difference from" a value.
percentOfCol (Percent of Column)	Indicates the field is shown as the percentage of column.
percentOfRow (Percentage of Row)	Indicates the field is shown as the percentage of row
percentOfTotal (Percentage of Total)	Indicates the field is shown as percentage of total.
runTotal (Running Total)	Indicates the field is shown as running total in the table.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ShowDataAs](#)) is located in §A.2. *end note*]

18.18.71 ST_SmartTagShow (Smart Tag Display Types)

This simple type defines options for displaying smart tags in the user interface.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
all (All)	Indicates that smart tags are enabled and shown in the user interface.
noIndicator (No Smart Tag Indicator)	Indicates that the smart tags are enabled but the indicator not be shown in the user interface.
none (None)	Indicates that smart tags are disabled and not displayed in the user interface.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_SmartTagShow](#)) is located in §A.2. *end note*]

18.18.72 ST_SortBy (Sort By)

Specifies what to sort by. In many cases a range of cells are sorted by their values. However, cells can also be sorted by their background color, font color, and type of icon in the cell.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
cellColor (Sort by Cell Color)	Sort by cell color
fontColor (Sort by Font Color)	Sort by font color
icon (Sort by Icon)	Sort by icon
value (Value)	Sort by value

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_SortBy](#)) is located in §A.2. *end note*]

18.18.73 ST_SortMethod (Sort Method)

Sort method. Chinese Simplified, Chinese Traditional, and Japanese support alternate sort methods (multiple sort options are available). All other languages support only 1 sort option. In that case, the value pinYin is used.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
none (None)	Not specified, use default sort method.
pinYin (PinYin Sort)	Default sort method. This is the only sort option for most languages.

Enumeration Value	Description
	For Chinese Simplified, Chinese Traditional, and Japanese, pinYin means sort by phonetic value. •
stroke (Sort by Stroke)	Sort by stroke count of the characters. Only applies to Chinese Simplified, Chinese Traditional, and Japanese.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_SortMethod](#)) is located in §A.2. *end note*]

18.18.74 ST_SortType (Set Sort Order)

This simple type defines the possible sort order for the PivotTable.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
ascending (Ascending)	Indicates that the PivotTable data is sorted in ascending order.
ascendingAlpha (Ascending Alpha)	Indicates that the PivotTable data is sorted in alphabetic order with ascending values.
ascendingNatural (Ascending Natural)	Indicates that the PivotTable data is sorted in natural order with ascending.
descending (Descending)	Indicates that the PivotTable data is sorted in descending.
descendingAlpha (Alphabetic Order Descending)	Indicates that the PivotTable data is sorted in alphabetic order with descending values.
descendingNatural (Natural Order Descending)	Indicates that the PivotTable data is sorted in natural order with descending values.
none (None)	Indicates that the PivotTable data is not sorted.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_SortType](#)) is located in §A.2. *end note*]

18.18.75 ST_SourceType (PivotCache Type)

This simple type defines the cache types for PivotTables.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
consolidation (Consolidation Ranges)	Indicates that the cache contains data that consolidates ranges.
external (External)	Indicates that the cache contains data from an external data source.
scenario (Scenario Summary Report)	Indicates that the cache contains a scenario summary report
worksheet (Worksheet)	Indicates that the cache contains worksheet data.

[Note: The W3C XML Schema definition of this simple type’s content model ([ST_SourceType](#)) is located in §A.2. *end note*]

18.18.76 ST_Sqref (Reference Sequence)

A sequence of cell references, space delimited.

This simple type allows a list of items of the ST_Ref simple type (§18.18.62).

[Note: The W3C XML Schema definition of this simple type’s content model ([ST_Sqref](#)) is located in §A.2. *end note*]

18.18.77 ST_TableStyleType (Table Style Type)

Enumeration of the different structured regions of a Table or PivotTable which can be formatted. Specifies which region is being formatted by this table style element.

Table Regions

Diagram illustrating the structure of a PivotTable with various regions and cells highlighted:

- First Column Stripe**: The first column of the table.
- Second Column Stripe**: The second column of the table.
- First Column**: The first column of the table.
- Second Column**: The second column of the table.
- Last Column**: The last column of the table.
- First Header Cell**: The first cell in the header row.
- Last Header Cell**: The last cell in the header row.
- Header Row**: The row containing the headers.
- Whole Table**: The entire data area.
- Total Row**: The row containing the totals.
- First Total Cell**: The first cell in the total row.
- Last Total Cell**: The last cell in the total row.
- First Row Stripe**: The first row of the table.
- Second Row Stripe**: The second row of the table.

Customer Name	Group	Country	Region	State	City
Michele Raman	Pacific	Australia	Australia	Victoria	Bendigo
Misty Raji	Pacific	Australia	Australia	Victoria	Bendigo
Tabitha E Arthur	Pacific	Australia	Australia	Victoria	Bendigo
Clarence D Rai	Pacific	Australia	Australia	Victoria	Bendigo
Jimmy L Moreno	Pacific	Australia	Australia	Victoria	Bendigo
Rob Verhoff	Pacific	Australia	Australia	Victoria	Bendigo
Levi Sai	Pacific	Australia	Australia	Victoria	Bendigo
Logan Gonzales	Pacific	Australia	Australia	Queensla	Brisbane
Dalton J Lee	Pacific	Australia	Australia	Queensla	Brisbane
Jessie J Ortega	Pacific	Australia	Australia	Queensla	Brisbane
Total					10

PivotTable Regions

Blank Row

Only applies when "Insert blank row after each item" is ON.

Country	{All}	
Sum of Sales Amount	Column Labels	
	2001	
	3	
	July	July Total
Row Labels	No Discount	
New South Wales	75625.4664	75625.4664
Coffs Harbour	699.0982	699.0982
Bikes	699.0982	699.0982
Road Bikes	699.0982	699.0982
Road-150 Red, 48		
Road-150 Red, 52		
Road-150 Red, 62		
Road-650 Red, 44	699.0982	699.0982
Darlinghurst	3578.27	3578.27
Bikes	3578.27	3578.27
Road Bikes	3578.27	3578.27
Road-150 Red, 48		
Road-150 Red, 56	3578.27	3578.27
Road-150 Red, 62		
Goulburn	18412.1682	18412.1682
Bikes	18412.1682	18412.1682
Mountain Bikes	3399.99	3399.99
Mountain-100 Silver, 44	3399.99	3399.99
Road Bikes	15012.1782	15012.1782

Whole Table

Country	{All}	
Sum of Sales Amount	Column Labels	
	2001	
	3	
	July	July Total
Row Labels	No Discount	
New South Wales	75625.4664	75625.4664
Coffs Harbour	699.0982	699.0982
Bikes	699.0982	699.0982
Road Bikes	699.0982	699.0982
Road-150 Red, 48		
Road-150 Red, 52		
Road-150 Red, 62		
Road-650 Red, 44	699.0982	699.0982
Darlinghurst	3578.27	3578.27
Bikes	3578.27	3578.27
Road Bikes	3578.27	3578.27
Road-150 Red, 48		
Road-150 Red, 56	3578.27	3578.27
Road-150 Red, 62		

Page Field Labels

Country	{All}	
Sum of Sales Amount	Column Labels	
	2001	
	3	
	July	July Total
Row Labels	No Discount	
New South Wales	75625.4664	75625.4664
Coffs Harbour	699.0982	699.0982
Bikes	699.0982	699.0982
Road Bikes	699.0982	699.0982

Page Field Values

Country	{All}	
Sum of Sales Amount	Column Labels	
	2001	
	3	
	July	July Total
Row Labels	No Discount	
New South Wales	75625.4664	75625.4664
Coffs Harbour	699.0982	699.0982
Bikes	699.0982	699.0982
Road Bikes	699.0982	699.0982

First Column Stripe

Country	{All}				
Sum of Sales Amount	Column Labels				
	2001				
	3				
	July	July Total	August	August Total	September
Row Labels	No Discount		No Discount		No Discount
New South Wales	75625.4664	75625.4664	119823.881	119823.881	83698.4064
Coffs Harbour	699.0982	699.0982	7156.54	7156.54	7156.54
Bikes	699.0982	699.0982	7156.54	7156.54	7156.54
Road Bikes	699.0982	699.0982	7156.54	7156.54	7156.54
Road-150 Red, 48					3578.27
Road-150 Red, 52			3578.27	3578.27	3578.27
Road-150 Red, 62			3578.27	3578.27	

Second Column Stripe

Country	{All}				
Sum of Sales Amount	Column Labels				
	2001				
	3				
	July				
	July Total				
	August				
	August Total				
	September				
Row Labels	No Discount				
New South Wales	75625.4664	75625.4664	119823.881	119823.881	83698.4064
Coffs Harbour	699.0982	699.0982	7156.54	7156.54	7156.54
Bikes	699.0982	699.0982	7156.54	7156.54	7156.54
Road Bikes	699.0982	699.0982	7156.54	7156.54	7156.54
Road-150 Red, 48					3578.27
Road-150 Red, 52			3578.27	3578.27	3578.27
Road-150 Red, 62			3578.27	3578.27	
Road-650 Red, 44	699.0982	699.0982			
Darlinghurst	3578.27	3578.27	3578.27	3578.27	7156.54
Bikes	3578.27	3578.27	3578.27	3578.27	7156.54
Road Bikes	3578.27	3578.27	3578.27	3578.27	7156.54
Road-150 Red, 48			3578.27	3578.27	
Road-150 Red, 56	3578.27	3578.27			3578.27
Road-150 Red, 62					3578.27

First Row Stripe

Country	{All}			
Sum of Sales Amount	Column Labels			
	2001			
	3			
	July	July Total	August	August Total
Row Labels	No Discount		No Discount	
New South Wales	75625.4664	75625.4664	119823.881	119823.881
Coffs Harbour	699.0982	699.0982	7156.54	7156.54
Bikes	699.0982	699.0982	7156.54	7156.54
Road Bikes	699.0982	699.0982	7156.54	7156.54
Road-150 Red, 48				
Road-150 Red, 52			3578.27	3578.27
Road-150 Red, 62			3578.27	3578.27
Road-650 Red, 44	699.0982	699.0982		
Darlinghurst	3578.27	3578.27	3578.27	3578.27
Bikes	3578.27	3578.27	3578.27	3578.27
Road Bikes	3578.27	3578.27	3578.27	3578.27
Road-150 Red, 48			3578.27	3578.27
Road-150 Red, 56	3578.27	3578.27		
Road-150 Red, 62				

Second Row Stripe

Country	(All)				
Sum of Sales Amount	Column Labels				
	2001				
	3				
	July	July Total	August	August Total	
Row Labels	No Discount		No Discount		
New South Wales		75625.4664	75625.4664	119823.881	119823.881
Coffs Harbour		699.0982	699.0982	7156.54	7156.54
Bikes		699.0982	699.0982	7156.54	7156.54
Road Bikes		699.0982	699.0982	7156.54	7156.54
Road-150 Red, 48					
Road-150 Red, 52				3578.27	3578.27
Road-150 Red, 62				3578.27	3578.27
Road-650 Red, 44		699.0982	699.0982		
Darlinghurst		3578.27	3578.27	3578.27	3578.27
Bikes		3578.27	3578.27	3578.27	3578.27
Road Bikes		3578.27	3578.27	3578.27	3578.27
Road-150 Red, 48				3578.27	3578.27
Road-150 Red, 56		3578.27	3578.27		
Road-150 Red, 62					

First Column

Country	(All)		
Sum of Sales Amount	Column Labels		
	2001		
	3		
	July	July Total	August
Row Labels	No Discount	No Discount	No Discount
New South Wales	75625.4664	75625.4664	119823.881
Coffs Harbour	699.0982	699.0982	7156.54
Bikes	699.0982	699.0982	7156.54
Road Bikes	699.0982	699.0982	7156.54
Road-150 Red, 48			
Road-150 Red, 52			3578.27
Road-150 Red, 62			3578.27
Road-650 Red, 44	699.0982	699.0982	
Darlinghurst	3578.27	3578.27	3578.27
Bikes	3578.27	3578.27	3578.27
Road Bikes	3578.27	3578.27	3578.27
Road-150 Red, 48			3578.27
Road-150 Red, 56	3578.27	3578.27	
Road-150 Red, 62			

Header Row

Country	(All)		
Sum of Sales Amount	Column Labels		
	2001		
	3		
	July	July Total	August
Row Labels	No Discount	No Discount	No Discount
New South Wales	75625.4664	75625.4664	119823.881
Coffs Harbour	699.0982	699.0982	7156.54
Bikes	699.0982	699.0982	7156.54
Road Bikes	699.0982	699.0982	7156.54
Road-150 Red, 48			
Road-150 Red, 52			3578.27
Road-150 Red, 62			3578.27
Road-650 Red, 44	699.0982	699.0982	

First Header Cell

Country	(All)			
Sum of Sales Amount	Column Labels			
	2001			
	3			
	July	July Total	August	
Row Labels	No Discount		No Discount	
New South Wales	75625.4664	75625.4664	119823.881	
Coffs Harbour	699.0982	699.0982	7156.54	
Bikes	699.0982	699.0982	7156.54	
Road Bikes	699.0982	699.0982	7156.54	
Road-150 Red, 48				
Road-150 Red, 52			3578.27	
Road-150 Red, 62			3578.27	
Road-650 Red, 44	699.0982	699.0982		

Subtotal Column 1

Country	(All)								
Sum of Sales Amount	Column Labels								
	2001								2001 Total
	3							3 Total	
	July	July Total	August	August Total	September	September Total			
Row Labels	No Discount		No Discount		No Discount				
New South Wales	75625.4664	75625.4664	119823.881	119823.881	83698.4064	83698.4064	279147.7538	279147.7538	
Coffs Harbour	699.0982	699.0982	7156.54	7156.54	7156.54	7156.54	15012.1782	15012.1782	
Bikes	699.0982	699.0982	7156.54	7156.54	7156.54	7156.54	15012.1782	15012.1782	
Road Bikes	699.0982	699.0982	7156.54	7156.54	7156.54	7156.54	15012.1782	15012.1782	
Road-150 Red, 48					3578.27	3578.27	3578.27	3578.27	
Road-150 Red, 52			3578.27	3578.27	3578.27	3578.27	7156.54	7156.54	
Road-150 Red, 62			3578.27	3578.27			3578.27	3578.27	
Road-650 Red, 44	699.0982	699.0982					699.0982	699.0982	

Subtotal Column 2

Country	(All)								
Sum of Sales Amount	Column Labels								
	2001								2001 Total
	3							3 Total	
	July	July Total	August	August Total	September	September Total			
Row Labels	No Discount		No Discount		No Discount				
New South Wales	75625.4664	75625.4664	119823.881	119823.881	83698.4064	83698.4064	279147.7538	279147.7538	
Coffs Harbour	699.0982	699.0982	7156.54	7156.54	7156.54	7156.54	15012.1782	15012.1782	
Bikes	699.0982	699.0982	7156.54	7156.54	7156.54	7156.54	15012.1782	15012.1782	
Road Bikes	699.0982	699.0982	7156.54	7156.54	7156.54	7156.54	15012.1782	15012.1782	
Road-150 Red, 48					3578.27	3578.27	3578.27	3578.27	
Road-150 Red, 52			3578.27	3578.27	3578.27	3578.27	7156.54	7156.54	
Road-150 Red, 62			3578.27	3578.27			3578.27	3578.27	
Road-650 Red, 44	699.0982	699.0982					699.0982	699.0982	

Subtotal Column 3

Country	{All}								
Sum of Sales Amount	Column Labels								
	2001								
	3								
	July		July Total	August	August Total	September	September Total	3 Total	2001 Total
Row Labels	No Discount			No Discount		No Discount			
New South Wales		75625.4664	75625.4664	119823.881	119823.881	83698.4064	83698.4064	279147.7538	279147.7538
Coffs Harbour		699.0982	699.0982	7156.54	7156.54	7156.54	7156.54	15012.1782	15012.1782
Bikes		699.0982	699.0982	7156.54	7156.54	7156.54	7156.54	15012.1782	15012.1782
Road Bikes		699.0982	699.0982	7156.54	7156.54	7156.54	7156.54	15012.1782	15012.1782
Road-150 Red, 48						3578.27	3578.27	3578.27	3578.27
Road-150 Red, 52				3578.27	3578.27	3578.27	3578.27	7156.54	7156.54
Road-150 Red, 62				3578.27	3578.27			3578.27	3578.27
Road-650 Red, 44		699.0982	699.0982					699.0982	699.0982

Subtotal Row 1

Country	(All)				
Sum of Sales Amount	Column Labels				
	2001				
	3				
	July	July Total	August	August Total	September
Row Labels	No Discount		No Discount		No Discount
Bendigo					
Mountain Bikes					
Mountain-100 Black, 38	3374.99	3374.99			
Mountain-100 Silver, 42	3399.99	3399.99			
Mountain-100 Silver, 48	3399.99	3399.99			
Mountain Bikes Total	10174.97	10174.97			
Road Bikes					
Road-150 Red, 44	3578.27	3578.27			
Road-150 Red, 52	3578.27	3578.27			
Road-150 Red, 62	3578.27	3578.27			3578.27
Road Bikes Total	10734.81	10734.81			3578.27
Bendigo Total	20909.78	20909.78			3578.27
Brisbane					
Road Bikes					
Road-150 Red, 44	3578.27	3578.27	3578.27	3578.27	
Road-150 Red, 62			3578.27	3578.27	
Road Bikes Total	3578.27	3578.27	7156.54	7156.54	
Brisbane Total	3578.27	3578.27	7156.54	7156.54	

Subtotal Row 2

Country	(All)				
Sum of Sales Amount	Column Labels				
	<input type="checkbox"/> 2001				
	<input type="checkbox"/> 3				
	<input type="checkbox"/> July	July Total	<input type="checkbox"/> August	August Total	<input type="checkbox"/> September
Row Labels	<input type="checkbox"/> No Discount		<input type="checkbox"/> No Discount		<input type="checkbox"/> No Discount
<input type="checkbox"/> Bendigo					
<input type="checkbox"/> Mountain Bikes					
Mountain-100 Black, 38	3374.99	3374.99			
Mountain-100 Silver, 42	3399.99	3399.99			
Mountain-100 Silver, 48	3399.99	3399.99			
Mountain Bikes Total	10174.97	10174.97			
<input type="checkbox"/> Road Bikes					
Road-150 Red, 44	3578.27	3578.27			
Road-150 Red, 52	3578.27	3578.27			
Road-150 Red, 62	3578.27	3578.27			3578.27
Road Bikes Total	10734.81	10734.81			3578.27
Bendigo Total	20909.78	20909.78			3578.27
<input type="checkbox"/> Brisbane					
<input type="checkbox"/> Road Bikes					
Road-150 Red, 44	3578.27	3578.27	3578.27	3578.27	
Road-150 Red, 62			3578.27	3578.27	
Road Bikes Total	3578.27	3578.27	7156.54	7156.54	

Subtotal Row 3

Country	{All}					
Sum of Sales Amount	Column Labels					
	2001					
	3					
	July		July Total	August	August Total	September
Row Labels	No Discount			No Discount		No Discount
New South Wales						
Coffs Harbour						
Road Bikes						
Road-150 Red, 48						3578.27
Road-150 Red, 52				3578.27	3578.27	3578.27
Road-150 Red, 62				3578.27	3578.27	
Road-650 Red, 44	699.0982		699.0982			
Road Bikes Total	699.0982		699.0982	7156.54	7156.54	7156.54
Coffs Harbour Total	699.0982		699.0982	7156.54	7156.54	7156.54
Darlinghurst						
Road Bikes						
Road-150 Red, 48				3578.27	3578.27	
Road-150 Red, 56	3578.27		3578.27			3578.27
Road-150 Red, 62						3578.27
Road Bikes Total	3578.27		3578.27	3578.27	3578.27	7156.54
Darlinghurst Total	3578.27		3578.27	3578.27	3578.27	7156.54

Column Subheading 1

Country	{All}							
Sum of Sales Amount	Column Labels							
	2001							2001 Total
	3						3 Total	
	July		July Total	August	August Total	September	September Total	
Row Labels	No Discount			No Discount		No Discount		
New South Wales	75625.4664		75625.4664	119823.881	119823.881	83698.4064	83698.4064	279147.7538
Coffs Harbour	699.0982		699.0982	7156.54	7156.54	7156.54	7156.54	15012.1782
Bikes	699.0982		699.0982	7156.54	7156.54	7156.54	7156.54	15012.1782
Road Bikes	699.0982		699.0982	7156.54	7156.54	7156.54	7156.54	15012.1782

Column Subheading 2

Country	{All}						
Sum of Sales Amount	Column Labels						
	2001						
	3						
	July	July Total	August	August Total	September	September Total	3 Total
Row Labels	No Discount						
New South Wales	75625.4664	75625.4664	119823.881	119823.881	83698.4064	83698.4064	279147.7538
Coffs Harbour	699.0982	699.0982	7156.54	7156.54	7156.54	7156.54	15012.1782
Bikes	699.0982	699.0982	7156.54	7156.54	7156.54	7156.54	15012.1782
Road Bikes	699.0982	699.0982	7156.54	7156.54	7156.54	7156.54	15012.1782

Column Subheading 3

Country	{All}						
Sum of Sales Amount	Column Labels						
	2001						
	3						
	July	July Total	August	August Total	September	September Total	2001 Total
Row Labels	No Discount						
New South Wales	75625.4664	75625.4664	119823.881	119823.881	83698.4064	83698.4064	279147.7538
Coffs Harbour	699.0982	699.0982	7156.54	7156.54	7156.54	7156.54	15012.1782
Bikes	699.0982	699.0982	7156.54	7156.54	7156.54	7156.54	15012.1782
Road Bikes	699.0982	699.0982	7156.54	7156.54	7156.54	7156.54	15012.1782

Row Subheading 1

Country	{All}						
Sum of Sales Amount	Column Labels						
	2001						
	3						
	July	July Total	August	August Total	September	September Total	
Row Labels	No Discount						
New South Wales							
Coffs Harbour							
Road Bikes							
Road-150 Red, 48							3578.27
Road-150 Red, 52				3578.27	3578.27		3578.27
Road-150 Red, 62				3578.27	3578.27		
Road-650 Red, 44		699.0982	699.0982				
Road Bikes Total		699.0982	699.0982	7156.54	7156.54		7156.54
Coffs Harbour Total		699.0982	699.0982	7156.54	7156.54		7156.54

Row Subheading 2

Country	{All}				
Sum of Sales Amount	Column Labels				
	2001				
		3			
	July	July Total	August	August Total	September
Row Labels	No Discount		No Discount		No Discount
New South Wales					
Coffs Harbour					
Road Bikes					
Road-150 Red, 48					3578.27
Road-150 Red, 52			3578.27	3578.27	3578.27
Road-150 Red, 62			3578.27	3578.27	
Road-650 Red, 44	699.0982	699.0982			
Road Bikes Total	699.0982	699.0982	7156.54	7156.54	7156.54
Coffs Harbour Total	699.0982	699.0982	7156.54	7156.54	7156.54
Darlinghurst					
Road Bikes					
Road-150 Red, 48			3578.27	3578.27	
Road-150 Red, 56	3578.27	3578.27			3578.27
Road-150 Red, 62					3578.27
Road Bikes Total	3578.27	3578.27	3578.27	3578.27	7156.54
Darlinghurst Total	3578.27	3578.27	3578.27	3578.27	7156.54
Goulburn					
Mountain Bikes					
Mountain-100 Silver, 44	3399.99	3399.99			

Row Subheading 3

Country	(All)								
Sum of Sales Amount	Column Labels								
	2001								
	3								
	July	July Total		August	August Total		September		
Row Labels	No Discount			No Discount			No Discount		
New South Wales									
Coffs Harbour									
Road Bikes									
Road-150 Red, 48									3578.27
Road-150 Red, 52				3578.27	3578.27				3578.27
Road-150 Red, 62				3578.27	3578.27				
Road-650 Red, 44	699.0982	699.0982							
Road Bikes Total	699.0982	699.0982	7156.54	7156.54					7156.54
Coffs Harbour Total	699.0982	699.0982	7156.54	7156.54					7156.54
Darlinghurst									
Road Bikes									
Road-150 Red, 48				3578.27	3578.27				
Road-150 Red, 56	3578.27	3578.27							3578.27
Road-150 Red, 62									3578.27
Road Bikes Total	3578.27	3578.27	3578.27	3578.27					7156.54
Darlinghurst Total	3578.27	3578.27	3578.27	3578.27					7156.54
Goulburn									
Mountain Bikes									
Mountain-100 Silver, 44	3399.99	3399.99							

Grand Total Column

Country	(All)									
Sum of Sales Amount	Column Labels									
	2001							2001 Total	Grand Total	
	3							3 Total		
	July	July Total	August	August Total	September	September Total				
Row Labels	No Discount		No Discount		No Discount					
New South Wales	75625.4664	75625.4664	119823.881	119823.881	83698.4064	83698.4064	279147.7538	279147.7538	279147.7538	
Coffs Harbour	699.0982	699.0982	7156.54	7156.54	7156.54	7156.54	15012.1782	15012.1782	15012.1782	
Bikes	699.0982	699.0982	7156.54	7156.54	7156.54	7156.54	15012.1782	15012.1782	15012.1782	
Road Bikes	699.0982	699.0982	7156.54	7156.54	7156.54	7156.54	15012.1782	15012.1782	15012.1782	
Road-150 Red, 48					3578.27	3578.27	3578.27	3578.27	3578.27	
Road-150 Red, 52			3578.27	3578.27	3578.27	3578.27	7156.54	7156.54	7156.54	
Road-150 Red, 62			3578.27	3578.27			3578.27	3578.27	3578.27	
Road-650 Red, 44	699.0982	699.0982					699.0982	699.0982	699.0982	

Grand Total Row

Country	(All)									
Sum of Sales Amount	Column Labels									
	2001							2001 Total	Grand Total	
	3							3 Total		
	July	July Total	August	August Total	September	September Total				
Row Labels	No Discount		No Discount		No Discount					
New South Wales	75625.4664	75625.4664	119823.881	119823.881	83698.4064	83698.4064	279147.7538	279147.7538	279147.7538	
Queensland	53228.4682	53228.4682	35376.14	35376.14	29821.0764	29821.0764	118425.6846	118425.6846	118425.6846	
South Australia	7156.54	7156.54	11255.6282	11255.6282	6978.26	6978.26	25390.4282	25390.4282	25390.4282	
Tasmania	6978.26	6978.26	10531.53	10531.53	3578.27	3578.27	21088.06	21088.06	21088.06	
Victoria	66664.17	66664.17	45551.11	45551.11	49917.5	49917.5	162132.78	162132.78	162132.78	
Grand Total	209652.9046	209652.9046	222538.2892	222538.2892	173993.5128	173993.5128	606184.7066	606184.7066	606184.7066	

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
blankRow (Blank Row Style)	Table style element that applies to PivotTable's blank rows.
firstColumn (First Column Style)	Table style element that applies to table's first column.
firstColumnStripe (First Column Stripe Style)	Table style element that applies to table's first column stripes.
firstColumnSubheading (First Column Subheading Style)	Table style element that applies to PivotTable's first column subheading.
firstHeaderCell (First Header Row Style)	Table style element that applies to table's first header row cell.
firstRowStripe (First Row Stripe Style)	Table style element that applies to table's first row stripes.
firstRowSubheading (First Row Subheading Style)	Table style element that applies to PivotTable's first row subheading.
firstSubtotalColumn (First Subtotal Column Style)	Table style element that applies to PivotTable's first subtotal column.
firstSubtotalRow (First Subtotal Row Style)	Table style element that applies to pivot table's first subtotal row.
firstTotalCell (First Total Row Style)	Table style element that applies to table's first total row cell.

Enumeration Value	Description
headerRow (Header Row Style)	Table style element that applies to table's header row.
lastColumn (Last Column Style)	Table style element that applies to table's last column.
lastHeaderCell (Last Header Style)	Table style element that applies to table's last header row cell.
lastTotalCell (Last Total Row Style)	Table style element that applies to table's last total row cell.
pageFieldLabels (Page Field Labels Style)	Table style element that applies to pivot table's page field labels.
pageFieldValues (Page Field Values Style)	Table style element that applies to pivot table's page field values.
secondColumnStripe (Second Column Stipe Style)	Table style element that applies to table's second column stripes.
secondColumnSubheading (Second Column Subheading Style)	Table style element that applies to pivot table's second column subheading.
secondRowStripe (Second Row Stripe Style)	Table style element that applies to table's second row stripes.
secondRowSubheading (Second Row Subheading Style)	Table style element that applies to pivot table's second row subheading.
secondSubtotalColumn (Second Subtotal Column Style)	Table style element that applies to PivotTable's second subtotal column.
secondSubtotalRow (Second Subtotal Row Style)	Table style element that applies to PivotTable's second subtotal row.
thirdColumnSubheading (Third Column Subheading Style)	Table style element that applies to PivotTable's third column subheading.
thirdRowSubheading (Third Row Subheading Style)	Table style element that applies to PivotTable's third row subheading.
thirdSubtotalColumn (Third Subtotal Column Style)	Table style element that applies to pivot table's third subtotal column.
thirdSubtotalRow (Third Subtotal Row Style)	Table style element that applies to PivotTable's third subtotal row.
totalRow (Total Row Style)	Table style element that applies to table's total row.
wholeTable (Whole Table Style)	Table style element that applies to table's entire content.

[Note: The W3C XML Schema definition of this simple type's content model ([ST TableStyleType](#)) is located in §A.2. *end note*]

18.18.78 ST_TableType (Table Type)

An enumeration that specifies what the table data is based on.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
queryTable (Query Table)	A table based on an external data query.
worksheet (Worksheet)	A table based on a worksheet data range.
xml (XML)	A table based on an XML mapping.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TableType](#)) is located in §A.2. *end note*]

18.18.79 ST_TargetScreenSize (Target Screen Size Types)

This simple type defines the collection of screen resolutions that are supported for this workbook.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
1024x768 (1024 x 768 Resolution)	Sets the target screen resolution to 1024x768 pixels.
1152x882 (1152 x 882 Resolution)	Sets the target screen resolution to 1152x882 pixels.
1152x900 (1152 x 900 Resolution)	Sets the target screen resolution to 1152x900 pixels
1280x1024 (1280 x 1024 Resolution)	Sets the target screen resolution to 1280x1024 pixels.
1600x1200 (1600 x 1200 Resolution)	Sets the target screen resolution to 1600x1200 pixels.
1800x1440 (1800 x 1440 Resolution)	Sets the target screen resolution to 1800x1440 pixels.
1920x1200 (1920 x 1200 Resolution)	Sets the target screen resolution to 1920x1200 pixels.
544x376 (544 x 376 Resolution)	Sets the target screen resolution to 544x376 pixels.
640x480 (640 x 480 Resolution)	Sets the target screen resolution to 640x480 pixels.
720x512 (720 x 512 Resolution)	Sets the target screen resolution to 720x512 pixels.
800x600 (800 x 600 Resolution)	Sets the target screen resolution to 800x600 pixels.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TargetScreenSize](#)) is located in §A.2. *end note*]

18.18.80 ST_TextHAlign (Comment Text Horizontal Alignment)

This simple type specifies the horizontal alignment of the text within a comment text field.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
center (Center Alignment)	Specifies that the text is centered horizontally.
distributed (Distributed Alignment)	Specifies that the text is distributed horizontally.
justify (Justify Alignment)	Specifies that the text is justified horizontally.
left (Left Alignment)	Specifies that the text is left-aligned.
right (Right Alignment)	Specifies that the text is right-aligned.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_TextHAlign](#)) is located in §A.2.
end note]

18.18.81 ST_TextVAlign (Comment Text Vertical Alignment)

This simple type specifies the vertical alignment of the text within a comment text field.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
bottom (Bottom Alignment)	Specifies that the text is bottom-aligned.
center (Center Alignment)	Specifies that the text is centered vertically.
distributed (Distributed Alignment)	Specifies that the text is distributed vertically.
justify (Justify Alignment)	Specifies that the text is justified vertically.
top (Top Alignment)	Specifies that the text is top-aligned.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_TextVAlign](#)) is located in §A.2.
end note]

18.18.82 ST_TimePeriod (Time Period Types)

Used in a "contains dates" conditional formatting rule. These are dynamic time periods, which change based on the date the conditional formatting is refreshed / applied.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
last7Days (Last 7 Days)	A date in the last seven days.
lastMonth (Last Month)	A date occurring in the last calendar month.

Enumeration Value	Description
lastWeek (Last Week)	A date occurring last week.
nextMonth (Next Month)	A date occurring in the next calendar month.
nextWeek (Next Week)	A date occurring next week.
thisMonth (This Month)	A date occurring in this calendar month.
thisWeek (This Week)	A date occurring this week.
today (Today)	Today's date.
tomorrow (Tomorrow)	Tomorrow's date.
yesterday (Yesterday)	Yesterday's date.

[Note: The W3C XML Schema definition of this simple type's content model ([ST TimePeriod](#)) is located in §A.2. *end note*]

18.18.83 ST_TotalsRowFunction (Totals Row Function Types)

An enumeration that specifies what function is used to aggregate the data in a column before it is displayed in the totals row.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
average (Average)	Represents the arithmetic mean.
count (Non Empty Cell Count)	Represents a count of the number of non-empty cells.
countNums (Count Numbers)	Represents the number of cells that contain numbers.
custom (Custom Formula)	Represents the formula provided in <code>totalsRowFormula</code> .
max (Maximum)	Represents the largest value.
min (Minimum)	Represents the smallest value.
none (None)	No total row.
stdDev (StdDev)	Represents the estimated standard deviation.
sum (Sum)	Represents the arithmetic sum.
var (Var)	Represents the estimated variance.

[Note: The W3C XML Schema definition of this simple type's content model ([ST TotalsRowFunction](#)) is located in §A.2. *end note*]

18.18.84 ST_Type (Top N Evaluation Type)

This simple type defines the values for the Top N conditional formatting evaluation for the PivotTable. For more information on Top N conditional formatting, see the Sheet (§18.3.1) reference material.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
all (All)	Indicates that Top N conditional formatting is evaluated across the entire scope range.
column (Column Top N)	Indicates that Top N conditional formatting is evaluated for each column.
none (Top N None)	Indicates that Top N conditional formatting is not evaluated
row (Row Top N)	Indicates that Top N conditional formatting is evaluated for each row.

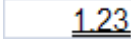


[Note: The W3C XML Schema definition of this simple type's content model (ST_Type) is located in §A.2. *end note*]


18.18.85 ST_UnderlineValues (Underline Types)

Represents the different types of possible underline formatting.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
double (Double Underline)	Double-line underlining under each character in the cell. underlines are drawn through the descenders of characters such as g and p. 
doubleAccounting (Accounting Double Underline)	Double-line accounting underlining under each character in the cell. The underlines are drawn under the descenders of characters such as g and p. 
none (None)	No underline.
single (Single Underline)	Single-line underlining under each character in the cell. The underline is drawn through the descenders of characters such as g and p. 
singleAccounting (Accounting Single Underline)	Single-line accounting underlining under each

Enumeration Value	Description
	character in the cell. The underline is drawn under the descenders of characters such as g and p. 

[Note: The W3C XML Schema definition of this simple type's content model ([ST_UnderlineValues](#)) is located in §A.2. *end note*]

18.18.86 ST_UnsignedIntHex (Hex Unsigned Integer)

This simple type represents the Hex representation of an unsigned integer.

This simple type's contents are a restriction of the W3C XML Schema hexBinary datatype.

This simple type also specifies the following restrictions:

- This simple type's contents have a length of exactly 8 hexadecimal digit(s).

[Note: The W3C XML Schema definition of this simple type's content model ([ST_UnsignedIntHex](#)) is located in §A.2. *end note*]

18.18.87 ST_UpdateLinks (Update Links Behavior Types)

This simple type defines when the application updates links to other workbooks when the workbook is opened.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
always (Always Update Links)	Indicates that links to other workbooks are always updated when the workbook is opened. The application will not display an alert in the user interface (UI).
never (Never Update Links)	Indicates that links to other workbooks are never updated when the workbook is opened. The application will not display an alert in the user interface.
userSet (User Set)	Indicates that the end-user specified whether they receive an alert to update links to other workbooks when the workbook is opened. [Example: The application can expose this option in an application settings dialog. <i>end example</i>]

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_UpdateLinks](#)) is located in §A.2.
end note]


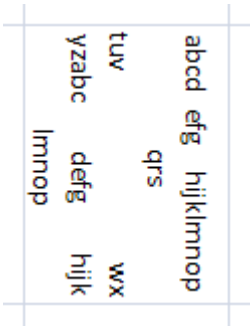
18.18.88 ST_VerticalAlignment (Vertical Alignment Types)

This enumeration value indicates the type of vertical alignment for a cell, i.e., whether it is aligned top, bottom, vertically centered, justified or distributed.

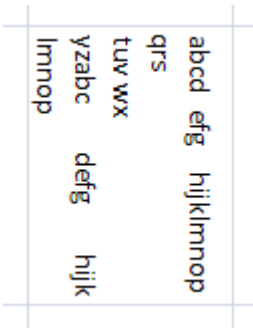
This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
bottom (Aligned To Bottom)	The vertical alignment is aligned-to-bottom.
center (Centered Vertical Alignment)	The vertical alignment is centered across the height of the cell.
distributed (Distributed Vertical Alignment)	<p>When text direction is horizontal: the vertical alignment of lines of text is distributed vertically, where each line of text inside the cell is evenly distributed across the height of the cell, with flush top and bottom margins.</p> <p>When text direction is vertical: behaves exactly as distributed horizontal alignment. The first words in a line of text (appearing at the top of the cell) are flush with the top edge of the cell, and the last words of a line of text are flush with the bottom edge of the cell, and the line of text is distributed evenly from top to bottom.</p> <p>[<i>Example</i>: Horizontal text: this first example shows four lines of text (read horizontally from left to right) distributed vertically across the height of the cell. The first line is "abc", the second line is "def", the third line is "ghi" and the fourth line is "jkl".</p>

Enumeration Value	Description
	<div></div> <p>Vertical text: this second example shows three lines of text (read vertically from top to bottom) distributed vertically across the height of the cell. The lines of text are:</p> <p>abcd efg hijklmnop qrs tuv wx yzabc defg hijk lmnop</p> <p>The rendering looks like this:</p> <div></div> <p><i>end example]</i></p>
justify (Justified Vertically)	<p>When text direction is horizontal: the vertical alignment of lines of text is distributed vertically, where each line of text inside the cell is evenly distributed across the height of the cell, with flush top</p>

Enumeration Value	Description																		
	<p>and bottom margins.</p> <p>When text direction is vertical: similar behavior as horizontal justification. The alignment is justified (flush top and bottom in this case). For each line of text, each line of the wrapped text in a cell is aligned to the top and bottom (except the last line). If no single line of text wraps in the cell, then the text is not justified.</p> <p>[<i>Example:</i> Horizontal text: this first example shows four lines of text (read horizontally from left to right) justified vertically across the height of the cell. The first line is "abc", the second line is "def", the third line is "ghi" and the fourth line is "jkl".</p> <table><tr><td></td><td>A</td><td>B</td></tr><tr><td>1</td><td></td><td></td></tr><tr><td></td><td></td><td>abc</td></tr><tr><td></td><td></td><td>def</td></tr><tr><td></td><td></td><td>ghi</td></tr><tr><td>2</td><td></td><td>jkl</td></tr></table> <p>Vertical text: this second example shows three lines of text (read vertically from top to bottom) distributed vertically across the height of the cell. The lines of text are:</p> <p>abcd efg hijklmnop qrs tuv wx yzabc defg hijk lmnop</p> <p>The rendering looks like this:</p>		A	B	1					abc			def			ghi	2		jkl
	A	B																	
1																			
		abc																	
		def																	
		ghi																	
2		jkl																	

Enumeration Value	Description
	 <p><i>end example]</i></p>
top (Align Top)	The vertical alignment is aligned-to-top.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_VerticalAlignment](#)) is located in §A.2. *end note*]

18.18.89 ST_Visibility (Visibility Types)

This simple type defines the possible states for sheet visibility.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
hidden (Hidden)	Indicates the workbook window is hidden, but can be shown by the user via the user interface.
veryHidden (Very Hidden)	Indicates the sheet is hidden and cannot be shown in the user interface (UI). This state is only available programmatically.
visible (Visible)	Indicates the workbook window is visible.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_Visibility](#)) is located in §A.2. *end note*]

18.18.90 ST_VolDepType (Volatile Dependency Types)

This simple type defines the dependency types available for this workbook.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
olapFunctions (OLAP Formulas)	Indicates that the type is Cube Functions.
realTimeData (Real Time Data)	Indicates that the type is Real Time Data (RTD).

[Note: The W3C XML Schema definition of this simple type's content model ([ST_VolDepType](#)) is located in §A.2.
end note]

18.18.91 ST_VolValueType (Volatile Dependency Value Types)

This simple type defines the data type of the values in the dependency cache.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
b (Boolean)	Indicates topic value is a boolean.
e (Error)	Indicates topic value is an error.
n (Real Number)	Indicates topic value is a real number.
s (String)	Indicates topic value is a string.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_VolValueType](#)) is located in §A.2.
end note]

18.18.92 ST_WebSourceType (Web Source Type)

This is an enumeration of types of objects which can be selected from the workbook to be published as HTML. For example, the entire sheet can be published, or a narrower set of objects on the sheet can be published, like a chart or a range.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
autoFilter (AutoFilter)	Auto filter
chart (Chart)	Chart
label (Label)	Label
pivotTable (PivotTable)	PivotTable
printArea (Print Area)	Print area
query (QueryTable)	Query Table

Enumeration Value	Description
range (Range)	Range of cells
sheet (All Sheet Content)	All content of a sheet

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_WebSourceType](#)) is located in §A.2. *end note*]

18.18.93 ST_XmlDataType (XML Data Types)

Represents a W3C XML built-in datatype name (<http://www.w3.org/TR/xmlschema-2/>). The values permitted by this type are the names of the simple datatypes defined by the XMLSchema Library, <http://www.w3.org/2001/XML-Schema-datatypes>.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

Note: The W3C XML Schema definition of this simple type's content model ([ST_XmlDataType](#)) is located in §A.2. *end note*]

18.18.94 ST_FontFamily (Font Family)

This simple type specifies a font family. A font family is a set of fonts having common stroke width and serif characteristics. This is system-level font information.

This simple type's contents are a restriction of the W3C XML Schema unsignedInt datatype.

This simple type is restricted to the values listed in the following table:

Value	Font Family
0	Not applicable.
1	Roman
2	Swiss
3	Modern
4	Script
5	Decorative
6	Reserved for future use
7	Reserved for future use
8	Reserved for future use
9	Reserved for future use
10	Reserved for future use
11	Reserved for future use
12	Reserved for future use
13	Reserved for future use

Value	Font Family
14	Reserved for future use

[*Note*: The W3C XML Schema definition of this simple type’s content model (ST_FontFamily) is located in §A.2.
end note]

19. PresentationML Reference Material

[Note: For further information on the mapping of elements and attributes to OPC parts, see the Bibliography entry, “Information on elements, attributes, and OPC parts in ECMA-376 (OOXML)”. *end note*]

The subordinate subclauses specify the semantics for the XML markup comprising a PresentationML document, as defined by §13 of this Part of ECMA-376.

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End of informative text.

19.2 Presentation

The Presentation portion of the PresentationML framework houses a set of elements that describe the storing of presentation-wide and view-specific properties. The presentation-wide properties are those that pertain to the entire presentation. The view-specific properties assist the generating application and viewing application by storing parameters that pertain to the final delivery of the presentation.

19.2.1 Presentation Properties

This section contains all presentation-level properties that pertain to a presentation document:

19.2.1.1 bold (Bold Embedded Font)

This element specifies a bold embedded font that is linked to a parent typeface. Once specified, this bold version of the given typeface name is available for use within the presentation. The actual font data is referenced using a relationships file that contains links to all fonts available. This font data contains font information for each of the characters to be made available.

[*Example:* Consider the following embedded font with a bold version specified.

```
<p:embeddedFont>
  <p:font typeface="MyFont" pitchFamily="34" charset="0"/>
  <p:bold r:id="rId2"/>
</p:embeddedFont>
```

end example]

[*Note*: Not all characters for a typeface must be stored. It is up to the generating application to determine which characters are to be stored in the corresponding font data files. *end note*]

Attributes	Description
id (Relationship Identifier) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the relationship identifier that is used in conjunction with a corresponding relationship file to resolve the location of this embedded font that is referenced in a presentation. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_EmbeddedFontDataId](#)) is located in §A.3. *end note*]

19.2.1.2 **boldItalic (Bold Italic Embedded Font)**

This element specifies a bold italic embedded font that is linked to a parent typeface. Once specified, this bold italic version of the given typeface name is available for use within the presentation. The actual font data is referenced using a relationships file that contains links to all fonts available. This font data contains font information for each of the characters to be made available.

[*Example*: Consider the following embedded font with a bold italic version specified.

```
<p:embeddedFont>  
  <p:font typeface="MyFont" pitchFamily="34" charset="0"/>  
  <p:boldItalic r:id="rId2"/>  
</p:embeddedFont>
```

end example]

[*Note*: Not all characters for a typeface must be stored. It is up to the generating application to determine which characters are to be stored in the corresponding font data files. *end note*]

Attributes	Description
id (Relationship Identifier) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the relationship identifier that is used in conjunction with a corresponding relationship file to resolve the location of this embedded font that is referenced in a presentation. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_EmbeddedFontDataId](#)) is located in §A.3. *end note*]

19.2.1.3 browse (Browse Slide Show Mode)

This element specifies that the presentation slide show should be viewed in a single window or browse mode, instead of full screen.

[*Example:* Consider the following presentation that is to be viewed in a browse mode.

```
<p:presentationPr xmlns:a="..." xmlns:r="..." xmlns:p="...">
  <p:showPr>
    ...
    <p:browse showScrollbar="0"/>
    ...
  </p:showPr>
</p:presentationPr>
```

end example]

Attributes	Description
showScrollbar (Show Scroll Bar in Window)	Specifies whether to show the scroll bar in the viewing window. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ShowInfoBrowse](#)) is located in §A.3. *end note*]

19.2.1.4 clrMru (Color MRU)

This specifies the most recently used user-selected colors within the presentation. This list contains custom user-selected colors outside the presentation's theme colors, enabling the application to expose these additional color choices for easy reuse. The first item in the list is the most recently used color.

[*Example:* Consider the following presentation with two user-selected colors in the color MRU list.

```
<p:presentationPr xmlns:a="..." xmlns:r="..." xmlns:p="...">
  ...
  <p:clrMru>
    <a:srgbClr val="5361EB"/>
    <a:srgbClr val="CCECFF"/>
  </p:clrMru>
  ...
</p:presentationPr>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ColorMRU](#)) is located in §A.4.1. *end note]*

19.2.1.5 `custShow` (Custom Show)

This element specifies a custom show which is an ordered list of a group of slides that are contained within the presentation. The custom show element allows for the specification of a presentation order that is different from the order in which the slides themselves are stored.

[*Example:* Consider the following custom show list that outlines a couple custom shows for a given set of slides.

```
<p:custShowLst>
  <p:custShow name="Custom Show 1" id="0">
    <p:sldLst>
      <p:sld r:id="rId4"/>
      <p:sld r:id="rId3"/>
      <p:sld r:id="rId2"/>
      <p:sld r:id="rId5"/>
    </p:sldLst>
  </p:custShow>
  <p:custShow name="Custom Show 2" id="1">
    <p:sldLst>
      <p:sld r:id="rId4"/>
      <p:sld r:id="rId5"/>
    </p:sldLst>
  </p:custShow>
</p:custShowLst>
```

In the above example there are two custom shows specified. The first specifies to present the slides in the order of 4, 3, 2 then 5 while the second specifies to play only slide 4 then 5. *end example]*

Attributes	Description
id (Custom Show Identifier)	<p>This attribute specifies the custom show identification number. This is a number given that should be unique within the presentation document.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CustomShowId](#)) is located in §A.3. *end note]*

19.2.1.6 `custShow` (Custom Show)

This element specifies a custom show that defines a specific slide sequence that the slides are displayed in. This allows for many variants of the same set of slides to be presented.

[*Example:* Consider the following custom show using three slides.

```
<p:custShow name="Custom Show 1" id="0">
  <p:sldLst>
    <p:sld r:id="rId5"/>
    <p:sld r:id="rId2"/>
    <p:sld r:id="rId4"/>
  </p:sldLst>
</p:custShow>
```

Notice here that the custom show specifies a show, or presentation, where slide 5 is shown first, then slide 2 and finally slide 4. *end example*

Attributes	Description
id (Custom Show ID)	Specifies the identification number for this custom show. This should be unique among all the custom shows within the corresponding presentation. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
name (Custom Show Name)	Specifies a name for the custom show. The possible values for this attribute are defined by the ST_Name simple type (§19.7.5).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CustomShow](#)) is located in §A.3. *end note*]

19.2.1.7 `custShowLst` (List of Custom Shows)

This element specifies a list of all custom shows that are available within the corresponding presentation. A custom show is a defined slide sequence that allows for the displaying of the slides with the presentation in any arbitrary order.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CustomShowList](#)) is located in §A.3. *end note*]

19.2.1.8 `defaultTextStyle` (Presentation Default Text Style)

This element specifies the default text styles that are to be used within the presentation. The text style defined here can be referenced when inserting a new slide if that slide is not associated with a master slide or if no styling information has been otherwise specified for the text within the presentation slide.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_TextListStyle](#)) is located in §A.4.1. *end note*]

19.2.1.9 [embeddedFont \(Embedded Font\)](#)

This element specifies an embedded font. Once specified, this font is available for use within the presentation. Within a font specification there can be regular, bold, italic and boldItalic versions of the font specified. The actual font data for each of these is referenced using a relationships file that contains links to all available fonts. This font data contains font information for each of the characters to be made available in each version of the font.

[*Example*: Consider the following embedded font.

```
<p:embeddedFont>
  <p:font typeface="MyFont" pitchFamily="34" charset="0"/>
  <p:regular r:id="rId2"/>
</p:embeddedFont>
```

end example]

[*Note*: Not all characters for a typeface must be stored. It is up to the generating application to determine which characters are to be stored in the corresponding font data files. *end note*]

[*Note*: The W3C XML Schema definition of this element's content model ([CT_EmbeddedFontListEntry](#)) is located in §A.3. *end note*]

19.2.1.10 [embeddedFontLst \(Embedded Font List\)](#)

This element specifies a list of fonts that are embedded within the corresponding presentation. The font data for these fonts is stored alongside the other document parts within the document container. The actual font data is referenced within the `embeddedFont` element.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_EmbeddedFontList](#)) is located in §A.3. *end note*]

19.2.1.11 [ext \(Extension\)](#)

This element specifies an extension that is used for future extensions to the current version of DrawingML. This allows for the specifying of currently unknown elements for later versions of generating applications.

[*Note*: This element is not intended to reintroduce transitional schema into the strict conformance class. *end note*]

Attributes	Description
uri (Uniform Resource Identifier)	This attribute specifies the URI, or uniform resource identifier that represents the data stored under this tag. The URI is used to identify the correct 'server' that can process the contents of this tag.

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema token datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Extension](#)) is located in §A.3. *end note*]

19.2.1.12 [extLst \(Extension List\)](#)

This element specifies the extension list within which all future extensions of element type `ext` are defined. The extension list along with corresponding future extensions is used to extend the storage capabilities of the PresentationML framework. This allows for various new kinds of data to be stored natively within the framework.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ExtensionList](#)) is located in §A.3. *end note*]

19.2.1.13 [font \(Embedded Font Name\)](#)

This element specifies specific properties describing an embedded font. Once specified, this font is available for use within the presentation. Within a font specification there can be regular, bold, italic and boldItalic versions of the font specified. The actual font data for each of these is referenced using a relationships file that contains links to all available fonts. This font data contains font information for each of the characters to be made available in each version of the font.

[*Example:* Consider the following embedded font.

```
<p:embeddedFont>
  <p:font typeface="MyFont" pitchFamily="34" charset="0"/>
  <p:regular r:id="rId2"/>
</p:embeddedFont>
```

end example]

Font Substitution Logic:

If the specified font is not available on a system being used for rendering, then the attributes of this element are to be utilized in selecting an alternate font.

[*Note:* Not all characters for a typeface must be stored. It is up to the generating application to determine which characters are to be stored in the corresponding font data files. *end note*]

Attributes	Description
typeface (Text Typeface)	Specifies the typeface, or name of the font that is to be used. The typeface is a string name of the specific font that should be used in rendering the presentation. If this font is

Attributes	Description
Namespace: http://purl.oclc.org/ooxml/drawingml/main	not available within the font list of the generating application than font substitution logic should be utilized in order to select an alternate font. The possible values for this attribute are defined by the ST_TextTypeface simple type (§20.1.10.80).

[Note: The W3C XML Schema definition of this element's content model ([CT_TextFont](#)) is located in §A.4.1. *end note*]

19.2.1.14 [handoutMasterId](#) (Handout Master ID)

This element specifies a handout master that is available within the corresponding presentation. A handout master is a slide that is specifically designed for printing as a handout.

[Example: Consider the following specification of a handout master within a presentation

```
<p:presentation xmlns:a="..." xmlns:r="..." xmlns:p="..." embedTrueTypeFonts="1">
...
  <p:handoutMasterIdLst>
    <p:handoutMasterId r:id="rId8"/>
  </p:handoutMasterIdLst>
...
</p:presentation>
```

end example]

Attributes	Description
id (Relationship Identifier) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the relationship identifier that is used in conjunction with a corresponding relationship file to resolve the location within a presentation of the handoutMaster element defining this handout master. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

[Note: The W3C XML Schema definition of this element's content model ([CT_HandoutMasterIdListEntry](#)) is located in §A.3. *end note*]

19.2.1.15 [handoutMasterIdLst](#) (List of Handout Master IDs)

This element specifies a list of identification information for the handout master slides that are available within the corresponding presentation. A handout master is a slide that is specifically designed for printing as a handout.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_HandoutMasterIdList](#)) is located in §A.3. *end note*]

19.2.1.16 *italic* (Italic Embedded Font)

This element specifies an italic embedded font that is linked to a parent typeface. Once specified, this italic version of the given typeface name is available for use within the presentation. The actual font data is referenced using a relationships file that contains links to all fonts available. This font data contains font information for each of the characters to be made available.

[*Example:* Consider the following embedded font with a italic version specified.

```
<p:embeddedFont>
  <p:font typeface="MyFont" pitchFamily="34" charset="0"/>
  <p:italic r:id="rId2"/>
</p:embeddedFont>
```

end example]

[*Note:* Not all characters for a typeface must be stored. It is up to the generating application to determine which characters are to be stored in the corresponding font data files. *end note*]

Attributes	Description
id (Relationship Identifier) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the relationship identifier that is used in conjunction with a corresponding relationship file to resolve the location of this embedded font that is referenced in a presentation. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_EmbeddedFontDataId](#)) is located in §A.3. *end note*]

19.2.1.17 *kinsoku* (Kinsoku Settings)

This element specifies the presentation-wide kinsoku settings that define the line breaking behaviour of East Asian text within the corresponding presentation.

Attributes	Description
invalEndChars (Invalid Kinsoku End Characters)	Specifies the characters that cannot end a line of text. The possible values for this attribute are defined by the W3C XML Schema string datatype.
invalStChars	Specifies the characters that cannot start a line of text.

Attributes	Description
(Invalid Kinsoku Start Characters)	The possible values for this attribute are defined by the W3C XML Schema string datatype.
lang (Language)	Specifies the corresponding East Asian language that these settings apply to. The possible values for this attribute are defined by the W3C XML Schema string datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Kinsoku](#)) is located in §A.3. *end note*]

19.2.1.18 kiosk (Kiosk Slide Show Mode)

This element specifies that the presentation slide show should be viewed in a full-screen kiosk mode. A presentation viewed in kiosk mode should have user input disabled and restarts after a specified interval.

[*Example:* Consider the following presentation that is set to be viewed in a looping kiosk mode.

```
<p:presentationPr xmlns:a="..." xmlns:r="..." xmlns:p="...">
  <p:showPr loop="1" showNarration="1">
    ...
  <p:kiosk/>
  ...
</p:showPr>
</p:presentationPr>
```

end example]

Attributes	Description
restart (Restart Show)	Specifies the time length that the presentation should run until it is to be restarted. That is, the presentation should loop back to the first slide specified in the presentation or custom show. This value is specified in 1/1000ths of a second and measured from the most recent time the presentation started or restarted. [<i>Note:</i> The counter is reset when a presentation is restarted due to automatic looping at the end of a show, if specified by the loop attribute of showPr. <i>end note</i>] The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ShowInfoKiosk](#)) is located in §A.3. *end note*]

19.2.1.19 `modifyVerifier` (Modification Verifier)

This element specifies the write protection settings which have been applied to a PresentationML document. *Write protection* refers to a mode in which the document's contents should not be modified, and the document should not be resaved using the same file name.

When present, the application shall require a password to enable modifications to the document. If the supplied password does not match the hash value in this attribute, then write protection shall be enabled. If this element is omitted, then no write protection shall be applied to the current document. Since this protection does not encrypt the document, malicious applications might circumvent its use.

The password supplied to the algorithm is to be a UTF-16LE encoded string; strings longer than 510 octets are truncated to 510 octets. If there is a leading BOM character (U+FEFF) in the encoded password it is removed before hash calculation. The attributes of this element specify the algorithm to be used to verify the password provided by the user.

[*Example:* Consider a PresentationML document that can only be opened in a write protected state unless a password is provided, in which case the file would be opened in an editable state. This requirement would be specified using the following PresentationML:

```
<p:modifyVerifier p:algorithmName="SHA-512" ...  
p:hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" ... />
```

...In order for the hosting application to enable edits to the document, the hosting application would have to be provided with a password that the hosting application would then hash using the algorithm specified by the algorithm attributes and compare to the value of the hashValue attribute (9oN7nWkCAyEZib1RomSJTjmPpCY=). If the two values matched, the file would be opened in an editable state. *end example*]

Attributes	Description						
algorithmName (Cryptographic Algorithm Name)	<p>Specifies the specific cryptographic hashing algorithm which shall be used along with the salt attribute and input password in order to compute the hash value.</p> <p>The following values are reserved:</p> <table> <tr> <th>Value</th><th>Algorithm</th></tr> <tr> <td>MD2</td><td> <p>Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used.</p> <p>[<i>Note:</i> It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p> </td></tr> <tr> <td>MD4</td><td> <p>Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used.</p> <p>[<i>Note:</i> It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known</p> </td></tr> </table>	Value	Algorithm	MD2	<p>Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used.</p> <p>[<i>Note:</i> It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>	MD4	<p>Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used.</p> <p>[<i>Note:</i> It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known</p>
Value	Algorithm						
MD2	<p>Specifies that the MD2 algorithm, as defined by RFC 1319, shall be used.</p> <p>[<i>Note:</i> It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. <i>end note</i>]</p>						
MD4	<p>Specifies that the MD4 algorithm, as defined by RFC 1320, shall be used.</p> <p>[<i>Note:</i> It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known</p>						

Attributes	Description
	breaks. <i>end note</i>]
	MD5 Specifies that the MD5 algorithm, as defined by RFC 1321, shall be used. <i>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. end note]</i>
	RIPEMD-128 Specifies that the RIPEMD-128 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used. <i>[Note: It is recommended that applications should avoid using this algorithm to store new hash values, due to publically known breaks. end note]</i>
	RIPEMD-160 Specifies that the RIPEMD-160 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	SHA-1 Specifies that the SHA-1 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	SHA-256 Specifies that the SHA-256 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	SHA-384 Specifies that the SHA-384 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	SHA-512 Specifies that the SHA-512 algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	WHIRLPOOL Specifies that the WHIRLPOOL algorithm, as defined by ISO/IEC 10118-3:2004 shall be used.
	<p><i>[Example: Consider an Office Open XML document with the following information stored in one of its protection elements:</i></p> <pre>< ... algorithmName="SHA-1" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The algorithmName attribute value of “SHA-1” specifies that the SHA-1 hashing algorithm must be used to generate a hash from the user-defined password. <i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
hashValue (Password Hash Value)	Specifies the hash value for the password required to edit this chartsheet. This value shall be compared with the resulting hash value after hashing the user-supplied password using the algorithm specified by the preceding attributes and parent XML element, and if the two values match, the protection shall no longer be enforced.

Attributes	Description
	<p>If this value is omitted, then the reservationPassword attribute shall contain the password hash for the workbook.</p> <p>[<i>Example:</i> Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre><... algorithmName="SHA-1" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The hashValue attribute value of 9oN7nWkCAyEZib1RomSJTjmPpCY= specifies that the user-supplied password must be hashed using the pre-processing defined by the parent element (if any) followed by the SHA-1 algorithm (specified via the algorithmName attribute value of SHA-1) and that the resulting has value must be 9oN7nWkCAyEZib1RomSJTjmPpCY= for the protection to be disabled. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema base64Binary datatype.</p>
saltValue (Salt Value for Password Verifier)	<p>Specifies the salt which was prepended to the user-supplied password before it was hashed using the hashing algorithm defined by the preceding attribute values to generate the hashValue attribute, and which shall also be prepended to the user-supplied password before attempting to generate a hash value for comparison. A <i>salt</i> is a random string which is added to a user-supplied password before it is hashed in order to prevent a malicious party from pre-calculating all possible password/hash combinations and simply using those pre-calculated values (often referred to as a "dictionary attack").</p> <p>If this attribute is omitted, then no salt shall be prepended to the user-supplied password before it is hashed for comparison with the stored hash value.</p> <p>[<i>Example:</i> Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre><... saltValue="ZUdHa+D8F/OAKP3I7ssUnQ==" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The saltValue attribute value of ZUdHa+D8F/OAKP3I7ssUnQ== specifies that the user-supplied password must have this value prepended before it is run through the specified hashing algorithm to generate a resulting hash value for comparison. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema base64Binary datatype.</p>
spinValue (Iterations to Run Hashing Algorithm)	<p>Specifies the number of times the hashing function shall be iteratively run (runs using each iteration's result plus a 4 byte value (0-based, little endian) containing the number of the iteration as the input for the next iteration) when attempting to compare a user-supplied password with the value stored in the hashValue attribute.</p>

Attributes	Description
	<p>[<i>Rationale</i>: Running the algorithm many times increases the cost of exhaustive search attacks correspondingly. Storing this value allows for the number of iterations to be increased over time to accommodate faster hardware (and hence the ability to run more iterations in less time). <i>end rationale</i>]</p> <p>[<i>Example</i>: Consider an Office Open XML document with the following information stored in one of its protection elements:</p> <pre><... spinCount="100000" hashValue="9oN7nWkCAyEZib1RomSJTjmPpCY=" /></pre> <p>The spinCount attribute value of 100000 specifies that the hashing function must be run one hundred thousand times to generate a hash value for comparison with the hashValue attribute. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_ModifyVerifier](#)) is located in §A.3. *end note*]

19.2.1.20 notesMasterId (Notes Master ID)

This element specifies a notes master that is available within the corresponding presentation. A notes master is a slide that is specifically designed for the printing of the slide along with any attached notes.

[*Example*: Consider the following specification of a notes master within a presentation

```
<p:presentation xmlns:a="..." xmlns:r="..." xmlns:p="..." embedTrueTypeFonts="1">
...
<p:notesMasterIdLst>
  <p:notesMasterId r:id="rId8"/>
</p:notesMasterIdLst>
...
</p:presentation>
```

end example]

Attributes	Description
id (Relationship Identifier)	Specifies the relationship identifier that is used in conjunction with a corresponding relationship file to resolve the location within a presentation of the notesMaster element defining this notes master.
Namespace: http://purl.oclc.org	The possible values for this attribute are defined by the ST_RelationshipId simple type

Attributes	Description
g/ooxml/officeDocument/relationships	(§22.8.2.1).

[*Note*: The W3C XML Schema definition of this element's content model ([CT_NotesMasterIdListEntry](#)) is located in §A.3. *end note*]

19.2.1.21 notesMasterIdLst (List of Notes Master IDs)

This element specifies a list of identification information for the notes master slides that are available within the corresponding presentation. A notes master is a slide that is specifically designed for the printing of the slide along with any attached notes.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_NotesMasterIdList](#)) is located in §A.3. *end note*]

19.2.1.22 notesSz (Notes Slide Size)

This element specifies the size of slide surface used for notes slides and handout slides. Objects within a notes slide can be specified outside these extents, but the notes slide has a background surface of the specified size when presented or printed. This element is intended to specify the region to which content is fitted in any special format of printout the application might choose to generate, such as an outline handout.

[*Example*: Consider the following specifying of the size of a notes slide.

```
<p:presentation xmlns:a="..." xmlns:r="..." xmlns:p="..." embedTrueTypeFonts="1">
...
<p:notesSz cx="9144000" cy="6858000"/>
...
</p:presentation>
```

end example]

Attributes	Description
cx (Extent Length) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies the length of the extents rectangle in EMUs. This rectangle shall dictate the size of the object as displayed (the result of any scaling to the original object).</p> <p>[<i>Example</i>: Consider a DrawingML object specified as follows:</p> <pre><... cx="1828800" cy="200000"/></pre> <p>The cx attributes specifies that this object has a height of 1828800 EMUs (English Metric Units). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple</p>

Attributes	Description
	type (§20.1.10.41).
cy (Extent Width) Namespace: http://purl.oclc.org/ooxml/drawing/ml/main	<p>Specifies the width of the extents rectangle in EMUs. This rectangle shall dictate the size of the object as displayed (the result of any scaling to the original object).</p> <p>[<i>Example</i>: Consider a DrawingML object specified as follows:</p> <pre>< ... cx="1828800" cy="200000"/></pre> <p>The cy attribute specifies that this object has a width of 200000 EMUs (English Metric Units). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_PositiveSize2D](#)) is located in §A.4.1. *end note*]

19.2.1.23 penClr (Pen Color for Slide Show)

This element specifies the pen color that should be used to make markings on the slides while in a presentation.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_Color](#)) is located in §A.4.1. *end note*]

19.2.1.24 photoAlbum (Photo Album Information)

This element specifies that the corresponding presentation contains a photo album. A photo album specifies a list of images within the presentation that spread across one or more slides, all of which share a consistent layout. Each image in the album is formatted with a consistent style. This functionality enables the application to manage all of the images together and modify their ordering, layout, and formatting as a set.

This element does not enforce the specified properties on individual photo album images; rather, it specifies common settings that should be applied by default to all photo album images and their containing slides. Images that are part of the photo album are identified by the presence of the isPhoto element in the definition of the picture.

[*Example*: Consider the following presentation that has been specified as a photo album

```
<p:presentation xmlns:a="..." xmlns:r="..." xmlns:p="..." embedTrueTypeFonts="1">
...
<p:photoAlbum bw="1" layout="2pic"/>
...
</p:presentation>
```

end example]

Attributes	Description
bw (Black and White)	Specifies whether all pictures in the photo album are to be displayed as black and white. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
frame (Frame Type)	Specifies the frame type that is to be used on all the pictures in the photo album. The possible values for this attribute are defined by the ST_PhotoAlbumFrameShape simple type (§19.7.7).
layout (Photo Album Layout)	Specifies the layout that is to be used to arrange the pictures in the photo album on individual slides. The possible values for this attribute are defined by the ST_PhotoAlbumLayout simple type (§19.7.8).
showCaptions (Show/Hide Captions)	Specifies whether to show captions for pictures in the photo album. Captions are text boxes grouped with each image, with the group set to not allow ungrouping. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_PhotoAlbum](#)) is located in §A.3. *end note*]

19.2.1.25 **present** (Presenter Slide Show Mode)

This element specifies that the presentation slide show should be viewed in a full-screen presenter mode. In this mode, the presentation is displayed on one monitor while a different monitor displays notes and provides navigation controls intended to be viewed only by the presenter.

[Example: Consider the following presentation that is set to be viewed in a present mode.

```
<p:presentationPr xmlns:a="..." xmlns:r="..." xmlns:p="...">
  <p:showPr>
    ...
    <p:present/>
    ...
  </p:showPr>
</p:presentationPr>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.3. *end note*]

19.2.1.26 **presentation** (Presentation)

This element specifies within it fundamental presentation-wide properties.

[*Example:* Consider the following presentation with a single slide master and two slides. In addition to these commonly used elements there can also be the specification of other properties such as slide size, notes size and default text styles.

```
<p:presentation xmlns:a="..." xmlns:r="..." xmlns:p="...">
  <p:sldMasterIdLst>
    <p:sldMasterId id="2147483648" r:id="rId1"/>
  </p:sldMasterIdLst>
  <p:sldIdLst>
    <p:sldId id="256" r:id="rId3"/>
    <p:sldId id="257" r:id="rId4"/>
  </p:sldIdLst>
  <p:sldSz cx="9144000" cy="6858000" type="screen4x3"/>
  <p:notesSz cx="6858000" cy="9144000"/>
  <p:defaultTextStyle>
    ...
  </p:defaultTextStyle>
</p:presentation>
```

end example]

Attributes	Description
autoCompressPictures (Automatically Compress Pictures)	<p>Specifies whether the generating application should automatically compress all pictures for this presentation.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
bookmarkIdSeed (Bookmark ID Seed)	<p>Specifies a seed for generating bookmark IDs to ensure IDs remain unique across the document. This value specifies the number to be used as the ID for the next new bookmark created.</p> <p>The possible values for this attribute are defined by the ST_BookmarkIdSeed simple type (§19.7.1).</p>
compatMode (Compatibility Mode)	<p>Specifies whether the generating application is to be in a compatibility mode which serves to inform the user of any loss of content or functionality when working with older formats.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
conformance (Document Conformance Class)	<p>Specifies the conformance class (§2.1) to which the PresentationML document conforms.</p> <p>If this attribute is omitted, its default value is <code>transitional</code>.</p> <p>[<i>Example:</i> Consider the following PresentationML Presentation part markup:</p>

Attributes	Description
	<p><p:presentation conformance="strict"> ... </p:presentation></p> <p>This document has a conformance attribute value of <code>strict</code>, therefore it conforms to the PML Strict conformance class. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_ConformanceClass</code> simple type (§22.9.2.2).</p>
embedTrueTypeFonts (Embed True Type Fonts)	<p>Specifies whether the generating application should automatically embed true type fonts or not.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
firstSlideNum (First Slide Number)	<p>Specifies the first slide number in the presentation.</p> <p>The possible values for this attribute are defined by the W3C XML Schema <code>int</code> datatype.</p>
removePersonalInfoOnSave (Remove Personal Information on Save)	<p>Specifies whether to automatically remove personal information when the presentation document is saved.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
rtl (Right-To-Left Views)	<p>Specifies if the current view of the user interface is oriented right-to-left or left-to-right. The view is right-to-left if this value is set to <code>true</code>, and left-to-right otherwise.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
saveSubsetFonts (Save Subset Fonts)	<p>Specifies to save only the subset of characters used in the presentation when a font is embedded.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
serverZoom (Server Zoom)	<p>Specifies the scaling to be used when the presentation is embedded in another document. The embedded slides are to be scaled by this percentage.</p> <p>The possible values for this attribute are defined by the <code>ST_Percentage</code> simple type (§20.1.10.40).</p>
showSpecialPlsOnTitleSld (Show Header and Footer Placeholders on Titles)	<p>Specifies whether to show the header and footer placeholders on the title slides.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
strictFirstAndLastC	<p>Specifies whether to use strict characters for starting and ending lines of Japanese text.</p>

Attributes	Description
hars (Strict First and Last Characters)	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT Presentation](#)) is located in §A.3. *end note*]

19.2.1.27 presentationPr (Presentation-wide Properties)

This element functions as a parent element within which additional presentation-wide document properties are contained. All properties and their corresponding settings are defined within the child elements.

[Note: The W3C XML Schema definition of this element's content model ([CT PresentationProperties](#)) is located in §A.3. *end note*]

19.2.1.28 prnPr (Printing Properties)

This element specifies the default printing properties associated with this presentation document.

Attributes	Description
clrMode (Print Color Mode)	Specifies the color mode to be used when printing. The possible values for this attribute are defined by the ST_PrintColorMode simple type (§19.7.11).
frameSlides (Frame slides when printing)	Specifies whether slides should be framed when printing. When framed, an outline border is printed for each slide. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
hiddenSlides (Print Hidden Slides)	Specifies whether hidden slides should be printed. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
prnWhat (Print Output)	Specifies what the default print output is in terms of content layout. The possible values for this attribute are defined by the ST_PrintWhat simple type (§19.7.12).
scaleToFitPaper (Scale to Fit Paper when printing)	Specifies whether the print output should be scaled to fit the paper being used. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_PrintProperties](#)) is located in §A.3. *end note*]

19.2.1.29 regular (Regular Embedded Font)

This element specifies a regular embedded font that is linked to a parent typeface. Once specified, this regular version of the given typeface name is available for use within the presentation. The actual font data is referenced using a relationships file that contains links to all fonts available. This font data contains font information for each of the characters to be made available.

[*Example:* Consider the following embedded font with a regular version specified.

```
<p:embeddedFont>
  <p:font typeface="MyFont" pitchFamily="34" charset="0"/>
  <p:regular r:id="rId2"/>
</p:embeddedFont>
```

end example]

[*Note:* Not all characters for a typeface must be stored. It is up to the generating application to determine which characters are to be stored in the corresponding font data files. *end note*]

Attributes	Description
id (Relationship Identifier) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the relationship identifier that is used in conjunction with a corresponding relationship file to resolve the location of this embedded font that is referenced in a presentation. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_EmbeddedFontDataId](#)) is located in §A.3. *end note*]

19.2.1.30 showPr (Presentation-wide Show Properties)

This element functions as a parent element within which all presentation-wide show properties are contained. All properties and their corresponding settings are defined within the child elements.

Attributes	Description
loop (Loop Slide Show)	Specifies whether the slide show should be set to loop at the end. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
showAnimation	Specifies whether slide show animation should be shown when presenting.

Attributes	Description
(Show Animation in Slide Show)	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
showNarration (Show Narration in Slide Show)	Specifies whether slide show narration should be played when presenting. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
useTimings (Use Timings in Slide Show)	Specifies whether slide transition timings should be used to advance slides when presenting. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element’s content model ([CT_ShowProperties](#)) is located in §A.3. end note]

19.2.1.31 sld (Presentation Slide)

This element specifies a slide within a slide list. The slide list is used to specify an ordering of slides.

[Example: Consider the following custom show with an ordering of slides.

```
<p:custShowLst>
  <p:custShow name="Custom Show 1" id="0">
    <p:sldLst>
      <p:sld r:id="rId4"/>
      <p:sld r:id="rId3"/>
      <p:sld r:id="rId2"/>
      <p:sld r:id="rId5"/>
    </p:sldLst>
  </p:custShow>
</p:custShowLst>
```

In the above example the order specified to present the slides is slide 4, then 3, 2 and finally 5. end example]

Attributes	Description
id (Relationship ID) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	This attribute specifies the relationship id that is used to reference to the actual slide XML file that contains all the information to the slide listed within the slide list. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

[Note: The W3C XML Schema definition of this element's content model ([CT_SlideRelationshipListEntry](#)) is located in §A.3. *end note*]

19.2.1.32 sldAll (All Slides)

This attribute specifies all slides instead of a given range of slides for use within the html publishing properties as well as the show properties.

[Note: The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.3. *end note*]

19.2.1.33 sldId (Slide ID)

This element specifies a presentation slide that is available within the corresponding presentation. A slide contains the information that is specific to a single slide such as slide-specific shape and text information.

[Example: Consider the following specification of a slide master within a presentation]

```
<p:presentation xmlns:a="..." xmlns:r="..." xmlns:p="..." embedTrueTypeFonts="1">
..
<p:sldIdLst>
  <p:sldId id="256" r:id="rId3"/>
  <p:sldId id="257" r:id="rId4"/>
  <p:sldId id="258" r:id="rId5"/>
  <p:sldId id="259" r:id="rId6"/>
  <p:sldId id="260" r:id="rId7"/>
</p:sldIdLst>
..
</p:presentation>
```

end example]

Attributes	Description
id (Relationship Identifier) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the relationship identifier that is used in conjunction with a corresponding relationship file to resolve the location within a presentation of the sld element defining this slide. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).
id (Slide Identifier)	Specifies the slide identifier that is to contain a value that is unique throughout the presentation. The possible values for this attribute are defined by the ST_SlideId simple type (§19.7.13).

[*Note*: The W3C XML Schema definition of this element's content model ([CT_SlideIdListEntry](#)) is located in §A.3. *end note*]

19.2.1.34 **sldIdLst (List of Slide IDs)**

This element specifies a list of identification information for the slides that are available within the corresponding presentation. A slide contains the information that is specific to a single slide such as slide-specific shape and text information.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_SlideIdList](#)) is located in §A.3. *end note*]

19.2.1.35 **sldLst (List of Presentation Slides)**

This element specifies a list of presentation slides. A presentation slide contains the information that is specific to a single slide such as slide-specific shape and text information.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_SlideRelationshipList](#)) is located in §A.3. *end note*]

19.2.1.36 **sldMasterId (Slide Master ID)**

This element specifies a slide master that is available within the corresponding presentation. A slide master is a slide that is specifically designed to be a template for all related child layout slides.

[*Example*: Consider the following specification of a slide master within a presentation

```
<p:presentation xmlns:a="..." xmlns:r="..." xmlns:p="..." embedTrueTypeFonts="1">
...
  <p:sldMasterIdLst>
    <p:sldMasterId id="2147483648" r:id="rId1"/>
  </p:sldMasterIdLst>
...
</p:presentation>
```

end example]

Attributes	Description
id (Relationship Identifier) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the relationship identifier that is used in conjunction with a corresponding relationship file to resolve the location within a presentation of the sldMaster element defining this slide master. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).
id (Slide Master Identifier)	Specifies the slide master identifier that is to contain a value that is unique throughout the presentation.

Attributes	Description
	The possible values for this attribute are defined by the ST_SlideMasterId simple type (§19.7.16).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SlideMasterIdListEntry](#)) is located in §A.3. *end note*]

19.2.1.37 sldMasterIdLst (List of Slide Master IDs)

This element specifies a list of identification information for the slide master slides that are available within the corresponding presentation. A slide master is a slide that is specifically designed to be a template for all related child layout slides.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SlideMasterIdList](#)) is located in §A.3. *end note*]

19.2.1.38 sldRg (Slide Range)

This element specifies a slide range for use within the html publishing properties as well as the show properties.

[*Note:* The indexes used here correlate directly with the presentation slide numbers which they reference to. That is the slide range must be greater than or equal to 1 and also less than or equal to the number of slides in the presentation document. *end note*]

Attributes	Description
end (End)	This attribute defines the end of the index range. The possible values for this attribute are defined by the ST_Index simple type (§19.7.3).
st (Start)	This attribute defines the start of the index range. The possible values for this attribute are defined by the ST_Index simple type (§19.7.3).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_IndexRange](#)) is located in §A.3. *end note*]

19.2.1.39 sldSz (Presentation Slide Size)

This element specifies the size of the presentation slide surface. Objects within a presentation slide can be specified outside these extents, but this is the size of background surface that is shown when the slide is presented or printed..

[*Example:* Consider the following specifying of the size of a presentation slide.

```
<p:presentation xmlns:a="..." xmlns:r="..." xmlns:p="..." embedTrueTypeFonts="1">
```

```
...  
<p:sldSz cx="9144000" cy="6858000" type="screen4x3"/>  
...  
</p:presentation>
```

end example]

Attributes	Description
cx (Extent Length)	<p>Specifies the length of the extents rectangle in EMUs. This rectangle shall dictate the size of the object as displayed (the result of any scaling to the original object).</p> <p>[<i>Example:</i> Consider a DrawingML object specified as follows:</p> <pre><... cx="1828800" cy="200000"/></pre> <p>The cx attributes specifies that this object has a height of 1828800 EMUs (English Metric Units). <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_SlideSizeCoordinate simple type (§19.7.17).</p>
cy (Extent Width)	<p>Specifies the width of the extents rectangle in EMUs. This rectangle shall dictate the size of the object as displayed (the result of any scaling to the original object).</p> <p>[<i>Example:</i> Consider a DrawingML object specified as follows:</p> <pre>< ... cx="1828800" cy="200000"/></pre> <p>The cy attribute specifies that this object has a width of 200000 EMUs (English Metric Units). <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_SlideSizeCoordinate simple type (§19.7.17).</p>
type (Type of Size)	<p>Specifies the kind of slide size that should be used. This identifies in particular the expected delivery platform for this presentation.</p> <p>The possible values for this attribute are defined by the ST_SlideSizeType simple type (§19.7.18).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_SlideSize](#)) is located in §A.3. *end note]*

19.2.1.40 smartTags (Smart Tags)

This element specifies that references to smart tags exist within this document. [*Note: For a complete definition of smart tags, which are semantically identical throughout Office Open XML, see §17.5.1. end note*] To denote the location of smart tags on individual runs of text, there smart tag identifier attributes are specified for each run to which a smart tag applies. These are further specified in the run property attributes within DrawingML.

[*Example: Consider the following PresentationML markup:*

```
<p:presentation>
...
<p:smartTags r:id="rId1"/>
</p:presentation>
```

The presence of the smartTags element specifies that there is smart tag information within the PresentationML package. Individual runs are then inspected for the value of the smtId attribute to determine where smart tags might apply, for example:

```
<p:txBody>
  <a:bodyPr/>
  <a:lstStyle/>
  <a:p>
    <a:r>
      <a:rPr lang="en-US" dirty="0" smtId="1"/>
      <a:t>CNTS</a:t>
    </a:r>
    <a:endParaRPr lang="en-US" dirty="0"/>
  </a:p>
</p:txBody>
```

In the sample above there is a smart tag identifier of 1 specified for this run of text to denote that the text should be inspected for smart tag information. *end example*]

Attributes	Description
id (Relationship Identifier) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the relationship identifier that is used in conjunction with a corresponding relationship file to resolve the location of this smart tag. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

[*Note: The W3C XML Schema definition of this element's content model ([CT_SmartTags](#)) is located in §A.3. end note*]

19.2.2 View Properties

This section contains all properties that pertain to the viewing of the presentation.

19.2.2.1 cSldViewPr (Common Slide View Properties)

This element functions as a container for slide view properties that are common across multiple view property elements. The specific properties and associated values for these view properties reside within the child elements and attributes.

Attributes	Description
showGuides (Show Guides in View)	Specifies whether to show guides when editing the presentation. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
snapToGrid (Snap Objects to Grid)	Specifies whether objects should snap to underlying presentation grid when editing. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
snapToObjects (Snap Objects to Objects)	Specifies whether objects should snap to other objects when editing the presentation. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_CommonSlideViewProperties](#)) is located in §A.3. *end note*]

19.2.2.2 cViewPr (Common View Properties)

This element specifies the view properties that are common across multiple view property elements.

Attributes	Description
varScale (Variable Scale)	Specifies that the view content should automatically scale to best fit the current window size. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_CommonViewProperties](#)) is located in §A.3. *end note*]

19.2.2.3 gridSpacing (Grid Spacing)

This element specifies the grid spacing that should be used for the grid underlying the presentation document. The grid can be used to align objects on the slide and to display visual positioning cues.

Attributes	Description
cx (Extent Length) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies the length of the extents rectangle in EMUs. This rectangle shall dictate the size of the object as displayed (the result of any scaling to the original object).</p> <p>[<i>Example:</i> Consider a DrawingML object specified as follows:</p> <pre><... cx="1828800" cy="200000"/></pre> <p>The cx attributes specifies that this object has a height of 1828800 EMUs (English Metric Units). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>
cy (Extent Width) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies the width of the extents rectangle in EMUs. This rectangle shall dictate the size of the object as displayed (the result of any scaling to the original object).</p> <p>[<i>Example:</i> Consider a DrawingML object specified as follows:</p> <pre>< ... cx="1828800" cy="200000"/></pre> <p>The cy attribute specifies that this object has a width of 200000 EMUs (English Metric Units). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_PositiveSize2D](#)) is located in §A.4.1. *end note*]

19.2.2.4 [guide \(A Guide\)](#)

This element specifies a guide within the presentation. Guides are lines used for arranging layouts and content and never appear except as an aid in editing slides.

Attributes	Description
orient (Guide Orientation)	<p>Specifies the orientation for a guide.</p> <p>The possible values for this attribute are defined by the ST_Direction simple type (§19.7.2).</p>
pos (Guide Position)	<p>Specifies the position information for a guide.</p> <p>The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_Guide](#)) is located in §A.3. *end note*]

19.2.2.5 [guideLst \(List of Guides\)](#)

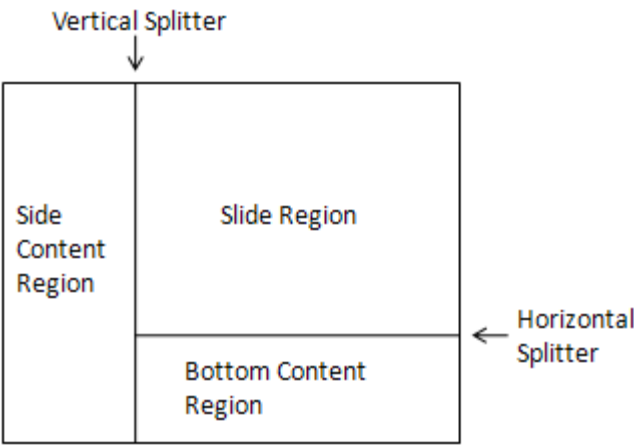
This element specifies a list of guides for a particular view of the presentation.

[Note: The W3C XML Schema definition of this element’s content model ([CT_GuideList](#)) is located in §A.3. *end note*]

19.2.2.6 [normalViewPr \(Normal View Properties\)](#)

This element specifies the view properties associated with the normal view mode. The normal view consists of three content regions: the slide itself, a side content region, and a bottom content region. The content of the side content region and bottom content region is determined by the generating application. Properties pertaining to the positioning of the different content regions are stored in this element. This information allows the application to save its view state to the file, so that when reopened the view is in the same state as when the presentation was last saved.

A vertical splitter bar separates the slide from the side content region. A horizontal splitter bar separates the slide from the content region below the slide. If the presentation is set to left-to-right, the side content region is to the left of the slide. If the presentation is set to right-to-left, the side content region is to the right of the slide.



Attributes	Description
horzBarState (State of the Horizontal Splitter Bar)	Specifies the state that the horizontal splitter bar should be in when in normal view mode. The region to be maximized or minimized is the side content region. The possible values for this attribute are defined by the ST_SplitterBarState simple type (§19.7.19).
preferSingleView (Prefer Single View)	Specifies whether the user prefers to see a full-window single-content region over the standard normal view with three content regions. If enabled, the application can choose to display one of the content regions in the entire window.

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
showOutlineIcons (Show Outline Icons in Normal View)	Specifies whether the application should show icons if displaying outline content in any of the content regions of normal view mode. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
snapVertSplitter (Snap Vertical Splitter)	Specifies whether the vertical splitter should snap to a minimized state when the side region is sufficiently small. The specific parameters of this behaviour are left to the generating application. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
vertBarState (State of the Vertical Splitter Bar)	Specifies the state that the vertical splitter bar should be in when in normal view mode. The region to be maximized or minimized is the slide region. The possible values for this attribute are defined by the ST_SplitterBarState simple type (§19.7.19).

[Note: The W3C XML Schema definition of this element's content model ([CT_NormalViewProperties](#)) is located in §A.3. *end note*]

19.2.2.7 [notesTextViewPr \(Notes Text View Properties\)](#)

This element functions as a parent element within which all properties associated with the notes text view are contained. All properties are defined within the child elements.

[Note: The W3C XML Schema definition of this element's content model ([CT_NotesTextViewProperties](#)) is located in §A.3. *end note*]

19.2.2.8 [notesViewPr \(Notes View Properties\)](#)

This element functions as a parent element within which all view properties associated with notes are contained. All properties are defined within the child elements.

[Note: The W3C XML Schema definition of this element's content model ([CT_NotesViewProperties](#)) is located in §A.3. *end note*]

19.2.2.9 [origin \(View Origin\)](#)

This element specifies the origin of the slide when it is being viewed with various scaling factors using the scale element.

Attributes	Description
x (X-Axis)	Specifies a coordinate on the x-axis. The origin point for this coordinate shall be specified

Attributes	Description
Coordinate)	by the parent XML element.
Namespace: http://purl.oclc.org/ooxml/drawing/ml/main	<p>[<i>Example:</i> Consider the following point on a basic wrapping polygon for a DrawingML object:</p> <pre><... x="0" y="100" /></pre> <p>The x attribute defines an x-coordinate of 0. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>
y (Y-Axis Coordinate)	Specifies a coordinate on the x-axis. The origin point for this coordinate shall be specified by the parent XML element.
Namespace: http://purl.oclc.org/ooxml/drawing/ml/main	<p>[<i>Example:</i> Consider the following point on a basic wrapping polygon for a DrawingML object:</p> <pre><... x="0" y="100" /></pre> <p>The y attribute defines a y-coordinate of 100. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Point2D](#)) is located in §A.4.1. *end note*]

19.2.2.10 outlineViewPr (Outline View Properties)

This element functions as a parent element within which all view properties associated with the outline view mode are contained. All properties are defined within the child elements.

Outline view displays only the textual content of a presentation. The presentation is formatted as an outline, with slide titles as the first level of the outline. Body text on slides is indented below the slide title.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_OutlineViewProperties](#)) is located in §A.3. *end note*]

19.2.2.11 restoredLeft (Normal View Restored Left Properties)

This element specifies the sizing of the side content region of the normal view, when the region is of a variable restored size (neither minimized nor maximized).

Attributes	Description
autoAdjust (Auto	Specifies whether the size of the side content region should compensate for the new size

Attributes	Description
Adjust Normal View)	when resizing the window containing the view within the application. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
sz (Normal View Dimension Size)	Specifies the size of the slide region (width when a child of restoredTop, height when a child of restoredLeft). The possible values for this attribute are defined by the ST_PositiveFixedPercentage simple type (§20.1.10.44).

[Note: The W3C XML Schema definition of this element's content model ([CT_NormalViewPortion](#)) is located in §A.3. *end note*]

19.2.2.12 [restoredTop \(Normal View Restored Top Properties\)](#)

This element specifies the sizing of the top slide region of the normal view, when the region is of a variable restored size (neither minimized nor maximized).

Attributes	Description
autoAdjust (Auto Adjust Normal View)	Specifies whether the size of the side content region should compensate for the new size when resizing the window containing the view within the application. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
sz (Normal View Dimension Size)	Specifies the size of the slide region (width when a child of restoredTop, height when a child of restoredLeft). The possible values for this attribute are defined by the ST_PositiveFixedPercentage simple type (§20.1.10.44).

[Note: The W3C XML Schema definition of this element's content model ([CT_NormalViewPortion](#)) is located in §A.3. *end note*]

19.2.2.13 [scale \(View Scale\)](#)

This element specifies the view scaling factors that the presentation was last viewed with.

[Note: The W3C XML Schema definition of this element's content model ([CT_Scale2D](#)) is located in §A.4.1. *end note*]

19.2.2.14 [sld \(Presentation Slide\)](#)

This element specifies a presentation slide and properties specific to the slide's appearance in outline view.

[Example: Consider the following presentation slide that has been collapsed in outline view.

```
<p:viewPr xmlns:a="..." xmlns:r="..." xmlns:p="..." lastView="outlineView">
...
<p:outlineViewPr>
...
<p:sldLst>
  <p:sld r:id="rId1" collapse="1"/>
</p:sldLst>
...
</p:outlineViewPr>
...
</p:viewPr>
```

end example]

Attributes	Description
collapse (Collapsed)	Specifies whether this presentation slide is to be shown as collapsed within outline view. That is, all text other than the slide title is not shown to the user. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
id (Relationship Identifier) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the relationship identifier that is used in conjunction with a corresponding relationship file to resolve the location of this presentation slide within a presentation. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

[Note: The W3C XML Schema definition of this element’s content model ([CT_OutlineViewSlideEntry](#)) is located in §A.3. end note]

19.2.2.15 sldLst (List of Presentation Slides)

This element specifies a list of presentation slides. A presentation slide contains the information that is specific to a single slide such as slide-specific shape and text information.

[Note: The W3C XML Schema definition of this element’s content model ([CT_OutlineViewSlideList](#)) is located in §A.3. end note]

19.2.2.16 slideViewPr (Slide View Properties)

This element functions as a parent element within which all view properties associated with the slide view mode are contained. All properties are defined within the child elements.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SlideViewProperties](#)) is located in §A.3. *end note*]

19.2.2.17 [sorterViewPr \(Slide Sorter View Properties\)](#)

This element functions as a parent element within which all view properties associated with the slide sorter view mode are contained. All properties are defined within the child elements.

The slide sorter view displays thumbnails of multiple slides at once; the number of slides and size of thumbnails depends on the scaling factor of the view.

Attributes	Description
showFormatting (Show Formatting)	Specifies whether to show associated slide formatting when in slide sorter view mode. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SlideSorterViewProperties](#)) is located in §A.3. *end note*]

19.2.2.18 [viewPr \(Presentation-wide View Properties\)](#)

This element functions as a parent element within which all presentation-wide view properties are contained. All properties and their corresponding settings are defined within the child elements.

Attributes	Description
lastView (Last View)	Specifies the view mode that was used when the presentation document was last saved. The possible values for this attribute are defined by the ST_ViewType simple type (§19.7.55).
showComments (Show Comments)	Specifies whether the slide comments should be shown. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ViewProperties](#)) is located in §A.3. *end note*]

19.3 Slides

The Slides portion of the PresentationML framework stores all information pertaining specifically to slides of various slide types. These slide types and corresponding parts can be broken down into three distinct parts, namely slides, embedded objects, and programmable tags.

19.3.1 Slides

Being the main segment of this section of PresentationML, the slides elements encompass all data that is to be contained within a slide. The best way to think of a slide is a container for all data that is to be on that slide. The specific shapes, images and relations within a slide do not come into play here. The elements here pertain to the six different slide types that can be described within PresentationML, namely slide, slide layout, slide master, handout master, notes master and notes slide.

19.3.1.1 **bg** (Slide Background)

This element specifies the background appearance information for a slide. The slide background covers the entire slide and is visible where no objects exist and as the background for transparent objects.


Attributes	Description
bwMode (Black and White Mode)	<p>Specifies that the background should be rendered using only black and white coloring. That is, the coloring information for the background should be converted to either black or white when rendering the picture.</p> <p>[<i>Note</i>: No gray is to be used in rendering this background, only stark black and stark white. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_BlackWhiteMode simple type (§20.1.10.10).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_Background](#)) is located in §A.3. *end note*]

19.3.1.2 **bgPr** (Background Properties)

This element specifies visual effects used to render the slide background. This includes any fill, image, or effects that are to make up the background of the slide.

Attributes	Description
shadeToTitle (Shade to Title)	<p>Specifies whether the background of the slide is of a shade to title background type. This kind of gradient fill is on the slide background and changes based on the placement of the slide title placeholder. An example is shown below.</p>

Attributes	Description
	<div></div> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_BackgroundProperties](#)) is located in §A.3. end note]

19.3.1.3 **bgRef (Background Style Reference)**

This element specifies the slide background is to use a fill style defined in the style matrix. The `idx` attribute refers to the index of a background fill style or fill style within the presentation's style matrix, defined by the `fmtScheme` element. A value of 0 or 1000 indicates no background, values 1-999 refer to the index of a fill style within the `fillStyleLst` element, and values 1001 and above refer to the index of a background fill style within the `bgFillStyleLst` element. The value 1001 corresponds to the first background fill style, 1002 to the second background fill style, and so on.

[Example:

```
<p:bgRef idx="2">
  <a:schemeClr val="bg2"/>
</p:bgRef>
```

The above code indicates a slide background with the style's second fill style using the second background color of the color scheme.

end example]

[Example:

```
<p:bgRef idx="1001">
  <a:schemeClr val="bg2"/>
</p:bgRef>
```

The above code indicates a slide background with the style's first background fill style using the second background color of the color scheme.

end example]

Attributes	Description
idx (Style Matrix Index) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies the style matrix index of the style referred to. The possible values for this attribute are defined by the ST_StyleMatrixColumnIndex simple type (§20.1.10.56).

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_StyleMatrixReference](#)) is located in §A.4.1. *end note*]

19.3.1.4 **blipFill (Picture Fill)**

This element specifies the kind of picture fill that the picture object has. Because a picture has a picture fill already by default, it is possible to have two fills specified for a picture object. An example of this is shown below.

[*Example:* Consider the picture below that has a blip fill applied to it. The image used to fill this picture object has transparent pixels instead of white pixels.

```
<p:pic>
...
<p:blipFill>
  <a:blip r:embed="rId2"/>
  <a:stretch>
    <a:fillRect/>
  </a:stretch>
</p:blipFill>
...
</p:pic>
```




The above picture object is shown as an example of this fill type. *end example*]

[*Example:* Consider now the same picture object but with an additional gradient fill applied within the shape properties portion of the picture.

```
<p:pic>
...
<p:blipFill>
  <a:blip r:embed="rId2"/>
  <a:stretch>
    <a:fillRect/>
  </a:stretch>
</p:blipFill>
<p:spPr>
  <a:gradFill>
    <a:gsLst>
      <a:gs pos="0">
        <a:schemeClr val="tx2">
          <a:shade val="50000"/>
        </a:schemeClr>
      </a:gs>
      <a:gs pos="39999">
        <a:schemeClr val="tx2">
          <a:tint val="20000"/>
        </a:schemeClr>
      </a:gs>
      <a:gs pos="70000">
        <a:srgbClr val="C4D6EB"/>
      </a:gs>
      <a:gs pos="100000">
        <a:schemeClr val="bg1"/>
      </a:gs>
    </a:gsLst>
  </a:gradFill>
</p:spPr>
```

```
</a:gs>
</a:gsLst>
</a:gradFill>
</p:spPr>
...
</p:pic>
```



The above picture object is shown as an example of this double fill type. *end example*]

Attributes	Description
dpi (DPI Setting) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies the DPI (dots per inch) used to calculate the size of the blip. If not present or zero, the DPI in the blip is used. [<i>Note</i> : This attribute is primarily used to keep track of the picture quality within a document. There are different levels of quality needed for print than on-screen viewing and thus a need to track this information. <i>end note</i>] The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
rotWithShape (Rotate With Shape) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies that the fill should rotate with the shape. That is, when the shape that has been filled with a picture and the containing shape (say a rectangle) is transformed with a rotation then the fill is transformed with the same rotation. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_BlipFillProperties](#)) is located in §A.4.1. *end note*]

19.3.1.5 bodyStyle (Slide Master Body Text Style)

This element specifies the text formatting style for all body text within a master slide. This formatting is used on all body text within presentation slides related to this master. The text formatting is specified by utilizing the DrawingML framework just as within a regular presentation slide. Within the bodyStyle element there can be many different style types defined as there are different kinds of text stored within the body of a slide.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TextListStyle](#)) is located in §A.4.1. *end note*]

19.3.1.6 clrMap (Color Scheme Map)

This element specifies the mapping layer that transforms one color scheme definition to another. Each attribute represents a color name that can be referenced in this master, and the value is the corresponding color in the theme.

[*Example:* Consider the following mapping of colors that applies to a slide master:

```
<p:clrMap bg1="dk1" tx1="lt1" bg2="dk2" tx2="lt2" accent1="accent1"
accent2="accent2" accent3="accent3" accent4="accent4" accent5="accent5"
accent6="accent6" hlink="hlink" folHlink="folHlink"/>
```

end example]

Attributes	Description
accent1 (Accent 1) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies a color defined which is associated as the accent 1 color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
accent2 (Accent 2) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies a color defined which is associated as the accent 2 color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
accent3 (Accent 3) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies a color defined which is associated as the accent 3 color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
accent4 (Accent 4)	Specifies a color defined which is associated as the accent 4 color.

Attributes	Description
Namespace: http://purl.oclc.org/ooxml/drawing/ml/main	The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
accent5 (Accent 5) Namespace: http://purl.oclc.org/ooxml/drawing/ml/main	Specifies a color defined which is associated as the accent 5 color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
accent6 (Accent 6) Namespace: http://purl.oclc.org/ooxml/drawing/ml/main	Specifies a color defined which is associated as the accent 6 color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
bg1 (Background 1) Namespace: http://purl.oclc.org/ooxml/drawing/ml/main	A color defined which is associated as the first background color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
bg2 (Background 2) Namespace: http://purl.oclc.org/ooxml/drawing/ml/main	Specifies a color defined which is associated as the second background color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
folHlink (Followed Hyperlink) Namespace: http://purl.oclc.org/ooxml/drawing/ml/main	Specifies a color defined which is associated as the color for a followed hyperlink. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
hlink (Hyperlink) Namespace: http://purl.oclc.org/ooxml/drawing/ml/main	Specifies a color defined which is associated as the color for a hyperlink. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
tx1 (Text 1) Namespace:	Specifies a color defined which is associated as the first text color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple

Attributes	Description
http://purl.oclc.org/ooxml/drawingml/main	type (§20.1.10.14).
tx2 (Text 2) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies a color defined which is associated as the second text color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).

[*Note*: The W3C XML Schema definition of this element's content model ([CT_ColorMapping](#)) is located in §A.4.1. *end note*]

19.3.1.7 clrMapOvr (Color Scheme Map Override)

This element provides a mechanism with which to override the color schemes listed within the ClrMap element. If the masterClrMapping element is present, the color scheme defined by the master is used. If the overrideClrMapping element is present, it defines a new color scheme specific to the parent notes slide, presentation slide, or slide layout.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_ColorMappingOverride](#)) is located in §A.4.1. *end note*]

19.3.1.8 cNvCxnSpPr (Non-Visual Connector Shape Drawing Properties)

This element specifies the non-visual drawing properties specific to a connector shape. This includes information specifying the shapes to which the connector shape is connected.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_NonVisualConnectorProperties](#)) is located in §A.4.1. *end note*]

19.3.1.9 cNvGraphicFramePr (Non-Visual Graphic Frame Drawing Properties)

This element specifies the non-visual drawing properties for a graphic frame. These non-visual properties are properties that the generating application would utilize when rendering the slide surface.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_NonVisualGraphicFrameProperties](#)) is located in §A.4.1. *end note*]

19.3.1.10 cNvGrpSpPr (Non-Visual Group Shape Drawing Properties)

This element specifies the non-visual drawing properties for a group shape. These non-visual properties are properties that the generating application would utilize when rendering the slide surface.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_NonVisualGroupDrawingShapeProps](#)) is located in §A.4.1. *end note*]

19.3.1.11 cNvPicPr (Non-Visual Picture Drawing Properties)

This element specifies the non-visual properties for the picture canvas. These properties are to be used by the generating application to determine how certain properties are to be changed for the picture object in question.

[Example: Consider the following DrawingML.

```
<p:pic>
...
<p:nvPicPr>
  <p:cNvPr id="4" name="Lilly_by_Lisher.jpg"/>
  <p:cNvPicPr>
    <a:picLocks noChangeAspect="1"/>
  </p:cNvPicPr>
</p:nvPicPr>
...
</p:pic>
```

end example]

Attributes	Description
preferRelativeResi ze (Relative Resize Preferred) Namespace: http://purl.oclc.or g/ooxml/drawing ml/main	<p>Specifies if the user interface should show the resizing of the picture based on the picture's current size or its original size. If this attribute is set to true, then scaling is relative to the original picture size as opposed to the current picture size.</p> <p>[Example: Consider the case where a picture has been resized within a document and is now 50% of the originally inserted picture size. Now if the user chooses to make a later adjustment to the size of this picture within the generating application, then the value of this attribute should be checked.</p> <p>If this attribute is set to true then a value of 50% is shown. Similarly, if this attribute is set to false, then a value of 100% should be shown because the picture has not yet been resized from its current (smaller) size. end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_NonVisualPictureProperties](#)) is located in §A.4.1. end note]

19.3.1.12 cNvPr (Non-Visual Drawing Properties)

This element specifies non-visual canvas properties. This allows for additional information that does not affect the appearance of the picture to be stored.

[*Example*: Consider the following DrawingML.

```
<p:pic>
...
<p:nvPicPr>
  <p:cNvPr id="4" name="Lilly_by_Lisher.jpg"/>
</p:nvPicPr>
...
</p:pic>
```

end example]

Attributes	Description
<p>descr (Alternative Text for Object)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies alternative text for the current DrawingML object, for use by assistive technologies or applications which do not display the current object.</p> <p>If this element is omitted, then no alternative text is present for the parent object.</p> <p>[<i>Example</i>: Consider a DrawingML object defined as follows:</p> <pre><... descr="A picture of a bowl of fruit"></pre> <p>The descr attribute contains alternative text which can be used in place of the actual DrawingML object. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
<p>hidden (Hidden)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies whether this DrawingML object is displayed. When a DrawingML object is displayed within a document, that object can be hidden (i.e., present, but not visible). This attribute determines whether the object is rendered or made hidden. [<i>Note</i>: An application can have settings which allow this object to be viewed. <i>end note</i>]</p> <p>If this attribute is omitted, then the parent DrawingML object shall be displayed (i.e., not hidden).</p> <p>[<i>Example</i>: Consider an inline DrawingML object which must be hidden within the document's content. This setting would be specified as follows:</p> <pre><... hidden="true" /></pre> <p>The hidden attribute has a value of true, which specifies that the DrawingML object is hidden and not displayed when the document is displayed. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
id (Unique	Specifies a unique identifier for the current DrawingML object within the current

Attributes	Description
<p>Identifier)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>document. This ID can be used to assist in uniquely identifying this object so that it can be referred to by other parts of the document.</p> <p>If multiple objects within the same document share the same id attribute value, then the document shall be considered non-conformant.</p> <p>[<i>Example</i>: Consider a DrawingML object defined as follows:</p> <pre data-bbox="451 531 678 562"><... id="10" ... ></pre> <p>The id attribute has a value of 10, which is the unique identifier for this DrawingML object. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DrawingElementId simple type (§20.1.10.21).</p>
<p>name (Name)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies the name of the object. [<i>Note</i>: Typically, this is used to store the original file name of a picture object. <i>end note</i>]</p> <p>[<i>Example</i>: Consider a DrawingML object defined as follows:</p> <pre data-bbox="451 972 776 1003">< ... name="foo.jpg" ></pre> <p>The name attribute has a value of foo.jpg, which is the name of this DrawingML object. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
<p>title (Title)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies the title (caption) of the current DrawingML object.</p> <p>If this attribute is omitted, then no title text is present for the parent object.</p> <p>[<i>Example</i>: Consider a DrawingML object defined as follows:</p> <pre data-bbox="451 1444 971 1476"><... title="Process Flow Diagram"></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_NonVisualDrawingProps](#)) is located in §A.4.1. *end note*]

19.3.1.13 cNvSpPr (Non-Visual Drawing Properties for a Shape)

This element specifies the non-visual drawing properties for a shape. These properties are to be used by the generating application to determine how the shape should be dealt with

[*Example:* Consider the shape that has a shape lock applied to it.

```
<p:sp>
  <p:nvSpPr>
    <p:cNvPr id="2" name="Rectangle 1"/>
    <p:cNvSpPr>
      <a:spLocks noGrp="1"/>
    </p:cNvSpPr>
  </p:nvSpPr>
  ...
</p:sp>
```

This shape lock is stored within the non-visual drawing properties for this shape. *end example*]

Attributes	Description
txBox (Text Box) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies that the corresponding shape is a text box and thus should be treated as such by the generating application. If this attribute is omitted then it is assumed that the corresponding shape is not specifically a text box. [Note: Because a shape is not specified to be a text box does not mean that it cannot have text attached to it. A text box is merely a specialized shape with specific properties. <i>end note</i>] The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_NonVisualDrawingShapeProps](#)) is located in §A.4.1. *end note*]

19.3.1.14 contentPart (Content Part)

This element specifies a reference to XML content in a format not defined by ECMA-376. [Note: This part allows the native use of other commonly used interchange formats, such as:

- MathML (<http://www.w3.org/TR/MathML2/>)
- SMIL (<http://www.w3.org/TR/REC-smil/>)
- SVG (<http://www.w3.org/TR/SVG11/>)

end note]

The relationship type of the explicit relationship specified by this element shall be <http://purl.oclc.org/ooxml/officeDocument/relationships/customXml> and have a TargetMode attribute value of Internal. If an application cannot process content of the content type specified by the targeted part, then it should continue to process the file. If possible, it should also provide some indication that unknown content was not imported.

[Note: For better interoperability, only standard XML formats should be used. *end note*]

[Example: Consider a PresentationML document which includes the following SMIL markup in a part named smil1.xml:

```
<!--
    Copyright: Copyright 1998-2001 W3C (MIT, INRIA, Keio), All Rights
    Reserved.
    See http://www.w3.org/Consortium/Legal/.
    Author: Aaron Cohen (Intel)
        Version: February 7, 2001
        Module: Animation Module
        Feature: animation
        File Name: animation-add-BE-05.smil
    Media Components: none
    Expected Behavior: Nine red rectangles numbered 1 to 9 shrink to squares
                      over 2s as follows:
                        at 2s #1 shrinks.
                        at 5s #2 shrinks, 1s after #1 completes
                        at 8s #3 shrinks.
                        #4 shrinks when it is clicked on.
                        #5 shrinks 1s after it is clicked on.
                        #6 shrinks 2s after it is clicked on.
                        #7 shrinks when the accesskey '1' is pressed.
                        #8 should be shrunk from 0s since it's wallclock time is in
the past.
                        #9 will not shrink unless a DOM call causes it to begin.
-->
<smil xmlns="http://www.w3.org/2001/SMIL20/Language">
  <head>
    <layout>
      <root-layout width="640" height="480" backgroundColor="white"/>
      <region id="whole" width="640" height="480" z-index="0"/>
      <region id="rect1" top="50px" left="90px" height="50px" width="30px"
backgroundColor="red" z-index="1"/>
      <region id="rect2" top="50px" left="234px" height="50px" width="30px"
backgroundColor="red" z-index="1"/>
```

```

    <region id="rect4" top="160px" left="90px" height="50px" width="30px"
backgroundColor="transparent" z-index="1"/>
    <region id="rect5" top="160px" left="234px" height="50px" width="30px"
backgroundColor="transparent" z-index="1"/>
    <region id="rect6" top="160px" left="380px" height="50px" width="30px"
backgroundColor="transparent" z-index="1"/>
    <region id="rect7" top="270px" left="90px" height="50px" width="30px"
backgroundColor="red" z-index="1"/>
    <region id="rect8" top="270px" left="234px" height="50px" width="30px"
backgroundColor="red" z-index="1"/>
    <region id="rect9" top="270px" left="380px" height="50px" width="30px"
backgroundColor="red" z-index="1"/>
  </layout>
</head>
<!-- Copyright 1998-2001 W3C (MIT, INRIA, Keio), All Rights Reserved.
See http://www.w3.org/Consortium/Legal/. -->
<body>
  <par dur="indefinite">
    
    <animate id="anim1" targetElement="rect1" attributeName="height" from="50"
to="25" begin="2s" dur="2s" fill="freeze"/>
    <animate id="anim2" targetElement="rect2" attributeName="height" from="50"
to="25" begin="anim1.end+1s" dur="2s" fill="freeze"/>
    <brush id="brush4" color="red" region="rect4" height="50px" width="30px"/>
    <animate id="anim4" targetElement="brush4" attributeName="height"
from="50" to="25" begin="brush4.activateEvent" dur="2s" fill="freeze"/>
    <brush id="brush5" color="red" region="rect5" height="50px" width="30px"/>
    <animate id="anim5" targetElement="brush5" attributeName="height"
from="50" to="25" begin="brush5.activateEvent+1s" dur="2s" fill="freeze"/>
    <brush id="brush6" color="red" region="rect6" height="50px" width="30px"/>
    <animate id="anim6a" targetElement="brush6" attributeName="width"
repeatCount="3" from="30" to="30" begin="brush6.activateEvent" dur="1s"
fill="freeze"/>
    <animate id="anim6b" targetElement="brush6" attributeName="height"
from="50" to="25" begin="anim6a.repeat(2)" dur="2s" fill="freeze"/>
    <animate id="anim7" targetElement="rect7" attributeName="height" from="50"
to="25" begin="accesskey(1)" dur="2s" fill="freeze"/>
    <animate id="anim8" targetElement="rect8" attributeName="height" from="50"
to="25" begin="wallclock(2000-01-01T00:00:00Z)" dur="2s" fill="freeze"/>
    <animate id="anim9" targetElement="rect9" attributeName="width" from="30"
to="30" begin="indefinite" dur="1s" fill="freeze"/>
  </par>
</body>

```

</smil>

A Slide Part would reference this content as follows:

```
<p:spTree>
...
<p:contentPart r:id="smil01"/>
...
</p:spTree>
```

The contentPart element specifies that the content targeted by the relationship with an ID of `smil01` is part of the PresentationML document. Examining the contents of the corresponding relationship part item, we can see the targets for that relationship:

```
<Relationships ... >
...
<Relationship Id="smil01" TargetMode="Internal"
Type="http://purl.oclc.org/ooxml/officeDocument/relationships/customXml"
Target="smil1.xml" />
...
</Relationships>
```

The corresponding relationship part item shows that the SMIL content is located next to the slide and is named `smil1.xml`. *end example*]

ttributes	Description
id (Relationship to Part) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	<p>Specifies the relationship ID to a content part.</p> <p>[<i>Example:</i> Consider an XML element which has the following id attribute:</p> <pre><... r:id="rId1" /></pre> <p>The markup specifies the associated relationship part with relationship ID <code>rId1</code> contains the corresponding relationship information for the parent XML element. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Rel](#)) is located in §A.3. *end note*]

19.3.1.15 controls (List of controls)

This element specifies a list of embedded controls for the corresponding slide. Custom embedded controls can be embedded on slides.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_ControlList](#)) is located in §A.3. *end note*]

19.3.1.16 cSld (Common Slide Data)

This element specifies a container for slide information that is relevant to all of the slide types. All slides share a common set of properties that is independent of the slide type; the description of these properties for any particular slide is stored within the slide's cSld container. Slide data specific to the slide type indicated by the parent element is stored elsewhere.

[*Note*: The actual data in cSld describe only the particular parent slide; it is only the kind of information stored that is common across all slides. *end note*]

[*Example*: Consider the following PresentationML slide

```
<p:sld>
  <p:cSld>
    <p:spTree>
      ...
    </p:spTree>
  </p:cSld>
  ...
</p:sld>
```

As the above example shows, the shape tree of a slide (spTree) is a child element of cSld because all slide types can contain a shape tree. Other slide properties specific to the slide type (such as transitions for sld slides) are specified elsewhere. *end example*]

Attributes	Description
name (Name)	Specifies the slide name property that is used to further identify this unique configuration of common slide data. This might be used to aid in distinguishing different slide layouts or various other slide types. The possible values for this attribute are defined by the W3C XML Schema string datatype.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_CommonSlideData](#)) is located in §A.3. *end note*]

19.3.1.17 custData (Customer Data)

This element specifies customer data which allows for the specifying and persistence of customer specific data within the presentation.

Attributes	Description
id (Relationship ID) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	This attribute specifies the relationship id for referencing other resources outside the scope of the current PresentationML file. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

[Note: The W3C XML Schema definition of this element’s content model ([CT_CustomerData](#)) is located in §A.3. end note]

19.3.1.18 [custDataLst \(Customer Data List\)](#)

This element allows for the specifying of customer defined data within the PresentationML framework. References to custom data or tags can be defined within this list.

[Note: The W3C XML Schema definition of this element’s content model ([CT_CustomerDataList](#)) is located in §A.3. end note]

19.3.1.19 [cxnSp \(Connection Shape\)](#)

This element specifies a connection shape that is used to connect two sp elements. Once a connection is specified using a cxnSp, it is left to the generating application to determine the exact path the connector takes. That is the connector routing algorithm is left up to the generating application as the desired path might be different depending on the specific needs of the application.



[Example: Consider the following connector shape that connects two regular shapes.

```
<p:spTree>
...
<p:sp>
  <p:nvSpPr>
    <p:cNvPr id="1" name="Rectangle 1"/>
    <p:cNvSpPr/>
    <p:nvPr/>
  </p:nvSpPr>
  ...
</p:sp>
<p:sp>
  <p:nvSpPr>
```

```

    <p:cNvPr id="2" name="Rectangle 2"/>
    <p:cNvSpPr/>
    <p:nvPr/>
  </p:nvSpPr>
  ...
</p:sp>
<p:cxnSp>
  <p:nvCxnSpPr>
    <p:cNvPr id="3" name="Elbow Connector 3"/>
    <p:cNvCxnSpPr>
      <a:stCxn id="1" idx="3"/>
      <a:endCxn id="2" idx="1"/>
    </p:cNvCxnSpPr>
    <p:nvPr/>
  </p:nvCxnSpPr>
  ...
</p:cxnSp>
</p:spTree>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Connector](#)) is located in §A.3. *end note*]

19.3.1.20 extLst (Extension List with Modification Flag)

This element specifies the extension list with modification ability within which all future extensions of element type `ext` are defined. The extension list along with corresponding future extensions is used to extend the storage capabilities of the PresentationML framework. This allows for various new kinds of data to be stored natively within the framework.

[*Note:* Using this `extLst` element allows the generating application to store whether this extension property has been modified. *end note*]

Attributes	Description
mod (Modify)	<p>This attribute specifies whether the data contained within this element has been modified and should thus be processed again by the generating application.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ExtensionListModify](#)) is located in §A.3. *end note*]

19.3.1.21 graphicFrame (Graphic Frame)

This element specifies the existence of a graphics frame. This frame contains a graphic that was generated by an external source and needs a container in which to be displayed on the slide surface.

Attributes	Description
bwMode (Black and White Mode) Namespace: .../drawingml/2006/main	Specifies how the graphical object should be rendered, using color, black or white, or grayscale. [Note: This does not mean that the graphical object itself is stored with only black and white or grayscale information. This attribute instead sets the rendering mode that the graphical object uses. <i>end note</i>] The possible values for this attribute are defined by the ST_BlackWhiteMode simple type (§20.1.10.10).

[Note: The W3C XML Schema definition of this element’s content model ([CT_GraphicalObjectFrame](#)) is located in §A.3. *end note*]

19.3.1.22 grpSp (Group Shape)

This element specifies a group shape that represents many shapes grouped together. This shape is to be treated just as if it were a regular shape but instead of being described by a single geometry it is made up of all the shape geometries encompassed within it. Within a group shape each of the shapes that make up the group are specified just as they normally would. The idea behind grouping elements however is that a single transform can apply to many shapes at the same time.

[Example: Consider the following group shape.

```
<p:grpSp>
  <p:nvGrpSpPr>
    <p:cNvPr id="10" name="Group 9"/>
    <p:cNvGrpSpPr/>
    <p:nvPr/>
  </p:nvGrpSpPr>
  <p:grpSpPr>
    <a:xfrm>
      <a:off x="838200" y="990600"/>
      <a:ext cx="2426208" cy="978408"/>
      <a:chOff x="838200" y="990600"/>
      <a:chExt cx="2426208" cy="978408"/>
    </a:xfrm>
  </p:grpSpPr>
</p:sp>
...
```



```

</p:sp>
<p:sp>
...
</p:sp>
<p:sp>
...
</p:sp>
</p:grpSp>

```

In the above example we see three shapes specified within a single group. These three shapes have their position and sizes specified just as they normally would within the shape tree. The generating application should apply the transformation after the bounding box for the group shape has been calculated. *end example*]

[*Note*: The W3C XML Schema definition of this element's content model ([CT_GroupShape](#)) is located in §A.3. *end note*]

19.3.1.23 grpSpPr (Group Shape Properties)

This element specifies the properties that are to be common across all of the shapes within the corresponding group. If there are any conflicting properties within the group shape properties and the individual shape properties then the individual shape properties should take precedence.

Attributes	Description
bwMode (Black and White Mode) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies that the group shape should be rendered using only black and white coloring. That is the coloring information for the group shape should be converted to either black or white when rendering the corresponding shapes.</p> <p>No gray is to be used in rendering this image, only stark black and stark white.</p> <p>[<i>Note</i>: This does not mean that the group shapes themselves are stored with only black and white color information. This attribute instead sets the rendering mode that the shapes use when rendering. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_BlackWhiteMode simple type (§20.1.10.10).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_GroupShapeProperties](#)) is located in §A.4.1. *end note*]

19.3.1.24 handoutMaster (Handout Master)

This element specifies an instance of a handout master slide. Within a handout master slide are contained all elements that describe the objects and their corresponding formatting for within a handout slide. Within a handout master slide the cSld element specifies the common slide elements such as shapes and their attached

text bodies. There are other properties within a handout master slide but cSld encompasses the majority of the intended purpose for a handoutMaster slide.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_HandoutMaster](#)) is located in §A.3.
end note]

19.3.1.25 hf (Header/Footer information for a slide master)

This element specifies the header and footer information for a slide. Headers and footers consist of placeholders for text that should be consistent across all slides and slide types, such as a date and time, slide numbering, and custom header and footer text.

Attributes	Description
dt (Date/Time Placeholder)	<p>Specifies whether the Date/Time placeholder is enabled for this master. If this attribute is not specified, a value of true should be assumed by the generating application.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fttr (Footer Placeholder)	<p>Specifies whether the Footer placeholder is enabled for this master. If this attribute is not specified, a value of true should be assumed by the generating application.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
hdr (Header Placeholder)	<p>Specifies whether the Header placeholder is enabled for this master. If this attribute is not specified, a value of true should be assumed by the generating application.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
sldNum (Slide Number Placeholder)	<p>Specifies whether the slide number placeholder is enabled. If this attribute is not specified, a value of true should be assumed by the generating application.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_HeaderFooter](#)) is located in §A.3.
end note]

19.3.1.26 notes (Notes Slide)

This element specifies the existence of a notes slide along with its corresponding data. Contained within a notes slide are all the common slide elements along with addition properties that are specific to the notes element.

[*Example*: Consider the following PresentationML notes slide

```
<p:notes>  
  <p:cSld>
```

```

...
</p:cSld>
...
</p:notes>

```

In the above example a notes element specifies the existence of a notes slide with all of its parts. Notice the cSld element, that specifies the common elements that can appear on any slide type and then any elements specify additional non-common properties for this notes slide. *end example]*

Attributes	Description
showMasterPhAnim (Show Master Placeholder Animations)	Specifies whether or not to display animations on placeholders from the master slide. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
showMasterSp (Show Master Shapes)	Specifies if shapes on the master slide should be shown on slides or not. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_NotesSlide](#)) is located in §A.3. *end note]*

19.3.1.27 notesMaster (Notes Master)

This element specifies an instance of a handout master slide. Within a handout master slide are contained all elements that describe the objects and their corresponding formatting for within a handout slide. Within a handout master slide the cSld element specifies the common slide elements such as shapes and their attached text bodies. There are other properties within a handout master slide but cSld encompasses the majority of the intended purpose for a handoutMaster slide.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_NotesMaster](#)) is located in §A.3. *end note]*

19.3.1.28 notesStyle (Notes Text Style)

This element specifies the text formatting style for the all other text within a notes slide. This formatting is used on all text within the corresponding notes slides. The text formatting is specified by utilizing the DrawingML framework just as within a regular presentation slide. Within the notesStyle element there can be many different style types defined as there are different kinds of text stored within a notes slide.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TextListStyle](#)) is located in §A.4.1. *end note]*

19.3.1.29 `nvCxnSpPr` (Non-Visual Properties for a Connection Shape)

This element specifies all non-visual properties for a connection shape. This element is a container for the non-visual identification properties, shape properties and application properties that are to be associated with a connection shape. This allows for additional information that does not affect the appearance of the connection shape to be stored.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_ConnectorNonVisual](#)) is located in §A.3. *end note*]

19.3.1.30 `nvGraphicFramePr` (Non-Visual Properties for a Graphic Frame)

This element specifies all non-visual properties for a graphic frame. This element is a container for the non-visual identification properties, shape properties and application properties that are to be associated with a graphic frame. This allows for additional information that does not affect the appearance of the graphic frame to be stored.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_GraphicalObjectFrameNonVisual](#)) is located in §A.3. *end note*]

19.3.1.31 `nvGrpSpPr` (Non-Visual Properties for a Group Shape)

This element specifies all non-visual properties for a group shape. This element is a container for the non-visual identification properties, shape properties and application properties that are to be associated with a group shape. This allows for additional information that does not affect the appearance of the group shape to be stored.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_GroupShapeNonVisual](#)) is located in §A.3. *end note*]

19.3.1.32 `nvPicPr` (Non-Visual Properties for a Picture)

This element specifies all non-visual properties for a picture. This element is a container for the non-visual identification properties, shape properties and application properties that are to be associated with a picture. This allows for additional information that does not affect the appearance of the picture to be stored.

[*Example*: Consider the following PresentationML.

```
<p:pic>
...
<p:nvPicPr>
...
</p:nvPicPr>
...
</p:pic>
```

end example]

[*Note: The W3C XML Schema definition of this element's content model ([CT_PictureNonVisual](#)) is located in §A.3. end note*]

19.3.1.33 [nvPr \(Non-Visual Properties\)](#)

This element specifies non-visual properties for objects. These properties include multimedia content associated with an object and properties indicating how the object is to be used or displayed in different contexts.

Attributes	Description
isPhoto (Is a Photo Album)	Specifies whether the picture belongs to a photo album and should thus be included when editing a photo album within the generating application. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
userDrawn (Is User Drawn)	Specifies if the corresponding object has been drawn by the user and should thus not be deleted. This allows for the flagging of slides that contain user drawn data. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[*Note: The W3C XML Schema definition of this element's content model ([CT_ApplicationNonVisualDrawingProps](#)) is located in §A.3. end note*]

19.3.1.34 [nvSpPr \(Non-Visual Properties for a Shape\)](#)

This element specifies all non-visual properties for a shape. This element is a container for the non-visual identification properties, shape properties and application properties that are to be associated with a shape. This allows for additional information that does not affect the appearance of the shape to be stored.

[*Note: The W3C XML Schema definition of this element's content model ([CT_ShapeNonVisual](#)) is located in §A.3. end note*]

19.3.1.35 [otherStyle \(Slide Master Other Text Style\)](#)

This element specifies the text formatting style for the all other text within a master slide. This formatting is used on all text not covered by the titleStyle or bodyStyle elements within related presentation slides. The text formatting is specified by utilizing the DrawingML framework just as within a regular presentation slide. Within the otherStyle element there can be many different style types defined as there are different kinds of text stored within a slide.

[*Note: The otherStyle element is to be used for specifying the text formatting of text within a slide shape but not within a text box. Text box styling is handled from within the bodyStyle element. end note*]

[*Note: The W3C XML Schema definition of this element's content model ([CT_TextListStyle](#)) is located in §A.4.1. end note*]

19.3.1.36 **ph (Placeholder Shape)**

This element specifies that the corresponding shape should be represented by the generating application as a placeholder. When a shape is considered a placeholder by the generating application it can have special properties to alert the user that they can enter content into the shape. Different placeholder types are allowed and can be specified by using the placeholder type attribute for this element.

Attributes	Description
hasCustomPrompt (Placeholder has custom prompt)	Specifies whether the corresponding placeholder should have a custom prompt or not. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
idx (Placeholder Index)	Specifies the placeholder index. This is used when applying templates or changing layouts to match a placeholder on one template/master to another. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
orient (Placeholder Orientation)	Specifies the orientation of a placeholder. The possible values for this attribute are defined by the ST_Direction simple type (§19.7.2).
sz (Placeholder Size)	Specifies the size of a placeholder. The possible values for this attribute are defined by the ST_PlaceholderSize simple type (§19.7.9).
type (Placeholder Type)	Specifies what content type a placeholder is intended to contain. The possible values for this attribute are defined by the ST_PlaceholderType simple type (§19.7.10).

[Note: The W3C XML Schema definition of this element’s content model ([CT_Placeholder](#)) is located in §A.3. *end note*]

19.3.1.37 **pic (Picture)**

This element specifies the existence of a picture object within the document.

[Example: Consider the following PresentationML that specifies the existence of a picture within a document. This picture can have non-visual properties, a picture fill as well as shape properties attached to it.

```
<p:pic>
  <p:nvPicPr>
    <p:cNvPr id="4" name="lake.JPG" descr="Picture of a Lake" />
    <p:cNvPicPr>
      <a:picLocks noChangeAspect="1"/>
    </p:cNvPicPr>
  </p:nvPicPr>
</p:pic>
```

```

    </p:cNvPicPr>
    <p:nvPr/>
  </p:nvPicPr>
  <p:blipFill>
    ...
  </p:blipFill>
  <p:spPr>
    ...
  </p:spPr>
</p:pic>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Picture](#)) is located in §A.3. *end note]*

19.3.1.38 sld (Presentation Slide)

This element specifies a slide within a slide list. The slide list is used to specify an ordering of slides.

[*Example:* Consider the following custom show with an ordering of slides.

```

<p:custShowLst>
  <p:custShow name="Custom Show 1" id="0">
    <p:sldLst>
      <p:sld r:id="rId4"/>
      <p:sld r:id="rId3"/>
      <p:sld r:id="rId2"/>
      <p:sld r:id="rId5"/>
    </p:sldLst>
  </p:custShow>
</p:custShowLst>

```

In the above example the order specified to present the slides is slide 4, then 3, 2 and finally 5. *end example]*

Attributes	Description
show (Show Slide in Slide Show)	Specifies that the current slide should be shown in slide show. If this attribute is omitted then a value of true is assumed. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
showMasterPhAnim (Show Master Placeholder)	Specifies whether or not to display animations on placeholders from the master slide. The possible values for this attribute are defined by the W3C XML Schema boolean

Attributes	Description
Animations)	datatype.
showMasterSp (Show Master Shapes)	Specifies if shapes on the master slide should be shown on slides or not. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Slide](#)) is located in §A.3. *end note*]

19.3.1.39 sldLayout (Slide Layout)

This element specifies an instance of a slide layout. The slide layout contains in essence a template slide design that can be applied to any existing slide. When applied to an existing slide all corresponding content should be mapped to the new slide layout.

Attributes	Description
matchingName (Matching Name)	Specifies a name to be used in place of the name attribute within the cSld element. This is used for layout matching in response to layout changes and template applications. The possible values for this attribute are defined by the W3C XML Schema string datatype.
preserve (Preserve Slide Layout)	Specifies whether the corresponding slide layout is deleted when all the slides that follow that layout are deleted. If this attribute is not specified then a value of false should be assumed by the generating application. This would mean that the slide would in fact be deleted if no slides within the presentation were related to it. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
showMasterPhAnim (Show Master Placeholder Animations)	Specifies whether or not to display animations on placeholders from the master slide. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
showMasterSp (Show Master Shapes)	Specifies if shapes on the master slide should be shown on slides or not. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
type (Slide Layout Type)	Specifies the slide layout type that is used by this slide. The possible values for this attribute are defined by the ST_SlideLayoutType simple type (§19.7.15).
userDrawn (Is User Drawn)	Specifies if the corresponding object has been drawn by the user and should thus not be deleted. This allows for the flagging of slides that contain user drawn data.

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_SlideLayout](#)) is located in §A.3. *end note*]

19.3.1.40 [sldLayoutId \(Slide Layout Id\)](#)

This element specifies the relationship information for each slide layout that is used within the slide master. The slide master has relationship identifiers that it uses internally for determining the slide layouts that should be used. Then, to resolve what these slide layouts should be the `sldLayoutId` elements in the `sldLayoutIdLst` are utilized.

Attributes	Description
id (ID Tag) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the relationship id value that the generating application can use to resolve which slide layout is used in the creation of the slide. This relationship id is used within the relationship file for the master slide to expose the location of the corresponding layout file within the presentation. The possible values for this attribute are defined by the <code>ST_RelationshipId</code> simple type (§22.8.2.1).
id (ID Tag)	Specifies the identification number that uniquely identifies this slide layout within the presentation file. The possible values for this attribute are defined by the <code>ST_SlideLayoutId</code> simple type (§19.7.14).

[Note: The W3C XML Schema definition of this element's content model ([CT_SlideLayoutIdListEntry](#)) is located in §A.3. *end note*]

19.3.1.41 [sldLayoutIdLst \(List of Slide Layouts\)](#)

This element specifies the existence of the slide layout identification list. This list is contained within the slide master and is used to determine which layouts are being used within the slide master file. Each layout within the list of slide layouts has its own identification number and relationship identifier that uniquely identifies it within both the presentation document and the particular master slide within which it is used.

[Note: The W3C XML Schema definition of this element's content model ([CT_SlideLayoutIdList](#)) is located in §A.3. *end note*]

19.3.1.42 `sldMaster` (Slide Master)

This element specifies an instance of a slide master slide. Within a slide master slide are contained all elements that describe the objects and their corresponding formatting for within a presentation slide. Within a slide master slide are two main elements. The `cSld` element specifies the common slide elements such as shapes and their attached text bodies. Then the `txStyles` element specifies the formatting for the text within each of these shapes. The other properties within a slide master slide specify other properties for within a presentation slide such as color information, headers and footers, as well as timing and transition information for all corresponding presentation slides.

Attributes	Description
<code>preserve</code> (Preserve Slide Master)	<p>Specifies whether the corresponding slide layout is deleted when all the slides that follow that layout are deleted. If this attribute is not specified then a value of false should be assumed by the generating application. This would mean that the slide would in fact be deleted if no slides within the presentation were related to it.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_SlideMaster](#)) is located in §A.3. *end note*]

19.3.1.43 `sp` (Shape)

This element specifies the existence of a single shape. A shape can either be a preset or a custom geometry, defined using the DrawingML framework. In addition to a geometry each shape can have both visual and non-visual properties attached. Text and corresponding styling information can also be attached to a shape. This shape is specified along with all other shapes within either the shape tree or group shape elements.

[Note: Shapes are the preferred mechanism for specifying text on a slide. *end note*]

Attributes	Description
<code>useBgFill</code> (Use Background Fill)	<p>Specifies that the shape fill should be set to that of the slide background surface.</p> <p>[Note: This attribute does not set the fill of the shape to be transparent but instead sets it to be filled with the portion of the slide background that is directly behind it. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_Shape](#)) is located in §A.3. *end note*]

19.3.1.44 spPr (Shape Properties)

This element specifies the visual shape properties that can be applied to a shape. These properties include the shape fill, outline, geometry, effects, and 3D orientation.

Attributes	Description
bwMode (Black and White Mode) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies that the picture should be rendered using only black and white coloring. That is the coloring information for the picture should be converted to either black or white when rendering the picture.</p> <p>No gray is to be used in rendering this image, only stark black and stark white.</p> <p>[<i>Note</i>: This does not mean that the picture itself that is stored within the file is necessarily a black and white picture. This attribute instead sets the rendering mode that the picture has applied to when rendering. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_BlackWhiteMode simple type (§20.1.10.10).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_ShapeProperties](#)) is located in §A.4.1. *end note*]

19.3.1.45 spTree (Shape Tree)

This element specifies all shape-based objects, either grouped or not, that can be referenced on a given slide. As most objects within a slide are shapes, this represents the majority of content within a slide. Text and effects are attached to shapes that are contained within the spTree element.

[*Example*: Consider the following PresentationML slide

```
<p:sld>
  <p:cSld>
    <p:spTree>
      <p:nvGrpSpPr>
        ...
      </p:nvGrpSpPr>
      <p:grpSpPr>
        ...
      </p:grpSpPr>
      <p:sp>
        ...
      </p:sp>
    </p:spTree>
  </p:cSld>
  ...
</p:sld>
```

</p:sld>

In the above example the shape tree specifies all the shape properties for this slide. *end example*

Each shape-based object within the shape tree, whether grouped or not, shall represent one unique level of z-ordering on the slide. The z-order for each shape-based object shall be determined by the lexical ordering of each shape-based object within the shape tree: the first shape-based object shall have the lowest z-order, while the last shape-based object shall have the highest z-order.

The z-ordering of shape-based objects within the shape tree shall also determine the navigation (tab) order of the shape-based objects: the shape-based object with the lowest z-order (the first shape in lexical order) shall be first in navigation order, with objects being navigated in ascending z-order.

[*Example*: Consider the following PresentationML slide with two shapes

```
<p:sld>
  <p:cSld>
    <p:spTree>
      ...
      <p:sp>
        <p:nvSpPr>
          <p:cNvPr id="5" name="Oval 4" />
          ...
        </p:nvSpPr>
        ...
      </p:sp>
      <p:sp>
        <p:nvSpPr>
          <p:cNvPr id="4" name="Isosceles Triangle 3" />
          ...
        </p:nvSpPr>
        ...
      </p:sp>
    </p:spTree>
  </p:cSld>
  ...
</p:sld>
```

In the above example the shape with name `Oval 4` has the lowest z-order value since that shape is the first shape in the shape tree. `Oval 4` is also the first shape in navigation order. The shape with name `Isosceles Triangle 3` has the highest z positioning value since that shape is the last shape in the shape tree. `Isosceles Triangle 3` is also the last shape in navigation order. *end example*

[*Note*: The W3C XML Schema definition of this element's content model ([CT_GroupShape](#)) is located in §A.3. *end note*]

19.3.1.46 style (Shape Style)

This element specifies the style information for a shape. This is used to define a shape's appearance in terms of the preset styles defined by the style matrix for the theme.

[Example:

```
<p:style>
  <a:lnRef idx="3">
    <a:schemeClr val="lt1"/>
  </a:lnRef>
  <a:fillRef idx="1">
    <a:schemeClr val="accent3"/>
  </a:fillRef>
  <a:effectRef idx="1">
    <a:schemeClr val="accent3"/>
  </a:effectRef>
  <a:fontRef idx="minor">
    <a:schemeClr val="lt1"/>
  </a:fontRef>
</p:style>
```

The parent shape of the above code is to have an outline that uses the third line style defined by the theme, use the first fill defined by the scheme, and be rendered with the first effect defined by the theme. Text inside the shape is to use the minor font defined by the theme.

end example]

[Note: The W3C XML Schema definition of this element’s content model ([CT_ShapeStyle](#)) is located in §A.4.1.
end note]

19.3.1.47 tags (Customer Data Tags)

This element specifies the existence of customer data in the form of tags. This allows for the storage of customer data within the PresentationML framework. While this is similar to the ext tag in that it can be used store information, this tag mainly focuses on referencing to other parts of the presentation document. This is accomplished via the relationship identification attribute that is required for all specified tags.

Attributes	Description
id (Relationship ID) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	This attribute specifies the relationship identifier for the customer data tag. This allows for a link to a resource that is external from the current XML document but still contained within the presentation document. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TagsData](#)) is located in §A.3. *end note*]

19.3.1.48 **timing** (Slide Timing Information for a Slide Layout)

This element specifies the timing information for handling all animations and timed events within the corresponding slide. This information is tracked via time nodes within the timing element. More information on the specifics of these time nodes and how they are to be defined can be found within the Animation section of the PresentationML framework.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SlideTiming](#)) is located in §A.3. *end note*]

19.3.1.49 **titleStyle** (Slide Master Title Text Style)

This element specifies the text formatting style for the title text within a master slide. This formatting is used on all title text within related presentation slides. The text formatting is specified by utilizing the DrawingML framework just as within a regular presentation slide. Within a title style there can be many different style types defined as there are different kinds of text stored within a slide title.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TextListStyle](#)) is located in §A.4.1. *end note*]

19.3.1.50 **transition** (Slide Transition for a Slide Layout)

This element specifies the kind of slide transition that should be used to transition to the current slide from the previous slide. That is, the transition information is stored on the slide that appears after the transition is complete.

Attributes	Description
advClick (Advance on Click)	Specifies whether a mouse click advances the slide or not. If this attribute is not specified then a value of true is assumed. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
advTm (Advance after time)	Specifies the time, in milliseconds, after which the transition should start. This setting can be used in conjunction with the advClick attribute. If this attribute is not specified then it is assumed that no auto-advance occurs. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
spd (Transition Speed)	Specifies the transition speed that is to be used when transitioning from the current slide to the next. The possible values for this attribute are defined by the ST_TransitionSpeed simple type (§19.7.54).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SlideTransition](#)) is located in §A.3. *end note*]

19.3.1.51 txBody (Shape Text Body)

This element specifies the existence of text to be contained within the corresponding shape. All visible text and visible text related properties are contained within this element. There can be multiple paragraphs and within paragraphs multiple runs of text.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TextBody](#)) is located in §A.4.1. *end note*]

19.3.1.52 txStyles (Slide Master Text Styles)

This element specifies the text styles within a slide master. Within this element is the styling information for title text, the body text and other slide text as well. This element is only for use within the Slide Master and thus sets the text styles for the corresponding presentation slides.

[*Example:* Consider the case where we would like to specify the title text for a master slide.



```
<p:txStyles>
  <p:titleStyle>
    <a:lvl1pPr algn="ctr" rtl="0" latinLnBrk="0">
      <a:spcBef>
        <a:spcPct val="0"/>
      </a:spcBef>
      <a:buNone/>
      <a:defRPr sz="4400" kern="1200">
        <a:solidFill>
          <a:schemeClr val="tx1"/>
        </a:solidFill>
        <a:latin typeface="+mj-lt"/>
        <a:ea typeface="+mj-ea"/>
        <a:cs typeface="+mj-cs"/>
      </a:defRPr>
    </a:lvl1pPr>
  </p:titleStyle>
</p:txStyles>
```

In the above example the title text is set according to the above formatting for all related slides within the presentation. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SlideMasterTextStyles](#)) is located in §A.3. *end note*]

19.3.1.53 xfrm (2D Transform for Graphic Frame)

This element specifies the transform to be applied to the corresponding graphic frame. This transformation is applied to the graphic frame just as it would be for a shape or group shape.

Attributes	Description
<p>flipH (Horizontal Flip)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies a horizontal flip. When true, this attribute defines that the shape is flipped horizontally about the center of its bounding box.</p> <p>[Example: The following illustrates the effect of a horizontal flip.</p> <div></div> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>flipV (Vertical Flip)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies a vertical flip. When true, this attribute defines that the group is flipped vertically about the center of its bounding box.</p> <p>[Example: The following illustrates the effect of a vertical flip.</p> <div></div> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>rot (Rotation)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies the rotation of the Graphic Frame. The units for which this attribute is specified in reside within the simple type definition referenced below.</p> <p>The possible values for this attribute are defined by the ST_Angle simple type (§20.1.10.3).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_Transform2D](#)) is located in §A.4.1.
end note]

19.3.2 Embedded Objects

Within the slides portion of PresentationML, there are the embedded elements. These are objects that can be embedded within a slide. As we defined a slide to be a container it can be seen that it does not just contain shapes, pictures and text but embedded objects as well that are not necessarily native to the PresentationML platform.

19.3.2.1 control (Embedded Control)

This element specifies the existence of an embedded control in the slide.

Attributes	Description
id (Relationship ID) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the relationship id that is used to identify this Embedded object from within a slide. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).
imgH (Image Height)	Specifies the height of the embedded control. The possible values for this attribute are defined by the ST_PositiveCoordinate32 simple type (§20.1.10.42).
imgW (Image Width)	Specifies the width of the embedded control. The possible values for this attribute are defined by the ST_PositiveCoordinate32 simple type (§20.1.10.42).
name (Embedded Object Name)	Specifies the identifying name class used by scripting languages. This name is also used to construct the clipboard name. The possible values for this attribute are defined by the W3C XML Schema string datatype.
showAsIcon (Show Embedded Object As Icon)	Specifies whether the Embedded object shows as an icon or using its native representation. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Control](#)) is located in §A.3. *end note*]

19.3.2.2 embed (Embedded Object or Control)

This element specifies an Embedded object or Control that is embedded within the presentation.

Attributes	Description
followColorScheme (Color Scheme Properties for Embedded object)	Specifies the Color Scheme Properties for the corresponding Embedded object being specified. The possible values for this attribute are defined by the ST_OleObjectFollowColorScheme simple type (§19.7.6).

[Note: The W3C XML Schema definition of this element's content model ([CT_OleObjectEmbed](#)) is located in §A.3. *end note*]

19.3.2.3 link (Linked Object or Control)

This element specifies a link to an external Embedded object or Control.

Attributes	Description
updateAutomatic (Update Linked Embedded Objects Automatically)	This attribute determines if linked embedded objects are automatically updated when the presentation is opened or printed. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_OleObjectLink](#)) is located in §A.3. *end note*]

19.3.2.4 oleObj (Global Element for Embedded objects and Controls)

This element specifies a global element to be used for an Embedded object and Control.

When the oleObject element contains a pic child element, the identifier specified by the pic/nvPicPr/cNvPr@id attribute shall be ignored and the identifier specified by the graphicFrame/nvGraphicFramePr/cNvPr@id attribute shall be used when deciding which identifier to use for the OLE object.

Attributes	Description
id (Relationship ID) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the relationship id that is used to identify this Embedded object from within a slide. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).
imgH (Image Height)	Specifies the height of the embedded control. The possible values for this attribute are defined by the ST_PositiveCoordinate32 simple

Attributes	Description
	type (§20.1.10.42).
imgW (Image Width)	Specifies the width of the embedded control. The possible values for this attribute are defined by the ST_PositiveCoordinate32 simple type (§20.1.10.42).
name (Embedded Object Name)	Specifies the identifying name class used by scripting languages. This name is also used to construct the clipboard name. The possible values for this attribute are defined by the W3C XML Schema string datatype.
progId (Embedded Object ProgID)	Specifies the progid for an Embedded object. The possible values for this attribute are defined by the W3C XML Schema string datatype.
showAsIcon (Show Embedded Object As Icon)	Specifies whether the Embedded object shows as an icon or using its native representation. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_OleObject](#)) is located in §A.3. *end note*]

19.3.3 Programmable Tags

Within the slides portion of PresentationML there are the tag elements. These are extensibility names and values that assist in the storage of legacy variables from older file formats.

19.3.3.1 tag (Programmable Extensibility Tag)

This element specifies a programmable extensibility tag to be used for storage of legacy variables.

Attributes	Description
name (Name)	Specifies the name associated with this specific programmable tag. The possible values for this attribute are defined by the W3C XML Schema string datatype.
val (Value)	Specifies the value associated with this specific programmable tag. The possible values for this attribute are defined by the W3C XML Schema string datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_StringTag](#)) is located in §A.3. *end note*]

19.3.3.2 tagLst (Programmable Tab List)

This element specifies the list of programmable extensibility tags that are used to store variables from legacy file formats.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TagList](#)) is located in §A.3. *end note*]

19.4 Comments

A comment is a text note attached to a slide, with the primary purpose of allowing readers of a presentation to provide feedback to the presentation author. Each comment contains an unformatted text string and information about its author, and is attached to a particular location on a slide. Comments can be visible while editing the presentation, but do not appear when a slide show is given. The displaying application decides when to display comments and determines their visual appearance.

19.4.1 cm (Comment)

This element specifies a single comment attached to a slide. It contains the text of the comment, its position on the slide, and attributes referring to its author and date.

[*Example:*

```
<p:cm authorId="0" dt="2006-08-28T17:26:44.129" idx="1">
  <p:pos x="10" y="10"/>
  <p:text>Add diagram to clarify.</p:text>
</p:cm>
```

end example]

Attributes	Description
authorId (Comment Author ID)	<p>This attribute specifies the author of the comment. It refers to the ID of an author in the comment author list for the document.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
dt (Comment Date/Time)	<p>This attribute specifies the date and time this comment was last modified.</p> <p>The possible values for this attribute are defined by the W3C XML Schema dateTime datatype.</p>
idx (Comment Index)	<p>This attribute specifies an identifier for this comment that is unique within a list of all comments by this author in this document. An author's first comment in a document has index 1.</p>

Attributes	Description
	<p>[<i>Note</i>: Because the index is unique only for the comment author, a document can contain multiple comments with the same index created by different authors. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_Index simple type (§19.7.3).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_Comment](#)) is located in §A.3. *end note*]

19.4.2 cmAuthor (Comment Author)

This element specifies a single author with comments in the document. It contains a unique author ID, the author's name and initials, the index of the author's last comment, and the index of a color associated with the author.

[*Example*:

```
<p:cmAuthor id="0" name="Julie Lee" initials="JL" lastIdx="1" clrIdx="0"/>
```

end example]

Attributes	Description
clrIdx (Comment Author Color Index)	<p>This attribute specifies an index into the generating application's comments color table to allow for visual (color) differentiation of different author's comments. This color is used for all comments by this author. If more authors exist than there are entries in the color table, the color index wraps around to the beginning of the table.</p> <p>[<i>Note</i>: It is left entirely up to the generating application to determine the amount of colors used in the comments color table and in what order these are used when rendering comments on a slide surface. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
id (Comment Author ID)	<p>This attribute specifies a unique (within the document) zero-based identifier that refers to a single comment author.</p> <p>[<i>Note</i>: The method of generating an author id is determined by the application and need not be sequential, provided each id is unique within the list of comment authors for the document. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
initials (Comment Author Initials)	<p>This attribute specifies a string that represents the initials of this particular author. The value is not necessarily unique. It is intended for use by the application as an abbreviated version of the comment author's name.</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_Name simple type (§19.7.5).
lastIdx (Index of Comment Author's last comment)	<p>Index of the last comment added to this document by this author. New comments by this author are counted starting with the value one greater than this index.</p> <p>[<i>Note:</i> The index of a deleted comment is not reused; therefore, this value is not an accurate count of the total number of comments by the author. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
name (Comment Author Name)	<p>This attribute specifies the full name of this particular author. As a string, it has no security or authentication data. This value is not guaranteed to be unique across all document authors.</p> <p>The possible values for this attribute are defined by the ST_Name simple type (§19.7.5).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CommentAuthor](#)) is located in §A.3. *end note*]

19.4.3 cmAuthorLst (List of Comment Authors)

This element specifies a list of authors with comments in the current document. Each comment in a document shall refer to an author in this list. To determine if a new author is in this list, the author's name and initials shall both match; otherwise, the new author is considered unique and a separate cmAuthor element is added.

[*Example:* A document contains comments left by two authors.

```
<p:cmAuthorLst>
  <p:cmAuthor id="0" name="Julie Lee" initials="JL" lastIdx="1" clrIdx="0"/>
  <p:cmAuthor id="1" name="Fred Jones" initials="FJ" lastIdx="2" clrIdx="1"/>
</p:cmAuthorLst>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CommentAuthorList](#)) is located in §A.3. *end note*]

19.4.4 cmLst (Comment List)

This element specifies a list of comments for a particular slide.

[*Example:* A slide contains two comments, each left by a different author. This example demonstrates that two comments can have the same index if they are created by different authors.

```
<p:cmLst>
```

```

<p:cm authorId="0" dt="2006-08-28T17:26:44.129" idx="1">
  <p:pos x="10" y="10"/>
  <p:text>Add diagram to clarify.</p:text>
</p:cm>
<p:cm authorId="1" dt="2006-08-28T17:44:19.679" idx="1">
  <p:pos x="1426" y="660"/>
  <p:text>Clean up this text.</p:text>
</p:cm>
</p:cmLst>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CommentList](#)) is located in §A.3.
end note]

19.4.5 pos (Comment Position)

This element specifies the positioning information for the placement of a comment on a slide surface. In LTR versions of the generating application, this position information should refer to the upper left point of the comment shape. In RTL versions of the generating application, this position information should refer to the upper right point of the comment shape.

[*Note:* The anchoring point on the slide surface is unaffected by a right-to-left or left-to-right layout change. That is the anchoring point remains the same for all language versions. *end note]*

[*Note:* Because there is no specified size or formatting for comments, this UI widget used to display a comment can be any size and thus the lower right point of the comment shape is determined by how the viewing application chooses to display comments. *end note]*

[*Example:*

```
<p:pos x="1426" y="660"/>
```

end example]

Attributes	Description
x (X-Axis Coordinate) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies a coordinate on the x-axis. The origin point for this coordinate shall be specified by the parent XML element.</p> <p>[<i>Example:</i> Consider the following point on a basic wrapping polygon for a DrawingML object:</p> <pre><... x="0" y="100" /></pre> <p>The x attribute defines an x-coordinate of 0. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type</p>

Attributes	Description
	(§20.1.10.16).
y (Y-Axis Coordinate) Namespace: http://purl.oclc.org/ooxml/drawing/ml/main	<p>Specifies a coordinate on the x-axis. The origin point for this coordinate shall be specified by the parent XML element.</p> <p>[<i>Example:</i> Consider the following point on a basic wrapping polygon for a DrawingML object:</p> <pre><... x="0" y="100" /></pre> <p>The y attribute defines a y-coordinate of 100. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Point2D](#)) is located in §A.4.1. *end note*]

19.4.6 text (Comment's Text Content)

This element specifies the content of a comment. This is the text with which the author has annotated the slide.

[*Example:*

```
<p:text>Add diagram to clarify.</p:text>
```

end example]

The possible values for this element are defined by the W3C XML Schema string datatype.

19.5 Animation

The Animation section of the PresentationML framework stores the movement and related information of objects.

This schema is loosely based on the syntax and concepts from the Synchronized Multimedia Integration Language (SMIL), a W3C Recommendation for describing multimedia presentations using XML.

The schema describes all the animations effects that reside on a slide and also the animation that occurs when going from slide to slide (slide transition).

Animations on a slide are inherently time-based and consist of an animation effects on an object or text. Slide transitions however do not follow this concept and always appear before any animation on a slide.

All elements described in this schema are contained within the slide XML file. More specifically they are in the <transition> and the <timing> element as shown below:


```

<p:sld>
  <p:cSld> ... </p:cSld>
  <p:clrMapOvr> ... </p:clrMapOvr>
  <p:transition> ... </p:transition>
  <p:timing> ... </p:timing>
</p:sld>

```

19.5.1 anim (Animate)

This element is a generic animation element that requires little or no semantic understanding of the attribute being animated. It can animate text within a shape or even the shape itself.

[*Example:* Consider trying to emphasize text within a shape by changing the size of its font by 150%. The <anim> element should be used as follows:

```

<p:anim to="1.5" calcmode="lin" valueType="num">
  <p:cBhvr override="childStyle">
    <p:cTn id="1" dur="2000" fill="hold"/>
    <p:tgtEl>
      <p:spTgt spid="1">
        <p:txEl>
          <p:charRg st="1" end="4"/>
        </p:txEl>
      </p:spTgt>
    </p:tgtEl>
    <p:attrNameLst>
      <p:attrName>style.fontSize</p:attrName>
    </p:attrNameLst>
  </p:cBhvr>
</p:anim>

```

end example]

Attributes	Description
by (By)	<p>This attribute specifies a relative offset value for the animation with respect to its position before the start of the animation.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
calcmode (Calculation Mode)	<p>This attribute specifies the interpolation mode for the animation.</p> <p>The possible values for this attribute are defined by the ST_TLAnimateBehaviorCalcMode simple type (§19.7.20).</p>
from (From)	This attribute specifies the starting value of the animation.

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema string datatype.
to (To)	This attribute specifies the ending value for the animation as a percentage. The possible values for this attribute are defined by the W3C XML Schema string datatype.
valueType (Value Type)	This attribute specifies the type of property value. The possible values for this attribute are defined by the ST_TLAnimateBehaviorValueType simple type (§19.7.21).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TLAnimateBehavior](#)) is located in §A.3. *end note*]

19.5.2 animClr (Animate Color Behavior)

This animation element is responsible for animating the color of an object.

[*Example:* Consider trying to emphasize a shape by changing its fill color to scheme color accent2. The <animClr> element should be used as follows:

```
<p:animClr clrSpc="rgb">
  <p:cBhvr>
    <p:cTn id="1" dur="2000" fill="hold"/>
    <p:tgtEl>
      <p:spTgt spid="1"/>
    </p:tgtEl>
    <p:attrNameLst>
      <p:attrName>fillcolor</p:attrName>
    </p:attrNameLst>
  </p:cBhvr>
  <p:to>
    <a:schemeClr val="accent2"/>
  </p:to>
</p:animClr>
```

end example]

Attributes	Description
clrSpc (Color Space)	This attribute specifies the color space in which to interpolate the animation. Values for example can be HSL & RGB.

Attributes	Description
	<p>The values for from/to/by/etc. can still be specified in any supported color format without affecting the color space within which the animation happens.</p> <p>The RGB color space is best used for doing animations between two different colors since it doesn't require going through any other hues between the two colors specified. The HSL space is useful for animating through a rainbow of colors or for modifying just the saturation by 30% for example.</p> <p>The possible values for this attribute are defined by the <code>ST_TLAnimateColorSpace</code> simple type (§19.7.23).</p>
dir (Direction)	<p>This attribute specifies which direction to cycle the hue around the color wheel. Values are clockwise or counter clockwise. Default is clockwise.</p> <p>The possible values for this attribute are defined by the <code>ST_TLAnimateColorDirection</code> simple type (§19.7.22).</p>

[*Note:* The W3C XML Schema definition of this element's content model (`CT_TLAnimateColorBehavior`) is located in §A.3. *end note*]

19.5.3 animEffect (Animate Effect)

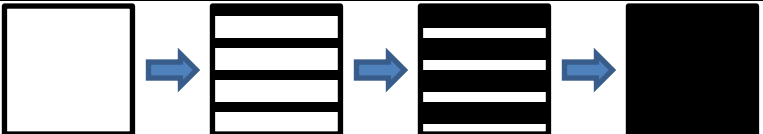
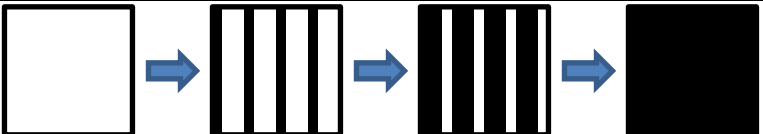
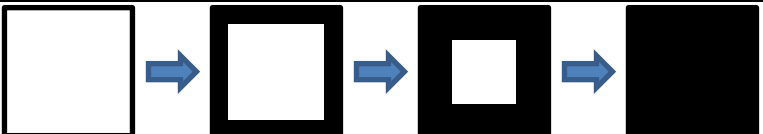
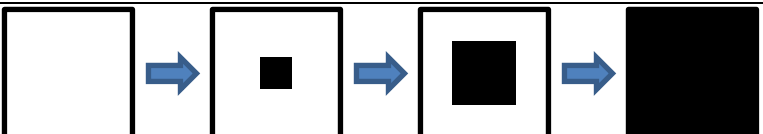
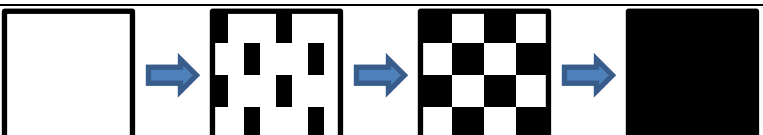
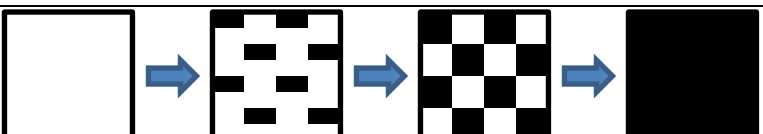
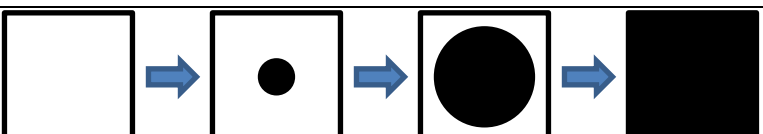
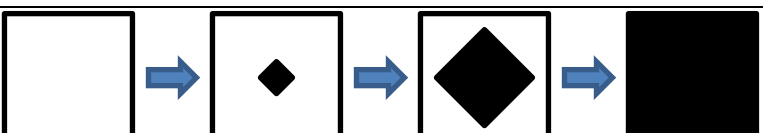
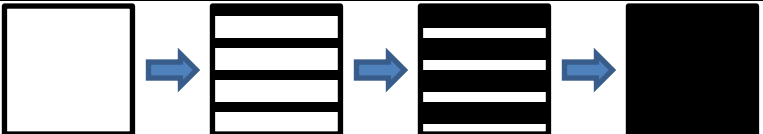
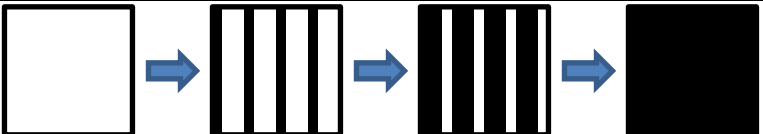
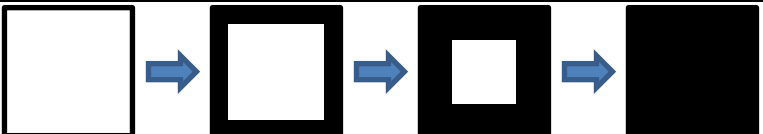
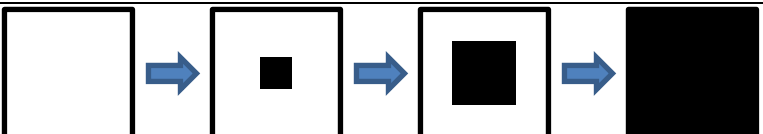
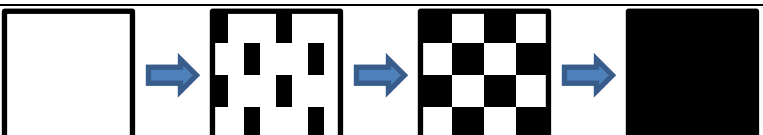
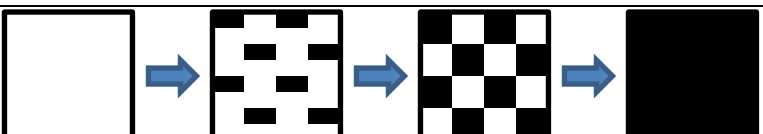
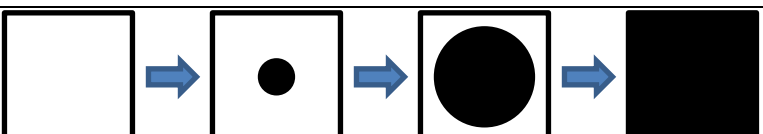
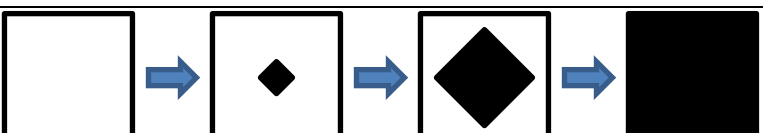
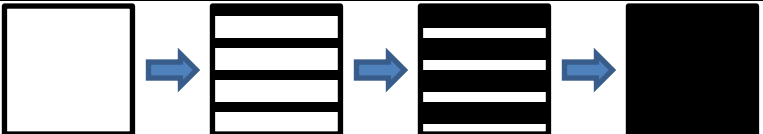
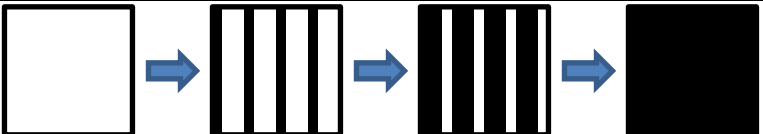
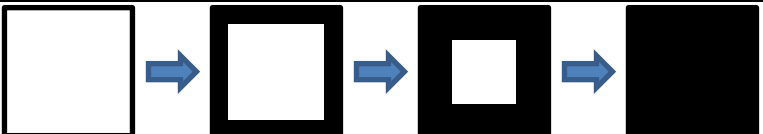
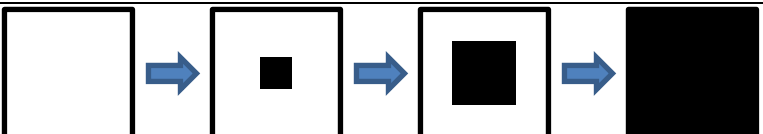
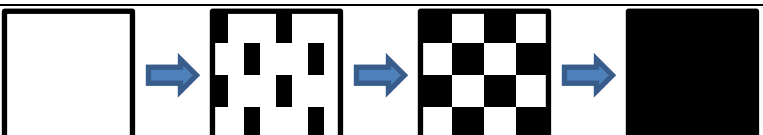
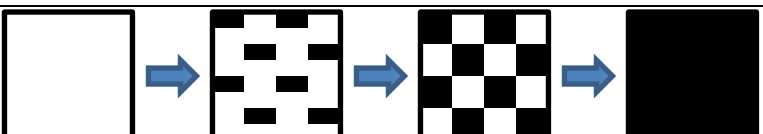
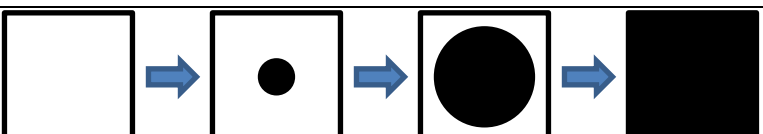
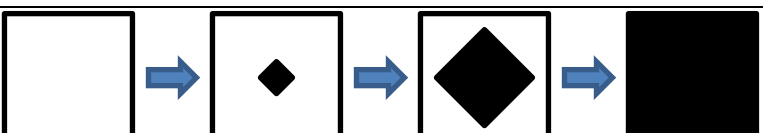
This animation behavior provides the ability to do image transform/filter effects on elements. Some visual effects are dynamic in nature and have a progress that animates from 0 to 1 over a period of time to do visual transitions between hidden and visible states. Other filters are static and apply a effects like a blur or drop-shadow which aren't inherently time-based.

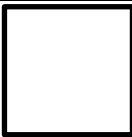

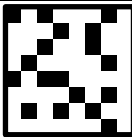

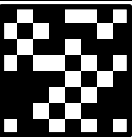
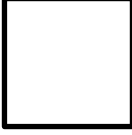




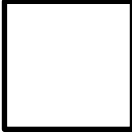




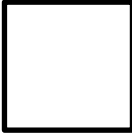




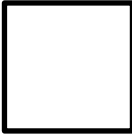

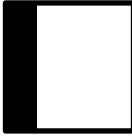


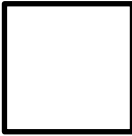

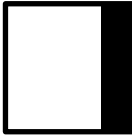

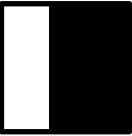
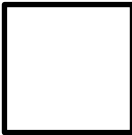

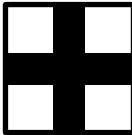

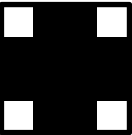
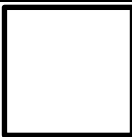

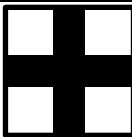

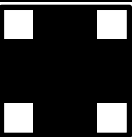
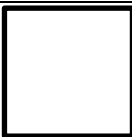

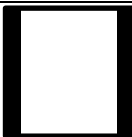

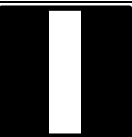
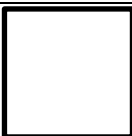

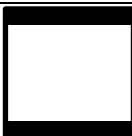


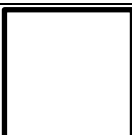

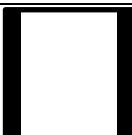

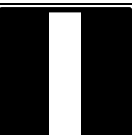
[*Example:* Consider trying to emphasize a shape by creating an entrance animation using a "blinds" motion.

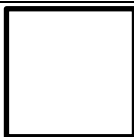





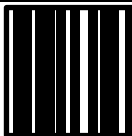
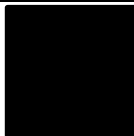
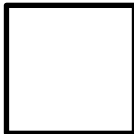


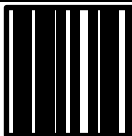

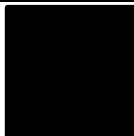
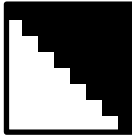

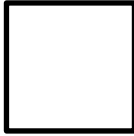

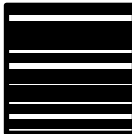


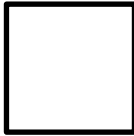
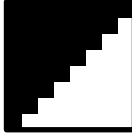


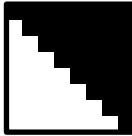
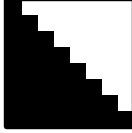

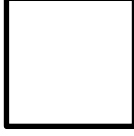



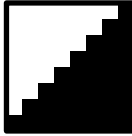


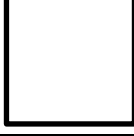

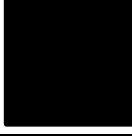

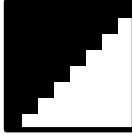
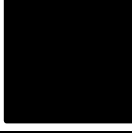
```
<p:animEffect transition="in" filter="blinds(horizontal)">
  <p:cBhvr>
    <p:cTn id="7" dur="500"/>
    <p:tgtEl>
      <p:spTgt spid="4"/>
    </p:tgtEl>
  </p:cBhvr>
</p:animEffect>
```

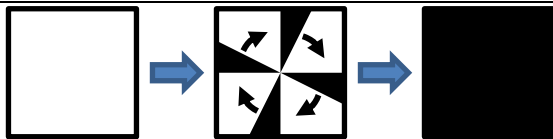
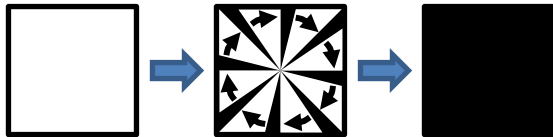
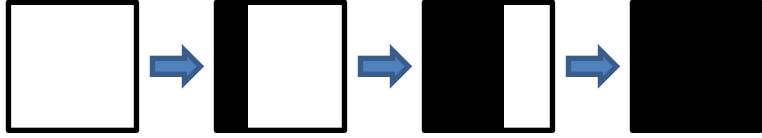
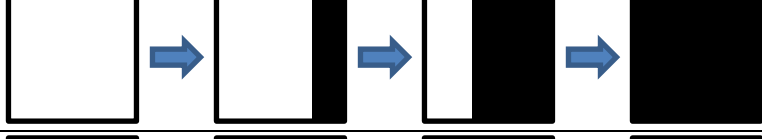
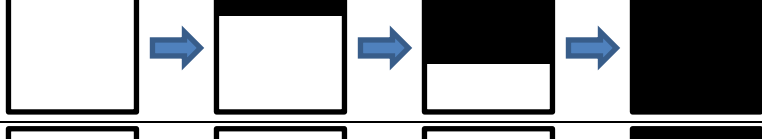
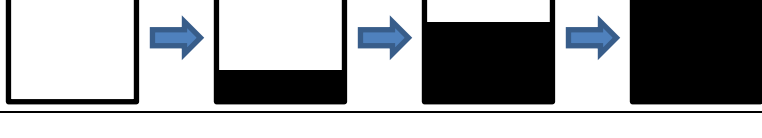
end example]

Attributes	Description
filter (Filter)	

Attributes	Description																		
	<p>This attribute specifies the animation types and subtypes to be used for the effect. Multiple animations are allowed to be listed so that in the event that a superseding animation (leftmost) cannot be rendered, a fallback animation is available. That is, the rendering application parses the list from left to right until a supported animation is found.</p> <p>The syntax used for the filter attribute value is as follows: "type(subtype);type(subtype)". Subtype can be a string value such as "fromLeft" or a numerical value depending on the type specified.</p> <p>Reserved Animation Types(subtypes):</p> <table><tr><th>Value</th><th>Description</th></tr><tr><td>blinds(horizontal)</td><td></td></tr><tr><td>blinds(vertical)</td><td></td></tr><tr><td>box(in)</td><td></td></tr><tr><td>box(out)</td><td></td></tr><tr><td>checkerboard(across)</td><td></td></tr><tr><td>checkerboard(down)</td><td></td></tr><tr><td>circle</td><td></td></tr><tr><td>diamond</td><td></td></tr></table>	Value	Description	blinds(horizontal)		blinds(vertical)		box(in)		box(out)		checkerboard(across)		checkerboard(down)		circle		diamond	
Value	Description																		
blinds(horizontal)																			
blinds(vertical)																			
box(in)																			
box(out)																			
checkerboard(across)																			
checkerboard(down)																			
circle																			
diamond																			

Attributes	Description			
	dissolve		 	 
	fade		 	 
	slide(fromTop)		 	 
	slide(fromBottom)		 	 
	slide(fromLeft)		 	 
	slide(fromRight)		 	 
	plus(in)		 	 
	plus(out)		 	 
	barn(inVertical)		 	 
	barn(inHorizontal)		 	 
	barn(outVertical)		 	 

Attributes	Description							
	barn(outHorizontal)		→		→		→	
	randomBars(horizontal)		→		→		→	
	randomBars(vertical)		→		→		→	
	strips(downLeft)		→		→		→	
	strips(upLeft)		→		→		→	
	strips(downRight)		→		→		→	
	strips(upRight)		→		→		→	
	wedge		→		→		→	
	wheel(1)		→		→			
	wheel(2)		→		→			
	wheel(3)		→		→			

Attributes	Description			
	wheel(4)			
	wheel(8)			
	wipe(right)			
	wipe(left)			
	wipe(down)			
	wipe(up)			
<p>[Note: The renderings shown above are for example purposes only. Exact rendering of any animation is determined by the rendering application. As such, the same animation can have many variations, depending on the implementation. More detail for each rendering above can be found in transition (§19.3.1.50). <i>end note</i>]</p> <p>[Example: Consider the following animation effect:</p> <pre><p:animEffect transition="in" filter="blinds(horizontal);blinds(vertical)"> <p:CBhvr> <p:cTn id="7" dur="500"/> <p:tgtEl> <p:spTgtspid="5"/> </p:tgtEl> </p:CBhvr> </p:animEffect></pre> <p>There are two animation filters shown in this example. The first is the blinds (horizontal), which the rendering application is to use as the primary animation effect. If, however, the rendering application does not support this animation, the blinds (vertical) animation is used. In this example there are only two animation filters listed, a primary and a</p>				

Attributes	Description
	<p>fallback, but it is possible to list multiple fallback filters using the syntax defined above.</p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
prLst (Property List)	<p>This attribute specifies a list of properties that coincide with the effect specified. Although there are many animation types allowed, this attribute allows the setting of specific property settings in order to describe an even wider variety of animation types.</p> <p>The syntax used for the prLst attribute value is as follows: "name:value;name:value". When multiple animation types are listed in the filter attribute, the rendering application attempts to apply each property value even though some might not apply to it.</p> <p>Reserved Names(values):</p> <ul style="list-style-type: none"> • opacity (float values of 0.0 - 1.0) <p>[<i>Example:</i> Consider the following animation effect:</p> <pre><p:animEffect filter="image" prLst="opacity: 0.5"> <p:cBhvr rctx="IE"> <p:cTn id="7" dur="indefinite"/> <p:tgtEl> <p:spTgtspid="3"/> </p:tgtEl> </p:cBhvr> </p:animEffect></pre> <p>The animation filter specified is an image filter type that has a specific property called opacity set to a value of 0.5. <i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
transition (Transition)	<p>This attribute specifies whether to transition the element in or out or treat it as a static filter. The values are "none", "in" and "out", and the default value is "in".</p> <p>When a value of "in" is specified, the element is not visible at the start of the animation and is completely visible be the end of the duration. When "out" is specified, the element is visible at the start and not visible at the end of the effect. This visibility is in addition to the effect of setting CSS visibility or display attributes.</p> <p>The possible values for this attribute are defined by the ST_TLAnimateEffectTransition simple type (§19.7.24).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TLAnimateEffectBehavior](#)) is located in §A.3. *end note*]

19.5.4 animMotion (Animate Motion)

Animate motion provides an abstracted way to move positioned elements. It provides the ability to specify from/to/by motion as well as to use more detailed path descriptions for motion over polylines or bezier curves.

[Example: Consider animating a shape from its original position to the right.. The <animMotion> element should be used as follows:

```
<p:animMotion origin="layout" path="M 0 0 L 0.25 0 E" pathEditMode="relative">
  <p:cBhvr>
    <p:cTn id="1" dur="2000" fill="hold"/>
    <p:tgtEl>
      <p:spTgt spid="1"/>
    </p:tgtEl>
    <p:attrNameLst>
      <p:attrName>ppt_x</p:attrName>
      <p:attrName>ppt_y</p:attrName>
    </p:attrNameLst>
  </p:cBhvr>
</p:animMotion>
```

end example]

Attributes	Description
origin (Origin)	<p>Specifies what the origin of the motion path is relative to such as the layout of the slide, or the parent.</p> <p>The possible values for this attribute are defined by the <code>ST_TLAnimateMotionBehaviorOrigin</code> simple type (§19.7.25).</p>
path (Path)	<p>Specifies the path primitive followed by coordinates for the animation motion. The allowed values that are understood within a path are as follows:</p> <p>M = move to, L = line to, C = curve to, Z=close loop, E=end UPPERCASE = absolute coords, lowercase = relative coords Thus total allowed set = {M,L,C,Z,E,m,l,c,z,e}</p> <p>[Example: The following string is a sample path. path: "M 0 0 L 1 1 c 1 2 3 4 4 4 Z" <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string</p>

Attributes	Description
	datatype.
pathEditMode (Path Edit Mode)	This attribute specifies how the motion path moves when the target element is moved. The possible values for this attribute are defined by the ST_TLAnimateMotionPathEditMode simple type (§19.7.26).
ptsTypes (Points Types)	This attribute describes the point type of the points in the path attribute. The allowed values that are understood for the ptsTypes attribute are as follows: A = Auto, F = Corner, T = Straight, S = Smooth UPPERCASE = Straight Line follows point, lowercase = curve follows point. Thus, the total allowed set = {A,F,T,S,a,f,t,s} The possible values for this attribute are defined by the W3C XML Schema string datatype.
rAng (Relative Angle)	The attribute describes the relative angle of the motion path. The possible values for this attribute are defined by the ST_Angle simple type (§20.1.10.3).

[Note: The W3C XML Schema definition of this element's content model ([CT_TLAnimateMotionBehavior](#)) is located in §A.3. *end note*]

19.5.5 animRot (Animate Rotation)

This animation element is responsible for animating the rotation of an object. Rotation values set in the "by" , "to, and "from" attributes are specified in degrees measured to a 60,000th, i.e 1 degree is 60,000. Rotation values can be larger than 360°.

The sign of the rotation angle specifies the direction for rotation. A negative rotation specifies that the rotation should appear in the host to go counter-clockwise".

[Example: Consider trying to emphasize a shape by rotating it 360 degrees clockwise. The <animRot> element should be used as follows:

```
<p:animRot by="21600000">
  <p:cBhvr>
    <p:cTn id="6" dur="2000" fill="hold"/>
    <p:tgtEl>
      <p:spTgt spid="5"/>
    </p:tgtEl>
    <p:attrNameLst>
      <p:attrName>r</p:attrName>
    </p:attrNameLst>
```

```

    </p:cBhvr>
  </p:animRot>

```

end example]

Attributes	Description
by (By)	This attribute describes the relative offset value for the animation. The possible values for this attribute are defined by the ST_Angle simple type (§20.1.10.3).
from (From)	This attribute describes the starting value for the animation. The possible values for this attribute are defined by the ST_Angle simple type (§20.1.10.3).
to (To)	This attribute describes the ending value for the animation. The possible values for this attribute are defined by the ST_Angle simple type (§20.1.10.3).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TLAnimateRotationBehavior](#)) is located in §A.3. *end note*]

19.5.6 animScale (Animate Scale)

This animation element is responsible for animating the scale of an object. When animating the scale, the element shall scale around the reference point of the element and the positioning system used should be consistent with the one used for motion paths. When animating the width and height of an element, all of the width/height animation values are calculated first then the scale animations are applied on top of that. So for example, an animation from 0 to 100 of the width with a concurrent scale from 100% to 200% would result in the element appearing to scale from 0 to 200.

[*Example:* Consider trying to emphasize a shape by scaling it larger by 150%. The <animScale> element should be used as follows:

```

<p:childTnLst>
  <p:animScale>
    <p:cBhvr>
      <p:cTn id="6" dur="2000" fill="hold"/>
      <p:tgtEl>
        <p:spTgt spid="5"/>
      </p:tgtEl>
    </p:cBhvr>
    <p:by x="150000" y="150000"/>
  </p:animScale>

```

</p:childTnLst>

end example]

Attributes	Description
zoomContents (Zoom Content)	This attribute specifies whether to zoom the contents of an object when doing a scaling animation. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element’s content model ([CT_TLAnimateScaleBehavior](#)) is located in §A.3. *end note*]

19.5.7 attrName (Attribute Name)

This element is used to contain an attribute value for an Attribute Name List. This value defines the specific attribute that an animation should be applied to, such as fill, style, and shadow, etc. A specific property is defined by using a "property.sub-property" format which is often extended to multiple sub properties as seen in the allowed values below.

Allowed property values:

style.opacity, style.rotation, style.visibility, style.color, style.fontSize, style.fontWeight, style.fontStyle, style.fontFamily, style.textEffectEmboss, style.textShadow, style.textTransform, style.textDecorationUnderline, style.textEffectOutline, style.textDecorationLineThrough, style.sRotation, imageData.cropTop, imageData.cropBottom, imageData.cropLeft, imageData.cropRight, imageData.cropRight, imageData.gain, imageData.blacklevel, imageData.gamma, imageData.grayscale, imageData.chromakey, fill.on, fill.type, fill.color, fill.opacity, fill.color2, fill.method, fill.opacity2, fill.angle, fill.focus, fill.focusposition.x, fill.focusposition.y, fill.focussize.x, fill.focussize.y, stroke.on, stroke.color, stroke.weight, stroke.opacity, stroke.linestyle, stroke.dashstyle, stroke.filltype, stroke.src, stroke.color2, stroke.imagesize.x, stroke.imagesize.y, stroke.startArrow, stroke.endArrow, stroke.startArrowWidth, stroke.startArrowLength, stroke.endArrowWidth, stroke.endArrowLength, shadow.on, shadow.type, shadow.color, shadow.color2, shadow.opacity, shadow.offset.x, shadow.offset.y, shadow.offset2.x, shadow.offset2.y, shadow.origin.x, shadow.origin.y, shadow.matrix.xtox, shadow.matrix.ytox, shadow.matrix.xtoy, shadow.matrix.ytoy, shadow.matrix.perspectiveX, shadow.matrix.perspectiveY, skew.on, skew.offset.x, skew.offset.y, skew.origin.x, skew.origin.y, skew.matrix.xtox, skew.matrix.ytox, skew.matrix.xtoy, skew.matrix.ytoy, skew.matrix.perspectiveX,

skew.matrix.perspectiveY, extrusion.on, extrusion.type, extrusion.render, extrusion.viewpointorigin.x, extrusion.viewpointorigin.y, extrusion.viewpoint.x, extrusion.viewpoint.y, extrusion.viewpoint.z, extrusion.plane, extrusion.skewangle, extrusion.skewamt, extrusion.backdepth, extrusion.foredepth, extrusion.orientation.x, extrusion.orientation.y, extrusion.orientation.z, extrusion.orientationangle, extrusion.color, extrusion.rotationangle.x, extrusion.rotationangle.y, extrusion.lockrotationcenter, extrusion.autorotationcenter, extrusion.rotationcenter.x, extrusion.rotationcenter.y, extrusion.rotationcenter.z, and extrusion.colormode.

[*Example:* Consider trying to emphasize the txt font size within the body of a shape. The attribute would be 'style.fontSize' and this can be done by doing the following:

```
<p:anim to="1.5" calcmode="lin" valueType="num">
  <p:cBhvr override="childStyle">
    <p:cTn id="6" dur="2000" fill="hold"/>
    <p:tgtEl>
      <p:spTgt spid="3">
        <p:txEl>
          <p:charRg st="4294967295" end="4294967295"/>
        </p:txEl>
      </p:spTgt>
    </p:tgtEl>
    <p:attrNameLst>
      <p:attrName>style.fontSize</p:attrName>
    </p:attrNameLst>
  </p:cBhvr>
</p:anim>
```

end example]

The possible values for this element are defined by the W3C XML Schema string datatype.

19.5.8 attrNameLst (Attribute Name List)

This element is used to describe a list of attributes in which to apply an animation to.

[*Example:* Consider trying to emphasize the txt font size within the body of a shape. The attribute would be 'style.fontSize' and this can be done by doing the following:

```
<p:anim to="1.5" calcmode="lin" valueType="num">
  <p:cBhvr override="childStyle">
    <p:cTn id="6" dur="2000" fill="hold"/>
    <p:tgtEl>
      <p:spTgt spid="3">
```

```
<p:txEl>
  <p:charRg st="4294967295" end="4294967295"/>
</p:txEl>
</p:spTgt>
</p:tgtEl>
<p:attrNameLst>
  <p:attrName>style.fontSize</p:attrName>
</p:attrNameLst>
</p:cBhvr>
</p:anim>
```

end example]

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_TLBehaviorAttributeNameList](#)) is located in §A.3. *end note*]

19.5.9 audio (Audio)

This element is used to include audio during an animation. This element specifies that this node within the animation tree triggers the playback of an audio file; the actual audio file used is specified by the `sndTgt` element (§19.5.70).

[*Example:* Consider adding applause sound to an animation sequence. The audio element is used as follows:

```
<p:cTn ...>
  <p:stCondLst>...</p:stCondLst>
  <p:childTnLst>...</p:childTnLst>
  <p:subTnLst>
    <p:audio>
      <p:cMediaNode vol="50%">...
        <p:tgtEl>
          <p:sndTgt r:embed="rId2" />
        </p:tgtEl>
      </p:cMediaNode>
    </p:audio>
  </p:subTnLst>
</p:cTn>
```

The audio element specifies the location of the audio playback within the animation; its child `sndTgt` element specifies that the audio to be played is the target of the relationship with ID `rId2`.

end example]

Attributes	Description
isNarration (Is Narration)	This attribute indicates whether the audio is a narration for the slide.

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TLMediaNodeAudio](#)) is located in §A.3. *end note*]

19.5.10 **bg (Background)**

This element is used to specify animating the background of an object.

[*Example:* Consider adding animation to the background of Shape Id 3. The <bg> tag can be used as follows:

```
<p:tgtEl>
  <p:spTgt spid="3">
    <p:bg/>
  </p:spTgt>
</p:tgtEl>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.3. *end note*]

19.5.11 **bldAsOne (Build As One)**

This element specifies in the build list to build the entire graphical object as one entity.

[*Example:* Consider having a graph appear as on entity as opposed to by category. The <bldAsOne> element should be used as follows:

```
<p:bldLst>
  <p:bldGraphic spid="4" grpId="0">
    <p:bldAsOne/>
  </p:bldGraphic>
</p:bldLst>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.3. *end note*]

19.5.12 **bldDgm (Build Diagram)**

This element specifies how to build the animation for a diagram.

[*Example:* Consider the following example where a chart is specified to be animated by category rather than as one entity. Thus, the bldChart element should be used as follows:

```
<p:bdldLst>
```

```

    <p:bldGraphic spid="4" grpId="0">
      <p:bldSub>
        <a:bldChart bld="category"/>
      </p:bldSub>
    </p:bldGraphic>
  </p:bldLst>

```

end example]

Attributes	Description
bld (Diagram Build Types)	<p>This attribute describes how the diagram is built. The animation animates the sub-elements in the container in the particular order defined by this attribute.</p> <p>The possible values for this attribute are defined by the ST_TLDiagramBuildType simple type (§19.7.33).</p>
grpId (Group ID)	<p>This attribute ties effects persisted in the animation to the build information. The attribute is used by the editor when changes to the build information are made. GroupIDs are unique for a given shape. They are not guaranteed to be unique IDs across all shapes on a slide.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
spid (Shape ID)	<p>This attribute specifies the shape to which the build applies.</p> <p>The possible values for this attribute are defined by the ST_DrawingElementId simple type (§20.1.10.21).</p>
uiExpand (Expand UI)	<p>This attribute describes the view option indicating if the build should be displayed expanded.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TLBuildDiagram](#)) is located in §A.3.
end note]

19.5.13 bldGraphic (Build Graphics)

This element specifies how to build a graphical element.

[Example: Consider having a chart graphical element appear as a whole as opposed to by a category. The <bldGraphic> element should be used as follows:

```

  <p:bldLdst>
    <p:bldGraphic spid="3" grpId="0">
      <p:bldSub>

```



```

        <a:bldChart bld="category"/>
    </p:bldSub>
</p:bldGraphic>
</p:bldLst>

```

end example]

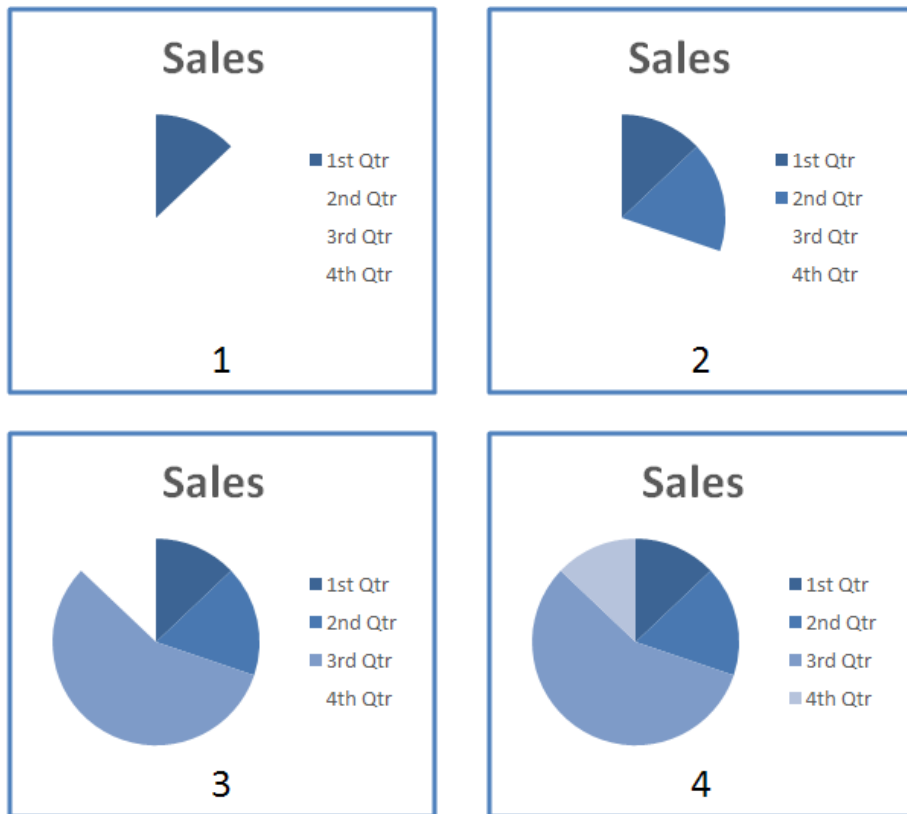
Attributes	Description
grpId (Group ID)	<p>This attribute ties effects persisted in the animation to the build information. The attribute is used by the editor when changes to the build information are made. GroupIDs are unique for a given shape. They are not guaranteed to be unique IDs across all shapes on a slide.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
spid (Shape ID)	<p>This attribute specifies the shape to which the build applies.</p> <p>The possible values for this attribute are defined by the ST_DrawingElementId simple type (§20.1.10.21).</p>
uiExpand (Expand UI)	<p>This attribute describes the view option indicating if the build should be displayed expanded.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TLGraphicalObjectBuild](#)) is located in §A.3. *end note*]

19.5.14 bldLst (Build List)

This element specifies the list of graphic elements to build. This refers to how the different sub-shapes or sub-components of a object are displayed. The different objects that can have build properties are text, diagrams, and charts.

[*Example:* Consider animating a pie chart but based on category as shown below:



The <bldList> element should be used as follows:

```
<p:bldLst>
  <p:bldGraphic spid="1" grpId="0">
    <p:bldSub>
      <a:bldChart bld="category"/>
    </p:bldSub>
  </p:bldGraphic>
</p:bldLst>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_BuildList](#)) is located in §A.3. *end note]*

19.5.15 bldOleChart (Build Embedded Chart)

This element describes animation on a embedded Chart.

[Example: Consider displaying animation on a embedded graphical chart. The <bldOleChart>element should be use as follows:

```
<p:bldLst>
```

```
<p:bldOleChart spid="1025" grpId="0"/>
</p:bldLst>
```

end example]

Attributes	Description
animBg (Animate Background)	This attribute describes whether to animate the background of the shape. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
bld (Build)	This attribute describes how the diagram is built. The animation animates the sub-elements in the container in the particular order defined by this attribute. The possible values for this attribute are defined by the ST_TLOleChartBuildType simple type (§19.7.35).
grpId (Group ID)	This attribute ties effects persisted in the animation to the build information. The attribute is used by the editor when changes to the build information are made. GroupIDs are unique for a given shape. They are not guaranteed to be unique IDs across all shapes on a slide. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
spid (Shape ID)	This attribute specifies the shape to which the build applies. The possible values for this attribute are defined by the ST_DrawingElementId simple type (§20.1.10.21).
uiExpand (Expand UI)	This attribute describes the view option indicating if the build should be displayed expanded. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_TLOleBuildChart](#)) is located in §A.3.
end note]

19.5.16 bldP (Build Paragraph)

This element specifies how to build paragraph level properties.

[Example: Consider having animation applied only to 1st level paragraphs. The <bldP> element should be used as follows:

```
<p:bldLst>
  <p:bldP spid="3" grpId="0" build="p"/>
</p:bldLst>
```

end example]

Attributes	Description
advAuto (Auto Advance Time)	<p>This attribute specifies time after which to automatically advance the build to the next step.</p> <p>The possible values for this attribute are defined by the ST_TLTime simple type (§19.7.38).</p>
animBg (Animate Background)	<p>This attribute indicates whether to animate the background of the shape associated with the text.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
autoUpdateAnimBg (Auto Update Animation Background)	<p>This attribute indicates whether to automatically update the "animateBg" setting to true when the shape associated with the text has a fill or line.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
bldLvl (Build Level)	<p>This attribute describes the build level for the paragraph. It is only supported in paragraph type builds i.e the build attribute shall also be set to "byParagraph" for this attribute to apply.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
build (Build Types)	<p>This attribute describe the build types.</p> <p>The possible values for this attribute are defined by the ST_TLParaBuildType simple type (§19.7.36).</p>
grpId (Group ID)	<p>This attribute ties effects persisted in the animation to the build information. The attribute is used by the editor when changes to the build information are made. GroupIDs are unique for a given shape. They are not guaranteed to be unique IDs across all shapes on a slide.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
rev (Reverse)	<p>This attribute is only supported in paragraph type builds. This specifies the direction of the build relative to the order of the elements in the container. When this is set to "true", the animations for the paragraphs are persisted in reverse order to the order of the paragraphs themselves such that the last paragraph animates first. Default value is "false".</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
spid (Shape ID)	<p>This attribute specifies the shape to which the build applies.</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_DrawingElementId simple type (§20.1.10.21).
uiExpand (Expand UI)	<p>This attribute describes the view option indicating if the build should be displayed expanded.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TLBuildParagraph](#)) is located in §A.3. *end note*]

19.5.17 bldSub (Build Sub Elements)

This element specifies the animation properties of a graphical object's sub-elements.

[Example: Consider applying animation to a graphical element consisting of a diagram. The <bldSub> element should be used as follows:

```
<p:bldLst>
  <p:bldGraphic spid="5" grpId="0">
    <p:bldSub>
      <a:bldDgm bld="one"/>
    </p:bldSub>
  </p:bldGraphic>
</p:bldLst>
```

end example]

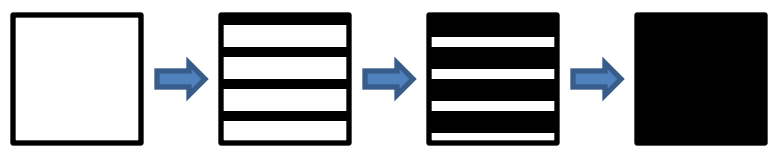
[Note: The W3C XML Schema definition of this element's content model ([CT_AnimationGraphicalObjectBuildProperties](#)) is located in §A.4.1. *end note*]

19.5.18 blinds (Blinds Slide Transition)

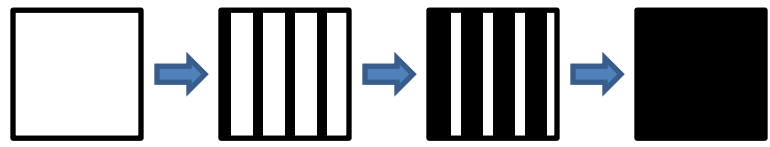
This element describes the blinds slide transition effect, which uses a set of horizontal or vertical bars and wipes them either left-to-right or top-to-bottom, respectively, until the new slide is fully shown. The rendering of this transition depends upon the attributes specified.

[Example: Consider the following cases in which the “blinds” slide transition is applied to a slide, along with a set of attributes. The proper usage and sample renderings are shown below, with the XML fragments preceding the corresponding rendering:

```
<p:transition>
  <p:blinds dir="horz"/>
</p:transition>
```



```
<p:transition>
  <p:blinds dir="vert"/>
</p:transition>
```



end example]

[*Note:* Any rendering shown above is for example purposes only. Exact rendering of any transition is determined by the rendering application. As such, the same transition can have many variations depending on the implementation. *end note]*

Attributes	Description
dir (Transition Direction)	<p>This attribute specifies a horizontal or vertical transition.</p> <p>The possible values for this attribute are defined by the ST_Direction simple type (§19.7.2).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_OrientationTransition](#)) is located in §A.3. *end note]*

19.5.19 boolVal (Boolean Variant)

This element specifies a boolean value to be used for evaluation by a parent element. The exact meaning of the value contained within this element is not defined here but is dependent on the usage of this element in conjunction with one of the listed parent elements.

Attributes	Description
val (Value)	<p>This attribute specifies the boolean value that this element contains and that should be used in evaluating this element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_TLAnimVariantBooleanVal](#)) is located in §A.3. *end note]*

19.5.20 **by (By)**

This element describes the relative offset value for the color animation.

[*Example:* Consider a shape with a lightening emphasis animation applied to it. The `<by>` element should be used as follows:

```
<p:animClr clrSpc="hsl">
  <p:cBhvr>
    <p:cTn id="8" dur="500" fill="hold"/>
    <p:tgtEl>
      <p:spTgt spid="4"/>
    </p:tgtEl>
    <p:attrNameLst>
      <p:attrName>stroke.color</p:attrName>
    </p:attrNameLst>
  </p:cBhvr>
  <p:by>
    <p:hsl h="0" s="0" l="0"/>
  </p:by>
</p:animClr>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TLByAnimateColorTransform](#)) is located in §A.3. *end note]*

19.5.21 **by (By)**

This element describes the relative offset value for the animation.

[*Example:* Consider a shape with an animation effect that scales the size of an object by 150%. The `<by>` element should be used as follows:

```
<p:animScale>
  <p:cBhvr>
    <p:cTn id="6" dur="2000" fill="hold"/>
    <p:tgtEl>
      <p:spTgt spid="4"/>
    </p:tgtEl>
  </p:cBhvr>
  <p:by x="150.000%" y="150.000%"/>
</p:animScale>
```

end example]

Attributes	Description
x (X coordinate)	This attribute describes the X coordinate. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).
y (Y coordinate)	This attribute describes the Y coordinate. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).

[Note: The W3C XML Schema definition of this element's content model ([CT_TLPoint](#)) is located in §A.3. *end note*]

19.5.22 cBhvr (Common Behavior)

This element describes the common behaviors of animations.

[Example: Consider trying to emphasize text within a shape by changing the size of its font. The <anim> element should be used as follows:

```
<p:anim to="1.5" calcmode="lin" valueType="num">
  <p:cBhvr override="childStyle">
    <p:cTn id="6" dur="2000" fill="hold"/>
    <p:tgtEl>
      <p:spTgt spid="3">
        <p:txEl>
          <p:charRg st="4294967295" end="4294967295"/>
        </p:txEl>
      </p:spTgt>
    </p:tgtEl>
    <p:attrNameLst>
      <p:attrName>style.fontSize</p:attrName>
    </p:attrNameLst>
  </p:cBhvr>
</p:anim>
```

end example]

Attributes	Description
accumulate (Accumulate)	This attribute makes a repeating animation build with each iteration when set to "always." The possible values for this attribute are defined by the ST_TLBehaviorAccumulateType simple type (§19.7.27).

Attributes	Description
additive (Additive)	<p>This attribute specifies how to apply the animation values to the original value for the property.</p> <p>The possible values for this attribute are defined by the ST_TLBehaviorAdditiveType simple type (§19.7.28).</p>
by (By)	<p>This attribute specifies a relative offset value for the animation..</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
from (From)	<p>This attribute specifies the starting value of the animation.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
override (Override)	<p>This attribute specifies how a behavior should override values of the attribute being animated on the target element. The "childStyle" clears the attributes on the children contained inside the target element.</p> <p>The possible values for this attribute are defined by the ST_TLBehaviorOverrideType simple type (§19.7.29).</p>
rctx (Runtime Context)	<p>This attribute describes the runtime context of the animation. The currently-understood values are "PPT" and "IE." This is used to specify the behavior used when animating in the PPT slideshow vs. IE HTML runtime. An example can be seen with the transparency effect. In IE, the transparency is animated as a bitmap, where in PPT, the style.opacity property of a shape is used to animate the transparency.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
to (To)	<p>This attribute specifies the ending value of the animation.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
xfrmType (Transform Type)	<p>This attribute specifies the kind of transform to be used.</p> <p>The possible values for this attribute are defined by the ST_TLBehaviorTransformType simple type (§19.7.30).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TLCommonBehaviorData](#)) is located in §A.3. end note]

19.5.23 charRg (Character Range)

This element specifies animation on a character range defined by a start and end character position.

[Example: Consider animating the first word (characters 1 through 9) within a sentence. The <charRg> element should be used as follows:

```
<p:animMotion>
  <p:cBhvr>
    <p:cTn id="6" dur="2000" fill="hold"/>
    <p:tgtEl>
      <p:spTgt spid="3">
        <p:txEl>
          <p:charRg st="0" end="9"/>
        </p:txEl>
      </p:spTgt>
    </p:tgtEl>
    <p:attrNameLst>
      <p:attrName>ppt_x</p:attrName>
      <p:attrName>ppt_y</p:attrName>
    </p:attrNameLst>
  </p:cBhvr>
</p:animMotion>
```

end example]

Attributes	Description
end (End)	This attribute defines the end of the index range. The possible values for this attribute are defined by the ST_Index simple type (§19.7.3).
st (Start)	This attribute defines the start of the index range. The possible values for this attribute are defined by the ST_Index simple type (§19.7.3).

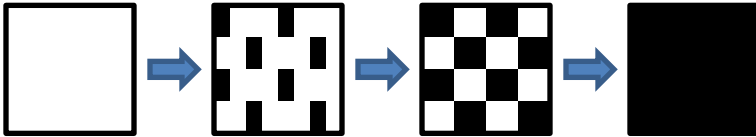
[Note: The W3C XML Schema definition of this element’s content model ([CT_IndexRange](#)) is located in §A.3. end note]

19.5.24 checker (Checker Slide Transition)

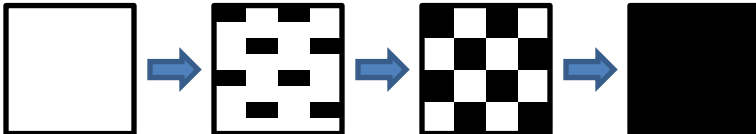
This element describes the checker slide transition effect, which uses a set of horizontal or vertical checkerboard squares and wipes them either left-to-right or top-to-bottom, respectively, until the new slide is fully shown. The rendering of this transition depends upon the attributes specified.

[*Example:* Consider the following cases in which the “checker” slide transition is applied to a slide, along with a set of attributes. The proper usage and sample renderings are shown below, with the XML fragments preceding the corresponding rendering:

```
<p:transition>
  <p:checker dir="horz"/>
</p:transition>
```



```
<p:transition>
  <p:checker dir="vert"/>
</p:transition>
```



end example]

[*Note:* Any rendering shown above is for example purposes only. Exact rendering of any transition is determined by the rendering application. As such, the same transition can have many variations depending on the implementation. *end note]*

Attributes	Description
dir (Transition Direction)	<p>This attribute specifies a horizontal or vertical transition.</p> <p>The possible values for this attribute are defined by the ST_Direction simple type (§19.7.2).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_OrientationTransition](#)) is located in §A.3. *end note]*

19.5.25 childTnLst (Children Time Node List)

This element describes the list of time nodes that have a fixed location in the timing tree based on their parent time node. The children’s start time is defined relative to their parent time node’s start.

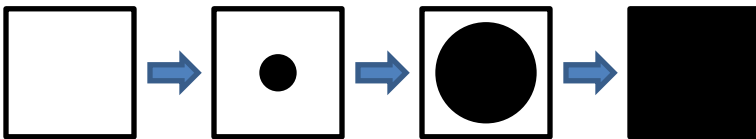
[*Note:* The W3C XML Schema definition of this element’s content model ([CT_TimeNodeList](#)) is located in §A.3. *end note]*

19.5.26 circle (Circle Slide Transition)

This element describes the circle slide transition effect, which uses a circle pattern centered on the slide that increases in size until the new slide is fully shown. The rendering of this transition has been shown below.

[*Example:* Consider the following case in which the “circle” slide transition is applied to a slide, along with a set of attributes. The proper usage and a sample rendering are shown below, with the XML fragments preceding the corresponding rendering:

```
<p:transition>
  <p:circle/>
</p:transition>
```



end example]

[*Note:* Any rendering shown above is for example purposes only. Exact rendering of any transition is determined by the rendering application. As such, the same transition can have many variations depending on the implementation. *end note]*

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Empty](#)) is located in §A.3. *end note]*

19.5.27 clrVal (Color Value)

This element describes the color variant. This is used to specify a color that is to be used for animating the color property of an object.

[*Example:* Consider trying to emphasize text within a shape by changing the color its font.

```
<p:set>
  <p:cBhvr override="childStyle">
    ...
  </p:cBhvr>
  <p:to>
    <p:clrVal>
      <a:schemeClr val="accent2"/>
    </p:clrVal>
  </p:to>
</p:set>
```

end example]

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Color](#)) is located in §A.4.1. *end note]*

19.5.28 cmd (Command)

This element describes the several non-durational commands that can be executed within a timeline. This can be used to send events, call functions on elements, and send verbs to embedded objects. For example “Object Action” effects for Embedded objects and Media commands for sounds/movies such as "PlayFrom(0.0)" and "togglePause".

Attributes	Description																								
cmd (Command)	<p>This attribute defines the actual command to be issued. Depending on the command specified, the actual command can be made to invoke a wide range of actions on the linked or embedded object.</p> <p>Reserved Values (when type = “call”):</p> <table> <tr> <th>Value</th><th>Description</th></tr> <tr> <td>play</td><td>play corresponding media</td></tr> <tr> <td>playFrom(s)</td><td>play corresponding media starting from s, where s is the number of seconds from the beginning of the clip</td></tr> <tr> <td>pause</td><td>pause corresponding media</td></tr> <tr> <td>resume</td><td>resume play of corresponding media</td></tr> <tr> <td>stop</td><td>stop play of corresponding media</td></tr> <tr> <td>togglePause</td><td>play corresponding media if media is already paused, pause corresponding media if media is already playing. If the corresponding media is not active, this command restarts the media and plays from its beginning.</td></tr> </table> <p>Reserved Values (when type = “evt”):</p> <table> <tr> <th>Value</th><th>Description</th></tr> <tr> <td>onstopaudio</td><td>stop play of all audio</td></tr> </table> <p>Reserved Values (when type = “verb”):</p> <table> <tr> <th>Value</th><th>Description</th></tr> <tr> <td>0</td><td>Open the object for editing</td></tr> <tr> <td>1</td><td>Open the object for viewing</td></tr> </table> <p>The value of the cmd attribute shall be the string representation of an integer that represents the embedded object verb number. This verb number determines the action that the rendering application should take corresponding to this object when this point in the animation is reached.</p> <p>[Example: Consider the following command</p>	Value	Description	play	play corresponding media	playFrom(s)	play corresponding media starting from s, where s is the number of seconds from the beginning of the clip	pause	pause corresponding media	resume	resume play of corresponding media	stop	stop play of corresponding media	togglePause	play corresponding media if media is already paused, pause corresponding media if media is already playing. If the corresponding media is not active, this command restarts the media and plays from its beginning.	Value	Description	onstopaudio	stop play of all audio	Value	Description	0	Open the object for editing	1	Open the object for viewing
Value	Description																								
play	play corresponding media																								
playFrom(s)	play corresponding media starting from s, where s is the number of seconds from the beginning of the clip																								
pause	pause corresponding media																								
resume	resume play of corresponding media																								
stop	stop play of corresponding media																								
togglePause	play corresponding media if media is already paused, pause corresponding media if media is already playing. If the corresponding media is not active, this command restarts the media and plays from its beginning.																								
Value	Description																								
onstopaudio	stop play of all audio																								
Value	Description																								
0	Open the object for editing																								
1	Open the object for viewing																								

Attributes	Description
	<pre> <p:cmd type="evt" cmd="onstopaudio"> <p:cBhvr> <p:cTn display="0" masterRel="sameClick"> <p:stCondLst> <p:cond evt="begin" delay="0"> <p:tn val="5"/> </p:cond> </p:stCondLst> </p:cTn> <p:tgtEl> <p:sldTgt/> </p:tgtEl> </p:cBhvr> </p:cmd> </pre> <p><i>end example]</i></p> <p>In the above example, the event of onstopaudio stops all audio from playing once this particular animation is reached in the timeline.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
type (Command Type)	<p>This attribute specifies the kind of command that is issued by the rendering application to the appropriate target application or object.</p> <p>There are three possible values, call, evt, and verb. A call command type is used to specify the class of commands that can then be issued.</p> <p>Call commands (type="call"): This command type is used to call methods on the object specified (play(), pause(), etc.)</p> <p>Event Commands (type="evt"): This command type is used to set an event for the object at this point in the timeline (onstopaudio, etc.)</p> <p>Verb Commands (type="verb"): This command type is used to set verbs for the object to occur at this point in the timeline (0, 1, etc.)</p> <p>The possible values for this attribute are defined by the ST_TLCommandType simple type (§19.7.32).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TLCommandBehavior](#)) is located in §A.3. *end note*]

19.5.29 cMediaNode (Common Media Node Properties)

This element is used to describe behavior of media elements, such as sound or movies, in an animation.

[*Example:* Consider a shape with a sound effect attached to its animation. The <cMediaNode> element should be used as follows:

```
<p:audio>
  <p:cMediaNode mute="1">
    <p:cTn display="0" masterRel="sameClick">
      <p:stCondLst> ... </p:stCondLst>
      <p:endCondLst> ... </p:endCondLst>
    </p:cTn>
    <p:tgtEl> ... </p:tgtEl>
  </p:cMediaNode>
</p:audio>
```

end example]

Attributes	Description
mute (Mute)	<p>This attribute describes whether the media should be mute.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
numSld (Number of Slides)	<p>This attribute describes the numbers of slides across which the media should play.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
showWhenStopped (Show When Stopped)	<p>This attribute describes whether the media should be displayed when it is stopped.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
vol (Volume)	<p>This attribute describes the volume of the media element.</p> <p>The possible values for this attribute are defined by the ST_PositiveFixedPercentage simple type (§20.1.10.44).</p>

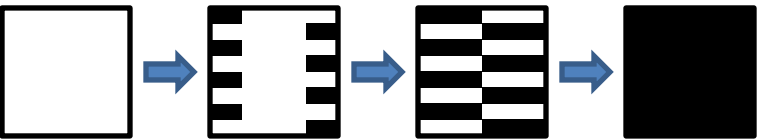
[*Note:* The W3C XML Schema definition of this element's content model ([CT_TLCommonMediaNodeData](#)) is located in §A.3. *end note]*

19.5.30 comb (Comb Slide Transition)

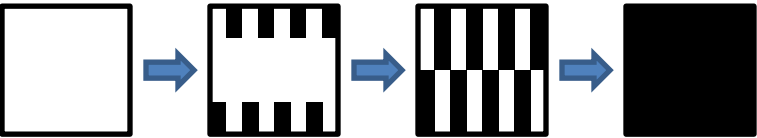
This element describes the comb slide transition effect, which uses a set of horizontal or vertical bars and wipes them from one end of the slide to the other until the new slide is fully shown. The rendering of this transition depends upon the attributes specified which have been shown below.

[Example: Consider the following cases in which the “comb” slide transition is applied to a slide, along with a set of attributes. The proper usage and sample renderings are shown below, with the XML fragments preceding the corresponding rendering:

```
<p:transition>
  <p:comb dir="horz"/>
</p:transition>
```



```
<p:transition>
  <p:comb dir="vert"/>
</p:transition>
```



end example]

[Note: Any rendering shown above is for example purposes only. Exact rendering of any transition is determined by the rendering application. As such, the same transition can have many variations depending on the implementation. end note]

Attributes	Description
dir (Transition Direction)	This attribute specifies a horizontal or vertical transition. The possible values for this attribute are defined by the ST_Direction simple type (§19.7.2).

[Note: The W3C XML Schema definition of this element’s content model ([CT_OrientationTransition](#)) is located in §A.3. end note]

19.5.31 cond (Condition)

This element specifies conditions on time nodes in a timeline. It is used within a list of start condition or list of end condition elements.

[Example: For example, suppose we have a shape with a two second delay after the animation is started.

```
<p:cTn>
  <p:stCondLst>
    <p:cond delay="2000"/>
  </p:stCondLst>
  <p:childTnLst>
    <p:set> ... </p:set>
    <p:animEffect transition="in" filter="blinds(horizontal)">
      <p:cBhvr>
        <p:cTn id="7" dur="1000"/>
        <p:tgtEl>
          <p:spTgt spid="4"/>
        </p:tgtEl>
      </p:cBhvr>
    </p:animEffect>
  </p:childTnLst>
</p:cTn>
```

end example]

Attributes	Description
delay (Trigger Delay)	This attribute describes the delay after an animation is triggered. The possible values for this attribute are defined by the ST_TLTime simple type (§19.7.38).
evt (Trigger Event)	This attribute describes the event that triggers an animation. The possible values for this attribute are defined by the ST_TLTriggerEvent simple type (§19.7.48).

[Note: The W3C XML Schema definition of this element's content model ([CT_TLTimeCondition](#)) is located in §A.3. *end note*]

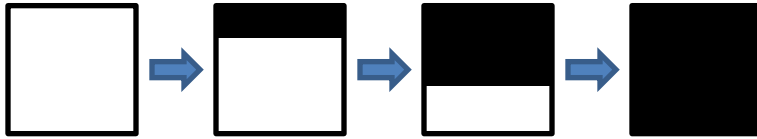
19.5.32 cover (Cover Slide Transition)

This element describes the cover slide transition effect, which moves the new slide in from an off-screen location, continually covering more of the previous slide until the new slide is fully shown. The rendering of this transition depends upon the attributes specified which have been shown below.

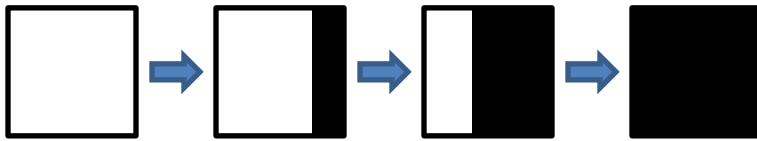
[Example: Consider the following cases in which the “cover” slide transition is applied to a slide, along with a set of attributes. The proper usage and sample renderings are shown below, with the XML fragments preceding the corresponding rendering:

```
<p:transition>
```

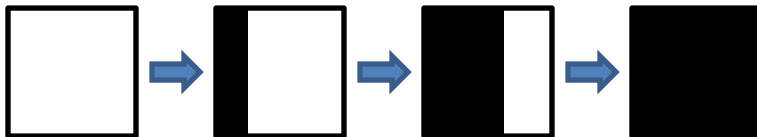
```
<p:cover dir="d"/>
</p:transition>
```



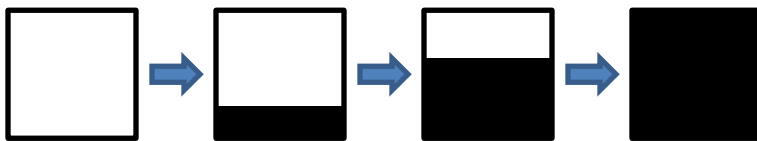
```
<p:transition>
  <p:cover dir="l"/>
</p:transition>
```



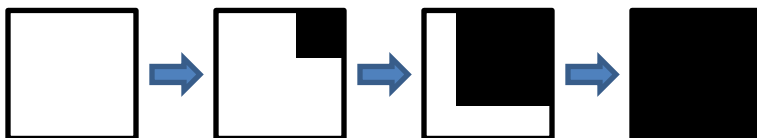
```
<p:transition>
  <p:cover dir="r"/>
</p:transition>
```



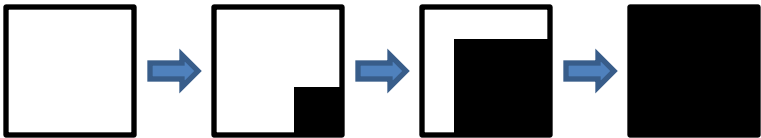
```
<p:transition>
  <p:cover dir="u"/>
</p:transition>
```



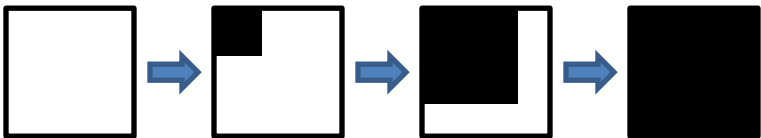
```
<p:transition>
  <p:cover dir="ld"/>
</p:transition>
```



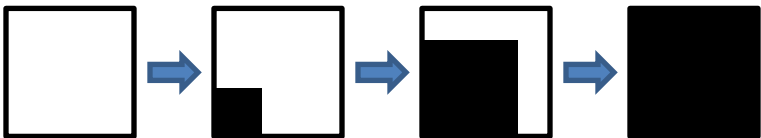
```
<p:transition>
  <p:cover dir="lu"/>
</p:transition>
```



```
<p:transition>  
  <p:cover dir="rd"/>  
</p:transition>
```



```
<p:transition>  
  <p:cover dir="ru"/>  
</p:transition>
```



end example]

[*Note:* Any rendering shown above is for example purposes only. Exact rendering of any transition is determined by the rendering application. As such, the same transition can have many variations depending on the implementation. *end note]*

Attributes	Description
dir (Direction)	<p>This attribute specifies if the direction of the transition.</p> <p>The possible values for this attribute are defined by the ST_TransitionEightDirectionType simple type (§19.7.51).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_EightDirectionTransition](#)) is located in §A.3. *end note]*

19.5.33 cTn (Common Time Node Properties)

This element describes the properties that are common for time nodes.

Attributes	Description
accel (Acceleration)	<p>This attribute describes the percentage of specified duration over which the element's time takes to accelerate from 0 up to the "run rate."</p> <p>The possible values for this attribute are defined by the ST_PositiveFixedPercentage</p>

Attributes	Description
	simple type (§20.1.10.44).
afterEffect (After Effect)	<p>This attribute specifies whether there is an after effect applied to the time node.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
autoRev (Auto Reverse)	<p>This attribute describes whether to automatically play the animation in reverse after playing it in the forward direction.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
bldLvl (Build level)	<p>This attribute describes the build level of the animation.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
decel (Deceleration)	<p>This attribute describes the percentage of specified duration over which the element's time takes to decelerate from the "run rate" down to 0.</p> <p>The possible values for this attribute are defined by the ST_PositiveFixedPercentage simple type (§20.1.10.44).</p>
display (Display)	<p>This attribute describes whether the state of the time node is visible or hidden.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
dur (Duration)	<p>This attribute describes the duration of the time node, expressed as unit time.</p> <p>The possible values for this attribute are defined by the ST_TLTime simple type (§19.7.38).</p>
evtFilter (Event Filter)	<p>This attribute describes the event filter for this time node.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
fill (Fill)	<p>This attribute describes the fill type for the time node.</p> <p>The possible values for this attribute are defined by the ST_TLTimeNodeFillType simple type (§19.7.41).</p>
grpId (Group ID)	<p>This attribute describes the Group ID of the time node.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
id (ID)	<p>This attribute specifies the identifier for the timenode.</p> <p>The possible values for this attribute are defined by the ST_TLTimeNodeID simple type</p>

Attributes	Description
	(§19.7.42).
masterRel (Master Relation)	<p>This attribute specifies how the time node plays back relative to its master time node.</p> <p>The possible values for this attribute are defined by the ST_TLTimeNodeMasterRelation simple type (§19.7.43).</p>
nodePh (Node Placeholder)	<p>This attribute describes whether this node is a placeholder.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
nodeType (Node Type)	<p>This attribute specifies the type of time node.</p> <p>The possible values for this attribute are defined by the ST_TLTimeNodeType simple type (§19.7.47).</p>
presetClass (Preset Types)	<p>This attribute describes the class of effect in which it belongs.</p> <p>The possible values for this attribute are defined by the ST_TLTimeNodePresetClassType simple type (§19.7.44).</p>
presetID (Preset ID)	<p>This attribute describes the preset identifier for the time node.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
presetSubtype (Preset SubType)	<p>This attribute is a bitflag that specifies a direction or some other attribute of the effect. For example it can be set to specify a “From Bottom” for the Fly In effect, or “Bold” for the Change Font Style effect.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
repeatCount (Repeat Count)	<p>This attribute describes the number of times the element should repeat, in units of thousandths.</p> <p>The possible values for this attribute are defined by the ST_TLTime simple type (§19.7.38).</p>
repeatDur (Repeat Duration)	<p>This attribute describes the amount of time over which the element should repeat. If absent, the attribute is taken to be the same as the specified duration.</p> <p>The possible values for this attribute are defined by the ST_TLTime simple type (§19.7.38).</p>
restart (Restart)	<p>This attribute specifies if a node is to restart when it completes its action.</p> <p>The possible values for this attribute are defined by the ST_TLTimeNodeRestartType simple type (§19.7.45).</p>
spd (Speed)	<p>This attribute specifies the percentage by which to speed up (or slow down) the timing. If negative, the timing is reversed. <i>[Example: if speed is 200% and the specified duration is 10 seconds, the actual duration is 5 seconds. end example]</i></p>

Attributes	Description
	The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).
syncBehavior (Synchronization Behavior)	This attribute specifies how the time node synchronizes to its group. The possible values for this attribute are defined by the ST_TLTimeNodeSyncType simple type (§19.7.46).
tmFilter (Time Filter)	This attribute specifies the time filter for the time node. The possible values for this attribute are defined by the W3C XML Schema string datatype.

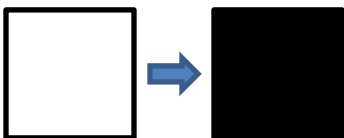
[Note: The W3C XML Schema definition of this element's content model ([CT_TLCommonTimeNodeData](#)) is located in §A.3. *end note*]

19.5.34 cut (Cut Slide Transition)

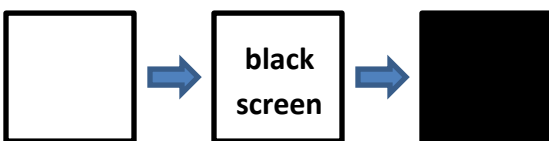
This element describes the cut slide transition effect, which simply replaces the previous slide with the new slide instantaneously. No animation is used, but an option exists to cut to a black screen before showing the new slide. The rendering of this transition depends upon the attributes specified which have been shown below.

[Example: Consider the following cases in which the “cut” slide transition is applied to a slide, along with a set of attributes. The proper usage and sample renderings are shown below, with the XML fragments preceding the corresponding rendering:

```
<p:transition>
  <p:cut thruBlk="0"/>
</p:transition>
```



```
<p:transition>
  <p:cut thruBlk="1"/>
</p:transition>
```



end example]

[*Note:* Any rendering shown above is for example purposes only. Exact rendering of any transition is determined by the rendering application. As such, the same transition can have many variations depending on the implementation. *end note]*

Attributes	Description
thruBlk (Transition Through Black)	<p>This attribute specifies if the transition starts from a black screen (and then transition the new slide over black).</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

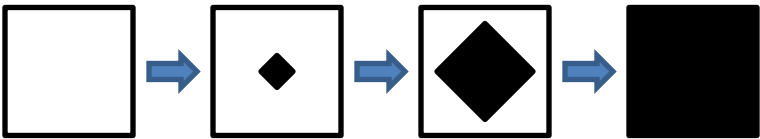
[*Note:* The W3C XML Schema definition of this element’s content model ([CT_OptionalBlackTransition](#)) is located in §A.3. *end note]*

19.5.35 diamond (Diamond Slide Transition)

This element describes the diamond slide transition effect, which uses a diamond pattern centered on the slide that increases in size until the new slide is fully shown. The rendering of this transition has been shown below.

[*Example:* Consider the following case in which the “diamond” slide transition is applied to a slide, along with a set of attributes. The proper usage and a sample rendering are shown below, with the XML fragments preceding the corresponding rendering:

```
<p:transition>  
  <p:diamond/>  
</p:transition>
```



end example]

[*Note:* Any rendering shown above is for example purposes only. Exact rendering of any transition is determined by the rendering application. As such, the same transition can have many variations depending on the implementation. *end note]*

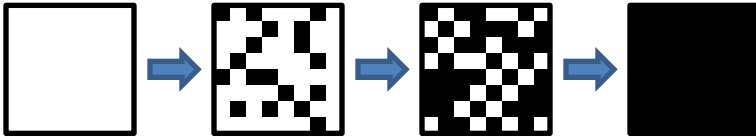
[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Empty](#)) is located in §A.3. *end note]*

19.5.36 dissolve (Dissolve Slide Transition)

This element describes the dissolve slide transition effect, which uses a set of randomly placed squares on the slide that continue to be added to until the new slide is fully shown. The rendering of this transition has been shown below.

[*Example:* Consider the following case in which the “dissolve” slide transition is applied to a slide, along with a set of attributes. The proper usage and a sample rendering are shown below, with the XML fragments preceding the corresponding rendering:

```
<p:transition>
  <p:dissolve/>
</p:transition>
```



end example]

[*Note:* Any rendering shown above is for example purposes only. Exact rendering of any transition is determined by the rendering application. As such, the same transition can have many variations depending on the implementation. *end note]*

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Empty](#)) is located in §A.3. *end note]*

19.5.37 **endCondLst (End Conditions List)**

This element describes a list of the end conditions that shall be met in order to stop the time node.

[*Example:* Consider a shape a shape with an audio attached to the animation. The <endCondList> element should be used as follows to specifies when the sound is done:

```
<p:audio>
  <p:cMediaNode>
    <p:cTn display="0" masterRel="sameClick">
      <p:stCondLst> ... </p:stCondLst>
      <p:endCondLst>
        <p:cond evt="onStopAudio" delay="0">
          <p:tgtEl>
            <p:sldTgt/>
          </p:tgtEl>
        </p:cond>
      </p:endCondLst>
    </p:cTn>
    <p:tgtEl> ... </p:tgtEl>
  </p:cMediaNode>
</p:audio>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TLTimeConditionList](#)) is located in §A.3. *end note*]

19.5.38 endSnd (Stop Sound Action)

This element stops all previous sounds during a slide transition.

[*Example:* Consider a slide transition that stops all previous sounds. The <endSnd> element should be used as follows:

```
<p:transition>
  <p:sndAc>
    <p:endSnd/>
  </p:sndAc>
</p:transition>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.3. *end note*]

19.5.39 endSync (EndSync)

This element is used to synchronizes the stopping of parallel elements in the timing tree. It is used on interactive timeline sequences to specify that the interactive sequence's duration ends when all of the child timenodes have ended. It is also used to make interactive sequences restart-able (so that the entire interactive sequence can be repeated if the trigger object is clicked on repeatedly).

[*Example:* Consider a shape with a fill change animation. The <endSync> element should be used as follows:

```
<p:seq concurrent="1" nextAc="seek">
  <p:cTn>
    <p:stCondLst/>
    <p:endSync evt="end" delay="0">
      <p:rtn val="all"/>
    </p:endSync>
    <p:childTnLst/>
  </p:cTn>
  <p:nextCondLst/>
</p:seq>
```

end example]

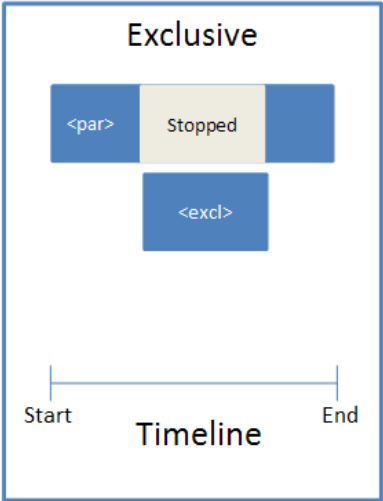
Attributes	Description
delay (Trigger Delay)	This attribute describes the delay after an animation is triggered. The possible values for this attribute are defined by the ST_TLTime simple type (§19.7.38).

Attributes	Description
evt (Trigger Event)	This attribute describes the event that triggers an animation. The possible values for this attribute are defined by the ST_TLTriggerEvent simple type (§19.7.48).

[Note: The W3C XML Schema definition of this element’s content model ([CT_TLTimeCondition](#)) is located in §A.3. end note]

19.5.40 excl (Exclusive)

This element describes the Exclusive time node. This time node is used to pause all other timelines when it is activated. Conceptually it can be though of as follows:



[Note: The W3C XML Schema definition of this element’s content model ([CT_TLTimeNodeExclusive](#)) is located in §A.3. end note]

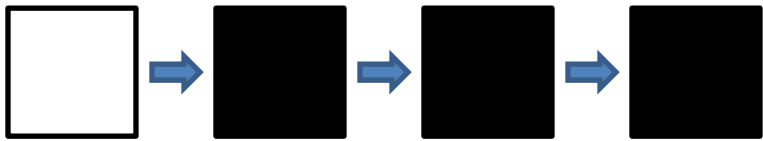
19.5.41 fade (Fade Slide Transition)

This element describes the fade slide transition effect, which smoothly fades the previous slide either directly to the new slide or first to a black screen and then to the new slide. The rendering of this transition depends upon the attributes specified which have been shown below.

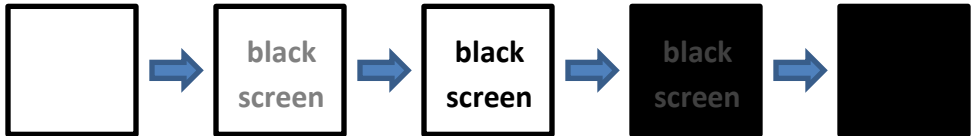
[Example: Consider the following cases in which the “fade” slide transition is applied to a slide, along with a set of attributes. The proper usage and sample renderings are shown below, with the XML fragments preceding the corresponding rendering:

```
<p:transition>  
  <p:fade thruBlk="0"/>
```

</p:transition>



<p:transition>
 <p:fade thruBlk="1"/>
</p:transition>



end example]

[*Note:* Any rendering shown above is for example purposes only. Exact rendering of any transition is determined by the rendering application. As such, the same transition can have many variations depending on the implementation. *end note]*

Attributes	Description
thruBlk (Transition Through Black)	<p>This attribute specifies if the transition starts from a black screen (and then transition the new slide over black).</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_OptionalBlackTransition](#)) is located in §A.3. *end note]*

19.5.42 **fltVal (Float Value)**

This element specifies a floating point value to be used for evaluation by a parent element. The exact meaning of the value contained within this element is not defined here but is dependent on the usage of this element in conjunction with one of the listed parent elements.

Attributes	Description
val (Value)	<p>This attribute specifies the floating point value that this element contains and that should be used in evaluating this element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema float datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TLAnimVariantFloatVal](#)) is located in §A.3. *end note*]

19.5.43 from (From)

This element is used to specify the starting color of the target element.

[*Example:* Consider a shape with an animation fill change from one accent color to another. The <from> element should be used as follows:

```
<p:animClr clrSpc="rgb" dir="cw">
  <p:cBhvr>
    <p:cTn id="6" dur="2000" fill="hold"/>
    <p:tgtEl> ... </p:tgtEl>
    <p:attrNameLst>
      <p:attrName>fillcolor</p:attrName>
    </p:attrNameLst>
  </p:cBhvr>
  <p:from>
    <a:schemeClr val="accent3"/>
  </p:from>
  <p:to>
    <a:schemeClr val="accent2"/>
  </p:to>
</p:animClr>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Color](#)) is located in §A.4.1. *end note*]

19.5.44 from (From)

This element specifies an x/y co-ordinate to start the animation from.

[*Example:* Consider a shape with an animation sequence that needs to start at a certain coordinate. The <from> element should be used as follows:

```
<p:animScale>
  <p:cBhvr>
    <p:cTn> ... </p:cTn>
    <p:tgtEl>
      <p:spTgt spid="4"/>
    </p:tgtEl>
  </p:cBhvr>
  <p:from x="100%" y="100%"/>
  <p:to x="80%" y="100%"/>
```

</p:animScale>

end example]

Attributes	Description
x (X coordinate)	This attribute describes the X coordinate. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).
y (Y coordinate)	This attribute describes the Y coordinate. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).

[Note: The W3C XML Schema definition of this element's content model ([CT_TLPoint](#)) is located in §A.3. *end note]*

19.5.45 graphicEl (Graphic Element)

This element specifies a graphical element which to animate.

[Example: Consider a diagram with an animation effect applied to it. The <graphicEl> element should be used as follows:

```
<p:set>
  <p:cBhvr>
    <p:cTn id="6" dur="1" fill="hold"> ... </p:cTn>
    <p:tgtEl>
      <p:spTgt spid="4">
        <p:graphicEl>
          <a:dgm id="{87C2C707-C3F4-4E81-A967-A8B8AE13E575}"/>
        </p:graphicEl>
      </p:spTgt>
    </p:tgtEl>
    <p:attrNameLst> ... </p:attrNameLst>
  </p:cBhvr>
  <p:to> ... </p:to>
</p:set>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_AnimationElementChoice](#)) is located in §A.4.1. *end note]*

19.5.46 hsl (HSL)

This element specifies an incremental HSL (Hue, Saturation, Lightness) value to add to a color animation.

[Example: Consider a shape with a lightening emphasis animation. The <hsl> element should be used as follows:

```
<p:animClr clrSpc="hsl">
  <p:cBhvr>
    <p:cTn id="8" dur="500" fill="hold"/>
    <p:tgtEl>
      <p:spTgt spid="4"/>
    </p:tgtEl>
    <p:attrNameLst>
      <p:attrName>stroke.color</p:attrName>
    </p:attrNameLst>
  </p:cBhvr>
  <p:by>
    <p:hsl h="0" s="0" l="0"/>
  </p:by>
</p:animClr>
```

end example]

Attributes	Description
h (Hue)	Specifies hue as an angle. The values range from [0, 360] degrees. The possible values for this attribute are defined by the ST_Angle simple type (§20.1.10.3).
l (Lightness)	Specifies a lightness as a percentage. The values are in the range [-100%, 100%]. The possible values for this attribute are defined by the ST_FixedPercentage simple type (§20.1.10.24).
s (Saturation)	Specifies a saturation as a percentage. The values are in the range [-100%, 100%]. The possible values for this attribute are defined by the ST_FixedPercentage simple type (§20.1.10.24).

[Note: The W3C XML Schema definition of this element’s content model ([CT_TLByHslColorTransform](#)) is located in §A.3. end note]

19.5.47 inkTgt (Ink Target)

This element specifies an animation target element that is represented by a sub-shape in a legacy graphical object.

[*Example:* Consider an ink diagram with an animation blinds transition effect applied to it. The <inkTgt> element should be used as follows:

```
<p:animEffect transition="in" filter="blinds(horizontal)">
  <p:cBhvr>
    <p:cTn id="7" dur="500"/>
    <p:tgtEl>
      <p:inkTgt spid="_x0000_s2057"/>
    </p:tgtEl>
  </p:cBhvr>
</p:animEffect>
```

end example]

Attributes	Description
spid (Shape ID)	This attribute specifies the shape identifier. The possible values for this attribute are defined by the ST_DrawingElementId simple type (§20.1.10.21).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TLSubShapeId](#)) is located in §A.3. *end note]*

19.5.48 intVal (Integer)

This element specifies an integer value to be used for evaluation by a parent element. The exact meaning of the value contained within this element is not defined here but is dependent on the usage of this element in conjunction with one of the listed parent elements.

Attributes	Description
val (Value)	This attribute specifies the integer value that this element contains and that should be used in evaluating this element. The possible values for this attribute are defined by the W3C XML Schema int datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TLAnimVariantIntegerVal](#)) is located in §A.3. *end note]*

19.5.49 iterate (Iterate)

This element specifies how the animation should be successively applied to sub elements of the target element for a repeated effect. It can be applied to contained timing and animation structures over the letters, words, or shapes within a target element.

[*Example:* Consider a text animation where the words appear letter by letter. The <iterate> element should be used as follows:

```
<p:par>
  <p:cTn id="1" >
    <p:stCondLst> ... </p:stCondLst>
    <p:iterate type="lt">
      <p:tmPct val="10000"/>
    </p:iterate>
    <p:childTnLst> ... </p:childTnLst>
  </p:cTn>
</p:par>
```

end example]

Attributes	Description
backwards (Backwards)	This attribute specifies whether to go backwards in the timeline to the previous node. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
type (Iterate Type)	This attribute specifies the iteration behavior and applies it to each letter, word or shape within a container element. Values are by word, by letter, or by element. If there is no text or block elements such as shapes within the container or a single word, letter, or shape (depending on iterate type) then no iteration happens and the behavior is applied to the element itself instead. The possible values for this attribute are defined by the ST_IterateType simple type (§19.7.4).

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_TLIterateData](#)) is located in §A.3.
end note]

19.5.50 newsflash (Newsflash Slide Transition)

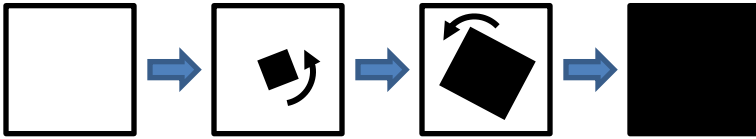
This element describes the newsflash slide transition effect, which grows and spins the new slide counter-clockwise into place over the previous slide. The rendering of this transition has been shown below.

[*Example:* Consider the following case in which the “newsflash” slide transition is applied to a slide, along with a set of attributes. The proper usage and a sample rendering are shown below, with the XML fragments preceding the corresponding rendering:

```
<p:transition>
```



```
<p:newsflash/>
</p:transition>
```



end example]

[*Note:* Any rendering shown above is for example purposes only. Exact rendering of any transition is determined by the rendering application. As such, the same transition can have many variations depending on the implementation. *end note]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.3. *end note]*

19.5.51 nextCondLst (Next Conditions List)

This element describes a list of conditions that shall be met to advance to the next animation sequence.

[*Example:* Consider a shape with a text emphasis changing the size of its font.

```
<p:seq concurrent="1" nextAc="seek">
  <p:cTn id="2" dur="indefinite" nodeType="mainSeq"> ... </p:cTn>
  <p:prevCondLst> ... </p:prevCondLst>
  <p:nextCondLst>
    <p:cond evt="onNext" delay="0">
      <p:tgtEl>
        <p:sldTgt/>
      </p:tgtEl>
    </p:cond>
  </p:nextCondLst>
</p:seq>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TLTimeConditionList](#)) is located in §A.3. *end note]*

19.5.52 oleChartEl (Embedded Chart Element)

This element specifies the subelement of an embedded chart to animate.

[*Example:* Consider an embedded Chart with a entrance animation effect applied to each of the graph's categories. The <oleChartEl> element should be used as follows:

```
<p:animEffect transition="in" filter="blinds(horizontal)">
  <p:cBhvr>
```

```
<p:cTn id="12" dur="500"/>
<p:tgtEl>
  <p:spTgt spid="19460">
    <p:oleChartEl type="category" lvl="1"/>
  </p:spTgt>
</p:tgtEl>
</p:cBhvr>
</p:animEffect>
```

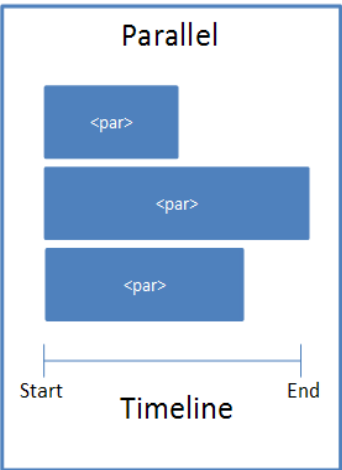
end example]

Attributes	Description
lvl (Level)	This attribute describes the element levels to animate. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
type (Type)	This attribute specifies how to chart should be built during its animation. The possible values for this attribute are defined by the ST_TLChartSubelementType simple type (§19.7.31).

[Note: The W3C XML Schema definition of this element’s content model ([CT_TLOleChartTargetElement](#)) is located in §A.3. *end note*]

19.5.53 par (Parallel Time Node)

This element describes the Parallel time node which can be activated along with other parallel time node containers. Conceptually it can be thought of as follows:



[Example: Consider a simple animation with a blind entrance. The <par> element should be used as follows:

```

<p:timing>
  <p:tnLst>
    <p:par>
      <p:cTn id="1" dur="indefinite" restart="never" nodeType="tmRoot">
        <p:childTnLst>
          <p:seq concurrent="1" nextAc="seek">
            ...
          </p:seq>
        </p:childTnLst>
      </p:cTn>
    </p:par>
  </p:tnLst>
</p:timing>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TLTimeNodeParallel](#)) is located in §A.3. *end note*]

19.5.54 plus (Plus Slide Transition)

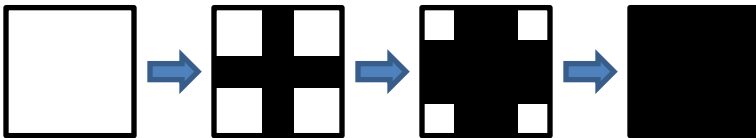
This element describes the plus slide transition effect, which uses a plus pattern centered on the slide that increases in size until the new slide is fully shown. The rendering of this transition has been shown below.

[*Example:* Consider the following case in which the “plus” slide transition is applied to a slide, along with a set of attributes. The proper usage and a sample rendering are shown below, with the XML fragments preceding the corresponding rendering:

```

<p:transition>
  <p:plus/>
</p:transition>

```



end example]

[*Note:* Any rendering shown above is for example purposes only. Exact rendering of any transition is determined by the rendering application. As such, the same transition can have many variations depending on the implementation. *end note*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.3. *end note*]

19.5.55 prevCondLst (Previous Conditions List)

This element describes a list of conditions that shall be met in order to go backwards in an animation sequence.

[*Example:* Consider trying to emphasize text within a shape by changing the size of its font.

```
<p:seq concurrent="1" nextAc="seek">
  <p:cTn id="2" dur="indefinite" nodeType="mainSeq">
    </p:cTn>
    <p:prevCondLst>
      <p:cond evt="onPrev" delay="0">
        <p:tgtEl>
          <p:sldTgt/>
        </p:tgtEl>
      </p:cond>
    </p:prevCondLst>
    <p:nextCondLst>
    </p:nextCondLst>
  </p:seq>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TLTimeConditionList](#)) is located in §A.3. *end note*]

19.5.56 pRg (Paragraph Text Range)

This element specifies a text range to animate based on starting and ending paragraph number.

[*Example:* Consider an animation entrance of the first 3 text paragraphs. The <pRg> element should be used as follows:

```
<p:animEffect transition="in" filter="checkerboard(across)">
  <p:cBhvr>
    <p:cTn id="12" dur="500"/>
    <p:tgtEl>
      <p:spTgt spid="3">
        <p:txEl>
          <p:pRg st="0" end="2"/>
        </p:txEl>
      </p:spTgt>
    </p:tgtEl>
  </p:cBhvr>
</p:animEffect>
```

end example]

Attributes	Description
end (End)	This attribute defines the end of the index range. The possible values for this attribute are defined by the ST_Index simple type (§19.7.3).
st (Start)	This attribute defines the start of the index range. The possible values for this attribute are defined by the ST_Index simple type (§19.7.3).

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_IndexRange](#)) is located in §A.3. *end note]*

19.5.57 progress (Progress)

This element defines the progression of an animation. The default for the way animation progress happens through an animEffect is a linear ramp from 0 to 1, starting at the effect’s begin time & ending at the effect’s end time. When you specify a value for the progress attribute, you are overriding this default behaviour. The value between 0 and 1 represents a percentage through the effect, where 0 is 0% and 1 is 100%.

Each animEffect is in fact an object-based transition. These transitions can be specified as “In” (where the object is not visible at 0% and becomes completely visible at 100%) or “Out” (where the object is visible at 0% and becomes completely invisible at 100%). You would set the progress attribute if you want to use the animEffect as a “static” effect, where the transition properties do not actually change over time. As an alternative to using the progress attribute, you can use the tmFilter (time filter), which is a base attribute of any effect/timenode, to specify the way that progress through an effect should be performed dynamically.

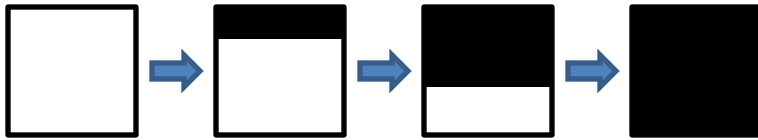
[*Note:* The W3C XML Schema definition of this element’s content model ([CT_TLAnimVariant](#)) is located in §A.3. *end note]*

19.5.58 pull (Pull Slide Transition)

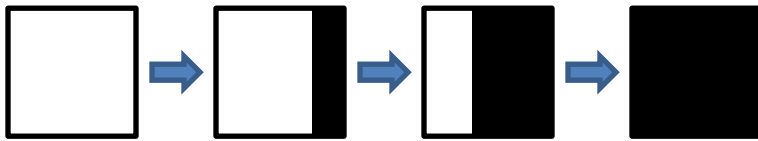
This element describes the pull slide transition effect, which moves the previous slide to an off-screen location, continually revealing more of the new slide until the new slide is fully shown. The rendering of this transition depends upon the attributes specified which have been shown below.

[*Example:* Consider the following cases in which the “pull” slide transition is applied to a slide, along with a set of attributes. The proper usage and sample renderings are shown below, with the XML fragments preceding the corresponding rendering:

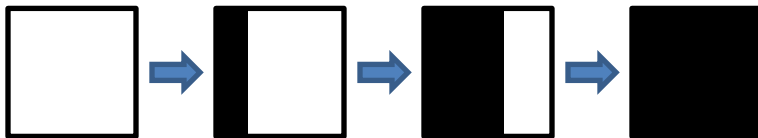
```
<p:transition>
  <p:pull dir="d"/>
</p:transition>
```



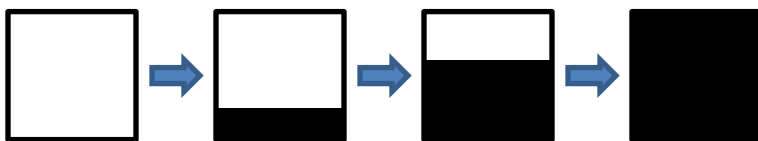
```
<p:transition>
  <p:pull dir="l"/>
</p:transition>
```



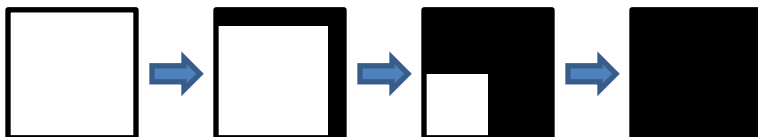
```
<p:transition>
  <p:pull dir="r"/>
</p:transition>
```



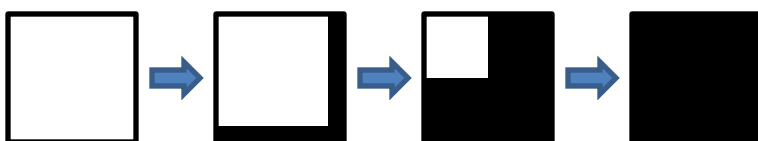
```
<p:transition>
  <p:pull dir="u"/>
</p:transition>
```



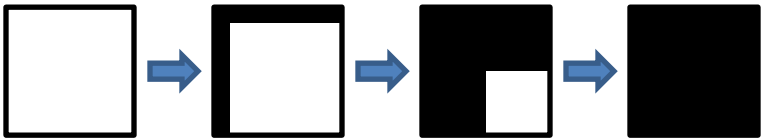
```
<p:transition>
  <p:pull dir="ld"/>
</p:transition>
```



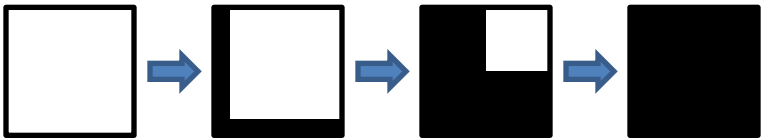
```
<p:transition>
  <p:pull dir="lu"/>
</p:transition>
```



```
<p:transition>
  <p:pull dir="rd"/>
</p:transition>
```



```
<p:transition>
  <p:pull dir="ru"/>
</p:transition>
```



end example]

[*Note:* Any rendering shown above is for example purposes only. Exact rendering of any transition is determined by the rendering application. As such, the same transition can have many variations depending on the implementation. *end note]*

Attributes	Description
dir (Direction)	<p>This attribute specifies if the direction of the transition.</p> <p>The possible values for this attribute are defined by the ST_TransitionEightDirectionType simple type (§19.7.51).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_EightDirectionTransition](#)) is located in §A.3. *end note]*

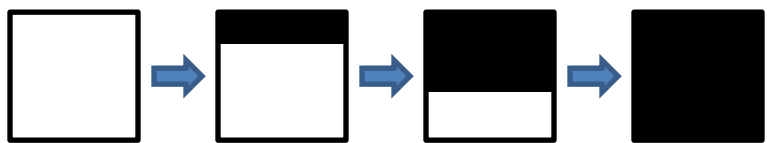
19.5.59 push (Push Slide Transition)

This element describes the push slide transition effect, which moves the new slide in from an off-screen location, continually pushing the previous slide to an opposite off-screen location until the new slide is fully shown. The rendering of this transition depends upon the attributes specified which have been shown below.

[*Example:* Consider the following cases in which the “push” slide transition is applied to a slide, along with a set of attributes. The proper usage and sample renderings are shown below, with the XML fragments preceding the corresponding rendering:

```
<p:transition>
  <p:push dir="d"/>
```

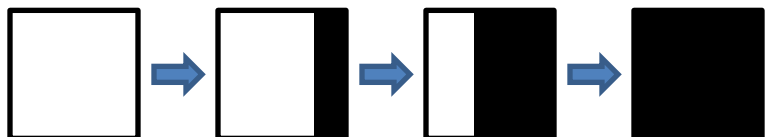
</p:transition>



<p:transition>

<p:push dir="l"/>

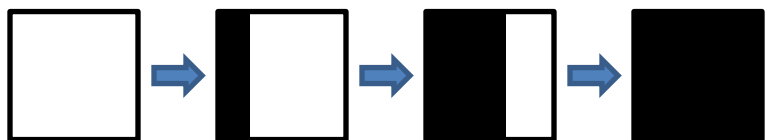
</p:transition>



<p:transition>

<p:push dir="r"/>

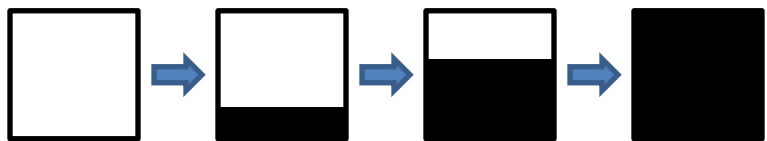
</p:transition>



<p:transition>

<p:push dir="u"/>

</p:transition>



end example]

[*Note:* Any rendering shown above is for example purposes only. Exact rendering of any transition is determined by the rendering application. As such, the same transition can have many variations depending on the implementation. *end note]*

Attributes	Description
dir (Direction)	This attribute specifies the direction of the slide transition. The possible values for this attribute are defined by the ST_TransitionSideDirectionType simple type (§19.7.53).

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_SideDirectionTransition](#)) is located in §A.3. *end note]*

19.5.60 random (Random Slide Transition)

This element describes the random slide transition effect, which chooses a random transition from the set available in the rendering application. This transition thus can be different each time it is used.

[*Example:* Consider the following case in which the “random” slide transition is applied to a slide, along with a set of attributes. The proper usage is shown below:

```
<p:transition>
  <p:random/>
</p:transition>
```

end example]

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Empty](#)) is located in §A.3. *end note]*

19.5.61 randomBar (Random Bar Slide Transition)

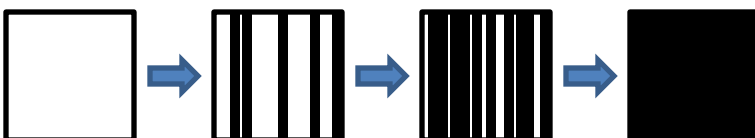
This element describes the randomBar slide transition effect, which uses a set of randomly placed horizontal or vertical bars on the slide that continue to be added to until the new slide is fully shown. The rendering of this transition depends upon the attributes specified which have been shown below.

[*Example:* Consider the following cases in which the “randomBar” slide transition is applied to a slide, along with a set of attributes. The proper usage and sample renderings are shown below, with the XML fragments preceding the corresponding rendering:

```
<p:transition>
  <p:randomBar dir="horz"/>
</p:transition>
```



```
<p:transition>
  <p:randomBar dir="vert"/>
</p:transition>
```



end example]

[*Note:* Any rendering shown above is for example purposes only. Exact rendering of any transition is determined by the rendering application. As such, the same transition can have many variations depending on the implementation. *end note]*

Attributes	Description
dir (Transition Direction)	This attribute specifies a horizontal or vertical transition. The possible values for this attribute are defined by the ST_Direction simple type (§19.7.2).

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_OrientationTransition](#)) is located in §A.3. *end note]*

19.5.62 rCtr (Rotation Center)

This element describes the center of the rotation used to rotate a motion path by X angle.

[*Example:* For example, suppose we have a simple animation with a checkbox text entrance.

```
<p:animMotion origin="layout" path="M 0 0 L 0.25 0.33333 E"
pathEditMode="relative" rAng="0" ptsTypes="">
  <p:cBhvr>
    <p:cTn id="6" dur="2000" fill="hold"/>
    <p:tgtEl>
      <p:spTgt spid="3"/>
    </p:tgtEl>
    <p:attrNameLst>
      <p:attrName>ppt_x</p:attrName>
      <p:attrName>ppt_y</p:attrName>
    </p:attrNameLst>
  </p:cBhvr>
  <p:rCtr x="56.7%" y="83.4%"/>
</p:animMotion>
```

end example]

Attributes	Description
x (X coordinate)	This attribute describes the X coordinate. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).
y (Y coordinate)	This attribute describes the Y coordinate.

Attributes	Description
	The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).

[Note: The W3C XML Schema definition of this element's content model ([CT_TLPoint](#)) is located in §A.3. *end note*]

19.5.63 rgb (RGB)

The element specifies an incremental RGB value to add to the color property.

[Example: Consider a shape with a color emphasis animation. The <rgb> element should be used as follows:

```
<p:animClr clrSpc="rgb">
  <p:cBhvr>
    <p:cTn id="8" dur="500" fill="hold"/>
    <p:tgtEl>
      <p:spTgt spid="4"/>
    </p:tgtEl>
    <p:attrNameLst>
      <p:attrName>stroke.color</p:attrName>
    </p:attrNameLst>
  </p:cBhvr>
  <p:by>
    <p:rgb r="10" g="20" b="30"/>
  </p:by>
</p:animClr>
```

end example]

Attributes	Description
b (Blue)	This attribute specifies a blue component luminance as a percentage. Values are in the range [-100%, 100%]. The possible values for this attribute are defined by the ST_FixedPercentage simple type (§20.1.10.24).
g (Green)	This attribute specifies a green component luminance as a percentage. Values are in the range [-100%, 100%]. The possible values for this attribute are defined by the ST_FixedPercentage simple type (§20.1.10.24).
r (Red)	This attribute specifies a red component luminance as a percentage. Values are in the range [-100%, 100%].

Attributes	Description
	The possible values for this attribute are defined by the ST_FixedPercentage simple type (§20.1.10.24).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TLByRgbColorTransform](#)) is located in §A.3. *end note*]

19.5.64 rtn (Runtime Node Trigger Choice)

This element specifies the child time node that triggers a time condition. References a child time node or all child nodes. Order is based on the child's end time.

[*Example:* Consider an animation which ends the synchronization of all parallel time nodes when all the child nodes have ended their animation. The <rtn> element should be used as follows:

```
<p:cTn>
  <p:stCondLst> ... </p:stCondLst>
  <p:endSync evt="end" delay="0">
    <p:rtn val="all"/>
  </p:endSync>
  <p:childTnLst> ... </p:childTnLst>
</p:cTn>
```

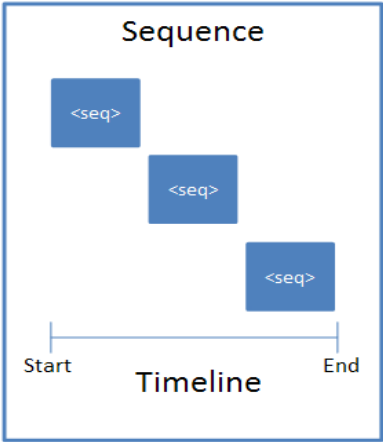
end example]

Attributes	Description
val (Value)	This attribute describes the value that triggers the runtime node. The possible values for this attribute are defined by the ST_TLTriggerRuntimeNode simple type (§19.7.49).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TLTriggerRuntimeNode](#)) is located in §A.3. *end note*]

19.5.65 seq (Sequence Time Node)

This element describes the Sequence time node and it can only be activated when the one before it finishes. Conceptually it can be thought of as follows:



[Example: For example, suppose we have a simple animation with a blind entrance.

```
<p:timing>
  <p:tnLst>
    <p:par>
      <p:cTn id="1" dur="indefinite" restart="never" nodeType="tmRoot">
        <p:childTnLst>
          <p:seq concurrent="1" nextAc="seek">
            ...
          </p:seq>
        </p:childTnLst>
      </p:cTn>
    </p:par>
  </p:tnLst>
</p:timing>
```

end example]

Attributes	Description
concurrent (Concurrent)	<p>This attribute specifies if concurrency is enabled or disabled. By default this attribute has a value of "disabled". When the value is set to "enabled", the previous element is left enabled when advancing to the next element in a sequence instead of being ended. This is only relevant for advancing via the next condition element being triggered. The only other way to advance to the next element would be to have the current element end, which implies it is no longer concurrent.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
nextAc (Next Action)	<p>This attribute specifies what to do when going forward in sequence. By default this attribute has a value of "none". When this is set to seek it seeks the element to a natural end time (not necessarily the actual end time).</p>

Attributes	Description
	<p>The natural end position is defined as the latest non-infinite end time of the children. If a child loops forever, the end of its first loop is used as its "end time" for the purposes of this calculation.</p> <p>Some container elements can have infinite durations due to an infinite-duration child element. The engine needs to recurse down through all infinite duration containers to calculate their natural duration in case a child might have non-infinite duration within it that needs to be taken into account.</p> <p>The possible values for this attribute are defined by the ST_TLNextActionType simple type (§19.7.34).</p>
prevAc (Previous Action)	<p>This attribute specifies what to do when going backwards in a sequence. By default it is set to "none" and nothing special is done. When the value is "skipTimed", the sequence continues to go backwards until it reaches a sequence element that was defined to begin only on the next condition element.</p> <p>The possible values for this attribute are defined by the ST_TLPreviousActionType simple type (§19.7.37).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TLTimeNodeSequence](#)) is located in §A.3. end note]

19.5.66 set (Set Time Node Behavior)

This element allows the setting of a particular property value to a fixed value while the behavior is active and restores the value when the behavior is reset or turned off.

[Example: For example, suppose we want to set certain properties during an animation effect. The <set> element should be used as follows:

```
<p:childTnLst>
  <p:set>
    <p:cBhvr>
      <p:cTn id="6" dur="1" fill="hold"> ... </p:cTn>
      <p:tgtEl>
        <p:spTgt spid="4"/>
      </p:tgtEl>
      <p:attrNameLst>
        <p:attrName>style.visibility</p:attrName>
      </p:attrNameLst>
    </p:cBhvr>
  <p:to>
    <p:strVal val="visible"/>
  </p:to>
</p:set>
</p:childTnLst>
```

```

    </p:to>
  </p:set>
  <p:animEffect transition="in" filter="blinds(horizontal)">
    ...
  </p:animEffect>
</p:childTnLst>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TLSetBehavior](#)) is located in §A.3. *end note]*

19.5.67 sldTgt (Slide Target)

This element specifies the slide as the target element.

[*Example:* For example, suppose we have a simple animation with a blind entrance.

```

<p:seq concurrent="1" nextAc="seek">
  <p:cTn id="2" dur="indefinite" nodeType="mainSeq"> ... </p:cTn>
  <p:prevCondLst> ... </p:prevCondLst>
  <p:nextCondLst>
    <p:cond evt="onNext" delay="0">
      <p:tgtEl>
        <p:sldTgt/>
      </p:tgtEl>
    </p:cond>
  </p:nextCondLst>
</p:seq>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.3. *end note]*

19.5.68 snd (Sound)

This element specifies the audio information to play during a slide transition.

[*Example:* Consider a slide transition with an audio effect. The <snd> element should be used as follows:

```

<p:transition>
  <p:sndAc>
    <p:stSnd>
      <p:snd r:embed="rId2"/>
    </p:stSnd>
  </p:sndAc>
</p:transition>

```

end example]

Attributes	Description
embed (Embedded Audio File Relationship ID) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the identification information for an embedded audio file. This attribute is used to specify the location of an object that resides locally within the file. [Note: A list of suggested audio types is provided in §15.2.2. <i>end note</i>] The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).
name (Sound Name) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies the original name or given short name for the corresponding sound. This is used to distinguish this sound from others by providing a human readable name for the attached sound should the user need to identify the sound among others within the UI. The possible values for this attribute are defined by the W3C XML Schema string datatype.

[Note: The W3C XML Schema definition of this element’s content model ([CT_EmbeddedWAVAudioFile](#)) is located in §A.4.1. *end note*]

19.5.69 **sndAc (Sound Action)**

This element describes a sound action for slide transition. This element specifies that the start of the slide transition is accompanied by the playback of an audio file; the actual audio file used is specified by the `snd` element (§19.5.68).

[Example: Consider a slide transition with a sound effect. The `<sndAc>` element should be used as follows:

```
<p:transition>
  <p:sndAc>
    <p:stSnd>
      <p:snd r:embed="rId2"/>
    </p:stSnd>
  </p:sndAc>
</p:transition>
```

end example]

[Note: The W3C XML Schema definition of this element’s content model ([CT_TransitionSoundAction](#)) is located in §A.3. *end note*]

19.5.70 sndTgt (Sound Target)

This element describes the sound information for a target object.

[*Example:* Consider a shape with a sound effect animation. The <sndTgt> element should be used as follows:

```
<p:subTnLst>
  <p:audio>
    <p:cMediaNode>
      <p:cTn display="0" masterRel="sameClick"> ... </p:cTn>
      <p:tgtEl>
        <p:sndTgt r:embed="rId2" r:link="rId3"/>
      </p:tgtEl>
    </p:cMediaNode>
  </p:audio>
</p:subTnLst>
```

end example]

Attributes	Description
embed (Embedded Audio File Relationship ID)	Specifies the identification information for an embedded audio file. This attribute is used to specify the location of an object that resides locally within the file. [<i>Note:</i> A list of suggested audio types is provided in §15.2.2. <i>end note</i>]
Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).
name (Sound Name)	Specifies the original name or given short name for the corresponding sound. This is used to distinguish this sound from others by providing a human readable name for the attached sound should the user need to identify the sound among others within the UI.
Namespace: http://purl.oclc.org/ooxml/drawingml/main	The possible values for this attribute are defined by the W3C XML Schema string datatype.

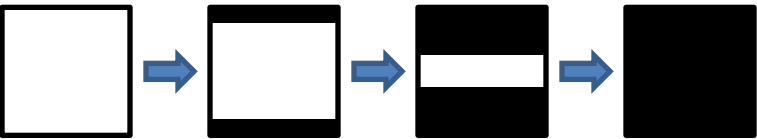
[*Note:* The W3C XML Schema definition of this element's content model ([CT_EmbeddedWAVAudioFile](#)) is located in §A.4.1. *end note*]

19.5.71 split (Split Slide Transition)

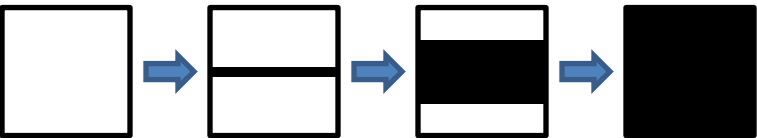
This element describes the split slide transition effect, which reveals the new slide directly on top of the previous one by wiping either horizontal or vertical from the outside in, or from the inside out, until the new slide is fully shown. The rendering of this transition depends upon the attributes specified which have been shown below.

[Example: Consider the following cases in which the “split” slide transition is applied to a slide, along with a set of attributes. The proper usage and sample renderings are shown below, with the XML fragments preceding the corresponding rendering:

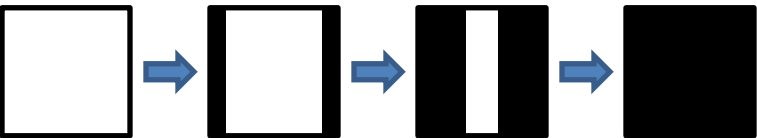
```
<p:transition>
  <p:split orient="horz" dir="in"/>
</p:transition>
```



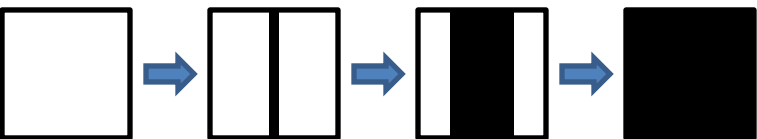
```
<p:transition>
  <p:split orient="horz" dir="out"/>
</p:transition>
```



```
<p:transition>
  <p:split orient="vert" dir="in"/>
</p:transition>
```



```
<p:transition>
  <p:split orient="vert" dir="out"/>
</p:transition>
```



end example]

[Note: Any rendering shown above is for example purposes only. Exact rendering of any transition is determined by the rendering application. As such, the same transition can have many variations depending on the implementation. *end note]*

Attributes	Description
dir (Direction)	This attribute specifies the direction of a "split" slide transition.

Attributes	Description
	The possible values for this attribute are defined by the ST_TransitionInOutDirectionType simple type (§19.7.52).
orient (Orientation)	This attribute specifies the orientation of a "split" slide transition. The possible values for this attribute are defined by the ST_Direction simple type (§19.7.2).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SplitTransition](#)) is located in §A.3. *end note*]

19.5.72 spTgt (Shape Target)

The element specifies the shape in which to apply a certain animation to.

[*Example:* Consider a shape whose id is 3 in which we want to apply a fade animation effect. The <spTgt> should be used as follows:

```
<p:animEffect transition="in" filter="fade">
  <p:cBhvr>
    <p:cTn id="7" dur="2000"/>
    <p:tgtEl>
      <p:spTgt spid="3"/>
    </p:tgtEl>
  </p:cBhvr>
</p:animEffect>
```

end example]

Attributes	Description
spid (Shape ID)	This attribute specifies the shape identifier. The possible values for this attribute are defined by the ST_DrawingElementId simple type (§20.1.10.21).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TLShapeTargetElement](#)) is located in §A.3. *end note*]

19.5.73 stCondLst (Start Conditions List)

This element contains a list conditions that shall be met for a time node to be activated.

[Example: For example, suppose we have a shape with an entrance appearance after 5 seconds. The <stCondLst>element should be used as follows:

```
<p:par>
  <p:cTn id="5" nodeType="clickEffect">
    <p:stCondLst>
      <p:cond delay="5000"/>
    </p:stCondLst>
    <p:childTnLst> ... </p:childTnLst>
  </p:cTn>
</p:par>
```

end example]

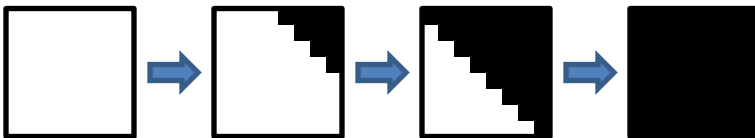
[Note: The W3C XML Schema definition of this element's content model ([CT_TLTimeConditionList](#)) is located in §A.3. *end note*]

19.5.74 strips (Strips Slide Transition)

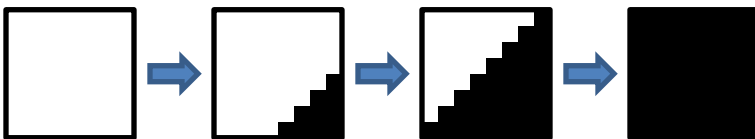
This element describes the strips slide transition effect, which uses a set of bars that are arranged in a staggered fashion and wipes them across the screen until the new slide is fully shown. The rendering of this transition depends upon the attributes specified which have been shown below.

[Example: Consider the following cases in which the “strips” slide transition is applied to a slide, along with a set of attributes. The proper usage and sample renderings are shown below, with the XML fragments preceding the corresponding rendering:

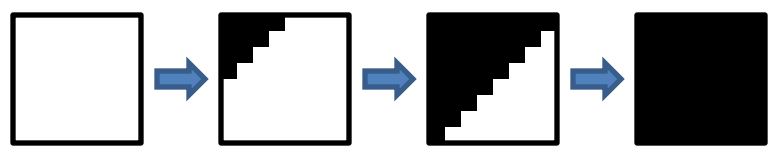
```
<p:transition>
  <p:strips dir="ld"/>
</p:transition>
```



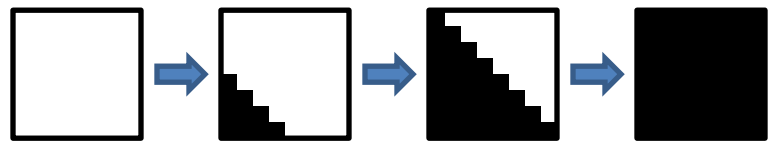
```
<p:transition>
  <p:strips dir="lu"/>
</p:transition>
```



```
<p:transition>
  <p:strips dir="rd"/>
</p:transition>
```



```
<p:transition>
  <p:strips dir="ru"/>
</p:transition>
```



end example]

[*Note:* Any rendering shown above is for example purposes only. Exact rendering of any transition is determined by the rendering application. As such, the same transition can have many variations depending on the implementation. *end note]*

Attributes	Description
dir (Direction)	This attribute specifies if the direction of the transition. The possible values for this attribute are defined by the ST_TransitionCornerDirectionType simple type (§19.7.50).

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_CornerDirectionTransition](#)) is located in §A.3. *end note]*

19.5.75 strVal (String Value)

This element specifies a string value to be used for evaluation by a parent element. The exact meaning of the value contained within this element is not defined here but is dependent on the usage of this element in conjunction with one of the listed parent elements.

Attributes	Description
val (Value)	This attribute specifies the string value that this element contains and that should be used in evaluating this element. The possible values for this attribute are defined by the W3C XML Schema string datatype.

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_TLAnimVariantStringVal](#)) is located in §A.3. *end note]*

19.5.76 **stSnd (Start Sound Action)**

This element describes the sound that starts playing during a slide transition.

[*Example:* Consider a slide transition that starts with a sound effect. The <stSnd> element should be used as follows:

```
<p:transition>
  <p:sndAc>
    <p:stSnd>
      <p:snd r:embed="rId2"/>
    </p:stSnd>
  </p:sndAc>
</p:transition>
```

end example]

Attributes	Description
loop (Loop Sound)	This attribute specifies if the sound loops until the next sound event occurs in slideshow. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_TransitionStartSoundAction](#)) is located in §A.3. *end note]*

19.5.77 **subSp (Subshape)**

This element specifies the subshape of a legacy graphical object to animate.

[*Example:* Consider adding animation to a legacy diagram. The <subSp> element should be used as follows:

```
<p:animEffect transition="in" filter="blinds(horizontal)">
  <p:cBhvr>
    <p:cTn id="7" dur="500"/>
    <p:tgtEl>
      <p:spTgt spid="2053">
        <p:subSp spid="_x0000_s70664"/>
      </p:spTgt>
    </p:tgtEl>
  </p:cBhvr>
</p:animEffect>
```

end example]

Attributes	Description
spid (Shape ID)	<p>This attribute specifies the shape identifier.</p> <p>The possible values for this attribute are defined by the ST_DrawingElementId simple type (§20.1.10.21).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TLSubShapeId](#)) is located in §A.3.
end note]

19.5.78 subTnLst (Sub-TimeNodes List)

This element describes time nodes that have a start time which is not based on the containing timenode. It is instead based on their master relationship (masterRel). At runtime, they are inserted dynamically into the timing tree as child timenodes for playback, based on the logic defined by the master relationship. These elements are used for animations such as "dim after" and "play sound effects"

[Example: Consider an animation with a "Fly In" effect on paragraphs so that each paragraph flies in on a separate click. Then the "Dim After" effect for paragraph 1 does not happen until paragraph 2 flies in. The <subTnLst> element should be used as follows:

```
<p:par>
  <p:cTn id="5" grpId="0" nodeType="clickEffect">
    <p:stCondLst> ... </p:stCondLst>
    <p:childTnLst> ... </p:childTnLst>
    <p:subTnLst>
      <p:set>
        <p:cBhvr override="childStyle">
          <p:cTn fill="hold" masterRel="nextClick" afterEffect="1"/>
          <p:tgtEl> ... </p:tgtEl>
          <p:attrNameLst> ... </p:attrNameLst>
        </p:cBhvr>
        <p:to> ... </p:to>
      </p:set>
    </p:subTnLst>
  </p:cTn>
</p:par>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_TimeNodeList](#)) is located in §A.3.
end note]

19.5.79 tav (Time Animate Value)

This element defines a "keypoint" in animation interpolation.

[Example: Consider a shape with a "fly-in" animation. The <tav> element should be used as follows:

```
<p:anim calcmode="lin" valueType="num">
  <p:cBhvr additive="base"> ... </p:cBhvr>
  <p:tavLst>
    <p:tav tm="0%">
      <p:val>
        <p:strVal val="1+#ppt_h/2"/>
      </p:val>
    </p:tav>
    <p:tav tm="100%">
      <p:val>
        <p:strVal val="#ppt_y"/>
      </p:val>
    </p:tav>
  </p:tavLst>
</p:anim>
```

end example]

Attributes	Description
fmla (Formula)	<p>This attribute allows for the specification of a formula to be used for describing a complex motion for an animated object. The formula manipulates the motion of the object by modifying a property of the object over a specified period of time. Each formula has zero or more inputs specified by the (\$) symbol, zero or more variables specified by the (#) symbol pre-pended to the variable name and a target variable which is specified by the previously specified attrName element. The formula can contain one or more of any of the constants, operators or functions listed below. In addition to this, the formula can also contain floating point numbers and parentheses.</p> <p>Mathematical operations have the following order of precedence, listed from lowest to highest. Operators listed on the same line have equal precedence.</p> <ul style="list-style-type: none">• "+", "-"• "*", "/", "%"• "^"• Unary minus, Unary plus (e.g. -2, meaning 3*-2 is the same as 3*(-2))• Variables, Constants (including numbers) and Functions (as listed previously) <p>Language Description:</p> <p>Digit = '0' '1' '2' '3' '4' '5' '6' '7' '8' '9' ;</p>

Attributes	Description																														
	<pre>number = digit , { digit } ; exponent = ['-'] , ('e' 'E') , number ; value = number , ['.' number] , [exponent] ; variable = '\$' 'ppt_x' 'ppt_y' 'ppt_w' 'ppt_h' ; constant = value 'pi' 'e' ; ident = 'abs' 'acos' 'asin' 'atan' 'ceil' 'cos' 'cosh' 'deg' 'exp' 'floor' 'ln' 'max' 'min' 'rad' 'rand' 'sin' 'sinh' 'sqrt' 'tan' 'tanh' ; function = ident , '(' , formula [',' , formula] , ')' ; formula = term , { ['+' '-'] , term } ; term = power , { ['*' '/' '%'] , power } ; power = unary ['^' , unary] ; unary = ['+' '-'] , factor ; factor = variable constant function parens ; parens = '(' , formula , ')' ;</pre> <p>[Note: Formulas can only support a calcMode (Calculation Mode) of linear or discrete. If another calcMode is specified or no calcMode is specified then a calcMode of linear is assumed. <i>end note</i>]</p> <p>[Note: Any additional characters in the formula string that are not contained within the set described are considered invalid. <i>end note</i>]</p> <p>Variables:</p> <table><tr><th>Name</th><th>Description</th></tr><tr><td>\$</td><td>Formula input</td></tr><tr><td>ppt_x</td><td>Pre-animation x position of the object on the slide</td></tr><tr><td>ppt_y</td><td>Pre-animation y position of the object on the slide</td></tr><tr><td>ppt_w</td><td>Pre-animation width of the object</td></tr><tr><td>ppt_h</td><td>Pre-animation height of the object</td></tr></table> <p>Constants:</p> <table><tr><th>Name</th><th>Description</th></tr><tr><td>pi</td><td>Mathematical constant pi</td></tr><tr><td>e</td><td>Mathematical constant e</td></tr></table> <p>Operators:</p> <table><tr><th>Name</th><th>Description</th><th>Usage</th></tr><tr><td>+</td><td>Addition</td><td>“x+y”, adds x to the value y</td></tr><tr><td>-</td><td>Subtraction</td><td>“x-y”, subtracts y from the value x</td></tr><tr><td>*</td><td>Multiplication</td><td>“x*y”, multiplies x by the value y</td></tr></table>	Name	Description	\$	Formula input	ppt_x	Pre-animation x position of the object on the slide	ppt_y	Pre-animation y position of the object on the slide	ppt_w	Pre-animation width of the object	ppt_h	Pre-animation height of the object	Name	Description	pi	Mathematical constant pi	e	Mathematical constant e	Name	Description	Usage	+	Addition	“x+y”, adds x to the value y	-	Subtraction	“x-y”, subtracts y from the value x	*	Multiplication	“x*y”, multiplies x by the value y
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*	Multiplication	“x*y”, multiplies x by the value y																													

Attributes	Description		
	/	Division	"x/y", divides x by the value y
	%	Modulus	"x%y", the remainder of x/y
	^	Power	"x^y", x raised to the power y
	Functions:		
	Name	Description	Usage
	abs	Absolute value	"abs(x)", absolute value of x
	acos	Arc Cosine	"acos(x)", arc cosine of the value x
	asin	Arc Sine	"asin(x)", arc sine of the value x
	atan	Arc Tangent	"atan(x)", arc tangent of the value x
	ceil	Ceil value	"ceil(x)", value of x rounded up
	cos	Cosine	"cos(x)", cosine of the value of x
	cosh	Hyperbolic Cosine	"cosh(x)", hyperbolic cosine of the value x
	deg	Radiant to Degree convert	"deg(x)", the degree value of radiant value x
	exp	Exponent	"exp(x)", value of constant e raised to the power of x
	floor	Floor value	"floor(x)", value of x rounded down
	ln	Natural logarithm	"ln(x)", natural logarithm of x
	max	Maximum of two values	"max(x,y)", returns x if (x > y) or returns y if (y > x)
	min	Minimum of two values	"min(x,y)", returns x if (x < y) or returns y if (y < x)
	rad	Degree to Radiant convert	"rad(x)", the radiant value of degree value x
	rand	Random value	"rand(x)", returns a random floating point value between 0 and x
	sin	Sine	"sin(x)", sine of the value x
	sinh	Hyperbolic Sine	"sinh(x)", hyperbolic sine of the value x
	sqrt	Square root	"sqrt(x)", square root of the value x
	tan	Tangent	"tan(x)", tangent of the value x
	tanh	Hyperbolic Tangent	"tanh(x)", hyperbolic tangent of the value x
[Example: Consider the following animation path:			

Attributes	Description
	<pre> <p:animcalcmode="lin" valueType="num"> <p:CBhvr> <p:cTn id="9" dur="664" tmFilter="0.0,0.0; 0.25,0.07; 0.50,0.2; 0.75,0.467; 1.0,1.0"> <p:stCondLst> <p:cond delay="0"/> </p:stCondLst> </p:cTn> <p:tgtEl> <p:spTgtspid="4"/> </p:tgtEl> <p:attrNameLst> <p:attrName>ppt_y</p:attrName> </p:attrNameLst> </p:CBhvr> <p:tavLst> <p:tav tm="0%" fmla="#ppt_y-sin(pi*\$)/3"> <p:val> <p:fltValval="0.5"/> </p:val> </p:tav> <p:tav tm="100%"> <p:val> <p:fltValval="1"/> </p:val> </p:tav> </p:tavLst> </p:anim> </pre> <p>The animation example above modifies the ppt_y variable of the object by subtracting $\sin(\pi * \\$)/3$ from the non-animated value of ppt_y. The start value is 0.5 and the end value is 1 specified in each of the val elements. The total time for this animation is specified within the dur attribute and the filtered time graph is specified by the tmFilter attribute. The end result is that the object moves from a point above its non-animated position back to its non-animated position. With the specification of the tmFilter it has a modified time graph such that it also appears to accelerate as it reaches its final position.</p> <p>[Note: For this example, the non-animated value of ppt_y is the value of this variable if the object were to be statically rendered on the slide without animation properties. <i>end note</i>]</p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
tm (Time)	This attribute specifies the time at which the attribute being animated takes on the value.

Attributes	Description
	The possible values for this attribute are defined by the ST_TLTimeAnimateValueTime simple type (§19.7.39).

[Note: The W3C XML Schema definition of this element's content model ([CT_TLTimeAnimateValue](#)) is located in §A.3. *end note*]

19.5.80 **tavLst (Time Animated Value List)**

This element specifies a list of time animated value elements.

[Example: Consider a shape with a "fly-in" animation. The <tav> element should be used as follows:

```
<p:anim calcmode="lin" valueType="num">
  <p:cBhvr additive="base"> ... </p:cBhvr>
  <p:tavLst>
    <p:tav tm="0%">
      <p:val>
        <p:strVal val="1+#ppt_h/2"/>
      </p:val>
    </p:tav>
    <p:tav tm="100000">
      <p:val>
        <p:strVal val="#ppt_y"/>
      </p:val>
    </p:tav>
  </p:tavLst>
</p:anim>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_TLTimeAnimateValueList](#)) is located in §A.3. *end note*]

19.5.81 **tgtEl (Target Element)**

This element specifies the target children elements which have the animation effects applied to.

[Example: Consider a shape with ID 3 with a fade effect animation applied to it. The <tgtEl> element should be used as follows:

```
<p:animEffect transition="in" filter="fade">
  <p:cBhvr>
    <p:cTn id="7" dur="2000"/>
```

```

    <p:tgtEl>
      <p:spTgt spid="3"/>
    </p:tgtEl>
  </p:cBhvr>
</p:animEffect>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TLTimeTargetElement](#)) is located in §A.3. *end note*]

19.5.82 tmAbs (Time Absolute)

This element describes the duration of the iteration interval in absolute time.

[*Example:* Consider a text animation where the words appear letter by letter every 10 seconds. The <tmAbs> element should be used as follows:

```

<p:par>
  <p:cTn id="5" >
    <p:stCondLst> ... </p:stCondLst>
    <p:iterate type="lt">
      <p:tmAbs val="10000"/>
    </p:iterate>
    <p:childTnLst> ... </p:childTnLst>
  </p:cTn>
</p:par>

```

end example]

Attributes	Description
val (Time)	<p>This attribute describes an amount of time, in milliseconds.</p> <p>The possible values for this attribute are defined by the ST_TLTime simple type (§19.7.38).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TLIterateIntervalTime](#)) is located in §A.3. *end note*]

19.5.83 tmPct (Time Percentage)

This element describes the duration of the iteration interval in a percentage of time.

[*Example:* Consider a text animation where the words appear letter by letter every 10th of the animation duration. The <tmPct> element should be used as follows:

```
<p:par>
  <p:cTn id="5" >
    <p:stCondLst> ... </p:stCondLst>
    <p:iterate type="lt">
      <p:tmPct val="10%"/>
    </p:iterate>
    <p:childTnLst> ... </p:childTnLst>
  </p:cTn>
</p:par>
```

end example]

Attributes	Description
val (Value)	This attribute specifies the time expressed as a percentage. The possible values for this attribute are defined by the ST_PositivePercentage simple type (§20.1.10.45).

[Note: The W3C XML Schema definition of this element’s content model ([CT_TLiterateIntervalPercentage](#)) is located in §A.3. *end note*]

19.5.84 [tmpl \(Template Effects\)](#)

This element specifies the "template" effects that are used by the build element. Template effects are used in text builds on the master slide. They define the rules of what effect should be applied to the 1st level paragraph, 2nd level paragraph, etc.

[Example: Consider a template with a fade in effect applied to it. The <tmpl> element should be used as follows:

```
<p:timing>
  <p:tnLst> ... </p:tnLst>
  <p:bldLst>
    <p:bldP spid="3" grpId="0" build="p">
      <p:tmplLst>
        <p:tmpl lvl="1">
        </p:tmpl>
      </p:tmplLst>
    </p:bldP>
  </p:bldLst>
</p:timing>
```

end example]

Attributes	Description
lvl (Level)	<p>This attribute describes the paragraph indent level to which this template effect applies.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TLTemplate](#)) is located in §A.3. *end note*]

19.5.85 **tmplLst (Template effects)**

This element describes a list of template effects that describe what kind of effects should be applied to a paragraph level properties.

[Example: Consider a template with a fade in effect applied to it. The <tmpl> element should be used as follows:

```
<p:timing>
  <p:tnLst> ... </p:tnLst>
  <p:bldLst>
    <p:bldP spid="3" grpId="0" build="p">
      <p:tmplLst>
        <p:tmpl lvl="1">
          </p:tmpl>
        </p:tmplLst>
      </p:bldP>
    </p:bldLst>
  </p:timing>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_TLTemplateList](#)) is located in §A.3. *end note*]

19.5.86 **tn (Time Node)**

This element describes the time node trigger choice.

[Example: Consider a time node with an event condition. The <tn> element should be used as follows:

```
<p:par>
  <p:cTn id="5">
    <p:stCondLst>
      <p:cond delay="0"/>
    </p:stCondLst>
    <p:endCondLst>
      <p:cond evt="begin" delay="0">
    </p:endCondLst>
  </p:cTn>
</p:par>
```

```

        <p:tn val="5"/>
      </p:cond>
    </p:endCondLst>
    <p:childTnLst> ... </p:childTnLst>
  </p:cTn>
</p:par>

```

end example]

Attributes	Description
val (Value)	This attribute specifies a time node identifier. The possible values for this attribute are defined by the ST_TLTimeNodeID simple type (§19.7.42).

[Note: The W3C XML Schema definition of this element’s content model ([CT_TLTriggerTimeNodeID](#)) is located in §A.3. *end note*]

19.5.87 tnLst (Time Node List)

This element specifies a list of time node elements used in an animation sequence.

[Example: Consider a simple animation sequence. The <tnLst> element should be used as follows:

```

<p:timing>
  <p:tnLst>
    <p:par> ... </p:par>
  </p:tnLst>
</p:timing>

```

end example]

[Note: The W3C XML Schema definition of this element’s content model ([CT_TimeNodeList](#)) is located in §A.3. *end note*]

19.5.88 to (To)

This element specifies the target location for an animation motion or animation scale effect

[Example: Consider an animation with a "light speed" entrance effect.

```

<p:animScale>
  <p:cBhvr>
    <p:cTn id="9" dur="200" decel="10.5%" autoRev="1" fill="hold">
      <p:stCondLst>
        <p:cond delay="600"/>
      </p:stCondLst>
    </p:cTn>
  </p:cBhvr>
</p:animScale>

```



```

    </p:stCondLst>
  </p:cTn>
  <p:tgtEl>
    <p:spTgt spid="4"/>
  </p:tgtEl>
</p:cBhvr>
<p:from x="100%" y="100%"/>
<p:to x="80%" y="100%"/>
</p:animScale>

```

end example]

Attributes	Description
x (X coordinate)	This attribute describes the X coordinate. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).
y (Y coordinate)	This attribute describes the Y coordinate. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).

[Note: The W3C XML Schema definition of this element's content model ([CT_TLPoint](#)) is located in §A.3. *end note]*

19.5.89 to (To)

The element specifies the certain attribute of a time node after an animation effect.

[Example: Consider an animation effect that leaves a string value visible afterwards. The <to> element should be used as follows:

```

<p:childTnLst>
  <p:set>
    <p:cBhvr> ... </p:cBhvr>
    <p:to>
      <p:strVal val="visible"/>
    </p:to>
  </p:set>
  <p:anim calcmode="lin" valueType="num"> ... </p:anim>
...</p:childTnLst>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TLAnimVariant](#)) is located in §A.3. *end note*]

19.5.90 to (To)

This element specifies the resulting color for the animation color change.

[*Example:* Consider emphasize a shape by changing its fill color from blue to red. The <to> element should be used as follows:

```
<p:childTnLst>
  <p:animClr clrSpc="rgb">
    <p:cBhvr> ... </p:cBhvr>
    <p:to>
      <a:schemeClr val="accent2"/>
    </p:to>
  </p:animClr>
</p:childTnLst>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Color](#)) is located in §A.4.1. *end note*]

19.5.91 txEl (Text Element)

This element specifies a text element to animate.

[*Example:* Consider a shape containing text to be animated. The <txEl> should be used as follows:

```
<p:tgtEl>
  <p:spTgt spid="5">
    <p:txEl>
      <p:pRg st="1" end="1"/>
    </p:txEl>
  </p:spTgt>
</p:tgtEl>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TLTextTargetElement](#)) is located in §A.3. *end note*]

19.5.92 val (Value)

The element specifies a value for a time animate.

[*Example:* Consider a shape with a fade in animation effect. The <val> element should be used as follows:

```

<p:anim calcmode="lin" valueType="num">
  <p:cBhvr additive="base"> ... </p:cBhvr>
  <p:tavLst>
    <p:tav tm="0%">
      <p:val>
        <p:strVal val="0-#ppt_w/2"/>
      </p:val>
    </p:tav>
    <p:tav tm="100%">
      <p:val>
        <p:strVal val="#ppt_x"/>
      </p:val>
    </p:tav>
  </p:tavLst>
</p:anim>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TLAnimVariant](#)) is located in §A.3.
end note]

19.5.93 video (Video)

This element specifies video information in an animation sequence. This element specifies that this node within the animation tree triggers the playback of a video file; the actual video file used is specified by the `videoFile` element (§20.1.3.6).

[*Example:* Consider a slide with an animated video content. The `<video>` element is used as follows:

```

<p:cSld>
  <p:spTree>
    <p:pic>
      <p:nvPicPr>
        <p:cNvPr id="4"/>
        ...
        <p:nvPr>
          <a:videoFile r:link="rId1" contentType="video/ogg"/>
        </p:nvPr>
      </p:nvPicPr>
      ...
    </p:pic>
  </p:spTree>
</p:cSld>
...
<p:childTnLst>

```

```
<p:seq concurrent="1" nextAc="seek">
...
</p:seq>
<p:video>
  <p:cMediaNode>
    ...
    <p:tgtEl>
      <p:spTgt spid="4"/>
    </p:tgtEl>
  </p:cMediaNode>
</p:video>
</p:childTnLst>
```

The video element specifies the location of the video playback within the animation sequence; its child spTgt element specifies that the shape which contains the video to be played has a shape ID of 4. If we look at the shape with that ID value, its child videoFile element references an external video file of content type video/ogg located at the target of the relationship with ID rId1.*end example*

Attributes	Description
fullScrn (Full Screen)	This attribute specifies if the video is displayed in full-screen. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

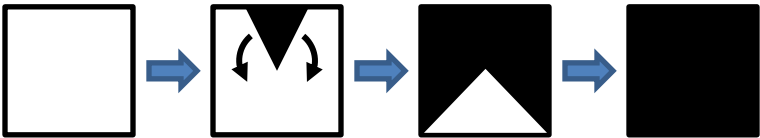
[Note: The W3C XML Schema definition of this element’s content model ([CT_TLMediaNodeVideo](#)) is located in §A.3. *end note*]

19.5.94 wedge (Wedge Slide Transition)

This element describes the wedge slide transition effect, which uses two radial edges that wipe from top to bottom in opposite directions until the new slide is fully shown. The rendering of this transition has been shown below.

[Example: Consider the following case in which the “wedge” slide transition is applied to a slide, along with a set of attributes. The proper usage and a sample rendering are shown below, with the XML fragments preceding the corresponding rendering:

```
<p:transition>
  <p:wedge/>
</p:transition>
```



end example]

[*Note:* Any rendering shown above is for example purposes only. Exact rendering of any transition is determined by the rendering application. As such, the same transition can have many variations depending on the implementation. *end note]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Empty](#)) is located in §A.3. *end note]*

19.5.95 wheel (Wheel Slide Transition)

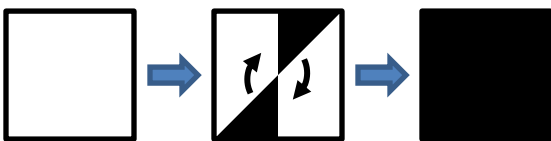
This element describes the wheel slide transition effect, which uses a set of radial edges and wipes them in the clockwise direction until the new slide is fully shown. The rendering of this transition depends upon the attributes specified which have been shown below.

[*Example:* Consider the following cases in which the “wheel” slide transition is applied to a slide, along with a set of attributes. The proper usage and sample renderings are shown below, with the XML fragments preceding the corresponding rendering:

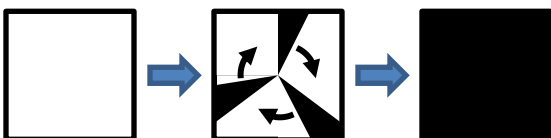
```
<p:transition>
  <p:wheel spokes="1"/>
</p:transition>
```



```
<p:transition>
  <p:wheel spokes="2"/>
</p:transition>
```

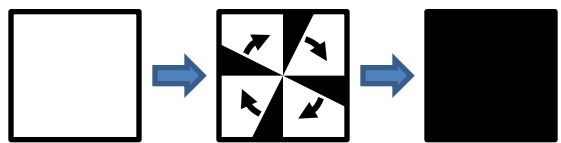


```
<p:transition>
  <p:wheel spokes="3"/>
</p:transition>
```

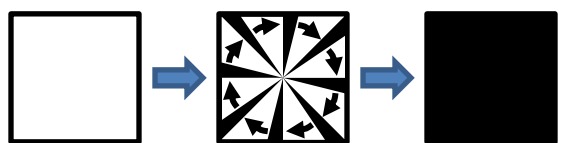


```
<p:transition>
```

```
<p:wheel spokes="4"/>
</p:transition>
```



```
<p:transition>
  <p:wheel spokes="8"/>
</p:transition>
```



end example]

[*Note:* Any rendering shown above is for example purposes only. Exact rendering of any transition is determined by the rendering application. As such, the same transition can have many variations depending on the implementation. *end note]*

Attributes	Description
spokes (Spokes)	This attributes specifies the number of spokes ("pie pieces") in the wheel The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_WheelTransition](#)) is located in §A.3. *end note]*

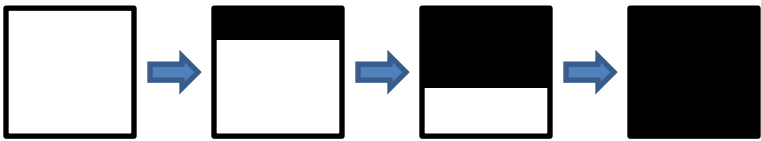
19.5.96 wipe (Wipe Slide Transition)

This element describes the wipe slide transition effect, which wipes the new slide over the previous slide from one edge of the screen to the opposite until the new slide is fully shown. The rendering of this transition depends upon the attributes specified which have been shown below.

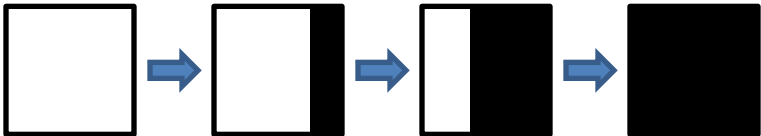
[*Example:* Consider the following cases in which the “wipe” slide transition is applied to a slide, along with a set of attributes. The proper usage and sample renderings are shown below, with the XML fragments preceding the corresponding rendering:

```
<p:transition>
  <p:wipe dir="d"/>
```

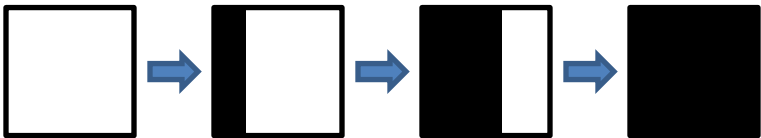
</p:transition>



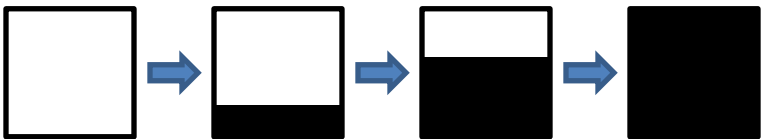
<p:transition>
 <p:wipe dir="t"/>
</p:transition>



<p:transition>
 <p:wipe dir="l"/>
</p:transition>



<p:transition>
 <p:wipe dir="r"/>
</p:transition>



end example]

[*Note:* Any rendering shown above is for example purposes only. Exact rendering of any transition is determined by the rendering application. As such, the same transition can have many variations depending on the implementation. *end note]*

Attributes	Description
dir (Direction)	This attribute specifies the direction of the slide transition. The possible values for this attribute are defined by the ST_TransitionSideDirectionType simple type (§19.7.53).

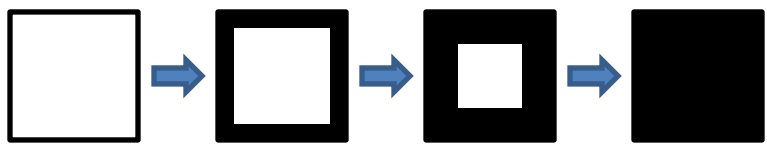
[*Note:* The W3C XML Schema definition of this element’s content model ([CT_SideDirectionTransition](#)) is located in §A.3. *end note]*

19.5.97 zoom (Zoom Slide Transition)

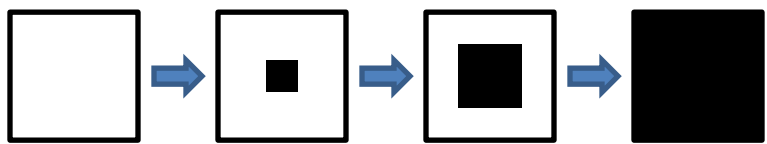
This element describes the zoom slide transition effect, which uses a box pattern centered on the slide that increases in size until the new slide is fully shown. The rendering of this transition depends upon the attributes specified which have been shown below.

[Example: Consider the following cases in which the “zoom” slide transition is applied to a slide, along with a set of attributes. The proper usage and sample renderings are shown below, with the XML fragments preceding the corresponding rendering:

```
<p:transition>
  <p:zoom dir="in"/>
</p:transition>
```



```
<p:transition>
  <p:zoom dir="out"/>
</p:transition>
```



end example]

[Note: Any rendering shown above is for example purposes only. Exact rendering of any transition is determined by the rendering application. As such, the same transition can have many variations depending on the implementation. end note]

Attributes	Description
dir (Direction)	This attribute specifies the direction of an "in/out" slide transition. The possible values for this attribute are defined by the ST_TransitionInOutDirectionType simple type (§19.7.52).

[Note: The W3C XML Schema definition of this element’s content model ([CT_InOutTransition](#)) is located in §A.3. end note]

19.6 Slide Synchronization Data

It is often the case that slides are repurposed from existing presentations to be used in other presentations. In such cases, it is often beneficial for there to be an association, or a pairing, between the original slide and all

copied instances of it. In the presence of such a pairing, applications can enable a variety of time-saving features, including the automatic updates of copied slides when the original slide changes. The Slide Synchronization Data part is designed to enable such application-defined functionality.

This information is stored in the Slide Synchronization Data part, which is referenced via an implicit relationship from the associated Slide part.

19.6.1 sldSyncPr (Slide Synchronization Properties)

This element specifies the information needed to associate the original slide with all copied instances of it.

Attributes	Description
clientInsertedTime (Client Slide Insertion date/time)	<p>The date and time that the original slide was last updated in the current presentation.</p> <p>The date/time is stored in ISO 8601 format.</p> <p>[<i>Note</i>: This value can be used to inform the user of when the last synchronization was, as well as to determine when to next check for an updated version. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema dateTime datatype.</p>
serverSldId (Server's Slide File ID)	<p>A string that, when paired with the target of the Slide Synchronization Data part's external relationship, uniquely identifies the original slide.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
serverSldModified Time (Server's Slide File's modification date/time)	<p>The date and time that the original slide was last modified in its location as defined by the target of the Slide Synchronization Data part's external relationship.</p> <p>The date and time are stored in ISO 8601 format.</p> <p>The possible values for this attribute are defined by the W3C XML Schema dateTime datatype.</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_SlideSyncProperties](#)) is located in §A.3. *end note*]

19.7 Simple Types

This is the complete list of simple types dedicated to PresentationML.

19.7.1 ST_BookmarkIdSeed (Bookmark ID Seed)

This simple type specifies constraints for value of the Bookmark ID seed.

This simple type's contents are a restriction of the W3C XML Schema unsignedInt datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 1.
- This simple type has a maximum value of less than 2147483648.

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_BookmarkIdSeed](#)) is located in §A.3. end note*]

19.7.2 ST_Direction (Direction)

This simple type defines a direction of either horizontal or vertical.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
horz (Horizontal)	Defines a horizontal direction.
vert (Vertical)	Defines a vertical direction.

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_Direction](#)) is located in §A.3. end note*]

19.7.3 ST_Index (Index)

This simple type defines the position of an object in an ordered list.

This simple type's contents are a restriction of the W3C XML Schema unsignedInt datatype.

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_Index](#)) is located in §A.3. end note*]

19.7.4 ST_IterateType (Iterate Type)

This simple type specifies how the animation is applied over subelements of the target element.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
el (Element)	Iterate by element.

Enumeration Value	Description
lt (Letter)	Iterate by Letter.
wd (Word)	Iterate by Word.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_IterateType](#)) is located in §A.3. *end note*]

19.7.5 ST_Name (Name string)

This simple type specifies a name, such as for a comment author or custom show.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_Name](#)) is located in §A.3. *end note*]

19.7.6 ST_OleObjectFollowColorScheme (Embedded object to Follow Color Scheme)

This simple type determines if the Embedded object is re-colored to reflect changes to the color schemes.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
full (Full)	Setting this enumeration causes the Embedded object to respond to all changes in the color scheme in the presentation.
none (None)	Setting this enumeration causes the Embedded object to not respond to changes in the color scheme in the presentation.
textAndBackground (Text and Background)	Setting this enumeration causes the Embedded object to respond only to changes in the text and background colors of the color scheme in the presentation.



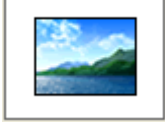
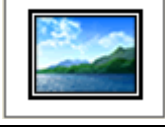


[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_OleObjectFollowColorScheme](#)) is located in §A.3. *end note*]

19.7.7 ST_PhotoAlbumFrameShape (Photo Album Shape for Photo Mask)

This simple type specifies the values for photo frame types within a photo album presentation.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
frameStyle1 (Rectangle Photo Frame)	
frameStyle2 (Rounded Rectangle Photo Frame)	
frameStyle3 (Simple White Photo Frame)	
frameStyle4 (Simple Black Photo Frame)	
frameStyle5 (Compound Black Photo Frame)	
frameStyle6 (Center Shadow Photo Frame)	
frameStyle7 (Soft Edge Photo Frame)	


[Note: The W3C XML Schema definition of this simple type's content model ([ST_PhotoAlbumFrameShape](#)) is located in §A.3. *end note*]




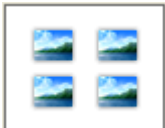
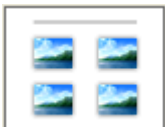
19.7.8 ST_PhotoAlbumLayout (Photo Album Layout Definition)


This simple type specifies the values for photo layouts within a photo album presentation.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
1pic (1 Photo per Slide)	

Enumeration Value	Description
	Specifies that photo album slides should have a single picture, centered horizontally and vertically, on the slide with no title.
1picTitle (1 Photo per Slide with Titles)	 <p>Specifies that photo album slides should have a single picture and a single title text box, centered horizontally and vertically, on the slide.</p>
2pic (2 Photos per Slide)	 <p>Specifies that photo album slides should have two pictures of the same size, positioned side-by-side, centered horizontally and vertically, on the slide with no title.</p>
2picTitle (2 Photos per Slide with Titles)	 <p>Specifies that photo album slides should have two pictures of the same size, positioned side-by-side, with a single title text box centered over them, collectively centered horizontally and vertically, on the slide.</p>
4pic (4 Photos per Slide)	 <p>Specifies that photo album slides should have four pictures of the same size, positioned in a two-by-two matrix, centered horizontally and vertically, on the slide with no title.</p>
4picTitle (4 Photos per Slide with Titles)	 <p>Specifies that photo album slides should have four pictures of the same size, positioned in a two-by-two matrix, with a single title text box centered over the matrix, centered horizontally and vertically, on the slide.</p>

Enumeration Value	Description
fitToSlide (Fit Photos to Slide)	 <p>Specifies that photo album slides should have a single picture, stretched to fit the entire slide size, with no title.</p>

[Note: The W3C XML Schema definition of this simple type's content model ([ST_PhotoAlbumLayout](#)) is located in §A.3. *end note*]

19.7.9 ST_PlaceholderSize (Placeholder Size)

This simple type facilitates the storing of the size of the placeholder. This size is described relative to the body placeholder on the master.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
full (Full)	Specifies that the placeholder should take the full size of the body placeholder on the master.
half (Half)	Specifies that the placeholder should take the half size of the body placeholder on the master. Half size vertically or horizontally? Needs a picture.
quarter (Quarter)	Specifies that the placeholder should take a quarter of the size of the body placeholder on the master. Picture would be helpful

[Note: The W3C XML Schema definition of this simple type's content model ([ST_PlaceholderSize](#)) is located in §A.3. *end note*]

19.7.10 ST_PlaceholderType (Placeholder IDs)

This simple type facilitates the storing of the content type a placeholder should contain.

[Note: Some placeholder types are not allowed for all SlideBase types. *end note*]

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
body (Body)	Contains body text. Allowed for Slide, Slide Layout,

Enumeration Value	Description
	Slide Master, Notes, Notes Master. Can be horizontal or vertical on Slide and Slide Layout.
chart (Chart)	Contains a chart or graph. Special type. Allowed for Slide and Slide Layout.
clipArt (Clip Art)	Contains a single clip art image. Special type. Allowed for Slide and Slide Layout.
ctrTitle (Centered Title)	Contains a title intended to be centered on the slide. Allowed for Slide and Slide Layout.
dgm (Diagram)	Contains a diagram. Special type. Allowed for Slide and Slide Layout.
dt (Date and Time)	Contains the date and time. Allowed for Slide, Slide Layout, Slide Master, Notes, Notes Master, Handout Master
fttr (Footer)	Contains text to be used as a footer in the document. Allowed for Slide, Slide Layout, Slide Master, Notes, Notes Master, Handout Master
hdr (Header)	Contains text to be used as a header for the document. Allowed for Notes, Notes Master, Handout Master .
media (Media)	Contains multimedia content such as audio or a movie clip. Special type. Allowed for Slide and Slide Layout.
obj (Object)	Contains any content type. Special type. Allowed for Slide and Slide Layout.
pic (Picture)	Contains a picture. Special type. Allowed for Slide and Slide Layout.
sldImg (Slide Image)	Contains an image of the slide. Allowed for Notes and Notes Master.
sldNum (Slide Number)	Contains the number of a slide. Allowed for Slide, Slide Layout, Slide Master, Notes, Notes Master, Handout Master
subTitle (Subtitle)	Contains a subtitle. Allowed for Slide and Slide Layout.
tbl (Table)	Contains a table. Special type. Allowed for Slide and Slide Layout.
title (Title)	Contains a slide title. Allowed for Slide, Slide Layout and Slide Master. Can be horizontal or vertical on Slide and Slide Layout.

[Note: The W3C XML Schema definition of this simple type's content model ([ST PlaceholderType](#)) is located in §A.3. end note]

19.7.11 ST_PrintColorMode (Print Color Mode)

This simple type specifies the color mode that should be used when printing a presentation document.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
bw (Black and White Mode)	Print should be in Black and White only
clr (Color Mode)	Print should be in Full Color
gray (Grayscale Mode)	Print should be in Grayscale only

[Note: The W3C XML Schema definition of this simple type's content model ([ST_PrintColorMode](#)) is located in §A.3. *end note*]

19.7.12 ST_PrintWhat (Default print output)

This simple type specifies the default print layout that should be used when printing

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
handouts1 (1 Slide / Handout Page)	1 Slide and Handout Page layout should be used.
handouts2 (2 Slides / Handout Page)	2 Slides and Handout Page layout should be used.
handouts3 (3 Slides / Handout Page)	3 Slides and Handout Page layout should be used.
handouts4 (4 Slides / Handout Page)	4 Slides and Handout Page layout should be used.
handouts6 (6 Slides / Handout Page)	6 Slides and Handout Page layout should be used.
handouts9 (9 Slides / Handout Page)	9 Slides and Handout Page layout should be used.
notes (Notes)	Notes layout should be used.
outline (Outline)	Outline layout should be used.
slides (Slides)	Slides layout should be used.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_PrintWhat](#)) is located in §A.3. *end note*]

19.7.13 ST_SlideId (Slide Identifier)

This simple type specifies the allowed numbering for the slide identifier.

This simple type's contents are a restriction of the W3C XML Schema unsignedInt datatype.

This simple type also specifies the following restrictions:

- This simple type has a maximum value of less than 2147483648.
- This simple type has a minimum value of greater than or equal to 256.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_SlideId](#)) is located in §A.3. *end note*]

19.7.14 ST_SlideLayoutId (Slide Layout ID)

This simple type sets the bounds for the slide layout id value. This layout id is used to identify the different slide layout designs.

This simple type's contents are a restriction of the W3C XML Schema unsignedInt datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 2147483648.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_SlideLayoutId](#)) is located in §A.3. *end note*]


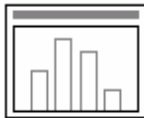
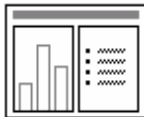
19.7.15 ST_SlideLayoutType (Slide Layout Type)



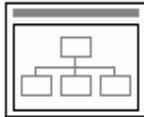







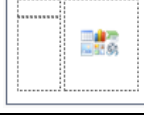

This simple type defines an arrangement of content on a slide. Each layout type is not tied to an exact positioning of placeholders, but rather provides a higher-level description of the content type and positioning of placeholders. This information can be used by the application to aid in mapping between different layouts. The application can choose which, if any, of these layouts to make available through its user interface.


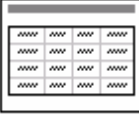


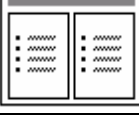






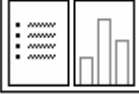
Each layout contains zero or more placeholders, each with a specific content type. An "object" placeholder can contain any kind of data. Media placeholders are intended to hold video or audio clips. The enumeration value descriptions include illustrations of sample layouts for each value of the simple type.






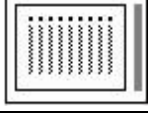

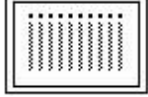
This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
blank (Slide Layout Type Enumeration (Blank))	 Blank
chart (Chart)	 Title and chart
chartAndTx (Slide Layout Type Enumeration (Chart and Text))	 Title, chart on left and text on right

Enumeration Value	Description
clipArtAndTx (Clip Art and Text)	 Title, clipart on left, text on right
clipArtAndVertTx (Clip Art and Vertical Text)	 Title, clip art on left, vertical text on right
cust (Slide Layout Type Enumeration (Custom))	Custom layout defined by user
dgm (Slide Layout Type Enumeration (Diagram))	 Title and diagram
fourObj (Four Objects)	 Title and four objects
mediaAndTx (Slide Layout Type Enumeration (Media and Text))	 Title, media on left, text on right
obj (Title and Object)	 Title and object
objAndTwoObj (Object and Two Object)	 Title, one object on left, two objects on right
objAndTx (Slide Layout Type Enumeration (Object and Text))	 Title, object on left, text on right
objOnly (Object)	 Object only
objOverTx (Slide Layout Type Enumeration (Object over Text))	 Title, object on top, text on bottom
objTx (Title, Object, and Caption)	 Title, object and caption text
picTx (Picture and Caption)	 Title, picture, and caption text
secHead (Section Header)	Section header title and subtitle text

Enumeration Value	Description
	
tbl (Slide Layout Type Enumeration (Table))	 Title and table
title (Slide Layout Type Enumeration (Title))	 Title layout with centered title and subtitle placeholders
titleOnly (Slide Layout Type Enumeration (Title Only))	 Title only
twoColTx (Slide Layout Type Enumeration (Two Column Text))	 Title, text on left, text on right
twoObj (Two Objects)	 Title, object on left, object on right
twoObjAndObj (Two Objects and Object)	 Title, two objects on left, one object on right
twoObjAndTx (Two Objects and Text)	 Title, two objects on left, text on right
twoObjOverTx (Two Objects over Text)	 Title, two objects on top, text on bottom
twoTxTwoObj (Two Text and Two Objects)	 Title, two objects each with text
tx (Slide Layout Type Enumeration (Text))	 Title and text
txAndChart (Slide Layout Type Enumeration (Text and Chart))	 Title, text on left and chart on right

Enumeration Value	Description
txAndClipArt (Text and Clip Art)	 Title, text on left, clip art on right
txAndMedia (Slide Layout Type Enumeration (Text and Media))	 Title, text on left, media on right
txAndObj (Slide Layout Type Enumeration (Text and Object))	 Title, text on left, object on right
txAndTwoObj (Text and Two Objects)	 Title, text on left, two objects on right
txOverObj (Slide Layout Type Enumeration (Text over Object))	 Title, text on top, object on bottom
vertTitleAndTx (Vertical Title and Text)	 Vertical title on right, vertical text on left
vertTitleAndTxOverChart (Vertical Title and Text Over Chart)	 Vertical title on right, vertical text on top, chart on bottom
vertTx (Vertical Text)	 Title and vertical text body

[Note: The W3C XML Schema definition of this simple type's content model ([ST_SlideLayoutType](#)) is located in §A.3. end note]

19.7.16 ST_SlideMasterId (Slide Master ID)

This simple type specifies the allowed numbering for the slide master identifier.

This simple type's contents are a restriction of the W3C XML Schema unsignedInt datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 2147483648.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_SlideMasterId](#)) is located in §A.3. end note]

19.7.17 ST_SlideSizeCoordinate (Slide Size Coordinate)

This simple type specifies the slide size coordinate in EMUs (English Metric Units).

This simple type's contents are a restriction of the ST_PositiveCoordinate32 datatype (§20.1.10.42).

This simple type also specifies the following restrictions:

- This simple type has a maximum value of less than or equal to 51206400.
- This simple type has a minimum value of greater than or equal to 914400.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_SlideSizeCoordinate](#)) is located in §A.3. *end note*]

19.7.18 ST_SlideSizeType (Slide Size Type)

This simple type specifies the kind of slide size that the slide should be optimized for.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
35mm (35mm Film)	Slide size should be optimized for 35mm film output
A3 (A3)	Slide size should be optimized for A3 output
A4 (A4)	Slide size should be optimized for A4 output
B4ISO (B4ISO)	Slide size should be optimized for B4ISO output
B4JIS (B4JIS)	Slide size should be optimized for B4JIS output
B5ISO (B5ISO)	Slide size should be optimized for B5ISO output
B5JIS (B5JIS)	Slide size should be optimized for B5JIS output
banner (Banner)	Slide size should be optimized for banner output
custom (Custom)	Slide size should be optimized for custom output
hagakiCard (Hagaki Card)	Slide size should be optimized for hagaki card output
ledger (Ledger)	Slide size should be optimized for ledger output
letter (Letter)	Slide size should be optimized for letter output
overhead (Overhead)	Slide size should be optimized for overhead output
screen16x10 (Screen 16x10)	Slide size should be optimized for 16x10 screen output
screen16x9 (Screen 16x9)	Slide size should be optimized for 16x9 screen output
screen4x3 (Screen 4x3)	Slide size should be optimized for 4x3 screen output

[Note: The W3C XML Schema definition of this simple type's content model ([ST_SlideSizeType](#)) is located in §A.3. *end note*]

19.7.19 ST_SplitterBarState (Splitter Bar State)

This simple type specifies the state that the splitter bar should be shown in. The splitter bar separates a primary and secondary region within a viewing area.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
maximized (Max)	The primary region occupies the greatest amount of the viewing area allowed by the application.
minimized (Min)	The primary region occupies the least amount of the viewing area allowed by the application.
restored (Restored)	The primary region has a specific intermediate size.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_SplitterBarState](#)) is located in §A.3. *end note*]

19.7.20 ST_TLAnimateBehaviorCalcMode (Time List Animate Behavior Calculate Mode)

This simple type specifies how the animation flows from point to point.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
discrete (Calc Mode Enum (Discrete))	Discrete
fm1a (Calc Mode Enum (Formula))	Formula
lin (Calc Mode Enum (Linear))	Linear

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TLAnimateBehaviorCalcMode](#)) is located in §A.3. *end note*]

19.7.21 ST_TLAnimateBehaviorValueType (Time List Animate Behavior Value Types)

This simple type specifies the type of property value.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
clr (Value Type Enum (Color))	Color
num (Value Type Enum (Number))	Number
str (Value Type Enum (String))	String

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TLAnimateBehaviorValueType](#)) is located in §A.3. *end note*]

19.7.22 ST_TLAnimateColorDirection (Time List Animate Color Direction)

This simple type specifies the direction in which to interpolate the animation (clockwise or counterclockwise).

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
ccw (Counter-Clockwise)	Counter-Clockwise
cw (Direction Enum (Clockwise))	Clockwise

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TLAnimateColorDirection](#)) is located in §A.3. *end note*]

19.7.23 ST_TLAnimateColorSpace (Time List Animate Color Space)

This simple type specifies the color space of the animation.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
hsl (Color Space Enum (HSL))	Hue, Saturation, Luminance
rgb (Color Space Enum (RGB))	Red, Green, Blue

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TLAnimateColorSpace](#)) is located in §A.3. *end note*]

19.7.24 ST_TLAnimateEffectTransition (Time List Animate Effect Transition)

This simple type specifies whether the effect is a transition in, transition out, or neither.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
in (Transition Enum (In))	In
none (Transition Enum (None))	None
out (Transition Enum (Out))	Out

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TLAnimateEffectTransition](#)) is located in §A.3. *end note*]

19.7.25 ST_TLAnimateMotionBehaviorOrigin (Time List Animate Motion Behavior Origin)

This simple type specifies what the origin of the motion path is relative to.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
layout (Origin Enum (Layout))	Layout
parent (Origin Enum (Parent))	Parent

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TLAnimateMotionBehaviorOrigin](#)) is located in §A.3. *end note*]

19.7.26 ST_TLAnimateMotionPathEditMode (Time List Animate Motion Path Edit Mode)

This simple type specifies how the motion path moves when the target element is moved.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
fixed (Path Edit Mode Enum (Fixed))	Fixed
relative (Path Edit Mode Enum (Relative))	Relative

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TLAnimateMotionPathEditMode](#)) is located in §A.3. *end note*]

19.7.27 ST_TLBehaviorAccumulateType (Behavior Accumulate Type)

This simple type makes a repeating animation build with each iteration when set to "always."

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
always (Accumulate Enum (Always))	Always
none (Accumulate Enum (None))	None

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_TLBehaviorAccumulateType](#)) is located in §A.3. *end note*]

19.7.28 ST_TLBehaviorAdditiveType (Behavior Additive Type)

This simple type specifies how to apply the animation values to the original value for the property.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
base (Additive Enum (Base))	Base
mult (Additive Enum (Multiply))	Multiply
none (None)	None
repl (Additive Enum (Replace))	Replace
sum (Additive Enum (Sum))	Sum

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_TLBehaviorAdditiveType](#)) is located in §A.3. *end note*]

19.7.29 ST_TLBehaviorOverrideType (Behavior Override Type)

This simple type specifies how a behavior should override values of the attribute being animated on the target element. The "childStyle" clears the attributes on the children contained inside the target element.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
childStyle (Override Enum (Child Style))	Child Style
normal (Override Enum (Normal))	Normal

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_TLBehaviorOverrideType](#)) is located in §A.3. *end note*]

19.7.30 ST_TLBehaviorTransformType (Behavior Transform Type)

This simple type specifies how the behavior animates the target element.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
img (Image)	Image transform
pt (Point)	Point transform

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TLBehaviorTransformType](#)) is located in §A.3. *end note*]

19.7.31 ST_TLChartSubelementType (Chart Subelement Type)

This simple type defines an animation target element that is represented by a subelement of a chart.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
category (Category Axis)	Category
gridLegend (Grid Legend)	Background Element (Grid and Legend)
ptInCategory (Single Point in Category)	Category Element
ptInSeries (Single Point in Data Series)	Series Element
series (Data Series)	Series

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TLChartSubelementType](#)) is located in §A.3. *end note*]

19.7.32 ST_TLCommandType (Command Type)

This simple type specifies a command type.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
call (Command Type Enum (Call))	Call
evt (Command Type Enum (Event))	Event
verb (Command Type Enum (Verb))	Verb

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TLCommandType](#)) is located in §A.3. *end note*]

19.7.33 ST_TLDiagramBuildType (Diagram Build Types)

This simple type specifies the different diagram build types.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
allAtOnce (Diagram Build Type Enum (All At Once))	All At Once
breadthByLvl (Diagram Build Type Enum (Breadth By Level))	Breadth By Level
breadthByNode (Diagram Build Type Enum (Breadth By Node))	Breadth By Node
ccw (Diagram Build Type Enum (Counter-Clockwise))	Counter-Clockwise
ccwIn (Diagram Build Type Enum (Counter-Clockwise-In))	Counter-Clockwise-In
ccwOut (Diagram Build Type Enum (Counter-Clockwise-Out))	Counter-Clockwise-Out
cust (Diagram Build Type Enum (Custom))	Custom
cw (Diagram Build Type Enum (Clockwise))	Clockwise
cwIn (Diagram Build Type Enum (Clockwise-In))	Clockwise-In
cwOut (Diagram Build Type Enum (Clockwise-Out))	Clockwise-Out
depthByBranch (Diagram Build Type Enum (Depth By Branch))	Depth By Branch
depthByNode (Diagram Build Type Enum (Depth By Node))	Depth By Node
down (Diagram Build Type Enum (Down))	Down
inByRing (Diagram Build Type Enum (In-By-Ring))	In-By-Ring
outByRing (Diagram Build Type Enum (Out-By-Ring))	Out-By-Ring
up (Diagram Build Type Enum (Up))	Up
whole (Diagram Build Type Enum (Whole))	Whole

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TLDiagramBuildType](#)) is located in §A.3. *end note*]

19.7.34 ST_TLNextActionType (Next Action Type)

This simple type specifies what to do when going forward in a sequence. When the value is "seek," it seeks the current child element to its natural end time before advancing to the next element.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
none (Next Action Type Enum (None))	None
seek (Next Action Type Enum (Seek))	Seek

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TLNextActionType](#)) is located in §A.3. *end note*]

19.7.35 ST_TLOleChartBuildType (Embedded Chart Build Type)

This simple type describes how to build an embedded Chart.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
allAtOnce (Chart Build Type Enum (All At Once))	All At Once
category (Chart Build Type Enum (Category))	By Category
categoryEl (Chart Build Type Enum (Category Element))	By Category Element
series (Chart Build Type Enum (Series))	By Series
seriesEl (Chart Build Type Enum (Series Element))	By Series Element

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TLOleChartBuildType](#)) is located in §A.3. *end note*]

19.7.36 ST_TLParaBuildType (Paragraph Build Type)

This simple type describes how to build a paragraph.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
allAtOnce (All At Once)	Specifies to animate all paragraphs at once.

Enumeration Value	Description
cust (Custom)	Specifies the build has custom user settings.
p (Paragraph)	Specifies to animate paragraphs grouped by bullet level.
whole (Whole)	Specifies to animate the entire body of text as one block.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TLParaBuildType](#)) is located in §A.3. *end note*]

19.7.37 ST_TLPreviousActionType (Previous Action Type)

This simple type specifies what to do when going backwards in a sequence. When the value is "skipTimed," the sequence continues to go backwards until it reaches a sequence element that was defined to being only on a "next" event.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
none (Previous Action Type Enum (None))	None
skipTimed (Previous Action Type Enum (Skip Timed))	Skip Timed

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TLPreviousActionType](#)) is located in §A.3. *end note*]

19.7.38 ST_TLTime (Time)

This simple type specifies time after which to automatically advance the build to the next step. An amount of time, in milliseconds.

This simple type is a union of the following types:

- The ST_TLTimeIndefinite simple type (§19.7.40).
- The W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TLTime](#)) is located in §A.3. *end note*]

19.7.39 ST_TLTimeAnimateValueTime (Animation Time)

This simple type specifies a percentage within the time span of the element. A value of indefinite means the attribute should be ignored.

This simple type is a union of the following types:

- The ST_PositiveFixedPercentage simple type (§20.1.10.44).
- The ST_TLTimeIndefinite simple type (§19.7.40).

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TLTimeAnimateValueTime](#)) is located in §A.3. *end note*]

19.7.40 ST_TLTimeIndefinite (Indefinite Time Declaration)

This simple type specifies a value that designates an "indefinite" amount time -- typically means this property is subordinate to other, defined properties.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
indefinite (Indefinite Type Enum)	Specifies Indefinite Time

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TLTimeIndefinite](#)) is located in §A.3. *end note*]

19.7.41 ST_TLTimeNodeFillType (Time Node Fill Type)

This simple type specifies what modifications the effect leaves on the target element's properties when the effect ends.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
freeze (Freeze)	Freeze
hold (TimeNode Fill Type Enum (Hold))	Hold
remove (Remove)	Remove
transition (Transition)	Transition

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TLTimeNodeFillType](#)) is located in §A.3. *end note*]

19.7.42 ST_TLTimeNodeID (Time Node ID)

This simple type represents a node or event on the timeline by its identifier.

This simple type's contents are a restriction of the W3C XML Schema unsignedInt datatype.

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_TLTimeNodeID](#)) is located in §A.3. end note*]

19.7.43 ST_TLTimeNodeMasterRelation (Time Node Master Relation)

This simple type specifies how the time node plays back relative to its master time node.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
lastClick (TimeNode Master Relation Enum (Last Click))	Last Click
nextClick (TimeNode Master Relation Enum (Next Click))	Next Click
sameClick (TimeNode Master Relation Enum (Same Click))	Same Click

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_TLTimeNodeMasterRelation](#)) is located in §A.3. end note*]

19.7.44 ST_TLTimeNodePresetClassType (Time Node Preset Class Type)

This simple type specifies the class of effect in which this effect belongs.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
emph (Preset Type Enum (Emphasis))	Emphasis Preset
entr (Preset Type Enum (Entrance))	Entrance Preset
exit (Exit)	Exit Preset
mediacall (Preset Type Enum (Media Call))	Media Call Preset
path (Preset Type Enum (Path))	Path Preset
verb (Preset Type Enum (Verb))	Verb Preset

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_TLTimeNodePresetClassType](#)) is located in §A.3. end note*]

19.7.45 ST_TLTimeNodeRestartType (Time Node Restart Type)

This simple type determines whether an effect can play more than once.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
always (Restart Enum (Always))	Always restart node
never (Restart Enum (Never))	Never restart node
whenNotActive (Restart Enum (When Not Active))	Restart when node is not active

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_TLTimeNodeRestartType](#)) is located in §A.3. *end note*]

19.7.46 ST_TLTimeNodeSyncType (Time Node Sync Type)

This simple type specifies how the time node synchronizes to its group.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
canSlip (TimeNode Sync Enum (Can Slip))	Can Slip
locked (TimeNode Sync Enum (Locked))	Locked

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_TLTimeNodeSyncType](#)) is located in §A.3. *end note*]

19.7.47 ST_TLTimeNodeType (Time Node Type)

This simple type specifies time node types.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
afterEffect (Node Type Enum (After Effect))	After Effect
afterGroup (Node Type Enum (After Group))	After Group
clickEffect (Node Type Enum (Click Effect))	Click Effect
clickPar (Node Type Enum (Click Paragraph))	Click Paragraph
interactiveSeq (Node Type Enum (Interactive Sequence))	Interactive Sequence
mainSeq (Node Type Enum (Main Sequence))	Main Sequence
tmRoot (Node Type Enum (Timing Root))	Timing Root

Enumeration Value	Description
withEffect (Node Type Enum (With Effect))	With Effect
withGroup (Node Type Enum (With Group))	With Group

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TLTimeNodeType](#)) is located in §A.3. *end note*]

19.7.48 ST_TLTriggerEvent (Trigger Event)

This simple type specifies a particular event that causes the time condition to be true.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
begin (Trigger Event Enum (Begin))	Fire trigger at the beginning
end (Trigger Event Enum (End))	Fire trigger at the end
onBegin (Trigger Event Enum (On Begin))	Fire trigger at the beginning
onClick (Trigger Event Enum (On Click))	Fire trigger on a mouse click
onDbClick (Trigger Event Enum (On Double Click))	Fire trigger on double-mouse click
onEnd (Trigger Event Enum (On End))	Fire trigger at the end
onMouseOut (Trigger Event Enum (On Mouse Out))	Fire trigger on mouse out
onMouseOver (Trigger Event Enum (On Mouse Over))	Fire trigger on mouse over
onNext (Trigger Event Enum (On Next))	Fire trigger on next node
onPrev (Trigger Event Enum (On Previous))	Fire trigger on previous node
onStopAudio (Trigger Event Enum (On Stop Audio))	Fire trigger on stop audio

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TLTriggerEvent](#)) is located in §A.3. *end note*]

19.7.49 ST_TLTriggerRuntimeNode (Trigger RunTime Node)

This simple type specifies the child time node that triggers a time condition. References a child TimeNode or all child nodes. Order is based on the child's end time.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
all (Trigger RunTime Node Enum (All))	All
first (Trigger RunTime Node (First))	First
last (Trigger RunTime Node (Last))	Last

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TLTriggerRuntimeNode](#)) is located in §A.3. *end note*]

19.7.50 ST_TransitionCornerDirectionType (Transition Corner Direction Type)

This simple type specifies diagonal directions for slide transitions.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
ld (Transition Corner Direction Enum (Left-Down))	Specifies the slide transition direction of left-down
lu (Transition Corner Direction Enum (Left-Up))	Specifies the slide transition direction of left-up
rd (Transition Corner Direction Enum (Right-Down))	Specifies the slide transition direction of right-down
ru (Transition Corner Direction Enum (Right-Up))	Specifies the slide transition direction of right-up

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TransitionCornerDirectionType](#)) is located in §A.3. *end note*]

19.7.51 ST_TransitionEightDirectionType (Transition Eight Direction)

This simple type specifies the direction of an animation.

This simple type is a union of the following types:

- The ST_TransitionCornerDirectionType simple type (§19.7.50).
- The ST_TransitionSideDirectionType simple type (§19.7.53).

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TransitionEightDirectionType](#)) is located in §A.3. *end note*]

19.7.52 ST_TransitionInOutDirectionType (Transition In/Out Direction Type)

This simple type specifies if a slide transition should go in or out.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
in (Transition In/Out Direction Enum (In))	Specifies the slide transition should go in
out (Transition In/Out Direction Enum (Out))	Specifies the slide transition should go out

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TransitionInOutDirectionType](#)) is located in §A.3. *end note*]

19.7.53 ST_TransitionSideDirectionType (Transition Side Direction Type)

This simple type defines a set of slide transition directions.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
d (Transition Side Direction Enum (Down))	Specifies that the transition direction is down
l (Transition Side Direction Enum (Left))	Specifies that the transition direction is left
r (Transition Side Direction (Right))	Specifies that the transition direction is right
u (Transition Side Direction Enum (Up))	Specifies that the transition direction is up

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TransitionSideDirectionType](#)) is located in §A.3. *end note*]

19.7.54 ST_TransitionSpeed (Transition Speed)

This simple type defines the allowed transition speeds for transitioning from the current slide to the next.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
fast (Fast)	Fast slide transition.
med (Medium)	Medium slide transition.
slow (low)	Slow slide transition.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TransitionSpeed](#)) is located in §A.3. *end note*]

19.7.55 ST_ViewType (List of View Types)

This simple type specifies the kind of view that should be used when displaying the presentation document to the user.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
handoutView (Handout View)	Handout View mode should be used.
notesMasterView (Notes Master View)	Notes Master View mode should be used.
notesView (Notes View)	Notes View mode should be used.
outlineView (Outline View)	Outline View mode should be used.
sldMasterView (Slide Master View)	Slide Master View mode should be used.
sldSorterView (Slide Sorter View)	Slide Sorter View mode should be used.
sldThumbnailView (Slide Thumbnail View)	Slide Thumbnail View mode should be used.
sldView (Normal Slide View)	Normal Slide View mode should be used.

[Note: The W3C XML Schema definition of this simple type’s content model ([ST_ViewType](#)) is located in §A.3.
end note]

20. DrawingML - Framework Reference Material

[Note: For further information on the mapping of elements and attributes to OPC parts, see the Bibliography entry, “Information on elements, attributes, and OPC parts in ECMA-376 (OOXML)” . *end note*]

The subordinate subclauses specify the semantics for the XML markup comprising DrawingML content, which can be used within the contents of WordprocessingML, SpreadsheetML, or PresentationML documents.

This portion of DrawingML defines its core pieces.

20.1 DrawingML - Main

The DrawingML Main namespace defines all of the base constructs for all kinds of DrawingML objects (charts, diagrams, shapes, pictures, and so on). These constructs and primitives are defined below.

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End of informative text.

20.1.2 Basics

This section describes all the basic common elements associated with the DrawingML framework.

20.1.2.1 EMU Unit of Measurement

Throughout ECMA-376, the EMU is used as a unit of measurement for length. An *EMU* is defined as follows:

$$1 \text{ emu} = \frac{1}{914400} \text{ US inch} = \frac{1}{360000} \text{ cm}$$

[*Rationale*: The EMU was created in order to be able to evenly divide in both English and Metric units, in order to avoid rounding errors during the calculation. The usage of EMUs also facilitates a more seamless system switch and interoperability between different locales utilizing different units of measurement. EMUs define an integer based, high precision coordinate system. *end rationale*]

20.1.2.2 Core Drawing Object Information

Within DrawingML, there is the notion of core drawing elements. These are elements that both are vital to and common across the DrawingML framework. These elements denote the most integral pieces of the DrawingML document structure and thus are among the most widely used.

[*Note*: Measurement Units - Length units must be expressed in device-independent physical units: English Metric units (EMUs), points, picas, and inches. Device-dependent units such as pixels must not be used. *end note*]

20.1.2.2.1 bldChart (Build Chart)

This element specifies how to build the animation for a diagram.

[*Example*: Consider the following example where a chart is specified to be animated by category rather than as one entity. Thus, the bldChart element should be used as follows:

```
<p:bdldLst>
  <p:bldGraphic spid="4" grpId="0">
    <p:bldSub>
      <a:bldChart bld="category"/>
    </p:bldSub>
  </p:bldGraphic>
</p:bdldLst>
```

end example]

Attributes	Description
animBg (Animate Background)	Specifies whether or not the chart background elements should be animated as well. [Note: An example of background elements are grid lines and the chart legend. <i>end note</i>] The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
bld (Build)	Specifies how the chart is built. The animation animates the sub-elements in the container in the particular order defined by this attribute. The possible values for this attribute are defined by the ST_AnimationChartBuildType simple type (§20.1.10.5).

[Note: The W3C XML Schema definition of this element’s content model ([CT_AnimationChartBuildProperties](#)) is located in §A.4.1. *end note*]

20.1.2.2.2 **bldDgm (Build Diagram)**

This element specifies how to build the animation for a diagram.

[Example: Consider having a diagram appear as on entity as opposed to by section. The bldDgm element should be used as follows:

```
<p:bdldLst>
  <p:bldGraphic spid="4" grpId="0">
    <p:bldSub>
      <a:bldDgm bld="one"/>
    </p:bldSub>
  </p:bldGraphic>
</p:bdldLst>
```

end example]

Attributes	Description
bld (Build)	Specifies how the chart is built. The animation animates the sub-elements in the container in the particular order defined by this attribute.

Attributes	Description
	The possible values for this attribute are defined by the ST_AnimationDgmBuildType simple type (§20.1.10.7).
rev (Reverse Animation)	Specifies whether the animation of the objects in this diagram should be reversed or not. If this attribute is not specified, a value of false is assumed. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_AnimationDgmBuildProperties](#)) is located in §A.4.1. *end note*]

20.1.2.2.3 chart (Chart to Animate)

This element specifies a reference to a chart that should be animated within a sequence of slide animations. In addition to simply acting as a reference to a chart there is also animation build steps defined.

Attributes	Description
bldStep (Animation Build Step)	Specifies which step this part of the chart should be built using. For instance the chart can be built as one object meaning it is animated as a single graphic. Alternatively the chart can be animated, or built as separate pieces. The possible values for this attribute are defined by the ST_ChartBuildStep simple type (§20.1.10.13).
categoryIdx (Category Index)	Specifies the index of the category within the corresponding chart that should be animated. The possible values for this attribute are defined by the W3C XML Schema int datatype.
seriesIdx (Series Index)	Specifies the index of the series within the corresponding chart that should be animated. The possible values for this attribute are defined by the W3C XML Schema int datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_AnimationChartElement](#)) is located in §A.4.1. *end note*]

20.1.2.2.4 cNvCxnSpPr (Non-Visual Connector Shape Drawing Properties)

This element specifies the non-visual drawing properties for a connector shape. These non-visual properties are properties that the generating application would utilize when rendering the slide surface.

[Note: The W3C XML Schema definition of this element's content model ([CT_NonVisualConnectorProperties](#)) is located in §A.4.1. *end note*]

20.1.2.2.5 cNvGraphicFramePr (Non-Visual Graphic Frame Drawing Properties)

This element specifies the non-visual drawing properties for a graphic frame. These non-visual properties are properties that the generating application would utilize when rendering the slide surface.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_NonVisualGraphicFrameProperties](#)) is located in §A.4.1. *end note*]

20.1.2.2.6 cNvGrpSpPr (Non-Visual Group Shape Drawing Properties)

This element specifies the non-visual drawing properties for a group shape. These non-visual properties are properties that the generating application would utilize when rendering the slide surface.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_NonVisualGroupDrawingShapeProps](#)) is located in §A.4.1. *end note*]

20.1.2.2.7 cNvPicPr (Non-Visual Picture Drawing Properties)

This element specifies the non-visual properties for the picture canvas. These properties are to be used by the generating application to determine how certain properties are to be changed for the picture object in question.

[*Example*: Consider the following DrawingML.

```
<p:pic>
...
<p:nvPicPr>
  <p:cNvPr id="4" name="Lilly_by_Lisher.jpg"/>
  <p:cNvPicPr>
    <a:picLocks noChangeAspect="1"/>
  </p:cNvPicPr>
  <p:nvPr/>
</p:nvPicPr>
...
</p:pic>
```

end example]

Attributes	Description
preferRelativeResize (Relative Resize Preferred)	<p>Specifies if the user interface should show the resizing of the picture based on the picture's current size or its original size. If this attribute is set to true, then scaling is relative to the original picture size as opposed to the current picture size.</p> <p>[<i>Example</i>: Consider the case where a picture has been resized within a document and is now 50% of the originally inserted picture size. Now if the user chooses to make a later adjustment to the size of this picture within the generating application, then the value of this attribute should be checked.</p> <p>If this attribute is set to true then a value of 50% is shown. Similarly, if this attribute is set</p>

Attributes	Description
	<p>to false, then a value of 100% should be shown because the picture has not yet been resized from its current (smaller) size. <i>end example</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_NonVisualPictureProperties](#)) is located in §A.4.1. *end note*]

20.1.2.2.8 cNvPr (Non-Visual Drawing Properties)

This element specifies non-visual canvas properties. This allows for additional information that does not affect the appearance of the picture to be stored.

[*Example:* Consider the following DrawingML.

```
<p:pic>
...
<p:nvPicPr>
  <p:cNvPr id="4" name="Lilly_by_Lisher.jpg"/>
</p:nvPicPr>
...
</p:pic>
```

end example]

Attributes	Description
descr (Alternative Text for Object)	<p>Specifies alternative text for the current DrawingML object, for use by assistive technologies or applications which do not display the current object.</p> <p>If this element is omitted, then no alternative text is present for the parent object.</p> <p>[<i>Example:</i> Consider a DrawingML object defined as follows:</p> <pre><... descr="A picture of a bowl of fruit"></pre> <p>The descr attribute contains alternative text which can be used in place of the actual DrawingML object. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
hidden (Hidden)	<p>Specifies whether this DrawingML object is displayed. When a DrawingML object is displayed within a document, that object can be hidden (i.e., present, but not visible). This attribute determines whether the object is rendered or made hidden. [<i>Note:</i> An</p>

Attributes	Description
	<p>application can have settings which allow this object to be viewed. <i>end note</i></p> <p>If this attribute is omitted, then the parent DrawingML object shall be displayed (i.e., not hidden).</p> <p>[<i>Example</i>: Consider an inline DrawingML object which must be hidden within the document's content. This setting would be specified as follows:</p> <pre data-bbox="456 533 760 562"><... hidden="true" /></pre> <p>The hidden attribute has a value of true, which specifies that the DrawingML object is hidden and not displayed when the document is displayed. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
id (Unique Identifier)	<p>Specifies a unique identifier for the current DrawingML object within the current document. This ID can be used to assist in uniquely identifying this object so that it can be referred to by other parts of the document.</p> <p>If multiple objects within the same document share the same id attribute value, then the document shall be considered non-conformant.</p> <p>[<i>Example</i>: Consider a DrawingML object defined as follows:</p> <pre data-bbox="456 1115 678 1144"><... id="10" ... ></pre> <p>The id attribute has a value of 10, which is the unique identifier for this DrawingML object. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DrawingElementId simple type (§20.1.10.21).</p>
name (Name)	<p>Specifies the name of the object. [<i>Note</i>: Typically, this is used to store the original file name of a picture object. <i>end note</i>]</p> <p>[<i>Example</i>: Consider a DrawingML object defined as follows:</p> <pre data-bbox="456 1556 776 1585">< ... name="foo.jpg" ></pre> <p>The name attribute has a value of foo.jpg, which is the name of this DrawingML object. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
title (Title)	<p>Specifies the title (caption) of the current DrawingML object.</p>

Attributes	Description
	<p>If this attribute is omitted, then no title text is present for the parent object.</p> <p>[<i>Example</i>: Consider a DrawingML object defined as follows:</p> <pre><... title="Process Flow Diagram"></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_NonVisualDrawingProps](#)) is located in §A.4.1. *end note*]

20.1.2.2.9 cNvSpPr (Non-Visual Shape Drawing Properties)

This element specifies the non-visual drawing properties for a shape. These properties are to be used by the generating application to determine how the shape should be dealt with

[*Example*: Consider the shape that has a shape lock applied to it.

```
<p:sp>
  <p:nvSpPr>
    <p:cNvPr id="2" name="Rectangle 1"/>
    <p:cNvSpPr>
      <a:spLocks noGrp="1"/>
    </p:cNvSpPr>
  </p:nvSpPr>
  ...
</p:sp>
```

This shape lock is stored within the non-visual drawing properties for this shape. *end example*]

Attributes	Description
txBox (Text Box)	<p>Specifies that the corresponding shape is a text box and thus should be treated as such by the generating application. If this attribute is omitted then it is assumed that the corresponding shape is not specifically a text box.</p> <p>[<i>Note</i>: Because a shape is not specified to be a text box does not mean that it cannot have text attached to it. A text box is merely a specialized shape with specific properties. <i>end note</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_NonVisualDrawingShapeProps](#)) is located in §A.4.1. *end note*]

20.1.2.2.10 cxnSp (Connection Shape)

This element specifies a connection shape that is used to connect two sp elements. Once a connection is specified using a cxnSp, it is left to the generating application to determine the exact path the connector takes. That is the connector routing algorithm is left up to the generating application as the desired path might be different depending on the specific needs of the application.



[*Example:* Consider the following connector shape that connects two regular shapes.

```
<p:spTree>
  ...
  <p:sp>
    <p:nvSpPr>
      <p:cNvPr id="1" name="Rectangle 1"/>
      <p:cNvSpPr/>
      <p:nvPr/>
    </p:nvSpPr>
    ...
  </p:sp>
  <p:sp>
    <p:nvSpPr>
      <p:cNvPr id="2" name="Rectangle 2"/>
      <p:cNvSpPr/>
      <p:nvPr/>
    </p:nvSpPr>
    ...
  </p:sp>
  <p:cxnSp>
```

```

<p:nvCxnSpPr>
  <p:cNvPr id="3" name="Elbow Connector 3"/>
  <p:cNvCxnSpPr>
    <a:stCxn id="1" idx="3"/>
    <a:endCxn id="2" idx="1"/>
  </p:cNvCxnSpPr>
</p:nvPr>
</p:nvCxnSpPr>
...
</p:cxnSp>
</p:spTree>

```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_GvmlConnector](#)) is located in §A.4.1. *end note*]

20.1.2.2.11 cxnSpLocks (Connection Shape Locks)

This element specifies all locking properties for a connection shape. These properties inform the generating application about specific properties that have been previously locked and thus should not be changed.

Attributes	Description
noAdjustHandles (Disallow Showing Adjust Handles)	Specifies that the generating application should not show adjust handles for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
noChangeArrowheads (Disallow Arrowhead Changes)	Specifies that the generating application should not allow arrowhead changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
noChangeAspect (Disallow Aspect Ratio Change)	Specifies that the generating application should not allow aspect ratio changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
noChangeShapeType (Disallow Shape Type Change)	Specifies that the generating application should not allow shape type changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed. The possible values for this attribute are defined by the W3C XML Schema boolean

Attributes	Description
	datatype.
noEditPoints (Disallow Shape Point Editing)	<p>Specifies that the generating application should not allow shape point changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noGrp (Disallow Shape Grouping)	<p>Specifies that the generating application should not allow shape grouping for the corresponding connection shape. That is it cannot be combined within other shapes to form a group of shapes. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noMove (Disallow Shape Movement)	<p>Specifies that the generating application should not allow position changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noResize (Disallow Shape Resize)	<p>Specifies that the generating application should not allow size changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noRot (Disallow Shape Rotation)	<p>Specifies that the generating application should not allow shape rotation changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noSelect (Disallow Shape Selection)	<p>Specifies that the generating application should not allow selecting of the corresponding connection shape. That means also that no picture, shapes or text attached to this connection shape can be selected if this attribute has been specified. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_ConnectorLocking](#)) is located in §A.4.1. *end note*]

20.1.2.2.12 dgm (Diagram to Animate)

This element specifies a reference to a diagram that should be animated within a sequence of slide animations. In addition to simply acting as a reference to a diagram there is also animation build steps defined.

Attributes	Description
bldStep (Animation Build Step)	Specifies which step this part of the diagram should be built using. For instance the diagram can be built as one object meaning it is animated as a single graphic. Alternatively the diagram can be animated, or built as separate pieces. The possible values for this attribute are defined by the ST_DgmBuildStep simple type (§20.1.10.20).
id (Identifier)	Specifies the GUID of the shape for this build step in the animation. The possible values for this attribute are defined by the ST_Guid simple type (§22.9.2.4).

[Note: The W3C XML Schema definition of this element's content model ([CT_AnimationDgmElement](#)) is located in §A.4.1. *end note*]

20.1.2.2.13 endCxn (Connection End)

This element specifies the ending connection that should be made by the corresponding connector shape. This connects the end tail of the connector to the final destination shape.

Attributes	Description
id (Identifier)	Specifies the id of the shape to make the final connection to. The possible values for this attribute are defined by the ST_DrawingElementId simple type (§20.1.10.21).
idx (Index)	Specifies the index into the connection site table of the final connection shape. That is there are many connection sites on a shape and it shall be specified which connection site the corresponding connector shape should connect to. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Connection](#)) is located in §A.4.1. *end note*]

20.1.2.2.14 ext (Extension)

This element specifies an extension that is used for future extensions to the current version of DrawingML. This allows for the specifying of currently unknown elements in the future that is used for later versions of generating applications.

[*Note: This element is not intended to reintroduce transitional schema into the strict conformance class. end note*]

Attributes	Description
uri (Uniform Resource Identifier)	Specifies the URI, or uniform resource identifier that represents the data stored under this tag. The URI is used to identify the correct 'server' that can process the contents of this tag. The possible values for this attribute are defined by the W3C XML Schema token datatype.

[*Note: The W3C XML Schema definition of this element's content model ([CT_OfficeArtExtension](#)) is located in §A.4.1. end note*]

20.1.2.2.15 extLst (Extension List)

This element specifies the extension list within which all future extensions of element type ext is defined. The extension list along with corresponding future extensions is used to extend the storage capabilities of the DrawingML framework. This allows for various new types of data to be stored natively within the framework.

[*Note: The W3C XML Schema definition of this element's content model ([CT_OfficeArtExtensionList](#)) is located in §A.4.1. end note*]

20.1.2.2.16 graphic (Graphic Object)

This element specifies the existence of a single graphic object. Document authors should refer to this element when they wish to persist a graphical object of some kind. The specification for this graphical object is provided entirely by the document author and referenced within the graphicData child element.

[*Note: The W3C XML Schema definition of this element's content model ([CT_GraphicalObject](#)) is located in §A.4.1. end note*]

20.1.2.2.17 graphicData (Graphic Object Data)

This element specifies the reference to a graphic object within the document. This graphic object is provided entirely by the document authors who choose to persist this data within the document.

[*Note: Depending on the kind of graphical object used not every generating application that supports the OOXML framework has the ability to render the graphical object. end note*]

[*Note: This element is not intended to reintroduce transitional schema into the strict conformance class. end note*]

Attributes	Description
uri (Uniform Resource Identifier)	Specifies the URI, or uniform resource identifier that represents the data stored under this tag. The URI is used to identify the correct 'server' that can process the contents of

Attributes	Description
	<p>this tag.</p> <p>The possible values for this attribute are defined by the W3C XML Schema token datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_GraphicalObjectData](#)) is located in §A.4.1. *end note*]

20.1.2.2.18 **graphicFrame** (Graphic Frame)

This element specifies the existence of a graphics frame. This frame contains a graphic that was generated by an external source and needs a container in which to be displayed on the slide surface.

[Note: The W3C XML Schema definition of this element's content model ([CT_GvmlGraphicalObjectFrame](#)) is located in §A.4.1. *end note*]

20.1.2.2.19 **graphicFrameLocks** (Graphic Frame Locks)

This element specifies all locking properties for a graphic frame. These properties inform the generating application about specific properties that have been previously locked and thus should not be changed.

Attributes	Description
noChangeAspect (Disallow Aspect Ratio Change)	<p>Specifies that the generating application should not allow aspect ratio changes for the corresponding graphic frame. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noDrilldown (Disallow Selection of Child Shapes)	<p>Specifies that the generating application should not allow selecting of objects within the corresponding graphic frame but allow selecting of the graphic frame itself. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noGrp (Disallow Shape Grouping)	<p>Specifies that the generating application should not allow shape grouping for the corresponding graphic frame. That is it cannot be combined within other shapes to form a group of shapes. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noMove (Disallow Shape Movement)	<p>Specifies that the corresponding graphic frame cannot be moved. Objects that reside within the graphic frame can still be moved unless they also have been locked. If this attribute is not specified, then a value of false is assumed.</p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
noResize (Disallow Shape Resize)	<p>Specifies that the generating application should not allow size changes for the corresponding graphic frame. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noSelect (Disallow Shape Selection)	<p>Specifies that the generating application should not allow selecting of the corresponding picture. That means also that no picture, shapes or text attached to this picture can be selected if this attribute has been specified. If this attribute is not specified, then a value of false is assumed.</p> <p>[<i>Note</i>: If this attribute is specified to be true then the graphic frame cannot be selected and the objects within the graphic frame cannot be selected as well. That is the entire graphic frame including all sub-parts are considered un-selectable. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_GraphicalObjectFrameLocking](#)) is located in §A.4.1. *end note*]

20.1.2.2.20 grpSp (Group shape)

This element specifies a group shape that represents many shapes grouped together. This shape is to be treated just as if it were a regular shape but instead of being described by a single geometry it is made up of all the shape geometries encompassed within it. Within a group shape each of the shapes that make up the group are specified just as they normally would. The idea behind grouping elements however is that a single transform can apply to many shapes at the same time.

[*Example*: Consider the following group shape.

```
<p:grpSp>
  <p:nvGrpSpPr>
    <p:cNvPr id="10" name="Group 9"/>
    <p:cNvGrpSpPr/>
    <p:nvPr/>
  </p:nvGrpSpPr>
```

```

<p:grpSpPr>
  <a:xfrm>
    <a:off x="838200" y="990600"/>
    <a:ext cx="2426208" cy="978408"/>
    <a:chOff x="838200" y="990600"/>
    <a:chExt cx="2426208" cy="978408"/>
  </a:xfrm>
</p:grpSpPr>
<p:sp>
...
</p:sp>
<p:sp>
...
</p:sp>
<p:sp>
...
</p:sp>
</p:grpSp>

```

In the above example we see three shapes specified within a single group. These three shapes have their position and sizes specified just as they normally would within the shape tree. The generating application should apply the transformation after the bounding box for the group shape has been calculated. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_GvmlGroupShape](#)) is located in §A.4.1. *end note*]

20.1.2.2.21 grpSpLocks (Group Shape Locks)

This element specifies all locking properties for a connection shape. These properties inform the generating application about specific properties that have been previously locked and thus should not be changed.

Attributes	Description
noChangeAspect (Disallow Aspect Ratio Change)	<p>Specifies that the generating application should not allow aspect ratio changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noGrp (Disallow Shape Grouping)	<p>Specifies that the corresponding group shape cannot be grouped. That is it cannot be combined within other shapes to form a group of shapes. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noMove (Disallow	Specifies that the corresponding graphic frame cannot be moved. Objects that reside

Attributes	Description
Moving Shape)	<p>within the graphic frame can still be moved unless they also have been locked. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noResize (Disallow Shape Resizing)	<p>Specifies that the corresponding group shape cannot be resized. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noRot (Disallow Shape Rotation)	<p>Specifies that the corresponding group shape cannot be rotated Objects that reside within the group can still be rotated unless they also have been locked. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noSelect (Disallow Shape Selection)	<p>Specifies that the corresponding group shape cannot have any part of it be selected. That means that no picture, shapes or attached text can be selected either if this attribute has been specified. If this attribute is not specified, then a value of false is assumed.</p> <p>[Note: This property is inherited by sub-elements and thus all shapes within the group shape cannot be selected when this attribute is set to a value of true. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noUnggrp (Disallow Shape Ungrouping)	<p>Specifies that the generating application should not show adjust handles for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_GroupLocking](#)) is located in §A.4.1. *end note*]

20.1.2.2.22 grpSpPr (Visual Group Shape Properties)

This element specifies the properties that are to be common across all of the shapes within the corresponding group. If there are any conflicting properties within the group shape properties and the individual shape properties then the individual shape properties should take precedence.

Attributes	Description
bwMode (Black and	Specifies that the group shape should be rendered using only black and white coloring.

Attributes	Description
White Mode)	<p>That is the coloring information for the group shape should be converted to either black or white when rendering the corresponding shapes.</p> <p>No gray is to be used in rendering this image, only stark black and stark white.</p> <p>[<i>Note</i>: This does not mean that the group shapes themselves are stored with only black and white color information. This attribute instead sets the rendering mode that the shapes use when rendering. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_BlackWhiteMode simple type (§20.1.10.10).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_GroupShapeProperties](#)) is located in §A.4.1. *end note*]

20.1.2.2.23 [hlinkHover](#) (Hyperlink for Hover)

This element specifies the hyperlink information to be activated when the user's mouse is hovered over the corresponding object. The operation of the hyperlink is to have the specified action be activated when the mouse of the user hovers over the object. When this action is activated then additional attributes can be used to specify other tasks that should be performed along with the action.

Attributes	Description
action (Action Setting)	<p>Specifies an action that is to be taken when this hyperlink is activated. This can be used to specify a slide to be navigated to or a script of code to be run.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
endSnd (End Sounds)	<p>Specifies if the URL in question should stop all sounds that are playing when it is clicked.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
highlightClick (Highlight Click)	<p>Specifies if this attribute has already been used within this document. That is when a hyperlink has already been visited that this attribute would be utilized so the generating application can determine the color of this text. If this attribute is omitted, then a value of 0 or false is implied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
history (Add Hyperlink to Page History)	<p>Specifies whether to add this URI to the history when navigating to it. This allows for the viewing of this presentation without the storing of history information on the viewing machine. If this attribute is omitted, then a value of 1 or true is assumed.</p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
id (Drawing Object Hyperlink Target) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the relationship id that when looked up in this slides relationship file contains the target of this hyperlink. This attribute cannot be omitted. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).
invalidUrl (Invalid URL)	Specifies the URL when it has been determined by the generating application that the URL is invalid. That is the generating application can still store the URL but it is known that this URL is not correct. The possible values for this attribute are defined by the W3C XML Schema string datatype.
tgtFrame (Target Frame)	Specifies the target frame that is to be used when opening this hyperlink. When the hyperlink is activated this attribute is used to determine if a new window is launched for viewing or if an existing one can be used. If this attribute is omitted, than a new window is opened. The possible values for this attribute are defined by the W3C XML Schema string datatype.
tooltip (Hyperlink Tooltip)	Specifies the tooltip that should be displayed when the hyperlink text is hovered over with the mouse. If this attribute is omitted, than the hyperlink text itself can be displayed. The possible values for this attribute are defined by the W3C XML Schema string datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Hyperlink](#)) is located in §A.4.1. *end note*]

20.1.2.2.24 [ln \(Outline\)](#)

This element specifies an outline style that can be applied to a number of different objects such as shapes and text. The line allows for the specifying of many different types of outlines including even line dashes and bevels.

Attributes	Description
algn (Stroke Alignment)	Specifies the alignment to be used for the underline stroke. The possible values for this attribute are defined by the ST_PenAlignment simple type (§20.1.10.39).

Attributes	Description
cap (Line Ending Cap Type)	<p>Specifies the ending caps that should be used for this line. [<i>Note</i>: Examples of cap types are rounded, flat, etc. <i>end note</i>] If this attribute is omitted, then a value of square is assumed.</p> <p>The possible values for this attribute are defined by the ST_LineCap simple type (§20.1.10.31).</p>
cmpd (Compound Line Type)	<p>Specifies the compound line type to be used for the underline stroke. If this attribute is omitted, then a value of sng is assumed.</p> <p>The possible values for this attribute are defined by the ST_CompoundLine simple type (§20.1.10.15).</p>
w (Line Width)	<p>Specifies the width to be used for the underline stroke. If this attribute is omitted, then a value of 0 is assumed.</p> <p>The possible values for this attribute are defined by the ST_LineWidth simple type (§20.1.10.35).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_LineProperties](#)) is located in §A.4.1. *end note*]

20.1.2.2.25 nvCxnSpPr (Non-Visual Properties for a Connection Shape)

This element specifies all non-visual properties for a connection shape. This element is a container for the non-visual identification properties, shape properties and application properties that are to be associated with a connection shape. This allows for additional information that does not affect the appearance of the connection shape to be stored.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_GvmlConnectorNonVisual](#)) is located in §A.4.1. *end note*]

20.1.2.2.26 nvGraphicFramePr (Non-Visual Properties for a Graphic Frame)

This element specifies all non-visual properties for a graphic frame. This element is a container for the non-visual identification properties, shape properties and application properties that are to be associated with a graphic frame. This allows for additional information that does not affect the appearance of the graphic frame to be stored.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_GvmlGraphicFrameNonVisual](#)) is located in §A.4.1. *end note*]

20.1.2.2.27 nvGrpSpPr (Non-Visual Properties for a Group Shape)

This element specifies all non-visual properties for a group shape. This element is a container for the non-visual identification properties, shape properties and application properties that are to be associated with a group

shape. This allows for additional information that does not affect the appearance of the group shape to be stored.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_GvmlGroupShapeNonVisual](#)) is located in §A.4.1. *end note*]

20.1.2.2.28 **nvPicPr (Non-Visual Properties for a Picture)**

This element specifies all non-visual properties for a picture. This element is a container for the non-visual identification properties, shape properties and application properties that are to be associated with a picture. This allows for additional information that does not affect the appearance of the picture to be stored.

[*Example:* Consider the following PresentationML.

```
<p:pic>
  ...
  <p:nvPicPr>
    ...
  </p:nvPicPr>
  ...
</p:pic>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_GvmlPictureNonVisual](#)) is located in §A.4.1. *end note*]

20.1.2.2.29 **nvSpPr (Non-Visual Properties for a Shape)**

This element specifies all non-visual properties for a shape. This element is a container for the non-visual identification properties, shape properties and application properties that are to be associated with a shape. This allows for additional information that does not affect the appearance of the shape to be stored.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_GvmlShapeNonVisual](#)) is located in §A.4.1. *end note*]

20.1.2.2.30 **pic (Picture)**

This element specifies the existence of a picture object within the document.

[*Example:* Consider the following PresentationML that specifies the existence of a picture within a document. This picture can have non-visual properties, a picture fill as well as shape properties attached to it.


```

<p:pic>
  <p:nvPicPr>
    <p:cNvPr id="4" name="lake.JPG" descr="Picture of a Lake" />
    <p:cNvPicPr>
      <a:picLocks noChangeAspect="1"/>
    </p:cNvPicPr>
    <p:nvPr/>
  </p:nvPicPr>
  <p:blipFill>
    ...
  </p:blipFill>
  <p:spPr>
    ...
  </p:spPr>
</p:pic>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_GvmlPicture](#)) is located in §A.4.1.
end note]

20.1.2.2.31 picLocks (Picture Locks)

This element specifies all locking properties for a graphic frame. These properties inform the generating application about specific properties that have been previously locked and thus should not be changed.

Attributes	Description
noAdjustHandles (Disallow Showing Adjust Handles)	Specifies that the generating application should not show adjust handles for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
noChangeArrowheads (Disallow Arrowhead Changes)	Specifies that the generating application should not allow arrowhead changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
noChangeAspect (Disallow Aspect Ratio Change)	Specifies that the generating application should not allow aspect ratio changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

Attributes	Description
noChangeShapeType (Disallow Shape Type Change)	<p>Specifies that the generating application should not allow shape type changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noCrop (Disallow Crop Changes)	<p>Specifies that the generating application should not allow cropping for the corresponding picture. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noEditPoints (Disallow Shape Point Editing)	<p>Specifies that the generating application should not allow shape point changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noGrp (Disallow Shape Grouping)	<p>Specifies that the generating application should not allow shape grouping for the corresponding connection shape. That is it cannot be combined within other shapes to form a group of shapes. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noMove (Disallow Shape Movement)	<p>Specifies that the generating application should not allow position changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noResize (Disallow Shape Resize)	<p>Specifies that the generating application should not allow size changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noRot (Disallow Shape Rotation)	<p>Specifies that the generating application should not allow shape rotation changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noSelect (Disallow Shape Selection)	<p>Specifies that the generating application should not allow selecting of the corresponding connection shape. That means also that no picture, shapes or text attached to this connection shape can be selected if this attribute has been specified. If this attribute is</p>

Attributes	Description
	not specified, then a value of false is assumed. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_PictureLocking](#)) is located in §A.4.1. *end note*]

20.1.2.2.32 **snd** (Hyperlink Sound)

This element specifies a sound to be played when a hyperlink within the document is activated. This sound is specified from within the parent hyperlink element.

Attributes	Description
embed (Embedded Audio File Relationship ID) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the identification information for an embedded audio file. This attribute is used to specify the location of an object that resides locally within the file. [<i>Note:</i> A list of suggested audio types is provided in §15.2.2. <i>end note</i>] The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).
name (Sound Name)	Specifies the original name or given short name for the corresponding sound. This is used to distinguish this sound from others by providing a human readable name for the attached sound should the user need to identify the sound among others within the UI. The possible values for this attribute are defined by the W3C XML Schema string datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_EmbeddedWAVAudioFile](#)) is located in §A.4.1. *end note*]

20.1.2.2.33 **sp** (Shape)

This element specifies the existence of a single shape. A shape can either be a preset or a custom geometry, defined using the DrawingML framework. In addition to a geometry each shape can have both visual and non-visual properties attached. Text and corresponding styling information can also be attached to a shape. This shape is specified along with all other shapes within either the shape tree or group shape elements.

[*Note:* Shapes are the preferred mechanism for specifying text on a slide. *end note*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_GvmlShape](#)) is located in §A.4.1. *end note*]

20.1.2.2.34 spLocks (Shape Locks)

This element specifies all locking properties for a shape. These properties inform the generating application about specific properties that have been previously locked and thus should not be changed.

Attributes	Description
noAdjustHandles (Disallow Showing Adjust Handles)	<p>Specifies that the generating application should not show adjust handles for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noChangeArrowheads (Disallow Arrowhead Changes)	<p>Specifies that the generating application should not allow arrowhead changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noChangeAspect (Disallow Aspect Ratio Change)	<p>Specifies that the generating application should not allow aspect ratio changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noChangeShapeType (Disallow Shape Type Change)	<p>Specifies that the generating application should not allow shape type changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noEditPoints (Disallow Shape Point Editing)	<p>Specifies that the generating application should not allow shape point changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noGrp (Disallow Shape Grouping)	<p>Specifies that the generating application should not allow shape grouping for the corresponding connection shape. That is it cannot be combined within other shapes to form a group of shapes. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noMove (Disallow Shape Movement)	<p>Specifies that the generating application should not allow position changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
noResize (Disallow Shape Resize)	<p>Specifies that the generating application should not allow size changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noRot (Disallow Shape Rotation)	<p>Specifies that the generating application should not allow shape rotation changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noSelect (Disallow Shape Selection)	<p>Specifies that the generating application should not allow selecting of the corresponding connection shape. That means also that no picture, shapes or text attached to this connection shape can be selected if this attribute has been specified. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noTextEdit (Disallow Shape Text Editing)	<p>Specifies that the generating application should not allow editing of the shape text for the corresponding shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_ShapeLocking](#)) is located in §A.4.1. end note]

20.1.2.2.35 spPr (Shape Properties)

This element specifies the visual shape properties that can be applied to a shape.

Attributes	Description
bwMode (Black and White Mode)	<p>Specifies that the picture should be rendered using only black and white coloring. That is the coloring information for the picture should be converted to either black or white when rendering the picture.</p> <p>No gray is to be used in rendering this image, only stark black and stark white.</p>

Attributes	Description
	<p>[<i>Note</i>: This does not mean that the picture itself that is stored within the file is necessarily a black and white picture. This attribute instead sets the rendering mode that the picture has applied to when rendering. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_BlackWhiteMode simple type (§20.1.10.10).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_ShapeProperties](#)) is located in §A.4.1. *end note*]

20.1.2.2.36 stCxn (Connection Start)

This element specifies the starting connection that should be made by the corresponding connector shape. This connects the head of the connector to the first shape.

Attributes	Description
id (Identifier)	<p>Specifies the id of the shape to make the final connection to.</p> <p>The possible values for this attribute are defined by the ST_DrawingElementId simple type (§20.1.10.21).</p>
idx (Index)	<p>Specifies the index into the connection site table of the final connection shape. That is there are many connection sites on a shape and it shall be specified which connection site the corresponding connector shape should connect to.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_Connection](#)) is located in §A.4.1. *end note*]

20.1.2.2.37 style (Shape Style)

This element specifies the style information for a shape.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_ShapeStyle](#)) is located in §A.4.1. *end note*]

20.1.2.2.38 sx (Horizontal Ratio)

This element specifies the horizontal ratio for use within a scaling calculation.

Attributes	Description
d (Denominator)	Specifies the denominator to be used within the equation.

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema long datatype.
n (Numerator)	Specifies the numerator to be used within the equation. The possible values for this attribute are defined by the W3C XML Schema long datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Ratio](#)) is located in §A.4.1. *end note*]

20.1.2.2.39 [sy](#) (Vertical Ratio)

This element specifies the vertical ratio for use within a scaling calculation.

Attributes	Description
d (Denominator)	Specifies the denominator to be used within the equation. The possible values for this attribute are defined by the W3C XML Schema long datatype.
n (Numerator)	Specifies the numerator to be used within the equation. The possible values for this attribute are defined by the W3C XML Schema long datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Ratio](#)) is located in §A.4.1. *end note*]

20.1.2.2.40 [txBody](#) (Shape Text Body)

This element specifies the existence of text to be contained within the corresponding shape. All visible text and visible text related properties are contained within this element. There can be multiple paragraphs and within paragraphs multiple runs of text.

[Note: The W3C XML Schema definition of this element's content model ([CT_TextBody](#)) is located in §A.4.1. *end note*]

20.1.2.2.41 [txSp](#) (Text Shape)

This element specifies the existence of a text shape within a parent shape. This text shape is specifically used for displaying text as it has only text related child elements.

[Note: The W3C XML Schema definition of this element's content model ([CT_GvmlTextShape](#)) is located in §A.4.1. *end note*]

20.1.2.2.42 useSpRect (Use Shape Text Rectangle)

This element specifies that the text rectangle from the parent shape should be used for this text shape. If this attribute is specified then the text rectangle, or text bounding box as it is also called should have the same dimensions as the text bounding box of the parent shape within which this text shape resides.

[Note: The W3C XML Schema definition of this element's content model ([CT_GvmlUseShapeRectangle](#)) is located in §A.4.1. *end note*]

20.1.2.2.43 cpLocks (Content Part Locks)

This element specifies all locking properties for a content part. These properties inform the generating application about specific properties that have been previously locked and thus should not be changed.

Attributes	Description
noAdjustHandles (Disallow Showing Adjust Handles)	<p>Specifies that the generating application should not show adjust handles for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noChangeArrowheads (Disallow Arrowhead Changes)	<p>Specifies that the generating application should not allow arrowhead changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noChangeAspect (Disallow Aspect Ratio Change)	<p>Specifies that the generating application should not allow aspect ratio changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noChangeShapeType (Disallow Shape Type Change)	<p>Specifies that the generating application should not allow shape type changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noEditPoints (Disallow Shape Point Editing)	<p>Specifies that the generating application should not allow shape point changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noGrp (Disallow	Specifies that the generating application should not allow shape grouping for the

Attributes	Description
Shape Grouping)	<p>corresponding connection shape. That is it cannot be combined within other shapes to form a group of shapes. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noMove (Disallow Shape Movement)	<p>Specifies that the generating application should not allow position changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noResize (Disallow Shape Resize)	<p>Specifies that the generating application should not allow size changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noRot (Disallow Shape Rotation)	<p>Specifies that the generating application should not allow shape rotation changes for the corresponding connection shape. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
noSelect (Disallow Shape Selection)	<p>Specifies that the generating application should not allow selecting of the corresponding connection shape. That means also that no picture, shapes, or text attached to this connection shape can be selected if this attribute has been specified. If this attribute is not specified, then a value of false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model (CT_ContentPartLocking) is located in §A.4.1. *end note*]

20.1.2.3 Colors

Given its own section within DrawingML Basics, colors are an integral part of the DrawingML framework. Colors are used in virtually every object to help describe its appearance when it is rendered on the screen. Since not every generating application wishes to represent color in the same manner, it is possible to specify color in a number of different ways.

20.1.2.3.1 alpha (Alpha)

This element specifies its input color with the specific opacity, but with its color unchanged.

Attributes	Description
val (Value)	<p>Specifies the opacity as expressed by a percentage value.</p> <p><i>[Example: The following represents a green solid fill which is 50% opaque</i></p> <pre><a:solidFill> <a:srgbClr val="00FF00"> <a:alpha val="50%"/> </a:srgbClr> </a:solidFill></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_PositiveFixedPercentage simple type (§20.1.10.44).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_PositiveFixedPercentage](#)) is located in §A.4.1. end note]

20.1.2.3.2 alphaMod (Alpha Modulation)

This element specifies a more or less opaque version of its input color. An alpha modulate never increases the alpha beyond 100%. A 200% alpha modulate makes a input color twice as opaque as before. A 50% alpha modulate makes a input color half as opaque as before.

Attributes	Description
val (Value)	<p>Specifies the opacity as expressed by a percentage relative to the input color.</p> <p><i>[Example: The following represents a green solid fill which is 50% opaque</i></p> <pre><a:solidFill> <a:srgbClr val="00FF00"> <a:alphaMod val="50%"/> </a:srgbClr> </a:solidFill></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_PositivePercentage simple type (§20.1.10.45).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_PositivePercentage](#)) is located in §A.4.1. end note]

20.1.2.3.3 alphaOff (Alpha Offset)

This element specifies a more or less opaque version of its input color. Increases or decreases the input alpha percentage by the specified percentage offset. A 10% alpha offset increases a 50% opacity to 60%. A -10% alpha offset decreases a 50% opacity to 40%. The transformed alpha values are limited to a range of 0 to 100%. A 10% alpha offset increase to a 100% opaque object still results in 100% opacity.

Attributes	Description
val (Value)	<p>Specifies the opacity as expressed by a percentage offset increase or decrease to the input color. Increases never increase the opacity beyond 100%, decreases never decrease the opacity below 0%.</p> <p>[Example: The following represents a green solid fill which is 90% opaque</p> <pre><a:solidFill> <a:srgbClr val="00FF00"> <a:alphaOff val="-10%"/> </a:srgbClr> </a:solidFill></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_FixedPercentage simple type (§20.1.10.24).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_FixedPercentage](#)) is located in §A.4.1. *end note*]

20.1.2.3.4 blue (Blue)

This element specifies the input color with the specific blue component, but with the red and green color components unchanged.

Attributes	Description
val (Value)	<p>Specifies the value of the blue component. The assigned value is specified as a percentage with 0% indicating minimal blue and 100% indicating maximum blue.</p> <p>[Example: The following manipulates the fill from having RGB value RRGGBB = (00, FF, 00) to value RRGGBB= (00, FF, FF)</p> <pre><a:solidFill> <a:srgbClr val="00FF00"> <a:blue val="100%"/> </a:srgbClr> </a:solidFill></pre>

Attributes	Description
	<i>end example]</i> The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).

[Note: The W3C XML Schema definition of this element's content model ([CT_Percentage](#)) is located in §A.4.1.
end note]

20.1.2.3.5 blueMod (Blue Modulation)

This element specifies the input color with its blue component modulated by the given percentage. A 50% blue modulate reduces the blue component by half. A 200% blue modulate doubles the blue component.

Attributes	Description
val (Value)	Specifies the blue component as expressed by a percentage relative to the input color component. Increases never increase the blue component beyond 100%, decreases never decrease the blue component below 0%. [Example: The following manipulates the fill from having RGB value RRGGBB = (00, 00, FF) to value RRGGBB= (00, 00, 80) <pre><a:solidFill> <a:srgbClr val="0000FF"> <a:blueMod val="50%"/> </a:srgbClr> </a:solidFill></pre> <i>end example]</i> The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).

[Note: The W3C XML Schema definition of this element's content model ([CT_Percentage](#)) is located in §A.4.1.
end note]

20.1.2.3.6 blueOff (Blue Offset)

This element specifies the input color with its blue component shifted, but with its red and green color components unchanged.

Attributes	Description
val (Value)	Specifies the blue component as expressed by a percentage offset increase or decrease to the input color component. Increases never increase the blue component beyond 100%, decreases never decrease the blue component below 0%.

Attributes	Description
	<p>[Example: The following manipulates the fill from having RGB value RRGGBB = (00, 00, FF) to value RRGGBB= (00, 00, CC)</p> <pre> <a:solidFill> <a:srgbClr val="00FF00"> <a:blueOff val="-20%"/> </a:srgbClr> </a:solidFill> </pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Percentage](#)) is located in §A.4.1. *end note]*

20.1.2.3.7 comp (Complement)

This element specifies that the color rendered should be the complement of its input color with the complement being defined as such. Two colors are called complementary if, when mixed they produce a shade of grey. For instance, the complement of red which is RGB (255, 0, 0) is cyan which is RGB (0, 255, 255).

Primary colors and secondary colors are typically paired in this way:

- red and cyan (where cyan is the mixture of green and blue)
- green and magenta (where magenta is the mixture of red and blue)
- blue and yellow (where yellow is the mixture of red and green)

[Example:

The following represents the complement of red:

```

<a:solidFill>
  <a:srgbClr val="FF0000">
    <a:comp/>
  </a:srgbClr>
</a:solidFill>

```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_ComplementTransform](#)) is located in §A.4.1. *end note]*

20.1.2.3.8 gamma (Gamma)

This element specifies that the output color rendered by the generating application should be the sRGB gamma shift of the input color.

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_GammaTransform](#)) is located in §A.4.1. *end note*]

20.1.2.3.9 gray (Gray)

This element specifies a grayscale of its input color, taking into relative intensities of the red, green, and blue primaries.

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_GrayscaleTransform](#)) is located in §A.4.1. *end note*]

20.1.2.3.10 green (Green)

This elements specifies the input color with the specified green component, but with its red and blue color components unchanged.

Attributes	Description
val (Value)	<p>Specifies the value of the green component. The assigned value is specified as a percentage with 0% indicating minimal green and 100% indicating maximum green.</p> <p>[<i>Example:</i> The following manipulates the fill from having RGB value RRGGBB = (00, 00, FF) to value RRGGBB= (00, FF, FF)</p> <pre><a:solidFill> <a:srgbClr val="0000FF"> <a:green val="100%"/> </a:srgbClr> </a:solidFill></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Percentage](#)) is located in §A.4.1. *end note*]

20.1.2.3.11 greenMod (Green Modulation)

This element specifies the input color with its green component modulated by the given percentage. A 50% green modulate reduces the green component by half. A 200% green modulate doubles the green component.

Attributes	Description
val (Value)	<p>Specifies the green component as expressed by a percentage relative to the input color component. Increases never increase the green component beyond 100%, decreases never decrease the green component below 0%.</p> <p>[<i>Example:</i> The following manipulates the fill from having RGB value RRGGBB = (00, FF, 00) to value RRGGBB= (00, 80, 00)</p> <pre><a:solidFill> <a:srgbClr val="00FF00"> <a:greenMod val="50%"/> </a:srgbClr> </a:solidFill></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Percentage](#)) is located in §A.4.1.
end note]

20.1.2.3.12 greenOff (Green Offset)

This element specifies the input color with its green component shifted, but with its red and blue color components unchanged.

Attributes	Description
val (Value)	<p>Specifies the green component as expressed by a percentage offset increase or decrease to the input color component. Increases never increase the green component beyond 100%, decreases never decrease the green component below 0%.</p> <p>[<i>Example:</i> The following manipulates the fill from having RGB value RRGGBB = (00, FF, 00) to value RRGGBB= (00, CC, 00)</p> <pre><a:solidFill> <a:srgbClr val="00FF00"> <a:greenOff val="-20%"/> </a:srgbClr> </a:solidFill></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_Percentage](#)) is located in §A.4.1. *end note*]

20.1.2.3.13 **hslClr (Hue, Saturation, Luminance Color Model)**

This element specifies a color using the HSL color model. A perceptual gamma of 2.2 is assumed.

Hue refers to the dominant wavelength of color, saturation refers to the purity of its hue, and luminance refers to its lightness or darkness.

As with all colors, colors defined with the HSL color model can have color transforms applied to it.

[Example:

The color blue having RGB value RRGGBB = (00, 00, 80) is equivalent to

```
<a:solidFill>
  <a:hslClr hue="14400000" sat="100%" lum="50%">
</a:solidFill>
```

end example]

Attributes	Description
hue (Hue)	<p>Specifies the angular value describing the wavelength. Expressed in 1/6000ths of a degree.</p> <p>The possible values for this attribute are defined by the ST_PositiveFixedAngle simple type (§20.1.10.43).</p>
lum (Luminance)	<p>Specifies the luminance referring to the lightness or darkness of the color. Expressed as a percentage with 0% referring to maximal dark (black) and 100% referring to maximal white.</p> <p>The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).</p>
sat (Saturation)	<p>Specifies the saturation referring to the purity of the hue. Expressed as a percentage with 0% referring to grey, 100% referring to the purest form of the hue.</p> <p>The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_HslColor](#)) is located in §A.4.1. *end note*]

20.1.2.3.14 **hue (Hue)**

This element specifies the input color with the specified hue, but with its saturation and luminance unchanged.

[Example: The following two solid fills are equivalent.

```
<a:solidFill>
  <a:hslClr hue="14400000" sat="100%" lum="50%">
</a:solidFill>
<a:solidFill>
  <a:hslClr hue="0" sat="100%" lum="50%">
    <a:hue val="14400000"/>
  <a:hslClr/>
</a:solidFill>
```

end example]

Attributes	Description
val (Value)	Specifies the actual angle value to be used with the input color's hue component. The possible values for this attribute are defined by the ST_PositiveFixedAngle simple type (§20.1.10.43).

[Note: The W3C XML Schema definition of this element's content model ([CT_PositiveFixedAngle](#)) is located in §A.4.1. *end note*]

20.1.2.3.15 hueMod (Hue Modulate)

This element specifies the input color with its hue modulated by the given percentage. A 50% hue modulate decreases the angular hue value by half. A 200% hue modulate doubles the angular hue value.

Attributes	Description
val (Value)	Specifies the opacity as expressed by a percentage relative to the input color. [Example: The following represents a green solid fill which is 50% opaque <pre><a:solidFill> <a:srgbClr val="00FF00"> <a:alphaMod val="50%"/> </a:srgbClr> </a:solidFill></pre> <i>end example]</i> The possible values for this attribute are defined by the ST_PositivePercentage simple type (§20.1.10.45).

[Note: The W3C XML Schema definition of this element's content model ([CT_PositivePercentage](#)) is located in §A.4.1. *end note*]

20.1.2.3.16 hueOff (Hue Offset)

This element specifies the input color with its hue shifted, but with its saturation and luminance unchanged.

Attributes	Description
val (Value)	<p>Specifies the actual angular value of the shift. The result of the shift shall be between 0 and 360 degrees. Shifts resulting in angular values less than 0 are treated as 0. Shifts resulting in angular values greater than 360 are treated as 360.</p> <p>[Example: The following increases the hue angular value by 10 degrees.</p> <pre><a:solidFill> <a:hslClr hue="0" sat="100%" lum="50%"/> <a:hueOff val="600000"/> </a:solidFill></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the ST_Angle simple type (§20.1.10.3).</p>

[Note: The W3C XML Schema definition of this element’s content model (CT_Angle) is located in §A.4.1. end note]

20.1.2.3.17 inv (Inverse)

This element specifies the inverse of its input color.

[Example:

The inverse of red (1, 0, 0) is cyan (0, 1, 1).

The following represents cyan, the inverse of red:

```
<a:solidFill>  
  <a:srgbClr val="FF0000">  
    <a:inv/>  
  </a:srgbClr>  
</a:solidFill>
```

end example]

[Note: The W3C XML Schema definition of this element’s content model (CT_InverseTransform) is located in §A.4.1. end note]

20.1.2.3.18 `invGamma` (Inverse Gamma)

This element specifies that the output color rendered by the generating application should be the inverse sRGB gamma shift of the input color.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_InverseGammaTransform](#)) is located in §A.4.1. *end note*]

20.1.2.3.19 `lum` (Luminance)

This element specifies the input color with the specified luminance, but with its hue and saturation unchanged. Typically luminance values fall in the range [0%, 100%].

[*Example:*

The following two solid fills are equivalent:

```
<a:solidFill>
  <a:hslClr hue="14400000" sat="100%" lum="50%">
</a:solidFill>
<a:solidFill>
  <a:hslClr hue="14400000" sat="100%" lum="0%">
    <a:lum val="50%"/>
  <a:hslClr/>
</a:solidFill>
```

end example]

Attributes	Description
val (Value)	<p>Specifies the value of the luminance. The assigned value is specified as a percentage with 0% indicating minimal luminance and 100% indicating maximum luminance.</p> <p>[<i>Example:</i> The following manipulates the fill from having RGB value RRGGBB = (00, FF, 00) to value RRGGBB= (00, 66, 00)</p> <pre><a:solidFill> <a:srgbClr val="00FF00"> <a:lum val="20%"/> </a:srgbClr> </a:solidFill></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Percentage](#)) is located in §A.4.1.
end note]

20.1.2.3.20 lumMod (Luminance Modulation)

This element specifies the input color with its luminance modulated by the given percentage. A 50% luminance modulate reduces the luminance by half. A 200% luminance modulate doubles the luminance.

Attributes	Description
val (Value)	<p>Specifies the luminance as expressed by a percentage relative to the input color. Increases never increase the luminance beyond 100%, decreases never decrease the luminance below 0%.</p> <p>[<i>Example:</i> The following manipulates the fill from having RGB value RRGGBB = (00, FF, 00) to value RRGGBB= (00, 75, 00)</p> <pre><a:solidFill> <a:srgbClr val="00FF00"> <a:lumMod val="50%"/> </a:srgbClr> </a:solidFill></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Percentage](#)) is located in §A.4.1.
end note]

20.1.2.3.21 lumOff (Luminance Offset)

This element specifies the input color with its luminance shifted, but with its hue and saturation unchanged.

Attributes	Description
val (Value)	<p>Specifies the luminance as expressed by a percentage offset increase or decrease to the input color. Increases never increase the luminance beyond 100%, decreases never decrease the luminance below 0%.</p> <p>[<i>Example:</i> The following manipulates the fill from having RGB value RRGGBB = (00, FF, 00) to value RRGGBB= (00, 99, 00)</p> <pre><a:solidFill> <a:srgbClr val="00FF00"> <a:lumOff val="-20%"/> </a:srgbClr> </a:solidFill></pre>

Attributes	Description
	<i>end example]</i> The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Percentage](#)) is located in §A.4.1.
end note]

20.1.2.3.22 prstClr (Preset Color)

This element specifies a color which is bound to one of a predefined collection of colors.

[*Example:*

The following defines a solid fill bound to the "black" preset color.

```
<a:solidFill>
  <a:prstClr val="black">
</a:solidFill>
```

end example]

Attributes	Description
val (Value)	Specifies the actual preset color value. The possible values for this attribute are defined by the ST_PresetColorVal simple type (§20.1.10.47).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_PresetColor](#)) is located in §A.4.1.
end note]

20.1.2.3.23 red (Red)

This element specifies the input color with the specified red component, but with its green and blue color components unchanged.

Attributes	Description
val (Value)	Specifies the value of the red component. The assigned value is specified as a percentage with 0% indicating minimal red and 100% indicating maximum red. [<i>Example:</i> The following manipulates the fill from having RGB value RRGGBB = (00, FF, 00) to value RRGGBB= (FF, FF, 00)

Attributes	Description
	<pre> <a:solidFill> <a:srgbClr val="00FF00"> <a:red val="100%"/> </a:srgbClr> </a:solidFill> </pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Percentage](#)) is located in §A.4.1.
end note]

20.1.2.3.24 redMod (Red Modulation)

This element specifies the input color with its red component modulated by the given percentage. A 50% red modulate reduces the red component by half. A 200% red modulate doubles the red component.

Attributes	Description
val (Value)	<p>Specifies the red component as expressed by a percentage relative to the input color component. Increases never increase the red component beyond 100%, decreases never decrease the red component below 0%.</p> <p>[Example: The following manipulates the fill from having RGB value RRGGBB = (FF, 00, 00) to value RRGGBB= (80, 00, 00)</p> <pre> <a:solidFill> <a:srgbClr val="FF0000"> <a:redMod val="50%"/> </a:srgbClr> </a:solidFill> </pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Percentage](#)) is located in §A.4.1.
end note]

20.1.2.3.25 redOff (Red Offset)

This element specifies the input color with its red component shifted, but with its green and blue color components unchanged.

Attributes	Description
val (Value)	<p>Specifies the red component as expressed by a percentage offset increase or decrease to the input color component. Increases never increase the red component beyond 100%, decreases never decrease the red component below 0%.</p> <p>[<i>Example:</i> The following manipulates the fill from having RGB value RRGGBB = (FF, 00, 00) to value RRGGBB= (CC, 00, 00)</p> <pre> <a:solidFill> <a:srgbClr val="FF0000"> <a:redOff val="-20%"/> </a:srgbClr> </a:solidFill> </pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Percentage](#)) is located in §A.4.1.
end note]

20.1.2.3.26 sat (Saturation)

This element specifies the input color with the specified saturation, but with its hue and luminance unchanged. Typically saturation values fall in the range [0%, 100%].

[*Example:*

The following two solid fills are equivalent:

```

<a:solidFill>
  <a:hslClr hue="14400000" sat="100%" lum="50%">
</a:solidFill>
<a:solidFill>
  <a:hslClr hue="14400000" sat="0%" lum="50%">
    <a:sat val="100000"/>
  <a:hslClr/>
</a:solidFill>

```

end example]

Attributes	Description
val (Value)	<p>Specifies the value of the saturation. The assigned value is specified as a percentage with 0% indicating minimal saturation and 100% indicating maximum saturation.</p>

Attributes	Description
	<p>[Example: The following manipulates the fill from having RGB value RRGGBB = (00, FF, 00) to value RRGGBB= (40, C0, 40)</p> <pre><a:solidFill> <a:srgbClr val="00FF00"> <a:sat val="50%"/> </a:srgbClr> </a:solidFill></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Percentage](#)) is located in §A.4.1. *end note*]

20.1.2.3.27 satMod (Saturation Modulation)

This element specifies the input color with its saturation modulated by the given percentage. A 50% saturation modulate reduces the saturation by half. A 200% saturation modulate doubles the saturation.

Attributes	Description
val (Value)	<p>Specifies the saturation as expressed by a percentage relative to the input color. Increases never increase the saturation beyond 100%, decreases never decrease the saturation below 0%.</p> <p>[Example: The following manipulates the fill from having RGB value RRGGBB = (00, FF, 00) to value RRGGBB= (66, 99, 66)</p> <pre><a:solidFill> <a:srgbClr val="00FF00"> <a:satMod val="20%"/> </a:srgbClr> </a:solidFill></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Percentage](#)) is located in §A.4.1. *end note*]

20.1.2.3.28 satOff (Saturation Offset)

This element specifies the input color with its saturation shifted, but with its hue and luminance unchanged. A 10% offset to 20% saturation yields 30% saturation.

Attributes	Description
val (Value)	<p>Specifies the saturation as expressed by a percentage offset increase or decrease to the input color. Increases never increase the saturation beyond 100%, decreases never decrease the saturation below 0%.</p> <p>[<i>Example</i>: The following manipulates the fill from having RGB value RRGGBB = (00, FF, 00) to value RRGGBB= (19, E5, 19)</p> <pre><a:solidFill> <a:srgbClr val="00FF00"> <a:satOff val="-20%"/> </a:srgbClr> </a:solidFill></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_Percentage](#)) is located in §A.4.1.
end note]

20.1.2.3.29 schemeClr (Scheme Color)

This element specifies a color bound to a user's theme. As with all elements which define a color, it is possible to apply a list of color transforms to the base color defined.

Attributes	Description
val (Value)	<p>Specifies the desired scheme.</p> <p>[<i>Example</i>: The following represents a color bound to the "lt1" theme color</p> <pre><a:solidFill> <a:schemeClr val="lt1"/> </a:solidFill></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_SchemeColorVal simple type (§20.1.10.53).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_SchemeColor](#)) is located in §A.4.1.
end note]

20.1.2.3.30 **scrgbClr (RGB Color Model - Percentage Variant)**

This element specifies a color using the red, green, blue RGB color model. Each component, red, green, and blue is expressed as a percentage from 0% to 100%. A linear gamma of 1.0 is assumed.

Specifies the level of red as expressed by a percentage offset increase or decrease relative to the input color.

[*Example*: The following represent the same color

```
<a:solidFill>
  <a:scrgbClr r="50%" g="50%" b="50%"/>
</a:solidFill>
<a:solidFill>
  <a:srgbClr val="BCBCBC"/>
</a:solidFill>
```

end example]

Attributes	Description
b (Blue)	Specifies the percentage of blue. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).
g (Green)	Specifies the percentage of green. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).
r (Red)	Specifies the percentage of red. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_ScRgbColor](#)) is located in §A.4.1.
end note]

20.1.2.3.31 **shade (Shade)**

This element specifies a darker version of its input color. A 10% shade is 10% of the input color combined with 90% black.

Attributes	Description
val (Value)	Specifies the shade as expressed by a percentage value.

Attributes	Description
	<p>[Example: The following manipulates the fill from having RGB value RRGGBB = (00, FF, 00) to value RRGGBB= (00, BC, 00)</p> <pre><a:solidFill> <a:srgbClr val="00FF00"> <a:shade val="50%"/> </a:srgbClr> </a:solidFill></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_PositiveFixedPercentage simple type (§20.1.10.44).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_PositiveFixedPercentage](#)) is located in §A.4.1. *end note*]

20.1.2.3.32 srgbClr (RGB Color Model - Hex Variant)

This element specifies a color using the red, green, blue RGB color model. Red, green, and blue is expressed as sequence of hex digits, RRGGBB. A perceptual gamma of 2.2 is used.

Specifies the level of red as expressed by a percentage offset increase or decrease relative to the input color.

[Example: The following represent the same color

```
<a:solidFill>
  <a:scrgbClr r="50%" g="50%" b="50%"/>
</a:solidFill>
<a:solidFill>
  <a:srgbClr val="BCBCBC"/>
</a:solidFill>
```

end example]

Attributes	Description
val (Value)	<p>The actual color value. Expressed as a sequence of hex digits RRGGBB.</p> <p>The possible values for this attribute are defined by the ST_HexColorRGB simple type (§22.9.2.5).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_SRgbColor](#)) is located in §A.4.1. *end note*]

20.1.2.3.33 sysClr (System Color)

This element specifies a color bound to predefined operating system elements.

[Example: The following represents the default color used for displaying text in a window.

```
<a:solidFill>
  <a:sysClr val="windowText"/>
</a:solidFill>
```

end example]

Attributes	Description
lastClr (Last Color)	Specifies the color value that was last computed by the generating application. The possible values for this attribute are defined by the ST_HexColorRGB simple type (§22.9.2.5).
val (Value)	Specifies the system color value. The possible values for this attribute are defined by the ST_SystemColorVal simple type (§20.1.10.57).

[Note: The W3C XML Schema definition of this element’s content model ([CT_SystemColor](#)) is located in §A.4.1.
end note]

20.1.2.3.34 tint (Tint)

This element specifies a lighter version of its input color. A 10% tint is 10% of the input color combined with 90% white.

Attributes	Description
val (Value)	Specifies the tint as expressed by a percentage value. [Example: The following manipulates the fill from having RGB value RRGGBB = (00, FF, 00) to value RRGGBB= (BC, FF, BC) <a:solidFill> <a:srgbClr val="00FF00"> <a:tint val="50%"/> </a:srgbClr> </a:solidFill> end example] The possible values for this attribute are defined by the ST_PositiveFixedPercentage simple type (§20.1.10.44).

[Note: The W3C XML Schema definition of this element's content model ([CT_PositiveFixedPercentage](#)) is located in §A.4.1. *end note*]

20.1.3 Audio and Video

The Audio and Video portion of the DrawingML framework deals with all media of these two kinds that can be attached to objects within a document. Types of audio that can be represented within a file are CD audio, QuickTime audio, and any other generic audio. When dealing with generic audio there is the option for embedding it within the file and also linking it. The linking option is preferable if the size of the audio file is too large and thus increases the size of the document by an undesirable amount. For video there are two kinds that can be represented and that is either a QuickTime movie or any other generic movie. When dealing with generic video there is only the option of linking to the media as video is too large to embed within a document.

20.1.3.1 audioCd (Audio from CD)

This element specifies the existence of Audio from a CD. This element is specified within the non-visual properties of an object. The audio shall be attached to an object as this is how it is represented within the document. The actual playing of the sound however is done within the timing node list that is specified under the timing element.

[Example: Consider the following picture object that has an audio from a CD attached to it.

```
<p:pic>
  <p:nvPicPr>
    <p:cNvPr id="7" name="Rectangle 6">
      <a:hlinkClick r:id="" action="ppaction://media"/>
    </p:cNvPr>
    <p:cNvPicPr>
      <a:picLocks noRot="1"/>
    </p:cNvPicPr>
    <p:nvPr>
      <a:audioCd>
        <a:st track="1"/>
        <a:end track="3" time="65"/>
      </a:audioCd>
    </p:nvPr>
  </p:nvPicPr>
  ...
</p:pic>
```

In the above example, we see that there is a single audioCD element attached to this picture. This picture is placed within the document just as a normal picture or shape would be. The id of this picture, namely 7 in this case, is used to refer to this audioCD element from within the timing node list. For this example we see that the audio for this CD starts playing at the 0 second mark on the first track and ends on the 1 minute 5 second mark of the third track. *end example*]

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_AudioCD](#)) is located in §A.4.1. *end note*]

20.1.3.2 **audioFile (Audio from File)**

This element specifies the existence of an audio file. This element is specified within the non-visual properties of an object. The audio shall be attached to an object as this is how it is represented within the document. The actual playing of the audio however is done within the timing node list that is specified under the timing element.

[*Example:* Consider the following picture object that has an audio file attached to it.

```
<p:pic>
  <p:nvPicPr>
    <p:cNvPr id="7" name="Rectangle 6">
      <a:hlinkClick r:id="" action="ppaction://media"/>
    </p:cNvPr>
    <p:cNvPicPr>
      <a:picLocks noRot="1"/>
    </p:cNvPicPr>
    <p:nvPr>
      <a:audioFile r:link="rId1"/>
    </p:nvPr>
  </p:nvPicPr>
  ...
</p:pic>
```

In the above example, we see that there is a single audioFile element attached to this picture. This picture is placed within the document just as a normal picture or shape would be. The id of this picture, namely 7 in this case, is used to refer to this audioFile element from within the timing node list. The Linked relationship id is used to retrieve the actual audio file for playback purposes. *end example*]

Attributes	Description
contentType (Content Type of Linked Audio File)	<p>Specifies the content type for the external file that is referenced by this element. Content types define a media type, a subtype, and an optional set of parameters, as defined in Part 2. If a rendering application cannot process external content of the content type specified, then the specified content can be ignored. [<i>Note:</i> A list of suggested audio types is provided in §15.2.2. <i>end note</i>]</p> <p>If this attribute is omitted, application should attempt to determine the content type by reading the contents of the relationship’s target.</p> <p>A producer that wants interoperability should use the following standard format:</p> <ul style="list-style-type: none">• audio/mpeg ISO/IEC 11172-3 <p>The possible values for this attribute are defined by the W3C XML Schema string</p>

Attributes	Description
	datatype.
link (Linked Relationship ID) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the identification information for a linked object. This attribute is used to specify the location of an object that does not reside within this file. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

[Note: The W3C XML Schema definition of this element's content model ([CT_AudioFile](#)) is located in §A.4.1. *end note*]

20.1.3.3 end (Audio End Time)

This element specifies the end point for a CD Audio sound element. Encompassed within this element are the time and track at which the sound should halt its playback. This element is used in conjunction with an Audio Start Time element to specify the time span for an entire audioCD sound element.

[Example: Consider the following DrawingML.

```
<a:audioCd>
  <a:st track="1" time="2"/>
  <a:end track="3" time="65"/>
</a:audioCd>
```

In the above example, the audioCD sound element shown specifies for a portion of audio spanning from 2 seconds into the first track to 1 minute, 5 seconds into the third track. *end example*]

Attributes	Description
time (Time)	Specifies the time in seconds that the CD Audio should be started at. If this attribute is omitted, then a value of 0 is assumed. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
track (Track)	Specifies which track of the CD this Audio begins playing on. This attribute is required and cannot be omitted. The possible values for this attribute are defined by the W3C XML Schema unsignedByte datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_AudioCDTime](#)) is located in §A.4.1. *end note*]

20.1.3.4 quickTimeFile (QuickTime from File)

This element specifies the existence of a QuickTime file, as defined in the 2007-09-04 version of the QuickTime File Format Specification: <http://developer.apple.com/documentation/QuickTime/QTFF/qtff.pdf>. [Note: For more information on the QuickTime format: <http://developer.apple.com/reference/QuickTime/>. end note]. This element is specified within the non-visual properties of an object. The QuickTime file shall be attached to an object as this is how it is represented within the document. The actual playing of the QuickTime however is done within the timing node list that is specified under the timing element.

[Example: Consider the following picture object that has a QuickTime file attached to it.

```
<p:pic>
  <p:nvPicPr>
    <p:cNvPr id="7" name="Rectangle 6">
      <a:hlinkClick r:id="" action="ppaction://media"/>
    </p:cNvPr>
    <p:cNvPicPr>
      <a:picLocks noRot="1"/>
    </p:cNvPicPr>
    <p:nvPr>
      <a:quickTimeFile r:link="rId1"/>
    </p:nvPr>
  </p:nvPicPr>
  ...
</p:pic>
```

In the above example, we see that there is a single quickTimeFile element attached to this picture. This picture is placed within the document just as a normal picture or shape would be. The id of this picture, namely 7 in this case, is used to refer to this quickTimeFile element from within the timing node list. The Linked relationship id is used to retrieve the actual video file for playback purposes. end example]

Attributes	Description
link (Linked Relationship ID)	Specifies the identification information for a linked object. This attribute is used to specify the location of an object that does not reside within this file.
Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

[Note: The W3C XML Schema definition of this element’s content model ([CT_QuickTimeFile](#)) is located in §A.4.1. end note]

20.1.3.5 `st` (Audio Start Time)

This element specifies the start point for a CD Audio sound element. Encompassed within this element are the time and track at which the sound should begin its playback. This element is used in conjunction with an Audio End Time element to specify the time span for an entire audioCD sound element.

[*Example:* Consider the following DrawingML.

```
<a:audioCd>
  <a:st track="1" time="2"/>
  <a:end track="3" time="65"/>
</a:audioCd>
```

In the above example, the audioCD sound element shown specifies for a portion of audio spanning from 2 seconds into the first track to 1 minute, 5 seconds into the third track. *end example*]

Attributes	Description
time (Time)	Specifies the time in seconds that the CD Audio should be started at. If this attribute is omitted, then a value of 0 is assumed. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
track (Track)	Specifies which track of the CD this Audio begins playing on. This attribute is required and cannot be omitted. The possible values for this attribute are defined by the W3C XML Schema unsignedByte datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_AudioCDTime](#)) is located in §A.4.1. *end note*]

20.1.3.6 `videoFile` (Video from File)

This element specifies the existence of a video file. This element is specified within the non-visual properties of an object. The video shall be attached to an object as this is how it is represented within the document. The actual playing of the video however is done within the timing node list that is specified under the timing element.

[*Example:* Consider the following picture object that has a video attached to it.

```
<p:pic>
  <p:nvPicPr>
    <p:cNvPr id="7" name="Rectangle 6">
      <a:hlinkClick r:id="" action="ppaction://media"/>
    </p:cNvPr>
```

```
<p:cNvPicPr>
  <a:picLocks noRot="1"/>
</p:cNvPicPr>
<p:nvPr>
  <a:videoFile r:link="rId1"/>
</p:nvPr>
</p:nvPicPr>
...
</p:pic>
```

In the above example, we see that there is a single videoFile element attached to this picture. This picture is placed within the document just as a normal picture or shape would be. The id of this picture, namely 7 in this case, is used to refer to this videoFile element from within the timing node list. The Linked relationship id is used to retrieve the actual video file for playback purposes. *end example*]

Attributes	Description
contentType (Content Type of Linked Video File)	<p>Specifies the content type for the external file that is referenced by this element. Content types define a media type, a subtype, and an optional set of parameters, as defined in Part 2. If a rendering application cannot process external content of the content type specified, then the specified content can be ignored. [<i>Note</i>: A list of suggested video types is provided in §15.2.17. <i>end note</i>]</p> <p>If this attribute is omitted, application should attempt to determine the content type by reading the contents of the relationship's target.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
link (Linked Relationship ID) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	<p>Specifies the identification information for a linked video file. This attribute is used to specify the location of an object that does not reside within this file.</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>

[*Note*: The W3C XML Schema definition of this element's content model (CT_VideoFile) is located in §A.4.1. *end note*]

20.1.3.7 wavAudioFile (Audio from WAV File)

This element specifies the existence of an audio WAV file. This element is specified within the non-visual properties of an object. The audio shall be attached to an object as this is how it is represented within the document. The actual playing of the audio however is done within the timing node list that is specified under the timing element.

[Example: Consider the following picture object that has an audio WAV file attached to it.

```
<p:pic>
  <p:nvPicPr>
    <p:cNvPr id="7" name="Rectangle 6">
      <a:hlinkClick r:id="" action="ppaction://media"/>
    </p:cNvPr>
    <p:cNvPicPr>
      <a:picLocks noRot="1"/>
    </p:cNvPicPr>
    <p:nvPr>
      <a:wavAudioFile r:embed="rId2"/>
    </p:nvPr>
  </p:nvPicPr>
  ...
</p:pic>
```

In the above example, we see that there is a single wavAudioFile element attached to this picture. This picture is placed within the document just as a normal picture or shape would be. The id of this picture, namely 7 in this case, is used to refer to this wavAudioFile element from within the timing node list. The Embedded relationship id is used to retrieve the actual audio file for playback purposes. *end example*

[Note: This element is generally used for the purposes of embedding audio files within the document. For linking to generic audio files the audioFile element should be used. *end note*]

Attributes	Description
embed (Embedded Audio File Relationship ID) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the identification information for an embedded audio file. This attribute is used to specify the location of an object that resides locally within the file. [Note: A list of suggested audio types is provided in §15.2.2. <i>end note</i>] The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).
name (Sound Name)	Specifies the original name or given short name for the corresponding sound. This is used to distinguish this sound from others by providing a human readable name for the attached sound should the user need to identify the sound among others within the UI. The possible values for this attribute are defined by the W3C XML Schema string datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_EmbeddedWAVAudioFile](#)) is located in §A.4.1. *end note*]

20.1.4 Styles

Styles within DrawingML refer to the way a particular object (be it text or a shape, or anything else) is formatted. Different aspects, ranging from color, line type, fill, and effects applied to the object can be predefined within a theme. The main purpose of a theme is to define a style matrix from which a document can pull style information from in order to format the visual look of objects in a document.

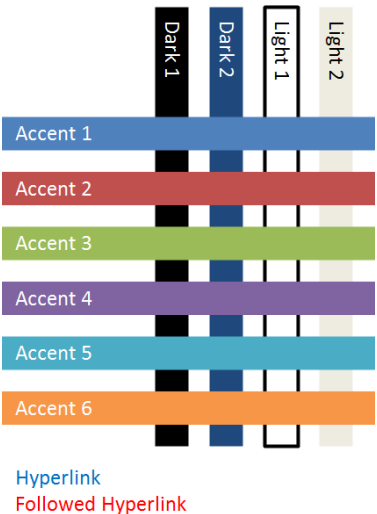
20.1.4.1 Styles

The elements in this section compose the basic definition of a style, including its associated colors, effect styles, line styles, fill styles, background styles, and font scheme.

20.1.4.1.1 accent1 (Accent 1)

This element defines a color that happens to be the accent 1 color. The set of twelve colors come together to form the color scheme for a theme.

[*Example:* Consider the following example of a set of colors that form a color scheme:



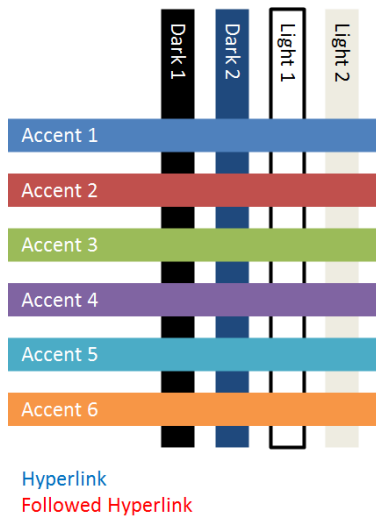
end example]

[*Note:* The W3C XML Schema definition of this element’s content model (CT_Color) is located in §A.4.1. *end note]*

20.1.4.1.2 accent2 (Accent 2)

This element defines a color that happens to be the accent 2 color. The set of twelve colors come together to form the color scheme for a theme.

[*Example:* Consider the following example of a set of colors that form a color scheme:



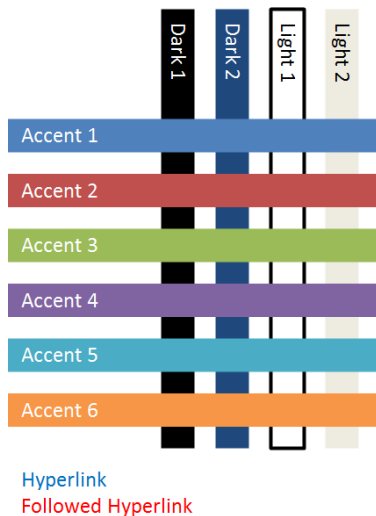
end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Color](#)) is located in §A.4.1. *end note]*

20.1.4.1.3 accent3 (Accent 3)

This element defines a color that happens to be the accent 3 color. The set of twelve colors come together to form the color scheme for a theme.

[*Example:* Consider the following example of a set of colors that form a color scheme:



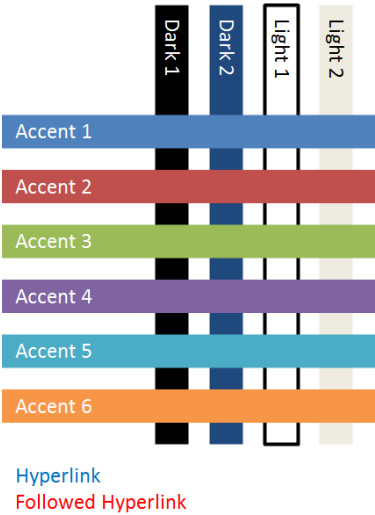
end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Color](#)) is located in §A.4.1. *end note]*

20.1.4.1.4 `accent4` (Accent 4)

This element defines a color that happens to be the accent 4 color. The set of twelve colors come together to form the color scheme for a theme.

[*Example:* Consider the following example of a set of colors that form a color scheme:



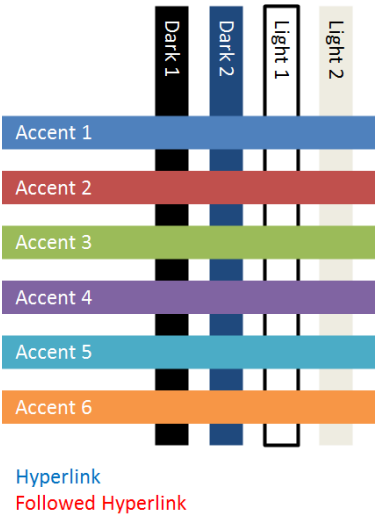
end example]

[*Note:* The W3C XML Schema definition of this element’s content model (`CT_Color`) is located in §A.4.1. *end note]*

20.1.4.1.5 `accent5` (Accent 5)

This element defines a color that happens to be the accent 5 color. The set of twelve colors come together to form the color scheme for a theme.

[*Example:* Consider the following example of a set of colors that form a color scheme:



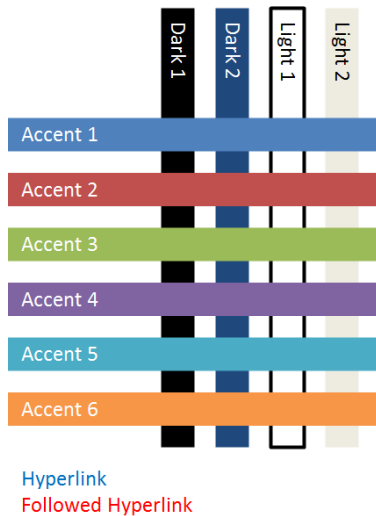
end example]

[Note: The W3C XML Schema definition of this element's content model (CT_Color) is located in §A.4.1. *end note]*

20.1.4.1.6 accent6 (Accent 6)

This element defines a color that happens to be the accent 1 color. The set of twelve colors come together to form the color scheme for a theme.

[Example: Consider the following example of a set of colors that form a color scheme:



end example]

[Note: The W3C XML Schema definition of this element's content model (CT_Color) is located in §A.4.1. *end note]*

20.1.4.1.7 bgFillStyleLst (Background Fill Style List)

This element defines a list of background fills that are used within a theme. The background fills consist of three fills, arranged in order from subtle to moderate to intense.

[Example: Consider the following example of a background fill style list within DrawingML:

```
<bgFillStyleLst>
  <solidFill>
...
  </solidFill>
  <gradFill rotWithShape="1">
...
  </gradFill>
  <blipFill>
...
  </blipFill>
</bgFillStyleLst>
```

In this example, we see that the list contains a solid fill for the subtle fill, a gradient fill for the moderate fill and an image fill for the intense background fill. *end example]*

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_BackgroundFillStyleList](#)) is located in §A.4.1. *end note]*

20.1.4.1.8 **custClr (Custom color)**

This element defines a custom color. The custom colors are used within a custom color list to define custom colors that are extra colors that can be appended to a theme. This is useful within corporate scenarios where there is a set corporate color palette from which to work.

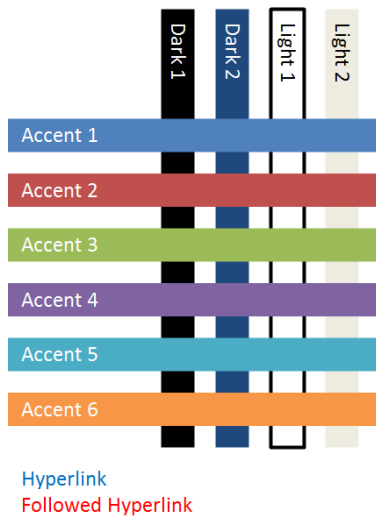
Attributes	Description
name (Name)	The name of the color shown in the color picker. The possible values for this attribute are defined by the W3C XML Schema string datatype.

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_CustomColor](#)) is located in §A.4.1. *end note]*

20.1.4.1.9 **dk1 (Dark 1)**

This element defines a color that happens to be the dark 1 color. The set of twelve colors come together to form the color scheme for a theme.

[*Example:* Consider the following example of a set of colors that form a color scheme:



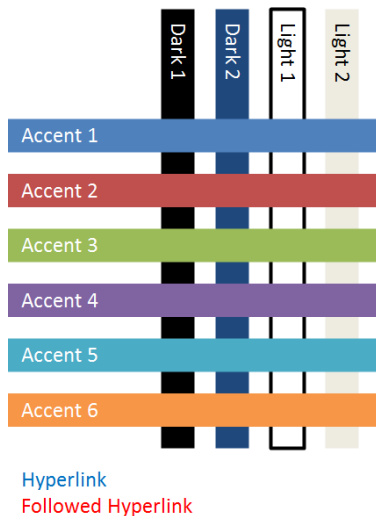
end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Color](#)) is located in §A.4.1. *end note]*

20.1.4.1.10 dk2 (Dark 2)

This element defines a color that happens to be the dark 2 color. The set of twelve colors come together to form the color scheme for a theme.

[*Example:* Consider the following example of a set of colors that form a color scheme:



end example]

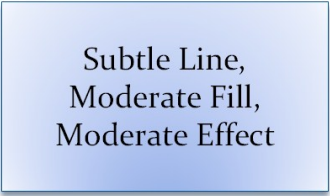
[*Note:* The W3C XML Schema definition of this element's content model ([CT_Color](#)) is located in §A.4.1. *end note]*

20.1.4.1.11 effectStyle (Effect Style)

This element defines a set of effects and 3D properties that can be applied to an object.

[Example: Consider the following example of an effect style within DrawingML:

```
<effectStyle>
  <effectLst>
    <outerShdw blurRad="57150" dist="38100" dir="5400000" align="ctr"
      rotWithShape="0">
      <schemeClr val="phClr">
        <shade val="9000"/>
        <satMod val="105000"/>
        <alpha val="48000"/>
      </schemeClr>
    </outerShdw>
  </effectLst>
</effectStyle>
```



Subtle Line,
Moderate Fill,
Moderate Effect

In this example, an outer shadow is being applied to a shape as the moderate effect. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_EffectStyleItem](#)) is located in §A.4.1. *end note*]

20.1.4.1.12 effectStyleLst (Effect Style List)

This element defines a set of three effect styles that create the effect style list for a theme. The effect styles are arranged in order of subtle to moderate to intense.

[Example: Consider the following example of an effect style list within DrawingML:

```
<effectStyleLst>
  <effectStyle>
    <effectLst>
      <outerShdw blurRad="57150" dist="38100" dir="5400000"
        align="ctr" rotWithShape="0">
      ...
    </outerShdw>
  </effectLst>
</effectStyle>
```

```

<effectStyle>
  <effectLst>
    <outerShdw blurRad="57150" dist="38100" dir="5400000"
      align="ctr" rotWithShape="0">
...
    </outerShdw>
  </effectLst>
</effectStyle>
<effectStyle>
  <effectLst>
    <outerShdw blurRad="57150" dist="38100" dir="5400000"
      align="ctr" rotWithShape="0">
...
    </outerShdw>
  </effectLst>
<scene3d>
...
</scene3d>
<sp3d prstMaterial="powder">
...
</sp3d>
</effectStyle>
</effectStyleLst>

```

In this example, we see three effect styles defined. The first two (subtle and moderate) define an outer shadow as the effect, while the third effect style (intense) defines an outer shadow along with 3D properties which are to be applied to the object as well. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_EffectStyleList](#)) is located in §A.4.1. *end note*]

20.1.4.1.13 fillStyleLst (Fill Style List)

This element defines a set of three fill styles that are used within a theme. The three fill styles are arranged in order from subtle to moderate to intense.

[*Example:* Consider the following example of a fill style list within DrawingML:

```

<fillStyleLst>
  <solidFill>
...
  </solidFill>
  <gradFill rotWithShape="1">
...
  </gradFill>

```

```
<gradFill rotWithShape="1">
...
</gradFill>
</fillStyleLst>
```






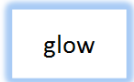



In this example, we see three fill styles being defined within the fill style list. The first style is the subtle style and defines simply a solid fill. The second and third styles (moderate and intense fills respectively) define gradient fills. *end example*]

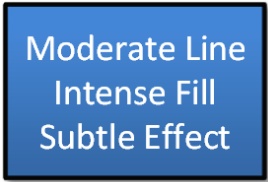
[*Note:* The W3C XML Schema definition of this element’s content model ([CT_FillStyleList](#)) is located in §A.4.1. *end note*]

20.1.4.1.14 **fmtScheme (Format Scheme)**

This element contains the background fill styles, effect styles, fill styles, and line styles which define the style matrix for a theme. The style matrix consists of subtle, moderate, and intense fills, lines, and effects. The background fills are not generally thought of to directly be associated with the matrix, but do play a role in the style of the overall document. Usually, a given object chooses a single line style, a single fill style, and a single effect style in order to define the overall final look of the object.

[*Example:* Consider the following example of the style matrix in use within DrawingML:

	Line	Fill	Effect
Subtle			
Moderate			
Intense			



In this example, we see a shape styled which utilizes different aspects from the above defined style matrix. *end example*]

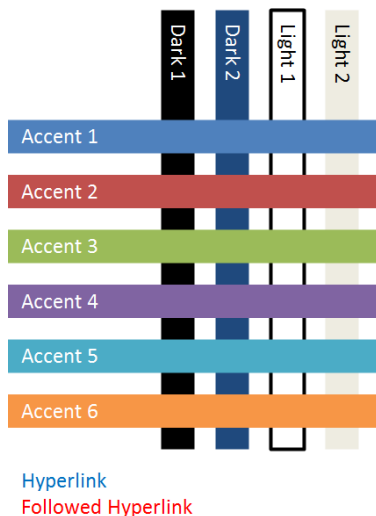
Attributes	Description
name (Name)	<p>Defines the name for the format scheme. The name is simply a human readable string which identifies the format scheme in the user interface.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_StyleMatrix](#)) is located in §A.4.1. *end note*]

20.1.4.1.15 folHlink (Followed Hyperlink)

This element defines a color that happens to be the followed hyperlink color. The set of twelve colors come together to form the color scheme for a theme.

[Example: Consider the following example of a set of colors that form a color scheme:



end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_Color](#)) is located in §A.4.1. *end note*]

20.1.4.1.16 font (Font)

This element defines a font within the styles area of DrawingML. A font is defined by a script along with a typeface.

[Example: Consider the following example of a font in DrawingML:

```
<font script="Thai" typeface="Cordia New"/>
```

In this example, we see that the script 'Thai' is supposed to use the font face 'Cordia New'. *end example*]

Attributes	Description
script (Script)	<p>Specifies the script, or language, in which the typeface is supposed to be used.</p> <p>[<i>Note</i>: It is recommended that script names as specified in ISO 15924 are used. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
typeface (Typeface)	<p>Specifies the font face to use.</p> <p>The possible values for this attribute are defined by the ST_TextTypeface simple type (§20.1.10.80).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_SupplementalFont](#)) is located in §A.4.1. *end note*]

20.1.4.1.17 fontRef (Font Reference)

This element represents a reference to a themed font. When used it specifies which themed font to use along with a choice of color.

[*Example*: Consider the following example of a font reference within DrawingML:

```
<fontRef idx="minor">
  <schemeClr val="tx1"/>
</fontRef>
```

In this example, we see a font referencing the minor font defined within the theme. *end example*]

Attributes	Description
idx (Identifier)	<p>Specifies the identifier of the font to reference.</p> <p>The possible values for this attribute are defined by the ST_FontCollectionIndex simple type (§20.1.10.25).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_FontReference](#)) is located in §A.4.1. *end note*]

20.1.4.1.18 fontScheme (Font Scheme)

This element defines the font scheme within the theme. The font scheme consists of a pair of major and minor fonts for which to use in a document. The major font corresponds well with the heading areas of a document, and the minor font corresponds well with the normal text or paragraph areas.

[*Example*: Consider the following example of a font scheme within DrawingML:

```

<fontScheme name="sample">
  <majorFont>
...
  </majorFont>
  <minorFont>
...
  </minorFont>
</fontScheme>

```

In this example, we see the major and minor font lists within the font scheme that is named 'sample'. *end example]*

Attributes	Description
name (Name)	<p>The name of the font scheme shown in the user interface.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_FontScheme](#)) is located in §A.4.1. *end note]*

20.1.4.1.19 hlink (Hyperlink)

This element defines a color that happens to be the hyperlink color. The set of twelve colors come together to form the color scheme for a theme.

[Example: Consider the following example of a set of colors that form a color scheme:



end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Color](#)) is located in §A.4.1. *end note*]

20.1.4.1.20 `lnDef` (Line Default)

This element defines a default line that is used within a document.

[*Example:* Consider the following example of a default line defined in DrawingML:

```
<lnDef>
  <spPr/>
  <bodyPr/>
  <lstStyle/>
  <style>
    <lnRef idx="1">
      <schemeClr val="accent2"/>
    </lnRef>
    <fillRef idx="0">
      <schemeClr val="accent2"/>
    </fillRef>
    <effectRef idx="0">
      <schemeClr val="accent2"/>
    </effectRef>
    <fontRef idx="minor">
      <schemeClr val="tx1"/>
    </fontRef>
  </style>
</lnDef>
```

In this example, we see that the default line for the document is being defined as a themed line which references the subtle line style with idx equal to 1. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DefaultShapeDefinition](#)) is located in §A.4.1. *end note*]

20.1.4.1.21 `lnStyleLst` (Line Style List)

This element defines a list of three line styles for use within a theme. The three line styles are arranged in order from subtle to moderate to intense versions of lines. This list makes up part of the style matrix.

[*Example:* Consider the following example of a line style list within DrawingML:


```

<lnStyleLst>
  <ln w="9525" cap="flat" cmpd="sng" algn="ctr">
    <solidFill>
      <schemeClr val="phClr">
        <shade val="50000"/>
        <satMod val="103000"/>
      </schemeClr>
    </solidFill>
    <prstDash val="solid"/>
  </ln>
  <ln w="25400" cap="flat" cmpd="sng" algn="ctr">
    <solidFill>
      <schemeClr val="phClr"/>
    </solidFill>
    <prstDash val="solid"/>
  </ln>
  <ln w="38100" cap="flat" cmpd="sng" algn="ctr">
    <solidFill>
      <schemeClr val="phClr"/>
    </solidFill>
    <prstDash val="solid"/>
  </ln>
</lnStyleLst>

```

In this example, we see three lines defined within a line style list. The first line corresponds to the subtle line, the second to the moderate, and the third corresponds to the intense line defined in the theme. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_LineStyleList](#)) is located in §A.4.1. *end note*]

20.1.4.1.22 lt1 (Light 1)

This element defines a color that happens to be the accent 1 color. The set of twelve colors come together to form the color scheme for a theme.

[Example: Consider the following example of a set of colors that form a color scheme:



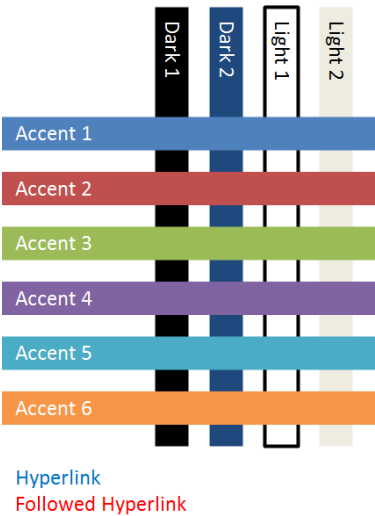
end example]

[*Note:* The W3C XML Schema definition of this element’s content model (CT_Color) is located in §A.4.1. *end note]*

20.1.4.1.23 lt2 (Light 2)

This element defines a color that happens to be the accent 1 color. The set of twelve colors come together to form the color scheme for a theme.

[*Example:* Consider the following example of a set of colors that form a color scheme:



end example]

[*Note:* The W3C XML Schema definition of this element’s content model (CT_Color) is located in §A.4.1. *end note]*

20.1.4.1.24 **majorFont** (Major Font)

This element defines the set of major fonts which are to be used under different languages or locals.

[*Example:* Consider the following example of the major fonts being defined within DrawingML:

```
<majorFont>
  <latin typeface="Calibri"/>
  <ea typeface="Arial"/>
  <cs typeface="Arial"/>
  <font script="Jpan" typeface="MS Pゴシック"/>
  <font script="Hang" typeface="HY중고딕"/>

  <font script="Hans" typeface="隶书"/>
  <font script="Hant" typeface="微軟黑體"/>
  <font script="Arab" typeface="Traditional Arabic"/>
  <font script="Hebr" typeface="Arial"/>
  <font script="Thai" typeface="Cordia New"/>
  <font script="Ethi" typeface="Nyala"/>
  <font script="Beng" typeface="Vrinda"/>
  <font script="Gujr" typeface="Shruti"/>
  <font script="Khmr" typeface="DaunPenh"/>
  <font script="Knda" typeface="Tunga"/>
</majorFont>
```

In this example, we see the latin, east asian, and complex script fonts defined along with many fonts for different locals. *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FontCollection](#)) is located in §A.4.1. *end note*]

20.1.4.1.25 **minorFont** (Minor fonts)

This element defines the set of minor fonts that are to be used under different languages or locals.

[*Example:* Consider the following example of the minor fonts being defined within DrawingML:

```

<minorFont>
  <latin typeface="Calibri"/>
  <ea typeface="Arial"/>
  <cs typeface="Arial"/>
  <font script="Jpan" typeface="MS Pゴシック"/>
  <font script="Hang" typeface="HY중고딕"/>
  <font script="Hans" typeface="隶书"/>
  <font script="Hant" typeface="微軟黑體"/>
  <font script="Arab" typeface="Traditional Arabic"/>
  <font script="Hebr" typeface="Arial"/>
  <font script="Thai" typeface="Cordia New"/>
  <font script="Ethi" typeface="Nyala"/>
  <font script="Beng" typeface="Vrinda"/>
  <font script="Gujr" typeface="Shruti"/>
  <font script="Khmr" typeface="DaunPenh"/>
  <font script="Knda" typeface="Tunga"/>
</minorFont>

```

In this example, we see the latin, east asian, and complex script fonts defined along with many fonts for different locals. *end example*]

[Note: The W3C XML Schema definition of this element's content model ([CT_FontCollection](#)) is located in §A.4.1. *end note*]

20.1.4.1.26 scene3d (3D Scene Properties)

This element defines optional scene-level 3D properties to apply to an object.

[Note: The W3C XML Schema definition of this element's content model ([CT_Scene3D](#)) is located in §A.4.1. *end note*]

20.1.4.1.27 spDef (Shape Default)

This element defines the formatting that is associated with the default shape. The default formatting can be applied to a shape when it is initially inserted into a document.

[Example: Consider the following example of a shape default being used within DrawingML:

```

<spDef>
  <spPr>
    <solidFill>
      <schemeClr val="accent2">
        <shade val="75000"/>
      </schemeClr>
    </solidFill>
  </spPr>

```

```

<bodyPr rtlCol="0" anchor="ctr"/>
<lstStyle>
  <defPPr align="ctr">
    <defRPr/>
  </defPPr>
</lstStyle>
<style>
  <lnRef idx="1">
    <schemeClr val="accent1"/>
  </lnRef>
  <fillRef idx="2">
    <schemeClr val="accent1"/>
  </fillRef>
  <effectRef idx="1">
    <schemeClr val="accent1"/>
  </effectRef>
  <fontRef idx="minor">
    <schemeClr val="dk1"/>
  </fontRef>
</style>
</spDef>

```

In this example, we see a default shape which references a certain themed fill, line, effect, and font along with an override fill to these. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DefaultShapeDefinition](#)) is located in §A.4.1. *end note*]

20.1.4.1.28 txDef (Text Default)

This element defines the default formatting which is applied to text in a document by default. The default formatting can and should be applied to the shape when it is initially inserted into a document.

[*Example:* Consider the following example of a text default being used within DrawingML:

```

<txDef>
  <spPr>
    <solidFill>
      <schemeClr val="accent2">
        <shade val="75000"/>
      </schemeClr>
    </solidFill>
  </spPr>
</bodyPr rtlCol="0" anchor="ctr"/>

```

```

<lstStyle>
  <defPPr align="ctr">
    <defRPr/>
  </defPPr>
</lstStyle>
<style>
  <lnRef idx="1">
    <schemeClr val="accent1"/>
  </lnRef>
  <fillRef idx="2">
    <schemeClr val="accent1"/>
  </fillRef>
  <effectRef idx="1">
    <schemeClr val="accent1"/>
  </effectRef>
  <fontRef idx="minor">
    <schemeClr val="dk1"/>
  </fontRef>
</style>
</txDef>

```

In this example, we see a default text which references a certain themed fill, line, effect, and font along with an override fill to these. *end example*]

[*Note*: The W3C XML Schema definition of this element's content model ([CT_DefaultShapeDefinition](#)) is located in §A.4.1. *end note*]

20.1.4.2 Table Styles

Table styles are responsible for the rapid formatting that can be applied to a table. This rapid formatting takes different parts of a table into account, such as if the first row or last row should be emphasized, or if there is some type of banding (row for example) present on the table. All of these different types of formatting can be defined within a table style

20.1.4.2.1 band1H (Band 1 Horizontal)

This element describes the formatting for the first row in horizontal banding. Two different row formatting are applied to the table alternating in order to create a banding effect on the table.


[*Example*: Consider the following example of band 1 horizontal being used within DrawingML:

```

<band1H>
  <tcStyle>
    <tcBdr/>
    <fill>
      <solidFill>
        <schemeClr val="accent1">
          <tint val="40000"/>
        </schemeClr>
      </solidFill>
    </fill>
  </tcStyle>
</band1H>

```

Band 1
Horizontal



text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text

In this example, we set the fill to be a solid fill referencing the accent 1 color defined in the theme. *end example]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TablePartStyle](#)) is located in §A.4.1. *end note]*

20.1.4.2.2 band1V (Band 1 Vertical)

This element describes the formatting for the first row in vertical banding. Two different row formatting are applied to the table alternating in order to create a banding effect on the table.

[*Example:* Consider the following example of band 1 vertical being used within DrawingML:

```

<band1V>
  <tcStyle>
    <tcBdr/>
    <fill>
      <solidFill>
        <schemeClr val="accent1">
          <tint val="40000"/>
        </schemeClr>
      </solidFill>
    </fill>
  </tcStyle>
</band1V>

```

Band 1 Vertical



text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text

In this example, we set the fill to be a solid fill referencing the accent 1 color defined in the theme. *end example]*

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_TablePartStyle](#)) is located in §A.4.1. *end note]*

20.1.4.2.3 band2H (Band 2 Horizontal)

This element describes the formatting for the second row in horizontal banding. Two different row formatting are applied to the table alternating in order to create a banding effect on the table.

[*Example:* Consider the following example of band 2 horizontal being used within DrawingML:

```
<band2H>
  <tcStyle>
    <tcBdr/>
    <fill>
      <solidFill>
        <schemeClr val="accent2">
          <tint val="40000"/>
        </schemeClr>
      </solidFill>
    </fill>
  </tcStyle>
</band2H>
```

Band 2 Horizontal



text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text

In this example, we set the fill to be a solid fill referencing the accent 2 color defined in the theme. *end example]*

[Note: The W3C XML Schema definition of this element's content model ([CT TablePartStyle](#)) is located in §A.4.1. *end note]*

20.1.4.2.4 band2V (Band 2 Vertical)

This element describes the formatting for the second row in vertical banding. Two different row formatting are applied to the table alternating in order to create a banding effect on the table.

[Example: Consider the following example of band 2 vertical being used within DrawingML:

```
<band2V>
  <tcStyle>
    <tcBdr/>
    <fill>
      <solidFill>
        <schemeClr val="accent2">
          <tint val="40000"/>
        </schemeClr>
      </solidFill>
    </fill>
  </tcStyle>
</band2V>
```

Band 2 Vertical



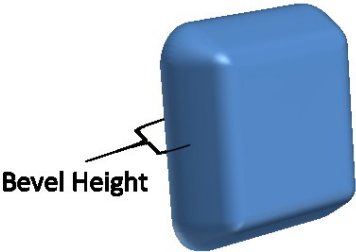
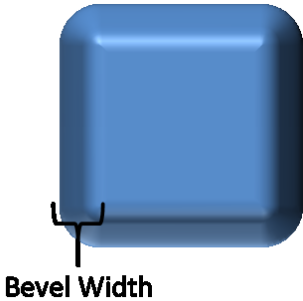
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text

In this example, we set the fill to be a solid fill referencing the accent 2 color defined in the theme. *end example]*

[Note: The W3C XML Schema definition of this element's content model ([CT TablePartStyle](#)) is located in §A.4.1. *end note]*

20.1.4.2.5 bevel (Bevel)

This element defines the properties of the bevel associated with the 3D effect applied to a cell in a table.

Attributes	Description
h (Height)	<p>Specifies the height of the bevel, or how far above the shape it is applied.</p> <p>[Example: Consider the following example bevel</p> <div data-bbox="431 512 784 762"></div> <p>In this example, we see the height of an example bevel on a shape. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>
prst (Preset Bevel)	<p>Specifies the preset bevel type which defines the look of the bevel.</p> <p>The possible values for this attribute are defined by the ST_BevelPresetType simple type (§20.1.10.9).</p>
w (Width)	<p>Specifies the width of the bevel, or how far into the shape it is applied.</p> <p>[Example: Consider the following example bevel</p> <div data-bbox="431 1266 732 1564"></div> <p>In this example, we see the width of an example bevel on a shape. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_Bevel](#)) is located in §A.4.1. *end note*]

20.1.4.2.6 bottom (Bottom Border)

This element defines the line properties associated with the bottom border in a table cell.

[*Example:* Consider the following example of the bottom border in use within DrawingML:

```
<bottom>
  <ln w="12700" cmpd="sng">
    <solidFill>
      <schemeClr val="accent1"/>
    </solidFill>
  </ln>
</bottom>
```

In this example, we see the bottom border on a table cell to be a single 1pt line which is colored accent 1. *end example]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ThemeableLineStyle](#)) is located in §A.4.1. *end note]*

20.1.4.2.7 effect (Effect)

This element defines the effect that can be applied to a table as a whole through a table style.

[*Example:* Consider the following example of an effect in use within DrawingML:

```
<effect>
  <effectLst>
    <glow rad="228600">
      <schemeClr val="accent1">
        <satMod val="175000"/>
        <alpha val="40000"/>
      </schemeClr>
    </glow>
  </effectLst>
</effect>
```

In this example, we see a glow being defined within the table style that is applied to the table as a whole. *end example]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_EffectProperties](#)) is located in §A.4.1. *end note]*

20.1.4.2.8 effectRef (Effect Reference)

This element defines a reference to an effect style within the style matrix. The `idx` attribute refers the index of an effect style within the `effectStyleLst` element.

Attributes	Description
idx (Style Matrix Index)	<p>Specifies the style matrix index of the style referred to.</p> <p>The possible values for this attribute are defined by the ST_StyleMatrixColumnIndex simple type (§20.1.10.56).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_StyleMatrixReference](#)) is located in §A.4.1. *end note*]

20.1.4.2.9 fill (Fill)

This element defines the fill that is applied to the table as a whole. The background of the table can contain a single fill that is the entire size of the table. This can allow for gradient fills, or image fills, which span the entire size of the table.

[Example: Consider the following example of a fill on a table background in DrawingML:

```
<fill>
  <gradFill flip="none" rotWithShape="1">
    <gsLst>
      <gs pos="0">
        <schemeClr val="accent2">
          <shade val="75000"/>
        </schemeClr>
      </gs>
      <gs pos="100000">
        <schemeClr val="accent2">
          <shade val="75000"/>
          <tint val="20000"/>
        </schemeClr>
      </gs>
    </gsLst>
    <lin ang="2700000" scaled="1"/>
    <tileRect/>
  </gradFill>
</fill>
```

In this example, we apply a gradient fill to the entire table on the background shape of the table. *end example*]

[Note: The W3C XML Schema definition of this element’s content model ([CT_FillProperties](#)) is located in §A.4.1. *end note*]

20.1.4.2.10 fillRef (Fill Reference)

This element defines a reference to a fill style within the style matrix. The `idx` attribute refers to the index of a fill style or background fill style within the presentation's style matrix, defined by the `fmtScheme` element. A value of 0 or 1000 indicates no background, values 1-999 refer to the index of a fill style within the `fillStyleLst` element, and values 1001 and above refer to the index of a background fill style within the `bgFillStyleLst` element. The value 1001 corresponds to the first background fill style, 1002 to the second background fill style, and so on.

[Example:

```
<a:fillRef idx="2">
  <a:schemeClr val="accent2"/>
</a:fillRef>
```

The above code indicates the object is to have the style's second fill style using the `accent2` color of the color scheme.

end example]

[Example:

```
<a:fillRef idx="1001">
  <a:schemeClr val="accent2"/>
</a:fillRef>
```

The above code indicates the object is to have the style's first background fill style using the `accent2` color of the color scheme.

end example]

Attributes	Description
<code>idx</code> (Style Matrix Index)	Specifies the style matrix index of the style referred to. The possible values for this attribute are defined by the <code>ST_StyleMatrixColumnIndex</code> simple type (§20.1.10.56).

[Note: The W3C XML Schema definition of this element's content model ([CT_StyleMatrixReference](#)) is located in §A.4.1. *end note*]

20.1.4.2.11 firstCol (First Column)

This element defines the cell formatting which can be applied to the first column of the table.

[Example: Consider the following example of first column formatting within DrawingML:

```
<firstCol>
  <tcTxStyle b="on">
    <fontRef idx="minor">
      <scrgbClr r="0" g="0" b="0"/>
    </fontRef>
    <schemeClr val="lt1"/>
  </tcTxStyle>
  <tcStyle>
    <tcBdr/>
    <fill>
      <solidFill>
        <schemeClr val="accent1"/>
      </solidFill>
    </fill>
  </tcStyle>
</firstCol>
```

First Column



text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text

In this example, we define the first column cell fills to be accent 1 along with the text properties to be bold when first column formatting is enabled through the user interface. *end example*]

[*Note:* The W3C XML Schema definition of this element’s content model ([CT TablePartStyle](#)) is located in §A.4.1. *end note*]

20.1.4.2.12 firstRow (First Row)


This element defines the cell formatting which can be applied to the first row of the table.

[*Example:* Consider the following example of first row formatting within DrawingML:

```

<firstRow>
  <tcTxStyle b="on">
    <fontRef idx="minor">
      <scrgbClr r="0" g="0" b="0"/>
    </fontRef>
    <schemeClr val="lt1"/>
  </tcTxStyle>
  <tcStyle>
    <tcBdr/>
    <fill>
      <solidFill>
        <schemeClr val="accent1"/>
      </solidFill>
    </fill>
  </tcStyle>
</firstRow>

```

First Row 

text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text

In this example, we define the first row cell fills to be accent 1 along with the text properties to be bold when first row formatting is enabled through the user interface. *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TablePartStyle](#)) is located in §A.4.1. *end note*]

20.1.4.2.13 font (Font)

This element defines the font to be used within a given table cell text style. This element allows for exact definition of the font within the table style instead of referencing a themed font.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FontCollection](#)) is located in §A.4.1. *end note*]

20.1.4.2.14 insideH (Inside Horizontal Border)

This element defines the line properties associated with the inner horizontal borders in a table.

[*Example:* Consider the following example of the inner horizontal borders in use within DrawingML:

```

<insideH>
  <ln w="12700" cmpd="sng">
    <solidFill>
      <schemeClr val="accent1"/>
    </solidFill>
  </ln>
</insideH>

```

In this example, we see the inner horizontal borders in a table to be a single 1pt line which is colored accent 1. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_ThemeableLineStyle](#)) is located in §A.4.1. *end note*]

20.1.4.2.15 `insideV` (Inside Vertical Border)

This element defines the line properties associated with the inner vertical borders in a table.

[Example: Consider the following example of the inside vertical borders in use within DrawingML:

```

<insideV>
  <ln w="12700" cmpd="sng">
    <solidFill>
      <schemeClr val="accent1"/>
    </solidFill>
  </ln>
</insideV>

```

In this example, we see the inner vertical borders in a table to be a single 1pt line which is colored accent 1. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_ThemeableLineStyle](#)) is located in §A.4.1. *end note*]

20.1.4.2.16 `lastCol` (Last Column)

This element defines the cell formatting which can be applied to the last column of the table.

[Example: Consider the following example of last column formatting within DrawingML:

```

<lastCol>
  <tcTxStyle b="on">
    <fontRef idx="minor">
      <scrgbClr r="0" g="0" b="0"/>
    </fontRef>
    <schemeClr val="lt1"/>
  </tcTxStyle>

```



```

<tcStyle>
  <tcBdr/>
  <fill>
    <solidFill>
      <schemeClr val="accent1"/>
    </solidFill>
  </fill>
</tcStyle>
</lastCol>

```

Last Column



text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text

In this example, we define the last column cell fills to be accent 1 along with the text properties to be bold when last column formatting is enabled through the user interface. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TablePartStyle](#)) is located in §A.4.1. *end note*]

20.1.4.2.17 lastRow (Last Row)

This element defines the cell formatting which can be applied to the last row of the table.

[*Example:* Consider the following example of last row formatting within DrawingML:

```

<lastRow>
  <tcTxStyle b="on">
    <fontRef idx="minor">
      <scrgbClr r="0" g="0" b="0"/>
    </fontRef>
    <schemeClr val="lt1"/>
  </tcTxStyle>

```

```
<tcStyle>
  <tcBdr/>
  <fill>
    <solidFill>
      <schemeClr val="accent1"/>
    </solidFill>
  </fill>
</tcStyle>
</lastRow>
```

Last Row 

text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text
text	text	text	text	text	text

In this example, we define the last row cell fills to be accent 1 along with the text properties to be bold when last row formatting is enabled through the user interface. *end example*]

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_TablePartStyle](#)) is located in §A.4.1. *end note*]

20.1.4.2.18 left (Left Border)

This element defines the line properties associated with the left border in a table cell.

[*Example:* Consider the following example of the left border in use within DrawingML:

```
<left>
  <ln w="12700" cmpd="sng">
    <solidFill>
      <schemeClr val="accent1"/>
    </solidFill>
  </ln>
</left>
```

In this example, we see the left border on a table cell to be a single 1pt line which is colored accent 1. *end example*]

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_ThemeableLineStyle](#)) is located in §A.4.1. *end note*]

20.1.4.2.19 **lnRef (Line Reference)**

This element defines a reference to a line style within the style matrix. The `idx` attribute refers the index of a line style within the `fillStyleLst` element.

Attributes	Description
<code>idx</code> (Style Matrix Index)	Specifies the style matrix index of the style referred to. The possible values for this attribute are defined by the <code>ST_StyleMatrixColumnIndex</code> simple type (§20.1.10.56).

[Note: The W3C XML Schema definition of this element's content model ([CT_StyleMatrixReference](#)) is located in §A.4.1. *end note*]

20.1.4.2.20 **neCell (Northeast Cell)**

This element defines the formatting for the cell in the northeast corner of a table when both the first row formatting and last column formatting are enabled. This formatting is only applied to the single cell which overlaps between the two formatting options.

[Example: Consider the following example of the northeast cell formatting within DrawingML:

```
<neCell>
  <tcTxStyle b="on">
    <fontRef idx="minor">
      <scrgbClr r="0" g="0" b="0"/>
    </fontRef>
    <schemeClr val="lt1"/>
  </tcTxStyle>
  <tcStyle>
    <tcBdr/>
    <fill>
      <solidFill>
        <schemeClr val="accent1"/>
      </solidFill>
    </fill>
  </tcStyle>
</neCell>
```

In this example, we specifically set the northeast cell to contain bold text with a solid cell fill in the color of accent 1. *end example*]

[Note: The W3C XML Schema definition of this element's content model ([CT_TablePartStyle](#)) is located in §A.4.1. *end note*]

20.1.4.2.21 nwCell (Northwest Cell)

This element defines the formatting for the cell in the northwest corner of a table when both the first row formatting and first column formatting are enabled. This formatting is only applied to the single cell which overlaps between the two formatting options.

[*Example:* Consider the following example of the northwest cell formatting within DrawingML:

```
<nwCell>
  <tcTxStyle b="on">
    <fontRef idx="minor">
      <scrgbClr r="0" g="0" b="0"/>
    </fontRef>
    <schemeClr val="lt1"/>
  </tcTxStyle>
  <tcStyle>
    <tcBdr/>
    <fill>
      <solidFill>
        <schemeClr val="accent1"/>
      </solidFill>
    </fill>
  </tcStyle>
</nwCell>
```

In this example, we specifically set the northwest cell to contain bold text with a solid cell fill in the color of accent 1. *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TablePartStyle](#)) is located in §A.4.1. *end note*]

20.1.4.2.22 right (Right Border)

This element defines the line properties associated with the right border in a table cell.

[*Example:* Consider the following example of the right border in use within DrawingML:

```
<right>
  <ln w="12700" cmpd="sng">
    <solidFill>
      <schemeClr val="accent1"/>
    </solidFill>
  </ln>
</right>
```

In this example, we see the right border on a table cell to be a single 1pt line which is colored accent 1. *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ThemeableLineStyle](#)) is located in §A.4.1. *end note*]

20.1.4.2.23 seCell (Southeast Cell)

This element defines the formatting for the cell in the southeast corner of a table when both the last row formatting and last column formatting are enabled. This formatting is only applied to the single cell which overlaps between the two formatting options.

[*Example:* Consider the following example of the southeast cell formatting within DrawingML:

```
<seCell>
  <tcTxStyle b="on">
    <fontRef idx="minor">
      <scrgbClr r="0" g="0" b="0"/>
    </fontRef>
    <schemeClr val="lt1"/>
  </tcTxStyle>
  <tcStyle>
    <tcBdr/>
    <fill>
      <solidFill>
        <schemeClr val="accent1"/>
      </solidFill>
    </fill>
  </tcStyle>
</seCell>
```

In this example, we specifically set the southeast cell to contain bold text with a solid cell fill in the color of accent 1. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TablePartStyle](#)) is located in §A.4.1. *end note*]

20.1.4.2.24 swCell (Southwest Cell)

This element defines the formatting for the cell in the southwest corner of a table when both the last row formatting and first column formatting are enabled. This formatting is only applied to the single cell which overlaps between the two formatting options.

[*Example:* Consider the following example of the southwest cell formatting within DrawingML:

```

<swCell>
  <tcTxStyle b="on">
    <fontRef idx="minor">
      <scrgbClr r="0" g="0" b="0"/>
    </fontRef>
    <schemeClr val="lt1"/>
  </tcTxStyle>
  <tcStyle>
    <tcBdr/>
    <fill>
      <solidFill>
        <schemeClr val="accent1"/>
      </solidFill>
    </fill>
  </tcStyle>
</swCell>

```

In this example, we specifically set the southwest cell to contain bold text with a solid cell fill in the color of accent 1. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_TablePartStyle](#)) is located in §A.4.1. *end note*]

20.1.4.2.25 tblBg (Table Background)

This element defines the formatting options which can be applied to the table background shape. The background shape is the same size as the entire table and can hold a fill or an effect which spans the entire table.

[Example: Consider the following example of a table background in use within DrawingML:

```

<tblBg>
  <fillRef idx="2">
    <schemeClr val="accent1"/>
  </fillRef>
  <effectRef idx="1">
    <schemeClr val="accent1"/>
  </effectRef>
</tblBg>

```

In this example, we see that there is a themed fill and themed effect being applied to the table background through the table style. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_TableBackgroundStyle](#)) is located in §A.4.1. *end note*]

20.1.4.2.26 `tblStyle` (Table Style)

This is the root element for a table style. Within the table style are different formatting options available in order to apply a table.

Attributes	Description
<code>styleId</code> (Style ID)	Specifies a GUID identifying the table style in a unique manner. The possible values for this attribute are defined by the <code>ST_Guid</code> simple type (§22.9.2.4).
<code>styleName</code> (Name)	Specifies the name of the table style which can show up in the user interface identifying the style to a user. The possible values for this attribute are defined by the W3C XML Schema string datatype.

[Note: The W3C XML Schema definition of this element's content model (`CT_TableStyle`) is located in §A.4.1. *end note*]

20.1.4.2.27 `tblStyleLst` (Table Style List)

This element is simply a list of table styles which are used within a document.

[Example: Consider the following example of a table style list within DrawingML:

```
<tblStyleLst def="{5C22544A-7EE6-4342-B048-85BDC9FD1C3A}">
  <tblStyle styleId="{5C22544A-7EE6-4342-B048-85BDC9FD1C3A}"
    styleName="Medium Style 2 - Accent 1">
    ...
  </tblStyle>
  <tblStyle styleId="{3C2FFA5D-87B4-456A-9821-1D502468CF0F}"
    styleName="Themed Style 1 - Accent 1">
    ...
  </tblStyle>
</tblStyleLst>
```

In this example, we see two table styles defined along with the default being specified. *end example*]

Attributes	Description
<code>def</code> (Default)	The GUID corresponding to the default table style in the list of table styles. This default can be used when a table is initially inserted into a document. The possible values for this attribute are defined by the <code>ST_Guid</code> simple type (§22.9.2.4).

[Note: The W3C XML Schema definition of this element's content model ([CT_TableStyleList](#)) is located in §A.4.1. *end note*]

20.1.4.2.28 tcBdr (Table Cell Borders)

This element defines the borders for the cells within a table.

[Example: Consider the following example of table cell borders being used within DrawingML:

```
<tcBdr>
  <left>
    <lnRef idx="1">
      <schemeClr val="accent1"/>
    </lnRef>
  </left>
  <right>
    <lnRef idx="1">
      <schemeClr val="accent1"/>
    </lnRef>
  </right>
  <top>
    <lnRef idx="1">
      <schemeClr val="accent1"/>
    </lnRef>
  </top>
  <bottom>
    <lnRef idx="2">
      <schemeClr val="lt1"/>
    </lnRef>
  </bottom>
  <insideH>
    <ln>
      <noFill/>
    </ln>
  </insideH>
  <insideV>
    <ln>
      <noFill/>
    </ln>
  </insideV>
</tcBdr>
```

In this example, we define borders for the bottom, top, right, and left borders of the table cells. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TableCellStyle](#)) is located in §A.4.1. *end note*]

20.1.4.2.29 `tcStyle` (Table Cell Style)

This element defines the style for a give cell in a table.

[*Example:* Consider the following example of a table cell style in use within DrawingML:

```
<tcStyle>
  <tcBdr>
    ...
  </tcBdr>
  <fill>
    ...
  </fill>
</tcStyle>
```

In this example, we see that a set of borders for the cell along with a cell fill are being defined. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TableStyleCellStyle](#)) is located in §A.4.1. *end note*]

20.1.4.2.30 `tcTxStyle` (Table Cell Text Style)

This element defines the text properties associated with the text contained within a table cell.

[*Example:* Consider the following example of a table cell text style in use within DrawingML:

```
<tcTxStyle b="on">
  <fontRef idx="minor">
    <scrgbClr r="0" g="0" b="0"/>
  </fontRef>
  <schemeClr val="lt1"/>
</tcTxStyle>
```

In this example, we define the text within the cell to be bold and reference the themed minor font and to also be the light 1 color. *end example*]

Attributes	Description
b (Bold)	Specifies if the text is to be bolded. The possible values for this attribute are defined by the ST_OnOffStyleType simple type (§20.1.10.36).
i (Italic)	Specifies if the text is to be italicized. The possible values for this attribute are defined by the ST_OnOffStyleType simple type

Attributes	Description
	(§20.1.10.36).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TableStyleTextStyle](#)) is located in §A.4.1. *end note*]

20.1.4.2.31 `tl2br` (Top Left to Bottom Right Border)

This element defines the line properties associated with the border which goes from the top-left to the bottom-right corner in a table cell.

[*Example:* Consider the following example of the top border in use within DrawingML:

```
<tl2br>
  <ln w="12700" cmpd="sng">
    <solidFill>
      <schemeClr val="accent1"/>
    </solidFill>
  </ln>
</tl2br>
```

In this example, we see the border on a table cell to be a single 1pt line which is colored accent 1. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ThemeableLineStyle](#)) is located in §A.4.1. *end note*]

20.1.4.2.32 `top` (Top Border)

This element defines the line properties associated with the top border in a table cell.

[*Example:* Consider the following example of the top border in use within DrawingML:

```
<top>
  <ln w="12700" cmpd="sng">
    <solidFill>
      <schemeClr val="accent1"/>
    </solidFill>
  </ln>
</top>
```

In this example, we see the top border on a table cell to be a single 1pt line which is colored accent 1. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ThemeableLineStyle](#)) is located in §A.4.1. *end note*]

20.1.4.2.33 `tr2bl` (Top Right to Bottom Left Border)

This element defines the line properties associated with the border which goes from the top-right to the bottom-left corner in a table cell.

[*Example:* Consider the following example of the top border in use within DrawingML:

```
<tr2bl>
  <ln w="12700" compd="sng">
    <solidFill>
      <schemeClr val="accent1"/>
    </solidFill>
  </ln>
</tr2bl>
```

In this example, we see the border on a table cell to be a single 1pt line which is colored accent 1. *end example]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ThemeableLineStyle](#)) is located in §A.4.1. *end note]*

20.1.4.2.34 `wholeTbl` (Whole Table)

This element contains formatting options which are applied to the table as a whole when it is in its default state with no formatting options (first row, last row, etc) enabled.

[*Example:* Consider the following example of whole table being used within DrawingML:

```
<wholeTbl>
  <tcTxStyle>
    ...
  </tcTxStyle>
  <tcStyle>
    ...
  </tcStyle>
</wholeTbl>
```

In this example, we see definitions for the text and the cells within the table. *end example]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TablePartStyle](#)) is located in §A.4.1. *end note]*

20.1.5 3D

The 3D portion of the DrawingML framework allows for the describing of a 3D scene to be placed within a document. This 3D scene can be described using text and shape objects along with various lighting, material and camera settings.

20.1.5.1 anchor (Anchor Point)

This element specifies a point in 3D space. This point is the point in space that anchors the backdrop plane. Please see the example in the backdrop (§20.1.5.2) definition for an in depth explanation of this element.

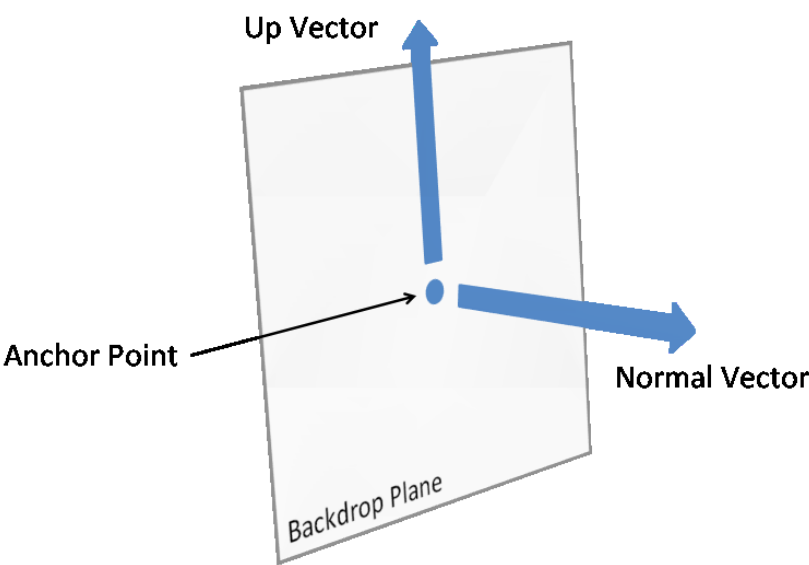
Attributes	Description
x (X-Coordinate in 3D)	X-Coordinate in 3D space. The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).
y (Y-Coordinate in 3D)	Y-Coordinate in 3D space. The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).
z (Z-Coordinate in 3D)	Z-Coordinate in 3D space. The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).

[Note: The W3C XML Schema definition of this element’s content model ([CT_Point3D](#)) is located in §A.4.1. end note]

20.1.5.2 backdrop (Backdrop Plane)

This element defines a plane in which effects, such as glow and shadow, are applied in relation to the shape they are being applied to. The points and vectors contained within the backdrop define a plane in 3D space.

[Example: Consider the following image as an explanation of the backdrop plane definition:



In this image we see a plane being defined by an anchor point, the vector normal to the face of the plane and a vector pointing up in relation to the plane. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_Backdrop](#)) is located in §A.4.1. *end note*]

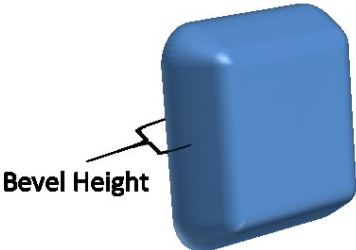
20.1.5.3 bevelB (Bottom Bevel)

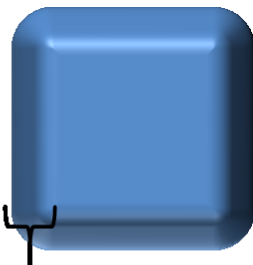
This element holds the properties associated with defining a bevel on the bottom or back face of a shape.

[Example: Consider the following example of an sp3d containing a bottom bevel.

```
<a:sp3d>
  <a:bevelB w="139700" h="127000" prst="coolSlant"/>
</a:sp3d>
```

In this example, we see a bottom bevel being defined with a preset bevel type along with a custom width and height. *end example*

Attributes	Description
h (Height)	<p>Specifies the height of the bevel, or how far above the shape it is applied.</p> <p>[Example: Consider the following example bevel</p>  <p>In this example, we see the height of an example bevel on a shape. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>
prst (Preset Bevel)	<p>Specifies the preset bevel type which defines the look of the bevel.</p> <p>The possible values for this attribute are defined by the ST_BevelPresetType simple type (§20.1.10.9).</p>
w (Width)	<p>Specifies the width of the bevel, or how far into the shape it is applied.</p> <p>[Example: Consider the following example bevel</p>

Attributes	Description
	<div><p>Bevel Width</p></div> <p>In this example, we see the width of an example bevel on a shape. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_Bevel](#)) is located in §A.4.1. *end note*]

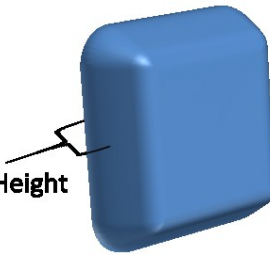
20.1.5.4 [bevelT \(Top Bevel\)](#)

This element holds the properties associated with defining a bevel on the top or front face of a shape.

[Example: Consider the following example of an sp3d containing a top bevel.

```
<a:sp3d>
  <a:bevelT w="139700" h="127000" prst="coolSlant"/>
</a:sp3d>
```

In this example, we see a top bevel being defined with a preset bevel type along with a custom width and height. *end example*

Attributes	Description
h (Height)	<p>Specifies the height of the bevel, or how far above the shape it is applied.</p> <p>[Example: Consider the following example bevel</p> <div><p>Bevel Height</p></div> <p>In this example, we see the height of an example bevel on a shape. <i>end example</i></p>

Attributes	Description
	The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).
prst (Preset Bevel)	<p>Specifies the preset bevel type which defines the look of the bevel.</p> <p>The possible values for this attribute are defined by the ST_BevelPresetType simple type (§20.1.10.9).</p>
w (Width)	<p>Specifies the width of the bevel, or how far into the shape it is applied.</p> <p>[Example: Consider the following example bevel]</p> <div data-bbox="477 659 732 919" data-label="Image"> </div> <p>Bevel Width</p> <p>In this example, we see the width of an example bevel on a shape. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Bevel](#)) is located in §A.4.1. *end note*]

20.1.5.5 camera (Camera)

This element defines the placement and properties of the camera in the 3D scene. The camera position and properties modify the view of the scene.

[Example: Consider the following example of a camera in DrawingML:

```
<a:camera prst="orthographicFront">
  <a:rot lat="19902513" lon="17826689" rev="1362739"/>
</a:camera>
```

In this example, we see a preset camera being defined along with a rotation containing latitude, longitude, and revolution overrides provided that further rotate the camera around the scene. The effect of this camera can be seen on the following shape:



end example]

Attributes	Description
fov (Field of View)	<p>Provides an override for the default field of view for the camera. Different perspectives can be obtained by modifying this attribute.</p> <p>[<i>Example:</i> Consider the following example of a fov in DrawingML:</p> <pre><a:camera prst="perspectiveContrastingRightFacing" fov="6900000"> <a:rot lat="1200000" lon="18000000" rev="1200000"/> </a:camera></pre> <p>In this example, we see a fov being defined which modifies the default fov for the preset camera. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_FOVAngle simple type (§20.1.10.26).</p>
prst (Preset Camera Type)	<p>Defines the preset camera that is being used by the camera element. The preset camera defines a starting point for common preset rotations in space.</p> <p>[<i>Example:</i> Consider the following example of a prst in DrawingML:</p> <pre><a:camera prst="perspectiveContrastingRightFacing" fov="6900000"> <a:rot lat="1200000" lon="18000000" rev="1200000"/> </a:camera></pre> <p>In this example, we see a prst being defined as perspectiveContrastingRightFacing. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_PresetCameraType simple type (§20.1.10.46).</p>
zoom (Zoom)	<p>Defines the zoom factor of a given camera element. The zoom modifies the scene as a whole and zooms in or out accordingly.</p> <p>[<i>Example:</i> Consider the following example of a zoom in DrawingML:</p>

Attributes	Description
	<pre data-bbox="456 285 1304 415"><a:camera prst="perspectiveContrastingRightFacing" fov="6900000" zoom="200%"> <a:rot lat="1200000" lon="18000000" rev="1200000"/> /a:camera></pre> <p data-bbox="415 457 1377 520">In this example, we see a zoom being used which zooms the scene by 200%. <i>end example</i></p> <p data-bbox="415 562 1446 632">The possible values for this attribute are defined by the ST_PositivePercentage simple type (§20.1.10.45).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Camera](#)) is located in §A.4.1. *end note*]

20.1.5.6 contourClr (Contour Color)

This element defines the color for the contour on a shape. The contour of a shape is a solid filled line which surrounds the outer edges of the shape.

[Example: Consider the following example of a contour defined on a shape which includes a contourClr. Lighting characteristics applied to the shape are ignored when it comes to the contour on the shape.

```
<a:sp3d contourW="101600" prstMaterial="plastic">
  <a:bevelT w="254000" h="254000"/>
  <a:bevelB w="254000" h="254000"/>
  <a:contourClr>
    <a:schemeClr val="bg1"/>
  </a:contourClr>
</a:sp3d>
```

In this example, we see a contour defined on a shape with a top and bottom bevel defined. In the image below, the contour is the white ring around the shape.



end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Color](#)) is located in §A.4.1. *end note*]

20.1.5.7 [extrusionClr](#) (Extrusion Color)

This element defines the color of the extrusion applied to a shape. The extrusion on a shape is an artificial height applied to the geometry.

[*Example:* Consider the following example of an extrusion which takes advantage of the `extrusionClr`. Lighting characteristics that are applied to the shape are also applied to the extrusion on the shape.

```
<a:sp3d extrusionH="139700" prstMaterial="plastic">
  <a:bevelT w="254000" h="254000"/>
  <a:bevelB w="254000" h="254000"/>
  <a:extrusionClr>
    <a:srgbClr val="FF0000"/>
  </a:extrusionClr>
</a:sp3d>
```

In this example, we see the extrusion color defined as red which can also be shown applied to the shape in the following image:



end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Color](#)) is located in §A.4.1. *end note]*

20.1.5.8 flatTx (No text in 3D scene)

Keep text out of 3D scene entirely.

Attributes	Description
z (Z Coordinate)	Specifies the Z coordinate to be used in positioning the flat text within the 3D scene. The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FlatText](#)) is located in §A.4.1. *end note]*

20.1.5.9 lightRig (Light Rig)

This element defines the light rig associated with the table. The light rig comes into play when there is a 3D bevel applied to a cell. When 3D is used, the light rig defines the lighting properties associated with the scene.

Attributes	Description
dir (Direction)	Defines the direction from which the light rig is oriented in relation to the scene. [<i>Example:</i> Consider the following example of dir being used in a light rig: <pre><a:lightRig rig="threePt" dir="t"/></pre> In this example, we define the direction to be top. <i>end example]</i>

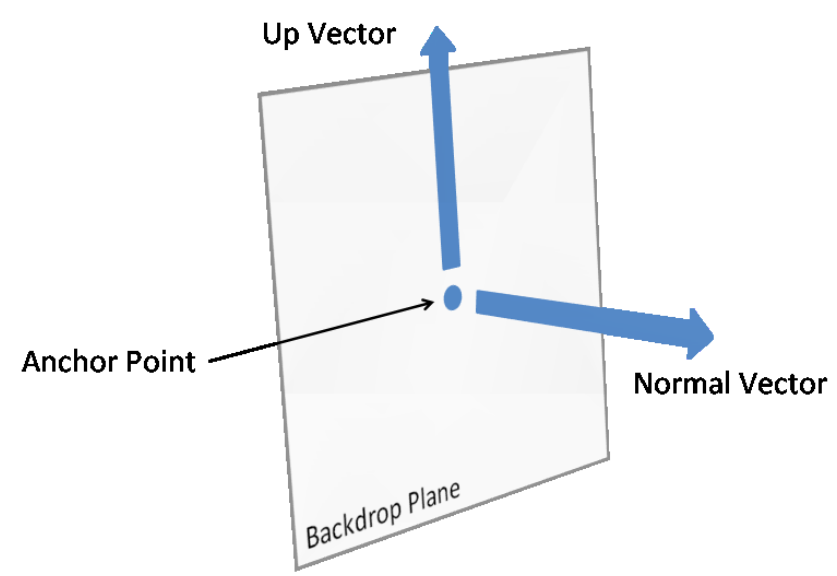
Attributes	Description
	The possible values for this attribute are defined by the ST_LightRigDirection simple type (§20.1.10.29).
rig (Rig Preset)	<p>Defines the preset type of light rig which is to be applied to the scene.</p> <p>[<i>Example:</i> Consider the following example of rig being used in a light rig:</p> <pre><a:lightRig rig="threePt" dir="t"/></pre> <p>In this example, we define the rig to be a threePt rig. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_LightRigType simple type (§20.1.10.30).</p>

[*Note:* The W3C XML Schema definition of this element’s content model (CT_LightRig) is located in §A.4.1. *end note*]

20.1.5.10 **norm (Normal)**

This element defines a normal vector. To be more precise, this attribute defines a vector normal to the face of the backdrop plane.

[*Example:* Consider the following image as an example of what a normal vector is in relation to the backdrop plane:



end example]

Attributes	Description
dx (Distance along X-axis in 3D)	Distance along X-axis in 3D The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).
dy (Distance along Y-axis in 3D)	Distance along Y-axis in 3D The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).
dz (Distance along Z-axis in 3D)	Distance along Z-axis in 3D The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).

[Note: The W3C XML Schema definition of this element's content model ([CT_Vector3D](#)) is located in §A.4.1. *end note*]

20.1.5.11 rot (Rotation)

This element defines a rotation in 3D space. A rotation in DrawingML is defined through the use of a latitude coordinate, a longitude coordinate, and a revolution about the axis as the latitude and longitude coordinates.

[Example: Consider the following example of a rotation defined by the rot elements being used in a lightRig in DrawingML:

```
<a:lightRig rig="twoPt" dir="t">
  <a:rot lat="0" lon="0" rev="6000000"/>
</a:lightRig>
```

In this example, we have only a revolution applied to the light rig which rotates it around it's center axis. *end example*]

Attributes	Description
lat (Latitude)	Defines the latitude value of the rotation. [Example: Consider the following example of a rot in DrawingML: <pre><a:rot lat="0" lon="0" rev="6000000"/></pre> In this example, we set the lat to be equal to 0. <i>end example</i>] The possible values for this attribute are defined by the ST_PositiveFixedAngle simple type (§20.1.10.43).
lon (Longitude)	Defines the longitude value of the rotation.

Attributes	Description
	<p>[<i>Example:</i> Consider the following example of a rot in DrawingML:</p> <pre data-bbox="456 321 1062 352"><a:rot lat="0" lon="0" rev="6000000"/></pre> <p>In this example, we set the lon to be equal to 0. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PositiveFixedAngle simple type (§20.1.10.43).</p>
rev (Revolution)	<p>This attributes defines the revolution around the central axis in the rotation.</p> <p>[<i>Example:</i> Consider the following example of a rot in DrawingML:</p> <pre data-bbox="456 688 1062 720"><a:rot lat="0" lon="0" rev="6000000"/></pre> <p>In this example, we set the rev to be equal to 6000000. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PositiveFixedAngle simple type (§20.1.10.43).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SphereCoords](#)) is located in §A.4.1. *end note*]

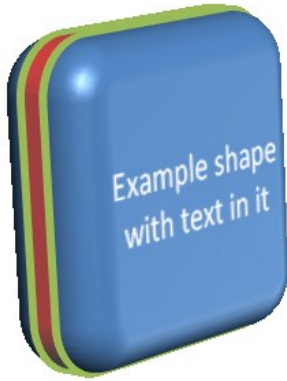
20.1.5.12 sp3d (Apply 3D shape properties)

This element defines the 3D properties associated with a particular shape in DrawingML. The 3D properties which can be applied to a shape are top and bottom bevels, a contour and an extrusion.

[*Example:* Consider the following example of an sp3d in DrawingML:

```
<a:sp3d extrusionH="165100" contourW="50800" prstMaterial="plastic">
  <a:bevelT w="254000" h="254000"/>
  <a:bevelB w="254000" h="254000"/>
  <a:extrusionClr>
    <a:srgbClr val="FF0000"/>
  </a:extrusionClr>
  <a:contourClr>
    <a:schemeClr val="accent3"/>
  </a:contourClr>
</a:sp3d>
```

In this example, we see an sp3d defined which contains information defining both a top and bottom bevel, along with an extrusion and contour on the shape. The following image illustrates a shape with the applied sp3d:



end example]

Attributes	Description
contourW (Contour Width)	<p>Defines the width of the contour on the shape.</p> <p>[<i>Example:</i> Consider the following example of a contourW in use within the sp3d element:</p> <pre> <a:sp3d extrusionH="165100" contourW="50800" prstMaterial="plastic"> <a:bevelT w="254000" h="254000"/> <a:bevelB w="254000" h="254000"/> <a:extrusionClr> <a:srgbClr val="FF0000"/> </a:extrusionClr> <a:contourClr> <a:schemeClr val="accent3"/> </a:contourClr> </a:sp3d> </pre> <p>In this example, we see a countourW defined as 50800. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>
extrusionH (Extrusion Height)	<p>Defines the height of the extrusion applied to the shape.</p> <p>[<i>Example:</i> Consider the following example of an extrusionH in use within the sp3d element:</p> <pre> <a:sp3d extrusionH="165100" contourW="50800" prstMaterial="plastic"> <a:bevelT w="254000" h="254000"/> <a:bevelB w="254000" h="254000"/> <a:extrusionClr> <a:srgbClr val="FF0000"/> </pre>

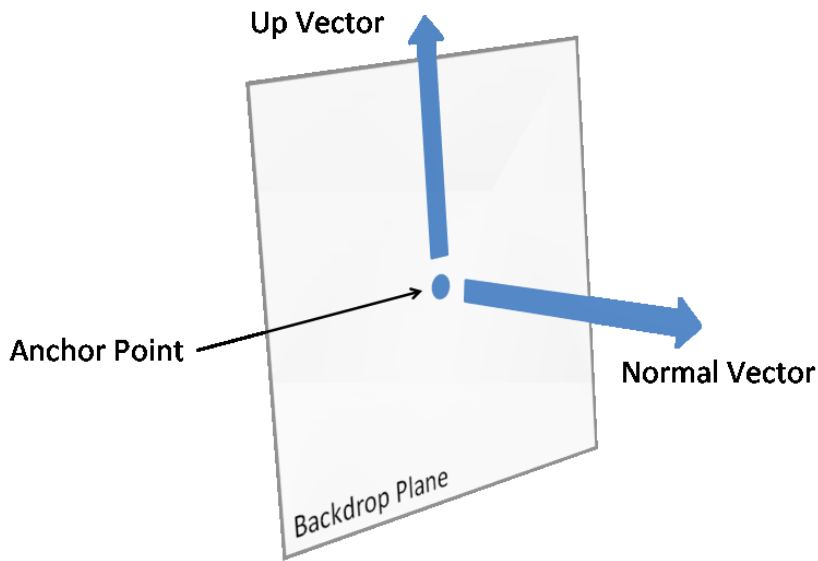
Attributes	Description
	<pre> </a:extrusionClr> <a:contourClr> <a:schemeClr val="accent3"/> </a:contourClr> </a:sp3d> </pre> <p>In this example, we see a extrusionH defined as 165100. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>
prstMaterial (Preset Material Type)	<p>Defines the preset material which is combined with the lighting properties to give the final look and feel of a shape.</p> <p>[<i>Example:</i> Consider the following example of a prstMaterial in use within the sp3d element:</p> <pre> <a:sp3d extrusionH="165100" contourW="50800" prstMaterial="plastic"> <a:bevelT w="254000" h="254000"/> <a:bevelB w="254000" h="254000"/> <a:extrusionClr> <a:srgbClr val="FF0000"/> </a:extrusionClr> <a:contourClr> <a:schemeClr val="accent3"/> </a:contourClr> </a:sp3d> </pre> <p>In this example, we see a prstMaterial defined as plastic. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_PresetMaterialType simple type (§20.1.10.49).</p>
z (Shape Depth)	<p>Defines the z coordinate for the 3D shape.</p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Shape3D](#)) is located in §A.4.1. *end note*]

20.1.5.13 up (Up Vector)

This element defines a vector representing up. To be more precise, this attribute defines a vector representing up in relation to the face of the backdrop plane.

[Example: Consider the following image as an example of what an up vector is in relation to the backdrop plane:



end example]

Attributes	Description
dx (Distance along X-axis in 3D)	Distance along X-axis in 3D The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).
dy (Distance along Y-axis in 3D)	Distance along Y-axis in 3D The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).
dz (Distance along Z-axis in 3D)	Distance along Z-axis in 3D The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).

[Note: The W3C XML Schema definition of this element's content model ([CT_Vector3D](#)) is located in §A.4.1. *end note]*

20.1.6 Shared Style Sheet

The shared style sheet aspects contained within DrawingML are responsible for containing formatting options and styles which can be used by applications to define a certain look or feel to documents. The shared style sheet can be used by any document category ([Note: For example, a presentation. *end note]*) to pull visual information from which formats the document in a certain way, or theme. The shared style sheet contains information that is not document-category specific.

20.1.6.1 clrMap (Color Map)

This element specifies the color mapping layer which allows a user to define colors for background and text. This allows for swapping out of light/dark colors for backgrounds and the text on top of the background in order to maintain readability of the text. On a deeper level, this specifies exactly which colors the first 12 values refer to in the color scheme.

[*Example:* Consider the following example of a color map in use:

```
<clrMap bg1="lt1" tx1="dk1" bg2="lt2" tx2="dk2" accent1="accent1"
  accent2="accent2" accent3="accent3" accent4="accent4" accent5="accent5"
  accent6="accent6" hlink="hlink" folHlink="folHlink"/>
```

In this example, we see that bg1 is mapped to lt1, tx1 is mapped to dk1, and so on. *end example]*

Attributes	Description
accent1 (Accent 1)	Specifies a color defined which is associated as the accent 1 color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
accent2 (Accent 2)	Specifies a color defined which is associated as the accent 2 color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
accent3 (Accent 3)	Specifies a color defined which is associated as the accent 3 color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
accent4 (Accent 4)	Specifies a color defined which is associated as the accent 4 color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
accent5 (Accent 5)	Specifies a color defined which is associated as the accent 5 color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
accent6 (Accent 6)	Specifies a color defined which is associated as the accent 6 color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
bg1 (Background 1)	A color defined which is associated as the first background color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
bg2 (Background 2)	Specifies a color defined which is associated as the second background color.

Attributes	Description
	The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
folHlink (Followed Hyperlink)	Specifies a color defined which is associated as the color for a followed hyperlink. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
hlink (Hyperlink)	Specifies a color defined which is associated as the color for a hyperlink. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
tx1 (Text 1)	Specifies a color defined which is associated as the first text color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
tx2 (Text 2)	Specifies a color defined which is associated as the second text color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).

[Note: The W3C XML Schema definition of this element's content model ([CT_ColorMapping](#)) is located in §A.4.1. *end note*]

20.1.6.2 clrScheme (Color Scheme)

This element defines a set of colors which are referred to as a color scheme. The color scheme is responsible for defining a list of twelve colors. The twelve colors consist of six accent colors, two dark colors, two light colors and a color for each of a hyperlink and followed hyperlink.

The Color Scheme Color elements appear in a sequence. The following listing shows the index value and corresponding Color Name.

Sequence Index	Element (Color) Name
0	dk1 (Dark 1)
1	lt1 (Light 1)
2	dk2 (Dark 2)
3	lt2 (Light 2)
4	accent1 (Accent 1)
5	accent2 (Accent 2)
6	accent3 (Accent 3)
7	accent4 (Accent 4)

Sequence Index	Element (Color) Name
8	accent5 (Accent 5)
9	accent6 (Accent 6)
10	hlink (Hyperlink)
11	folHlink (Followed Hyperlink)

[Example: Consider the following example of a color scheme defined in DrawingML:

```

<clrScheme name="sample">
  <dk1>
    <sysClr val="windowText"/>
  </dk1>
  <lt1>
    <sysClr val="window"/>
  </lt1>
  <dk2>
    <srgbClr val="04617B"/>
  </dk2>
  <lt2>
    <srgbClr val="DBF5F9"/>
  </lt2>
  <accent1>
    <srgbClr val="0F6FC6"/>
  </accent1>
  <accent2>
    <srgbClr val="009DD9"/>
  </accent2>
  <accent3>
    <srgbClr val="0BD0D9"/>
  </accent3>
  <accent4>
    <srgbClr val="10CF9B"/>
  </accent4>
  <accent5>
    <srgbClr val="7CCA62"/>
  </accent5>
  <accent6>
    <srgbClr val="A5C249"/>
  </accent6>
  <hlink>
    <srgbClr val="FF9800"/>
  </hlink>

```

```

<folHlink>
  <srgbClr val="F45511"/>
</folHlink>
</clrScheme>

```

In this example, are defined the 12 theme colors in the sample color scheme. *end example]*

Attributes	Description
name (Name)	<p>The common name for this color scheme. This name can show up in the user interface in a list of color schemes.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_ColorScheme](#)) is located in §A.4.1. *end note]*

20.1.6.3 [custClrLst \(Custom Color List\)](#)

This element allows for a custom color palette to be created and which shows up alongside other color schemes. This can be very useful, for example, when someone would like to maintain a corporate color palette.

[Note: The W3C XML Schema definition of this element's content model ([CT_CustomColorList](#)) is located in §A.4.1. *end note]*

20.1.6.4 [extraClrScheme \(Extra Color Scheme\)](#)

This element defines an auxiliary color scheme, which includes both a color scheme and color mapping. This is mainly used for backward compatibility concerns and roundtrips information required by earlier versions.

[Example: Consider the following example of an extra color scheme in use in DrawingML:

```

<extraClrScheme>
  <clrScheme name="extraColorSchemeSample">
    <dk1>
      <sysClr val="windowText"/>
    </dk1>
    <lt1>
      <sysClr val="window"/>
    </lt1>
    <dk2>
      <srgbClr val="04617B"/>
    </dk2>
    <lt2>
      <srgbClr val="DBF5F9"/>
    </lt2>
  </clrScheme>
</extraClrScheme>

```

```

    <accent1>
      <srgbClr val="0F6FC6"/>
    </accent1>
    <accent2>
      <srgbClr val="009DD9"/>
    </accent2>
    <accent3>
      <srgbClr val="0BD0D9"/>
    </accent3>
    <accent4>
      <srgbClr val="10CF9B"/>
    </accent4>
    <accent5>
      <srgbClr val="7CCA62"/>
    </accent5>
    <accent6>
      <srgbClr val="A5C249"/>
    </accent6>
    <hlink>
      <srgbClr val="FF9800"/>
    </hlink>
    <folHlink>
      <srgbClr val="F45511"/>
    </folHlink>
  </clrScheme>
  <clrMap bg1="lt1" tx1="dk1" bg2="lt2" tx2="dk2" accent1="accent1"
  accent2="accent2" accent3="accent3" accent4="accent4" accent5="accent5"
  accent6="accent6" hlink="hlink" folHlink="folHlink"/>
</extraClrScheme>

```

In this example, the extra color scheme contains a color scheme and a color map for that color scheme. *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ColorSchemeAndMapping](#)) is located in §A.4.1. *end note*]

20.1.6.5 [extraClrSchemeLst](#) (Extra Color Scheme List)

This element is a container for the list of extra color schemes present in a document.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ColorSchemeList](#)) is located in §A.4.1. *end note*]

20.1.6.6 masterClrMapping (Master Color Mapping)

This element is a part of a choice for which color mapping is used within the document. There is also defined an `overrideClrMapping` (§20.1.6.8) element which, when specified, the override is used rather than the color mapping defined in the master. If this element is specified, then we specifically use the color mapping defined in the master.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_EmptyElement](#)) is located in §A.4.1. *end note*]

20.1.6.7 objectDefaults (Object Defaults)

This element allows for the definition of default shape, line, and textbox formatting properties. An application can use this information to format a shape (or text) initially on insertion into a document.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ObjectStyleDefaults](#)) is located in §A.4.1. *end note*]

20.1.6.8 overrideClrMapping (Override Color Mapping)

This element provides an override for the color mapping in a document. When defined, this color mapping is used in place of the already defined color mapping, or master color mapping. This color mapping is defined in the same manner as the other mappings within this document.

[*Example:* Consider the following example of an override color mapping in DrawingML:

```
<overrideClrMapping bg1="lt1" tx1="dk1" bg2="lt2" tx2="dk2" accent1="accent1"
  accent2="accent2" accent3="accent3" accent4="accent4" accent5="accent5"
  accent6="accent6" hlink="hlink" folHlink="folHlink"/>
```

end example]

Attributes	Description
accent1 (Accent 1)	Specifies a color defined which is associated as the accent 1 color. The possible values for this attribute are defined by the <code>ST_ColorSchemeIndex</code> simple type (§20.1.10.14).
accent2 (Accent 2)	Specifies a color defined which is associated as the accent 2 color. The possible values for this attribute are defined by the <code>ST_ColorSchemeIndex</code> simple type (§20.1.10.14).
accent3 (Accent 3)	Specifies a color defined which is associated as the accent 3 color. The possible values for this attribute are defined by the <code>ST_ColorSchemeIndex</code> simple type (§20.1.10.14).
accent4 (Accent 4)	Specifies a color defined which is associated as the accent 4 color.

Attributes	Description
	The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
accent5 (Accent 5)	<p>Specifies a color defined which is associated as the accent 5 color.</p> <p>The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).</p>
accent6 (Accent 6)	<p>Specifies a color defined which is associated as the accent 6 color.</p> <p>The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).</p>
bg1 (Background 1)	<p>A color defined which is associated as the first background color.</p> <p>The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).</p>
bg2 (Background 2)	<p>Specifies a color defined which is associated as the second background color.</p> <p>The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).</p>
folHlink (Followed Hyperlink)	<p>Specifies a color defined which is associated as the color for a followed hyperlink.</p> <p>The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).</p>
hlink (Hyperlink)	<p>Specifies a color defined which is associated as the color for a hyperlink.</p> <p>The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).</p>
tx1 (Text 1)	<p>Specifies a color defined which is associated as the first text color.</p> <p>The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).</p>
tx2 (Text 2)	<p>Specifies a color defined which is associated as the second text color.</p> <p>The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_ColorMapping](#)) is located in §A.4.1.
end note]

20.1.6.9 theme (Theme)

This element defines the root level complex type associated with a shared style sheet (or theme). This element holds all the different formatting options available to a document through a theme and defines the overall look and feel of the document when themed objects are used within the document.

[Example: Consider the following image as an example of different themes in use applied to a presentation:



In this example, we see how a theme can affect font, colors, backgrounds, fills, and effects for different objects in a presentation. *end example*]

Attributes	Description
name (Name)	Specifies the name given to the theme. The possible values for this attribute are defined by the W3C XML Schema string datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_OfficeStyleSheet](#)) is located in §A.4.1. *end note*]

20.1.6.10 themeElements (Theme Elements)

This element defines the theme formatting options for the theme and is the workhorse of the theme. This is where the bulk of the shared theme information is contained and used by a document. This element contains the color scheme, font scheme, and format scheme elements which define the different formatting aspects of what a theme defines.

[Example: Consider the following example of a theme elements defined in DrawingML:

```

<themeElements>
  <clrScheme name="sample">
...
  </clrScheme>
  <fontScheme name="sample">
...
  </fontScheme>
  <fmtScheme name="sample">
    <fillStyleLst>
...
    </fillStyleLst>
    <lnStyleLst>
...
    </lnStyleLst>
    <effectStyleLst>
...
    </effectStyleLst>
    <bgFillStyleLst>
...
    </bgFillStyleLst>
  </fmtScheme>
</themeElements>

```

In this example, we see the basic structure of how a theme elements is defined and have left out the true guts of each individual piece to save room. Each part (color scheme, font scheme, format scheme) is defined elsewhere within DrawingML. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_BaseStyles](#)) is located in §A.4.1. *end note*]

20.1.6.11 `themeManager` (Theme Manager)

The starting part for a theme file.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_EmptyElement](#)) is located in §A.4.1. *end note*]

20.1.6.12 `themeOverride` (Theme Override)

This element allows for an override which changes just the colors, fonts, or effects of a single object, like a table for example. Currently it is used only to control overrides on the non-top-level masters within a presentation.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_BaseStylesOverride](#)) is located in §A.4.1. *end note*]

20.1.7 Coordinate Systems and Transformations

The following elements are used to reflect dimensions, scaling, location, rotation, and flip information on groups and individual shapes respectively.

20.1.7.1 chExt (Child Extents)

This element specifies the size dimensions of the child extents rectangle and is used for calculations of grouping, scaling, and rotation behavior of shapes placed within a group.

Attributes	Description
cx (Extent Length)	<p>Specifies the length of the extents rectangle in EMUs. This rectangle shall dictate the size of the object as displayed (the result of any scaling to the original object).</p> <p>[<i>Example:</i> Consider a DrawingML object specified as follows:</p> <pre><... cx="1828800" cy="200000"/></pre> <p>The cx attributes specifies that this object has a height of 1828800 EMUs (English Metric Units). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>
cy (Extent Width)	<p>Specifies the width of the extents rectangle in EMUs. This rectangle shall dictate the size of the object as displayed (the result of any scaling to the original object).</p> <p>[<i>Example:</i> Consider a DrawingML object specified as follows:</p> <pre>< ... cx="1828800" cy="200000"/></pre> <p>The cy attribute specifies that this object has a width of 200000 EMUs (English Metric Units). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_PositiveSize2D](#)) is located in §A.4.1. *end note*]

20.1.7.2 chOff (Child Offset)

This element specifies the location of the child extents rectangle and is used for calculations of grouping, scaling, and rotation behavior of shapes placed within a group.

Attributes	Description
x (X-Axis)	Specifies a coordinate on the x-axis. The origin point for this coordinate shall be specified

Attributes	Description
Coordinate)	<p>by the parent XML element.</p> <p>[<i>Example:</i> Consider the following point on a basic wrapping polygon for a DrawingML object:</p> <pre><... x="0" y="100" /></pre> <p>The x attribute defines an x-coordinate of 0. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>
y (Y-Axis Coordinate)	<p>Specifies a coordinate on the x-axis. The origin point for this coordinate shall be specified by the parent XML element.</p> <p>[<i>Example:</i> Consider the following point on a basic wrapping polygon for a DrawingML object:</p> <pre><... x="0" y="100" /></pre> <p>The y attribute defines a y-coordinate of 100. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Point2D](#)) is located in §A.4.1. *end note*]

20.1.7.3 [ext \(Extents\)](#)

This element specifies the size of the bounding box enclosing the referenced object.

Attributes	Description
cx (Extent Length)	<p>Specifies the length of the extents rectangle in EMUs. This rectangle shall dictate the size of the object as displayed (the result of any scaling to the original object).</p> <p>[<i>Example:</i> Consider a DrawingML object specified as follows:</p> <pre><... cx="1828800" cy="200000"/></pre> <p>The cx attributes specifies that this object has a height of 1828800 EMUs (English Metric Units). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>

Attributes	Description
cy (Extent Width)	<p>Specifies the width of the extents rectangle in EMUs. This rectangle shall dictate the size of the object as displayed (the result of any scaling to the original object).</p> <p>[<i>Example:</i> Consider a DrawingML object specified as follows:</p> <pre>< ... cx="1828800" cy="200000" /></pre> <p>The cy attribute specifies that this object has a width of 200000 EMUs (English Metric Units). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_PositiveSize2D](#)) is located in §A.4.1. *end note*]

20.1.7.4 off (Offset)

This element specifies the location of the bounding box of an object. Effects on an object are not included in this bounding box.



Attributes	Description
x (X-Axis Coordinate)	<p>Specifies a coordinate on the x-axis. The origin point for this coordinate shall be specified by the parent XML element.</p> <p>[<i>Example:</i> Consider the following point on a basic wrapping polygon for a DrawingML object:</p> <pre><... x="0" y="100" /></pre> <p>The x attribute defines an x-coordinate of 0. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>
y (Y-Axis Coordinate)	<p>Specifies a coordinate on the x-axis. The origin point for this coordinate shall be specified by the parent XML element.</p> <p>[<i>Example:</i> Consider the following point on a basic wrapping polygon for a DrawingML object:</p> <pre><... x="0" y="100" /></pre> <p>The y attribute defines a y-coordinate of 100. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type</p>

Attributes	Description
	(§20.1.10.16).

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_Point2D](#)) is located in §A.4.1. *end note*]

20.1.7.5 **xfrm (2D Transform for Grouped Objects)**



This element is nearly identical to the representation of 2-D transforms for ordinary shapes (§20.1.7.6). The only addition is a member to represent the Child offset and the Child extents.

Attributes	Description
flipH (Horizontal Flip)	<p>Horizontal flip. When true, this attribute defines that the group is flipped horizontally about the center of its bounding box.</p> <p>[<i>Example</i>: The following illustrates the effect of a horizontal flip.</p> <div></div> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
flipV (Vertical Flip)	<p>Vertical flip. When true, this attribute defines that the group is flipped vertically about the center of its bounding box.</p> <p>[<i>Example</i>: The following illustrates the effect of a vertical flip.</p> <div></div> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
rot (Rotation)	<p>Rotation. Specifies the clockwise rotation of a group in 1/64000 of a degree.</p> <p>The possible values for this attribute are defined by the ST_Angle simple type (§20.1.10.3).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_GroupTransform2D](#)) is located in §A.4.1. *end note*]

20.1.7.6 xfrm (2D Transform for Individual Objects)

This element represents 2-D transforms for ordinary shapes.

Attributes	Description
flipH (Horizontal Flip)	<p>Specifies a horizontal flip. When true, this attribute defines that the shape is flipped horizontally about the center of its bounding box.</p> <p>[Example: The following illustrates the effect of a horizontal flip.</p>  <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
flipV (Vertical Flip)	<p>Specifies a vertical flip. When true, this attribute defines that the group is flipped vertically about the center of its bounding box.</p> <p>[Example: The following illustrates the effect of a vertical flip.</p>  <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
rot (Rotation)	<p>Specifies the rotation of the Graphic Frame. The units for which this attribute is specified in reside within the simple type definition referenced below.</p> <p>The possible values for this attribute are defined by the ST_Angle simple type (§20.1.10.3).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Transform2D](#)) is located in §A.4.1. *end note*]

20.1.8 Shape Fills, Effects, and Line Properties

This portion of the DrawingML framework describes effects defining the visual appearance of shapes and lines. Shapes can be filled in a variety of ways, with images, solid colors, gradients, or pattern fills. In addition, several visual effects can alter the appearance of a shape, and multiple effects can be combined together. Lines also can have special properties defining how they are rendered, including a dashed appearance or decorations at the line ends. This section documents the elements that define these properties and effects for shapes and lines.

20.1.8.1 `alphaBiLevel` (Alpha Bi-Level Effect)

This element represents an Alpha Bi-Level Effect.

Alpha (Opacity) values less than the threshold are changed to 0 (fully transparent) and alpha values greater than or equal to the threshold are changed to 100% (fully opaque).

Attributes	Description
thresh (Threshold)	Specifies the threshold value for the alpha bi-level effect. The possible values for this attribute are defined by the ST_PositiveFixedPercentage simple type (§20.1.10.44).

[Note: The W3C XML Schema definition of this element's content model ([CT_AlphaBiLevelEffect](#)) is located in §A.4.1. *end note*]

20.1.8.2 `alphaCeiling` (Alpha Ceiling Effect)

This element represents an alpha ceiling effect.

Alpha (opacity) values greater than zero are changed to 100%. In other words, anything partially opaque becomes fully opaque.

[Note: The W3C XML Schema definition of this element's content model ([CT_AlphaCeilingEffect](#)) is located in §A.4.1. *end note*]

20.1.8.3 `alphaFloor` (Alpha Floor Effect)

This element represents an alpha floor effect.

Alpha (opacity) values less than 100% are changed to zero. In other words, anything partially transparent becomes fully transparent.

[Note: The W3C XML Schema definition of this element's content model ([CT_AlphaFloorEffect](#)) is located in §A.4.1. *end note*]

20.1.8.4 `alphaInv` (Alpha Inverse Effect)

This element represents an alpha inverse effect.

Alpha (opacity) values are inverted by subtracting from 100%.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_AlphaInverseEffect](#)) is located in §A.4.1. *end note*]

20.1.8.5 [alphaMod \(Alpha Modulate Effect\)](#)

This element represents an alpha modulate effect.

Effect alpha (opacity) values are multiplied by a fixed percentage. The effect container specifies an effect containing alpha values to modulate.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_AlphaModulateEffect](#)) is located in §A.4.1. *end note*]

20.1.8.6 [alphaModFix \(Alpha Modulate Fixed Effect\)](#)

This element represents an alpha modulate fixed effect.

Effect alpha (opacity) values are multiplied by a fixed percentage.

Attributes	Description
amt (Amount)	Specifies the percentage amount to scale the alpha. The possible values for this attribute are defined by the ST_PositivePercentage simple type (§20.1.10.45).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_AlphaModulateFixedEffect](#)) is located in §A.4.1. *end note*]

20.1.8.7 [alphaOutset \(Alpha Inset/Outset Effect\)](#)

This element specifies an alpha outset/inset effect.

This is equivalent to an alpha ceiling, followed by alpha blur, followed by either an alpha ceiling (positive radius) or alpha floor (negative radius).

Attributes	Description
rad (Radius)	Specifies the radius of outset/inset. The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_AlphaOutsetEffect](#)) is located in §A.4.1. *end note*]

20.1.8.8 [alphaRepl \(Alpha Replace Effect\)](#)

This element specifies an alpha replace effect.

Effect alpha (opacity) values are replaced by a fixed alpha.

Attributes	Description
a (Alpha)	Specifies the new opacity value. The possible values for this attribute are defined by the ST_PositiveFixedPercentage simple type (§20.1.10.44).

[Note: The W3C XML Schema definition of this element’s content model ([CT_AlphaReplaceEffect](#)) is located in §A.4.1. *end note*]

20.1.8.9 [bevel \(Line Join Bevel\)](#)

This element specifies a Bevel Line Join.

A bevel joint specifies that an angle joint is used to connect lines.

[Example:



end example]

[Note: The W3C XML Schema definition of this element’s content model ([CT_LineJoinBevel](#)) is located in §A.4.1. *end note*]

20.1.8.10 [bgClr \(Background color\)](#)

This element specifies the background color of a Pattern fill.

[Note: The W3C XML Schema definition of this element’s content model ([CT_Color](#)) is located in §A.4.1. *end note*]

20.1.8.11 [biLevel \(Bi-Level \(Black/White\) Effect\)](#)

This element specifies a bi-level (black/white) effect. Input colors whose luminance is less than the specified threshold value are changed to black. Input colors whose luminance are greater than or equal the specified value are set to white. The alpha effect values are unaffected by this effect.

Attributes	Description
thresh (Threshold)	Specifies the luminance threshold for the Bi-Level effect. Values greater than or equal to the threshold are set to white. Values lesser than the threshold are set to black.

Attributes	Description
	The possible values for this attribute are defined by the ST_PositiveFixedPercentage simple type (§20.1.10.44).

[Note: The W3C XML Schema definition of this element's content model ([CT_BiLevelEffect](#)) is located in §A.4.1.
end note]

20.1.8.12 [blend \(Blend Effect\)](#)

This element specifies a blend of several effects. The container specifies the raw effects to blend while the blend mode specifies how the effects are to be blended.

Attributes	Description
blend (Blend Mode)	Specifies how to blend the two effects. The possible values for this attribute are defined by the ST_BlendMode simple type (§20.1.10.11).

[Note: The W3C XML Schema definition of this element's content model ([CT_BlendEffect](#)) is located in §A.4.1.
end note]

20.1.8.13 [blip \(Blip\)](#)

This element specifies the existence of an image (binary large image or picture) and contains a reference to the image data.

Attributes	Description
cstate (Compression State)	Specifies the compression state with which the picture is stored. This allows the application to specify the amount of compression that has been applied to a picture. The possible values for this attribute are defined by the ST_BlipCompression simple type (§20.1.10.12).
embed (Embedded Picture Reference) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the identification information for an embedded picture. This attribute is used to specify an image that resides locally within the file. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).
link (Linked Picture Reference)	Specifies the identification information for a linked picture. This attribute is used to specify an image that does not reside within this file.

Attributes	Description
Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

[Note: The W3C XML Schema definition of this element’s content model ([CT_Blip](#)) is located in §A.4.1. *end note*]

20.1.8.14 [blipFill \(Picture Fill\)](#)

This element specifies the type of picture fill that the picture object has. Because a picture has a picture fill already by default, it is possible to have two fills specified for a picture object. An example of this is shown below.

[Example: Consider the picture below that has a blip fill applied to it. The image used to fill this picture object has transparent pixels instead of white pixels.

```
<p:pic>
...
<p:blipFill>
  <a:blip r:embed="rId2"/>
  <a:stretch>
    <a:fillRect/>
  </a:stretch>
</p:blipFill>
...
</p:pic>
```



The above picture object is shown as an example of this fill type. *end example*]

[Example: Consider now the same picture object but with an additional gradient fill applied within the shape properties portion of the picture.

```
<p:pic>
...
<p:blipFill>
  <a:blip r:embed="rId2"/>
  <a:stretch>
    <a:fillRect/>
  </a:stretch>
</p:blipFill>
<p:spPr>
  <a:gradFill>
    <a:gsLst>
      <a:gs pos="0">
        <a:schemeClr val="tx2">
          <a:shade val="50000"/>
        </a:schemeClr>
      </a:gs>
      <a:gs pos="39999">
        <a:schemeClr val="tx2">
          <a:tint val="20000"/>
        </a:schemeClr>
      </a:gs>
      <a:gs pos="70000">
        <a:srgbClr val="C4D6EB"/>
      </a:gs>
      <a:gs pos="100000">
        <a:schemeClr val="bg1"/>
      </a:gs>
    </a:gsLst>
  </a:gradFill>
</p:spPr>
...
</p:pic>
```



The above picture object is shown as an example of this double fill type. *end example*]



Attributes	Description
dpi (DPI Setting)	<p>Specifies the DPI (dots per inch) used to calculate the size of the blip. If not present or zero, the DPI in the blip is used.</p> <p>[<i>Note</i>: This attribute is primarily used to keep track of the picture quality within a document. There are different levels of quality needed for print than on-screen viewing and thus a need to track this information. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
rotWithShape (Rotate With Shape)	<p>Specifies that the fill should rotate with the shape. That is, when the shape that has been filled with a picture and the containing shape (say a rectangle) is transformed with a rotation then the fill is transformed with the same rotation.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_BlipFillProperties](#)) is located in §A.4.1. *end note*]

20.1.8.15 blur (Blur Effect)

This element specifies a blur effect that is applied to the entire shape, including its fill. All color channels, including alpha, are affected.

Attributes	Description
grow (Grow Bounds)	<p>Specifies whether the bounds of the object should be grown as a result of the blurring. True indicates the bounds are grown while false indicates that they are not.</p> <p>[<i>Example</i>:</p>

Attributes	Description
	<p>With grow set to false, the blur effect does not extend beyond the original bounds of the object:</p>  <p>With grow set to true, the blur effect can extend beyond the original bounds of the object:</p>  <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
rad (Radius)	<p>Specifies the radius of blur.</p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_BlurEffect](#)) is located in §A.4.1. *end note*]

20.1.8.16 [clrChange \(Color Change Effect\)](#)

This element specifies a Color Change Effect. Instances of clrFrom are replaced with instances of clrTo.

Attributes	Description
useA (Consider Alpha Values)	<p>Specifies whether alpha values are considered for the effect. Effect alpha values are considered if useA is true, else they are ignored.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ColorChangeEffect](#)) is located in §A.4.1. *end note*]

20.1.8.17 **clrFrom (Change Color From)**

This element specifies a color getting removed in a color change effect. It is the "from" or source input color.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Color](#)) is located in §A.4.1. *end note*]

20.1.8.18 **clrRepl (Solid Color Replacement)**

This element specifies a solid color replacement value. All effect colors are changed to a fixed color. Alpha values are unaffected.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ColorReplaceEffect](#)) is located in §A.4.1. *end note*]

20.1.8.19 **clrTo (Change Color To)**

This element specifies the color which replaces the clrFrom in a clrChange effect. This is the "target" or "to" color in the color change effect.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Color](#)) is located in §A.4.1. *end note*]

20.1.8.20 **cont (Effect Container)**

This element specifies an Effect Container. It is a list of effects.

Attributes	Description
name (Name)	<p>Specifies an optional name for this list of effects, so that it can be referred to later. Shall be unique across all effect trees and effect containers.</p> <p>The possible values for this attribute are defined by the W3C XML Schema token datatype.</p>
type (Effect Container Type)	<p>Specifies the kind of container, either sibling or tree.</p> <p>The possible values for this attribute are defined by the ST_EffectContainerType simple type (§20.1.10.22).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_EffectContainer](#)) is located in §A.4.1. *end note*]

20.1.8.21 **custDash (Custom Dash)**

This element specifies a custom dashing scheme. It is a list of dash stop elements which represent building block atoms upon which the custom dashing scheme is built.

[*Note: The W3C XML Schema definition of this element's content model ([CT_DashStopList](#)) is located in §A.4.1. end note*]

20.1.8.22 [ds \(Dash Stop\)](#)

This element specifies a dash stop primitive. Dashing schemes are built by specifying an ordered list of dash stop primitive. A dash stop primitive consists of a dash and a space.

Attributes	Description
d (Dash Length)	Specifies the length of the dash relative to the line width. The possible values for this attribute are defined by the ST_PositivePercentage simple type (§20.1.10.45).
sp (Space Length)	Specifies the length of the space relative to the line width. The possible values for this attribute are defined by the ST_PositivePercentage simple type (§20.1.10.45).

[*Note: The W3C XML Schema definition of this element's content model ([CT_DashStop](#)) is located in §A.4.1. end note*]

20.1.8.23 [duotone \(Duotone Effect\)](#)

This element specifies a duotone effect.

For each pixel, combines clr1 and clr2 through a linear interpolation to determine the new color for that pixel.

[*Note: The W3C XML Schema definition of this element's content model ([CT_DuotoneEffect](#)) is located in §A.4.1. end note*]

20.1.8.24 [effect \(Effect\)](#)

This element specifies a reference to an existing effect container.

Attributes	Description
ref (Reference)	Specifies the reference. Its value can be the name of an effect container, or one of four special references: fill - refers to the fill effect line - refers to the line effect fillLine - refers to the combined fill and line effects children - refers to the combined effects from logical child shapes or text The possible values for this attribute are defined by the W3C XML Schema token datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_EffectReference](#)) is located in §A.4.1. *end note*]

20.1.8.25 [effectDag \(Effect Container\)](#)

This element specifies a list of effects. Effects are applied in the order specified by the container type (sibling or tree).

[*Note:* An effectDag element can contain multiple effect containers as child elements. Effect containers with different styles can be combined in an effectDag to define a directed acyclic graph (DAG) that specifies the order in which all effects are applied. *end note*]

Attributes	Description
name (Name)	Specifies an optional name for this list of effects, so that it can be referred to later. Shall be unique across all effect trees and effect containers. The possible values for this attribute are defined by the W3C XML Schema token datatype.
type (Effect Container Type)	Specifies the kind of container, either sibling or tree. The possible values for this attribute are defined by the ST_EffectContainerType simple type (§20.1.10.22).

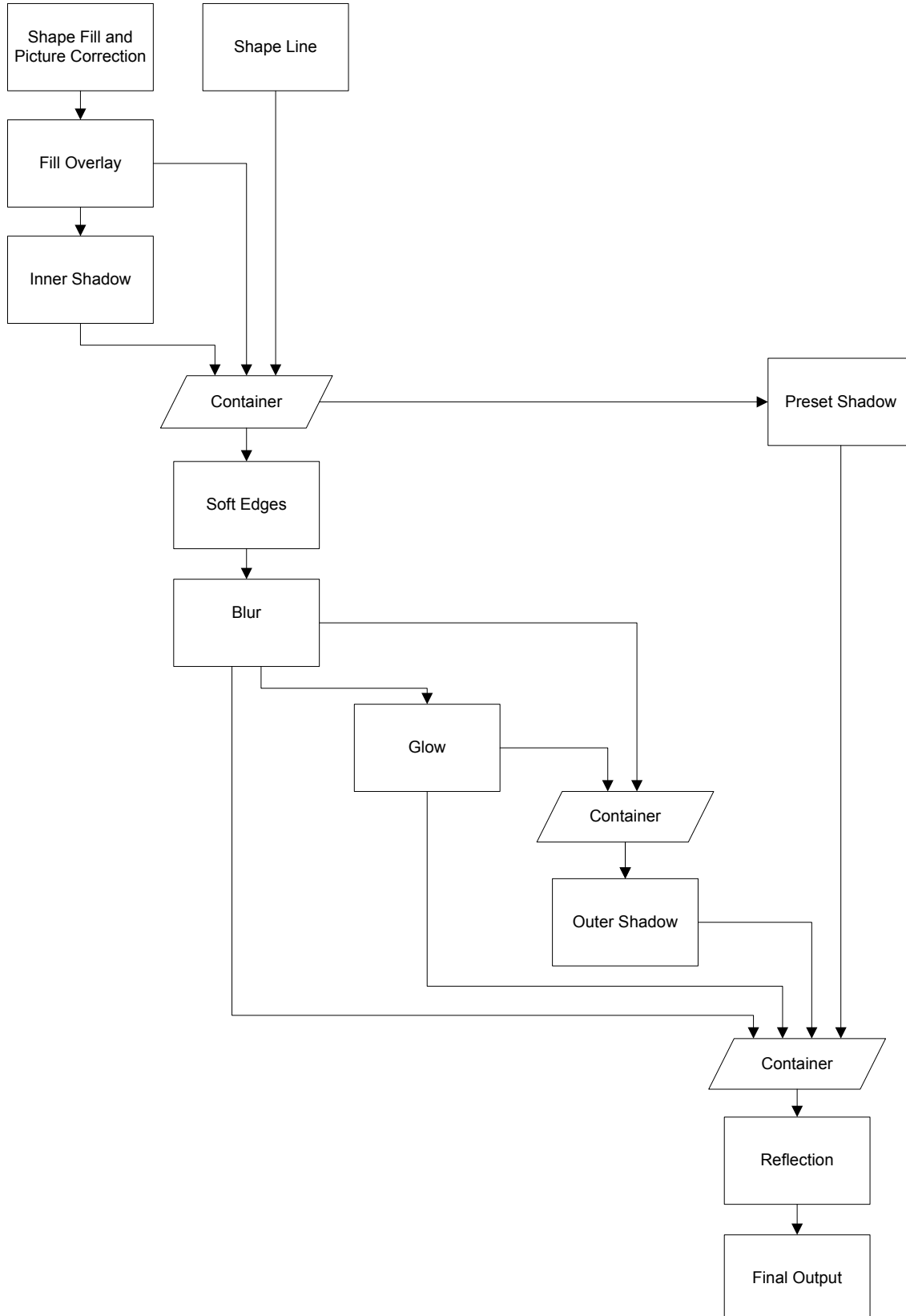
[*Note:* The W3C XML Schema definition of this element's content model ([CT_EffectContainer](#)) is located in §A.4.1. *end note*]

20.1.8.26 [effectLst \(Effect Container\)](#)

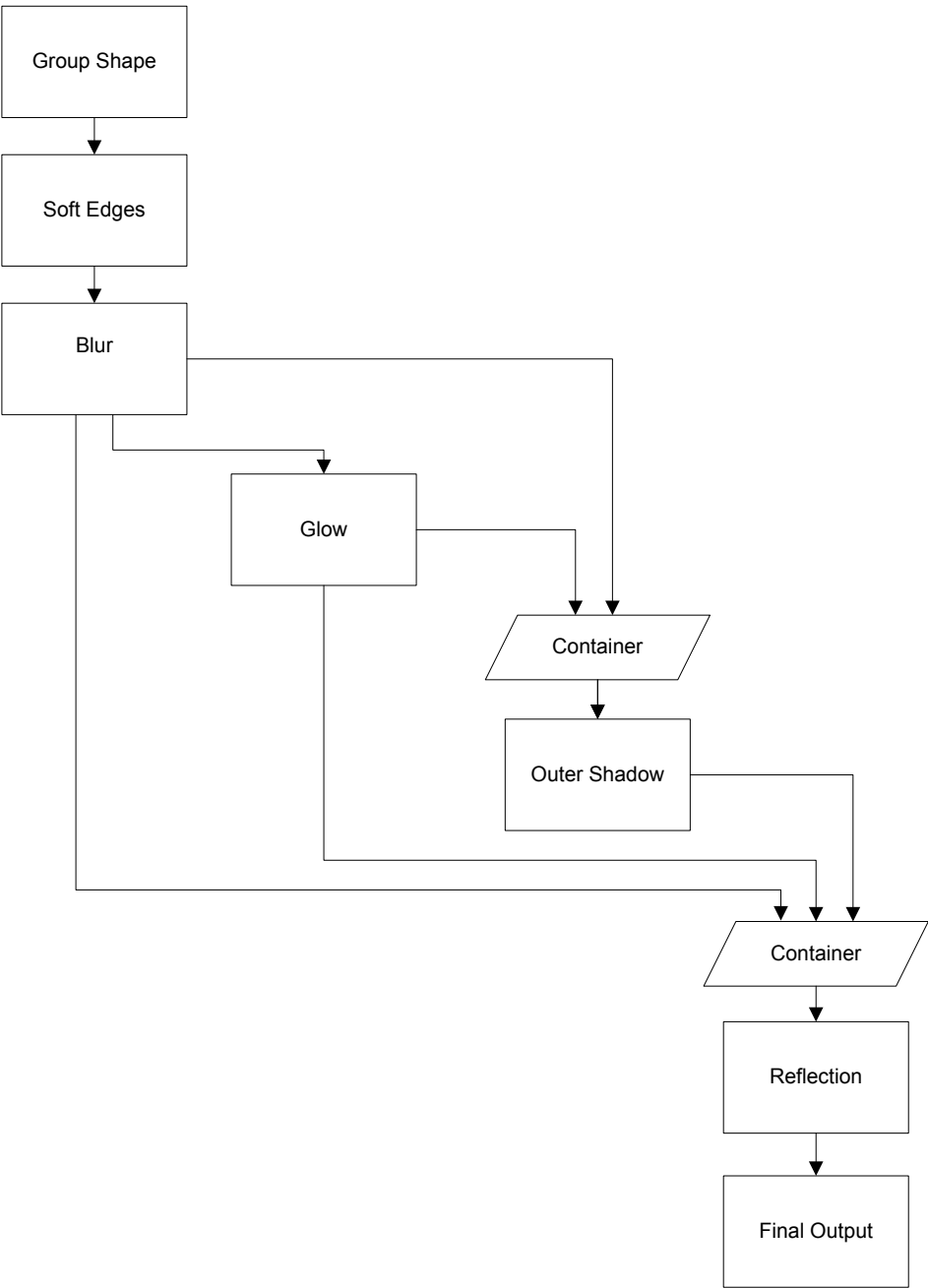
This element specifies a list of effects. Effects in an effectLst are applied in the default order by the rendering engine. The following diagrams illustrate the order in which effects are applied, both for shapes and for group shapes.

[*Note:* The output of many effects does not include the input shape. For effects that should be applied to the result of previous effects as well as the original shape, a container is used to group the inputs together. *end note*]

[*Example:* Outer Shadow is applied both to the original shape and the original shape's glow. The result of blur contains the original shape, while the result of glow contains only the added glow. Therefore, a container that groups the blur result with the glow result is used as the input to Outer Shadow. *end example*]

effectLst Processing for Shapes

effectLst Processing for Group Shapes



[Note: The W3C XML Schema definition of this element’s content model (CT_EffectList) is located in §A.4.1. *end note*]

20.1.8.27 fgClr (Foreground color)

This element specifies the foreground color of a pattern fill.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Color](#)) is located in §A.4.1. *end note*]

20.1.8.28 fill (Fill)

This element specifies a fill which is one of blipFill, gradFill, grpFill, noFill, pattFill or solidFill.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FillEffect](#)) is located in §A.4.1. *end note*]

20.1.8.29 fillOverlay (Fill Overlay Effect)

This element specifies a fill overlay effect. A fill overlay can be used to specify an additional fill for an object and blend the two fills together.

Attributes	Description
blend (Blend)	Specifies how to blend the fill with the base effect. The possible values for this attribute are defined by the ST_BlendMode simple type (§20.1.10.11).

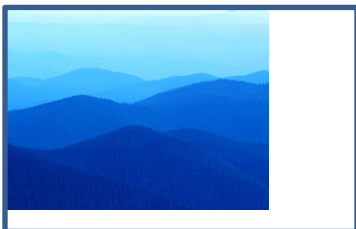
[*Note:* The W3C XML Schema definition of this element's content model ([CT_FillOverlayEffect](#)) is located in §A.4.1. *end note*]

20.1.8.30 fillRect (Fill Rectangle)

This element specifies a fill rectangle. When stretching of an image is specified, a source rectangle, srcRect, is scaled to fit the specified fill rectangle.

Each edge of the fill rectangle is defined by a percentage offset from the corresponding edge of the shape's bounding box. A positive percentage specifies an inset, while a negative percentage specifies an outset. [*Note:* For example, a left offset of 25% specifies that the left edge of the fill rectangle is located to the right of the bounding box's left edge by an amount equal to 25% of the bounding box's width. *end note*]

[*Example:*



```
<a:blipFill>
  <a:blip r:embed="rId2"/>
  <a:stretch>
    <a:fillRect b="10000" r="25000"/>
  </a:stretch>
</a:blipFill>
```

```
</a:stretch>
</a:blipFill>
```

The above image is stretched to fill the entire rectangle except for the bottom 10% and rightmost 25%.

end example]

Attributes	Description
b (Bottom Offset)	Specifies the bottom edge of the rectangle. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).
l (Left Offset)	Specifies the left edge of the rectangle. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).
r (Right Offset)	Specifies the right edge of the rectangle. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).
t (Top Offset)	Specifies the top edge of the rectangle. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).

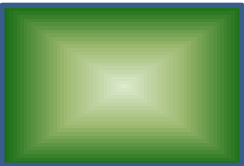
[*Note:* The W3C XML Schema definition of this element’s content model ([CT_RelativeRect](#)) is located in §A.4.1.
end note]

20.1.8.31 [fillToRect \(Fill To Rectangle\)](#)

This element defines the "focus" rectangle for the center shade, specified relative to the fill tile rectangle. The center shade fills the entire tile except the margins specified by each attribute.

Each edge of the center shade rectangle is defined by a percentage offset from the corresponding edge of the tile rectangle. A positive percentage specifies an inset, while a negative percentage specifies an outset. [*Note:* For example, a left offset of 25% specifies that the left edge of the center shade rectangle is located to the right of the tile rectangle's left edge by an amount equal to 25% of the tile rectangle's width. *end note]*

[*Example:*

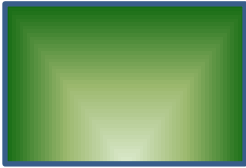


```
<a:path path="rect">
  <a:fillToRect l="50000" r="50000" t="50000" b="50000"/>
</a:path>
```

In the above shape, the rectangle defined by fillToRect is a single point in the center of the shape. This creates the effect of the center shade focusing at a point in the center of the region.

end example]

[Example:



```
<a:path path="rect">
  <a:fillToRect l="25000" t="25000" r="25000" b="0"/>
</a:path>
```

The center shade occupies the rectangle defined by excluding the topmost, leftmost, and rightmost 25% of the region. Therefore, the gradient fills the remaining leftmost 25%, topmost 25%, and rightmost 25% of the region.

end example]

Attributes	Description
b (Bottom Offset)	Specifies the bottom edge of the rectangle. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).
l (Left Offset)	Specifies the left edge of the rectangle. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).
r (Right Offset)	Specifies the right edge of the rectangle. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).
t (Top Offset)	Specifies the top edge of the rectangle. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).

[Note: The W3C XML Schema definition of this element's content model ([CT_RelativeRect](#)) is located in §A.4.1.
end note]

20.1.8.32 glow (Glow Effect)

This element specifies a glow effect, in which a color blurred outline is added outside the edges of the object.

Attributes	Description
rad (Radius)	<p>Specifies the radius of the glow.</p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_GlowEffect](#)) is located in §A.4.1.
end note]

20.1.8.33 gradFill (Gradient Fill)

This element defines a gradient fill.

A gradient fill is a fill which is characterized by a smooth gradual transition from one color to the next. At its simplest, it is a fill which transitions between two colors; or more generally, it can be a transition of any number of colors.

The desired transition colors and locations are defined in the gradient stop list (gsLst) child element.

The other child element defines the properties of the gradient fill (there are two styles-- a linear shade style as well as a path shade style)

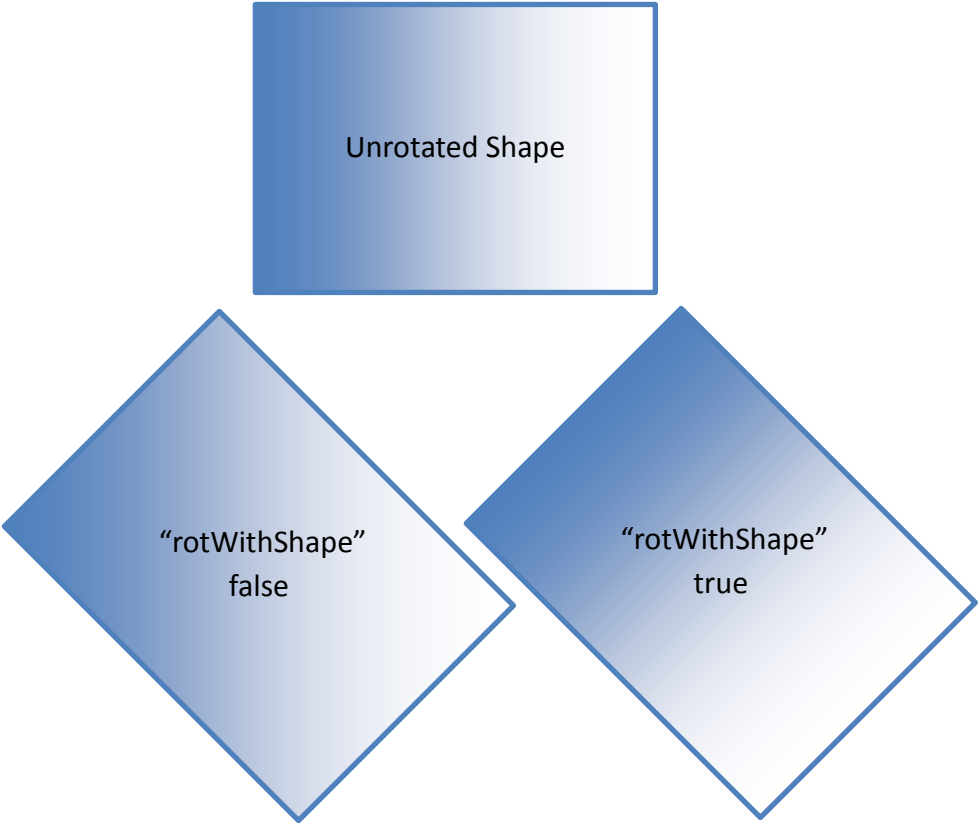
[Example:

The following is a sample gradient fill, varying from blue to white:



end example]

Attributes	Description
flip (Tile Flip)	<p>Specifies the direction(s) in which to flip the gradient while tiling.</p> <p>Normally a gradient fill encompasses the entire bounding box of the shape which contains the fill. However, with the tileRect element, it is possible to define a "tile" rectangle which is smaller than the bounding box. In this situation, the gradient fill is encompassed within the tile rectangle, and the tile rectangle is tiled across the bounding box to fill the entire area.</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_TileFlipMode simple type (§20.1.10.85).
rotWithShape (Rotate With Shape)	<p>Specifies if a fill rotates along with a shape when the shape is rotated.</p> <p><i>[Example:</i></p> <p>The following is a fill with the flip attribute set to "x". The black interior rectangle indicates the tile rectangle. Notice that the adjacent rectangle to the right in the tile has been flipped along the x-axis.</p>  <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_GradientFillProperties](#)) is located in §A.4.1. *end note*]

20.1.8.34 **grayscale** (Gray Scale Effect)

This element specifies a gray scale effect. Converts all effect color values to a shade of gray, corresponding to their luminance. Effect alpha (opacity) values are unaffected.

[Note: The W3C XML Schema definition of this element’s content model ([CT_GrayscaleEffect](#)) is located in §A.4.1. *end note*]

20.1.8.35 **groupFill** (Group Fill)

This element specifies a group fill. When specified, this setting indicates that the parent element is part of a group and should inherit the fill properties of the group.

[Note: The W3C XML Schema definition of this element’s content model ([CT_GroupFillProperties](#)) is located in §A.4.1. *end note*]

20.1.8.36 **gradientStops** (Gradient stops)

This element defines a gradient stop. A gradient stop consists of a position where the stop appears in the color band.

Attributes	Description
pos (Position)	<p>Specifies where this gradient stop should appear in the color band. This position is specified in the range [0%, 100%], which corresponds to the beginning and the end of the color band respectively.</p> <p>The possible values for this attribute are defined by the ST_PositiveFixedPercentage simple type (§20.1.10.44).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_GradientStop](#)) is located in §A.4.1. *end note*]

20.1.8.37 **gradientStopsList** (Gradient Stop List)

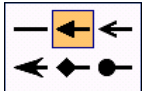
The list of gradient stops that specifies the gradient colors and their relative positions in the color band.

[Note: The W3C XML Schema definition of this element’s content model ([CT_GradientStopList](#)) is located in §A.4.1. *end note*]

20.1.8.38 **lineHeadEnd** (Line Head/End Style)

This element specifies decorations which can be added to the head of a line.

[Example:



end exmaple]

Attributes	Description
len (Length of Head/End)	Specifies the line end length in relation to the line width. The possible values for this attribute are defined by the ST_LineEndLength simple type (§20.1.10.32).
type (Line Head/End Type)	Specifies the line end decoration, such as a triangle or arrowhead. The possible values for this attribute are defined by the ST_LineEndType simple type (§20.1.10.33).
w (Width of Head/End)	Specifies the line end width in relation to the line width. The possible values for this attribute are defined by the ST_LineEndWidth simple type (§20.1.10.34).

[Note: The W3C XML Schema definition of this element's content model ([CT_LineEndProperties](#)) is located in §A.4.1. *end note*]

20.1.8.39 hsl (Hue Saturation Luminance Effect)

This element specifies a hue/saturation/luminance effect. The hue, saturation, and luminance can each be adjusted relative to its current value.

Attributes	Description
hue (Hue)	Specifies the number of degrees by which the hue is adjusted. The possible values for this attribute are defined by the ST_PositiveFixedAngle simple type (§20.1.10.43).
lum (Luminance)	Specifies the percentage by which the luminance is adjusted. The possible values for this attribute are defined by the ST_FixedPercentage simple type (§20.1.10.24).
sat (Saturation)	Specifies the percentage by which the saturation is adjusted. The possible values for this attribute are defined by the ST_FixedPercentage simple type (§20.1.10.24).

[Note: The W3C XML Schema definition of this element's content model ([CT_HSLEffect](#)) is located in §A.4.1. *end note*]

20.1.8.40 innerShdw (Inner Shadow Effect)

This element specifies an inner shadow effect. A shadow is applied within the edges of the object according to the parameters given by the attributes.



Attributes	Description
blurRad (Blur Radius)	Specifies the blur radius. The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).
dir (Direction)	Specifies the direction to offset the shadow. The possible values for this attribute are defined by the ST_PositiveFixedAngle simple type (§20.1.10.43).
dist (Distance)	Specifies how far to offset the shadow. The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).

[Note: The W3C XML Schema definition of this element’s content model ([CT_InnerShadowEffect](#)) is located in §A.4.1. *end note*]

20.1.8.41 lin (Linear Gradient Fill)

This element specifies a linear gradient.

Attributes	Description
ang (Angle)	Specifies the direction of color change for the gradient. To define this angle, let its value be x measured clockwise. Then $(-\sin x, \cos x)$ is a vector parallel to the line of constant color in the gradient fill. The possible values for this attribute are defined by the ST_PositiveFixedAngle simple type (§20.1.10.43).
scaled (Scaled)	Whether the gradient angle scales with the fill region. Mathematically, if this flag is true, then the gradient vector $(\cos x, \sin x)$ is scaled by the width (w) and height (h) of the fill region, so that the vector becomes $(w \cos x, h \sin x)$ (before normalization). Observe that now if the gradient angle is 45 degrees, the gradient vector is (w, h) , which goes

Attributes	Description
	<p>from top-left to bottom-right of the fill region. If this flag is false, the gradient angle is independent of the fill region and is not scaled using the manipulation described above. So a 45-degree gradient angle always give a gradient band whose line of constant color is parallel to the vector (1, -1).</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_LinearShadeProperties](#)) is located in §A.4.1. *end note*]

20.1.8.42 lum (Luminance Effect)

This element specifies a luminance effect. Brightness linearly shifts all colors closer to white or black. Contrast scales all colors to be either closer or further apart.

Attributes	Description
bright (Brightness)	<p>Specifies the percent to change the brightness.</p> <p>The possible values for this attribute are defined by the ST_FixedPercentage simple type (§20.1.10.24).</p>
contrast (Contrast)	<p>Specifies the percent to change the contrast.</p> <p>The possible values for this attribute are defined by the ST_FixedPercentage simple type (§20.1.10.24).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_LuminanceEffect](#)) is located in §A.4.1. *end note*]

20.1.8.43 miter (Miter Line Join)

This element specifies that a line join shall be mitered.

[Example: The following sample illustrated two lines which are joined using a mitered style



end example]

Attributes	Description
lim (Miter Join)	Specifies the amount by which lines is extended to form a miter join - otherwise miter

Attributes	Description
Limit)	joins can extend infinitely far (for lines which are almost parallel). The possible values for this attribute are defined by the ST_PositivePercentage simple type (§20.1.10.45).

[Note: The W3C XML Schema definition of this element's content model ([CT_LineJoinMiterProperties](#)) is located in §A.4.1. *end note*]

20.1.8.44 noFill (No Fill)

This element specifies that no fill is applied to the parent element.

[Note: The W3C XML Schema definition of this element's content model ([CT_NoFillProperties](#)) is located in §A.4.1. *end note*]

20.1.8.45 outerShdw (Outer Shadow Effect)

This element specifies an Outer Shadow Effect.

[Example: The following is an example of an outer shadow effect.



end example]

Attributes	Description
aln (Shadow Alignment)	Specifies shadow alignment; alignment happens first, effectively setting the origin for scale, skew, and offset. The possible values for this attribute are defined by the ST_RectAlignment simple type (§20.1.10.52).
blurRad (Blur Radius)	Specifies the blur radius of the shadow. The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).
dir (Shadow Direction)	Specifies the direction to offset the shadow. The possible values for this attribute are defined by the ST_PositiveFixedAngle simple

Attributes	Description
	type (§20.1.10.43).
dist (Shadow Offset Distance)	Specifies the how far to offset the shadow. The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).
kx (Horizontal Skew)	Specifies the horizontal skew angle. The possible values for this attribute are defined by the ST_FixedAngle simple type (§20.1.10.23).
ky (Vertical Skew)	Specifies the vertical skew angle. The possible values for this attribute are defined by the ST_FixedAngle simple type (§20.1.10.23).
rotWithShape (Rotate With Shape)	Specifies whether the shadow rotates with the shape if the shape is rotated. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
sx (Horizontal Scaling Factor)	Specifies the horizontal scaling factor; negative scaling causes a flip. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).
sy (Vertical Scaling Factor)	Specifies the vertical scaling factor; negative scaling causes a flip. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).

[Note: The W3C XML Schema definition of this element's content model ([CT_OuterShadowEffect](#)) is located in §A.4.1. *end note*]

20.1.8.46 [path \(Path Gradient\)](#)

This element defines that a gradient fill follows a path vs. a linear line.

[Example:



The examples above illustrate gradient fills following a circular, rectangular or shape path.

end example]

Attributes	Description
path (Gradient Fill Path)	Specifies the shape of the path to follow. The possible values for this attribute are defined by the ST_PathShadeType simple type (§20.1.10.38).

[Note: The W3C XML Schema definition of this element’s content model ([CT_PathShadeProperties](#)) is located in §A.4.1. *end note*]

20.1.8.47 [pattFill \(Pattern Fill\)](#)

This element specifies a pattern fill. A repeated pattern is used to fill the object.

Attributes	Description
prst (Preset Pattern)	Specifies one of a set of preset patterns to fill the object. The possible values for this attribute are defined by the ST_PresetPatternVal simple type (§20.1.10.50).

[Note: The W3C XML Schema definition of this element’s content model ([CT_PatternFillProperties](#)) is located in §A.4.1. *end note*]

20.1.8.48 [prstDash \(Preset Dash\)](#)

This element specifies that a preset line dashing scheme should be used.

Attributes	Description
val (Value)	Specifies which preset dashing scheme is to be used. The possible values for this attribute are defined by the ST_PresetLineDashVal simple type (§20.1.10.48).

[Note: The W3C XML Schema definition of this element's content model ([CT_PresetLineDashProperties](#)) is located in §A.4.1. *end note*]

20.1.8.49 `prstShdw` (Preset Shadow)

This element specifies that a preset shadow is to be used. Each preset shadow is equivalent to a specific outer shadow effect. For each preset shadow, the color element, direction attribute, and distance attribute represent the color, direction, and distance parameters of the corresponding outer shadow. Additionally, the `rotateWithShape` attribute of corresponding outer shadow is always false. Other non-default parameters of the outer shadow are dependent on the `prst` attribute.

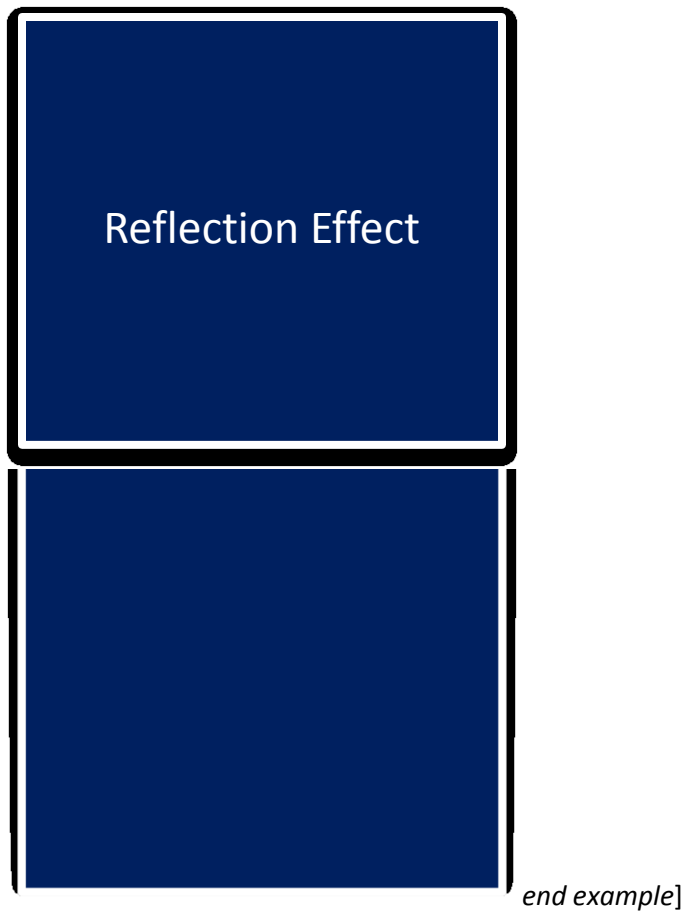
Attributes	Description
<code>dir</code> (Direction)	Specifies the direction to offset the shadow. The possible values for this attribute are defined by the <code>ST_PositiveFixedAngle</code> simple type (§20.1.10.43).
<code>dist</code> (Distance)	Specifies how far to offset the shadow. The possible values for this attribute are defined by the <code>ST_PositiveCoordinate</code> simple type (§20.1.10.41).
<code>prst</code> (Preset Shadow)	Specifies which preset shadow to use. The possible values for this attribute are defined by the <code>ST_PresetShadowVal</code> simple type (§20.1.10.51).

[Note: The W3C XML Schema definition of this element's content model ([CT_PresetShadowEffect](#)) is located in §A.4.1. *end note*]

20.1.8.50 `reflection` (Reflection Effect)

This element specifies a reflection effect.

[Example:



Attributes	Description
align (Shadow Alignment)	Specifies shadow alignment. The possible values for this attribute are defined by the ST_RectAlignment simple type (§20.1.10.52).
blurRad (Blur Radius)	Specifies the blur radius. The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).
dir (Direction)	Specifies the direction of the alpha gradient ramp relative to the shape itself. The possible values for this attribute are defined by the ST_PositiveFixedAngle simple type (§20.1.10.43).
dist (Distance)	Specifies how far to distance the shadow. The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).
endA (End Alpha)	Specifies the ending reflection opacity.

Attributes	Description
	The possible values for this attribute are defined by the ST_PositiveFixedPercentage simple type (§20.1.10.44).
endPos (End Position)	<p>Specifies the end position (along the alpha gradient ramp) of the end alpha value.</p> <p>The possible values for this attribute are defined by the ST_PositiveFixedPercentage simple type (§20.1.10.44).</p>
fadeDir (Fade Direction)	<p>Specifies the direction to offset the reflection.</p> <p>The possible values for this attribute are defined by the ST_PositiveFixedAngle simple type (§20.1.10.43).</p>
kx (Horizontal Skew)	<p>Specifies the horizontal skew angle.</p> <p>The possible values for this attribute are defined by the ST_FixedAngle simple type (§20.1.10.23).</p>
ky (Vertical Skew)	<p>Specifies the vertical skew angle.</p> <p>The possible values for this attribute are defined by the ST_FixedAngle simple type (§20.1.10.23).</p>
rotWithShape (Rotate With Shape)	<p>Specifies if the reflection rotates with the shape.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
stA (Start Opacity)	<p>starting reflection opacity.</p> <p>The possible values for this attribute are defined by the ST_PositiveFixedPercentage simple type (§20.1.10.44).</p>
stPos (Start Position)	<p>Specifies the start position (along the alpha gradient ramp) of the start alpha value.</p> <p>The possible values for this attribute are defined by the ST_PositiveFixedPercentage simple type (§20.1.10.44).</p>
sx (Horizontal Ratio)	<p>Specifies the horizontal scaling factor.</p> <p>The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).</p>
sy (Vertical Ratio)	<p>Specifies the vertical scaling factor.</p> <p>The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_ReflectionEffect](#)) is located in §A.4.1. *end note*]

20.1.8.51 relOff (Relative Offset Effect)

This element specifies a relative offset effect. Sets up a new origin by offsetting relative to the size of the previous effect.

Attributes	Description
tx (Offset X)	Specifies the X offset. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).
ty (Offset Y)	Specifies the Y offset. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).

[Note: The W3C XML Schema definition of this element's content model ([CT_RelativeOffsetEffect](#)) is located in §A.4.1. *end note*]

20.1.8.52 round (Round Line Join)

This element specifies that lines joined together have a round join.

[Example:



end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_LineJoinRound](#)) is located in §A.4.1. *end note*]

20.1.8.53 softEdge (Soft Edge Effect)

This element specifies a soft edge effect. The edges of the shape are blurred, while the fill is not affected.

Attributes	Description
rad (Radius)	Specifies the radius of blur to apply to the edges. The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).

[Note: The W3C XML Schema definition of this element's content model ([CT_SoftEdgesEffect](#)) is located in §A.4.1. *end note*]

20.1.8.54 `solidFill` (Solid Fill)

This element specifies a solid color fill. The shape is filled entirely with the specified color.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SolidColorFillProperties](#)) is located in §A.4.1. *end note*]

20.1.8.55 `srcRect` (Source Rectangle)

This element specifies the portion of the blip used for the fill.

Each edge of the source rectangle is defined by a percentage offset from the corresponding edge of the bounding box. A positive percentage specifies an inset, while a negative percentage specifies an outset. [*Note:* For example, a left offset of 25% specifies that the left edge of the source rectangle is located to the right of the bounding box's left edge by an amount equal to 25% of the bounding box's width. *end note*]

Attributes	Description
b (Bottom Offset)	Specifies the bottom edge of the rectangle. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).
l (Left Offset)	Specifies the left edge of the rectangle. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).
r (Right Offset)	Specifies the right edge of the rectangle. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).
t (Top Offset)	Specifies the top edge of the rectangle. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_RelativeRect](#)) is located in §A.4.1. *end note*]

20.1.8.56 `stretch` (Stretch)

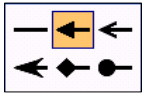
This element specifies that a BLIP should be stretched to fill the target rectangle. The other option is a tile where a BLIP is tiled to fill the available area.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_StretchInfoProperties](#)) is located in §A.4.1. *end note*]

20.1.8.57 **tailEnd (Tail line end style)**

This element specifies decorations which can be added to the tail of a line.

[Example:



end example]

Attributes	Description
len (Length of Head/End)	Specifies the line end length in relation to the line width. The possible values for this attribute are defined by the ST_LineEndLength simple type (§20.1.10.32).
type (Line Head/End Type)	Specifies the line end decoration, such as a triangle or arrowhead. The possible values for this attribute are defined by the ST_LineEndType simple type (§20.1.10.33).
w (Width of Head/End)	Specifies the line end width in relation to the line width. The possible values for this attribute are defined by the ST_LineEndWidth simple type (§20.1.10.34).

[Note: The W3C XML Schema definition of this element’s content model ([CT_LineEndProperties](#)) is located in §A.4.1. end note]

20.1.8.58 **tile (Tile)**

This element specifies that a BLIP should be tiled to fill the available space. This element defines a "tile" rectangle within the bounding box. The image is encompassed within the tile rectangle, and the tile rectangle is tiled across the bounding box to fill the entire area.

[Example:

The following is a fill with the flip attribute set to "x". The black interior rectangle indicates the tile rectangle. Notice that the adjacent rectangle to the right in the tile has been flipped along the x-axis.



end example]

Attributes	Description
align (Alignment)	<p>Specifies where to align the first tile with respect to the shape. Alignment happens after the scaling, but before the additional offset.</p> <p>The possible values for this attribute are defined by the ST_RectAlignment simple type (§20.1.10.52).</p>
flip (Tile Flipping)	<p>Specifies the direction(s) in which to flip the source image while tiling. Images can be flipped horizontally, vertically, or in both directions to fill the entire region.</p> <p>The possible values for this attribute are defined by the ST_TileFlipMode simple type (§20.1.10.85).</p>
sx (Horizontal Ratio)	<p>Specifies the amount to horizontally scale the srcRect.</p> <p>The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).</p>
sy (Vertical Ratio)	<p>Specifies the amount to vertically scale the srcRect.</p> <p>The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).</p>
tx (Horizontal Offset)	<p>Specifies additional horizontal offset after alignment.</p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>
ty (Vertical Offset)	<p>Specifies additional vertical offset after alignment.</p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>

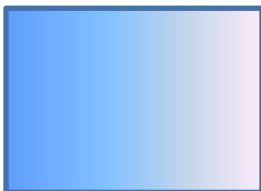
[Note: The W3C XML Schema definition of this element's content model ([CT_TileInfoProperties](#)) is located in §A.4.1. *end note*]

20.1.8.59 tileRect (Tile Rectangle)

This element specifies a rectangular region of the shape to which the gradient is applied. This region is then tiled across the remaining area of the shape to complete the fill. The tile rectangle is defined by percentage offsets from the sides of the shape's bounding box.

Each edge of the tile rectangle is defined by a percentage offset from the corresponding edge of the bounding box. A positive percentage specifies an inset, while a negative percentage specifies an outset. [*Note*: For example, a left offset of 25% specifies that the left edge of the tile rectangle is located to the right of the bounding box's left edge by an amount equal to 25% of the bounding box's width. *end note*]

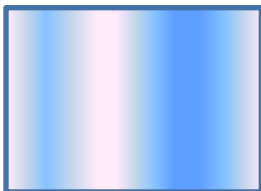
[*Example*:



The image above depicts a horizontal gradient with no tileRect element.



The image above depicts the same gradient with a tileRect element specifying l="50000" (50%). The right half of the shape is the tile to which the gradient is applied, and the left half of the shape contains a tiled copy of that gradient fill.



The image above depicts the same gradient with a tileRect element specifying l="75000" (75%). The rightmost 25% of the shape contains the tile rectangle to which the gradient is applied. This gradient is tiled three times to cover the leftmost 75% of the shape. The tile rectangle is flipped horizontally when covering the shape.

end example]

Attributes	Description
b (Bottom Offset)	Specifies the bottom edge of the rectangle. The possible values for this attribute are defined by the ST_Percentage simple type

Attributes	Description
	(§20.1.10.40).
l (Left Offset)	Specifies the left edge of the rectangle. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).
r (Right Offset)	Specifies the right edge of the rectangle. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).
t (Top Offset)	Specifies the top edge of the rectangle. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).

[*Note*: The W3C XML Schema definition of this element's content model ([CT_RelativeRect](#)) is located in §A.4.1. *end note*]

20.1.8.60 tint (Tint Effect)

This element specifies a tint effect. Shifts effect color values towards/away from hue by the specified amount.

Attributes	Description
amt (Amount)	Specifies by how much the color value is shifted. The possible values for this attribute are defined by the ST_FixedPercentage simple type (§20.1.10.24).
hue (Hue)	Specifies the hue towards which to tint. The possible values for this attribute are defined by the ST_PositiveFixedAngle simple type (§20.1.10.43).

[*Note*: The W3C XML Schema definition of this element's content model ([CT_TintEffect](#)) is located in §A.4.1. *end note*]

20.1.8.61 xfrm (Transform Effect)

This element specifies a transform effect. The transform is applied to each point in the shape's geometry using the following matrix:

$$\begin{bmatrix} sx & \tan(kx) & tx \\ \tan(ky) & sy & ty \\ 0 & 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} x \\ y \\ 1 \end{bmatrix}$$

Attributes	Description
kx (Horizontal Skew)	<p>Specifies the horizontal skew angle, defined as the angle between the top-left corner and bottom-left corner of the object's original bounding box. If positive, the bottom edge of the shape is positioned to the right relative to the top edge.</p> <p>The possible values for this attribute are defined by the ST_FixedAngle simple type (§20.1.10.23).</p>
ky (Vertical Skew)	<p>Specifies the vertical skew angle, defined as the angle between the top-left corner and top-right corner of the object's original bounding box. If positive, the right edge of the object is positioned lower relative to the left edge.</p> <p>The possible values for this attribute are defined by the ST_FixedAngle simple type (§20.1.10.23).</p>
sx (Horizontal Ratio)	<p>Specifies a percentage by which to horizontally scale the object.</p> <p>The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).</p>
sy (Vertical Ratio)	<p>Specifies a percentage by which to vertically scale the object.</p> <p>The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).</p>
tx (Horizontal Shift)	<p>Specifies an amount by which to shift the object along the x-axis.</p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>
ty (Vertical Shift)	<p>Specifies an amount by which to shift the object along the y-axis.</p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TransformEffect](#)) is located in §A.4.1. *end note*]

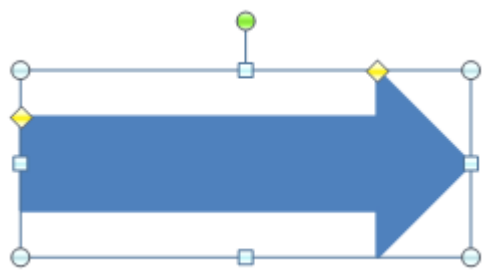
20.1.9 Shape Definitions and Attributes

The Shape Definitions and Attributes portion of the DrawingML framework deals with all geometric properties for shapes within a document. This includes both preset geometries that publicly are interpreted by the generating application and custom geometries that have their points and curves explicitly specified. In addition to the underlying geometry of the shape there are also other coordinate-based properties for each shape that this framework describes.

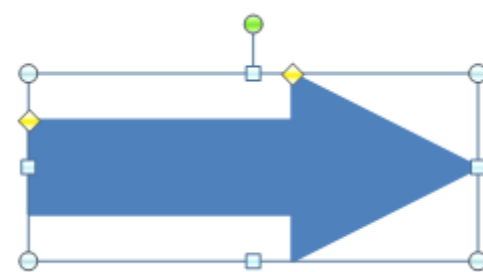
20.1.9.1 ahLst (List of Shape Adjust Handles)

This element specifies the adjust handles that are applied to a custom geometry. These adjust handles specify points within the geometric shape that can be used to perform certain transform operations on the shape.

[Example: Consider the scenario where a custom geometry, an arrow in this case, has been drawn and adjust handles have been placed at the top left corner of both the arrow head and arrow body. The user interface can then be made to transform only certain parts of the shape by using the corresponding adjust handle.



For instance if the user wished to change only the width of the arrow head then they would use the adjust handle located on the top left of the arrow head. The result of adjusting this transforms the shape as shown below.



end example]

[Note: The W3C XML Schema definition of this element’s content model ([CT AdjustHandleList](#)) is located in §A.4.1. end note]

20.1.9.2 ahPolar (Polar Adjust Handle)

This element specifies a polar adjust handle for a custom shape. The position of this adjust handle is specified by the corresponding pos child element. The allowed adjustment of this adjust handle are specified via it’s min and max attributes. Based on the adjustment of this adjust handle certain corresponding guides are updated to contain these values.

Attributes	Description
gdRefAng (Angle Adjustment Guide)	Specifies the name of the guide that is updated with the adjustment angle from this adjust handle.

Attributes	Description
	The possible values for this attribute are defined by the ST_GeomGuideName simple type (§20.1.10.28).
gdRefR (Radial Adjustment Guide)	<p>Specifies the name of the guide that is updated with the adjustment radius from this adjust handle.</p> <p>The possible values for this attribute are defined by the ST_GeomGuideName simple type (§20.1.10.28).</p>
maxAng (Maximum Angle Adjustment)	<p>Specifies the maximum angle position that is allowed for this adjustment handle. If this attribute is omitted, then it is assumed that this adjust handle cannot move angularly. That is the maxAng and minAng are equal.</p> <p>The possible values for this attribute are defined by the ST_AdjAngle simple type (§20.1.10.1).</p>
maxR (Maximum Radial Adjustment)	<p>Specifies the maximum radial position that is allowed for this adjustment handle. If this attribute is omitted, then it is assumed that this adjust handle cannot move radially. That is the maxR and minR are equal.</p> <p>The possible values for this attribute are defined by the ST_AdjCoordinate simple type (§20.1.10.2).</p>
minAng (Minimum Angle Adjustment)	<p>Specifies the minimum angle position that is allowed for this adjustment handle. If this attribute is omitted, then it is assumed that this adjust handle cannot move angularly. That is the maxAng and minAng are equal.</p> <p>The possible values for this attribute are defined by the ST_AdjAngle simple type (§20.1.10.1).</p>
minR (Minimum Radial Adjustment)	<p>Specifies the minimum radial position that is allowed for this adjustment handle. If this attribute is omitted, then it is assumed that this adjust handle cannot move radially. That is the maxR and minR are equal.</p> <p>The possible values for this attribute are defined by the ST_AdjCoordinate simple type (§20.1.10.2).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_PolarAdjustHandle](#)) is located in §A.4.1. *end note*]

20.1.9.3 ahXY (XY Adjust Handle)

This element specifies an XY-based adjust handle for a custom shape. The position of this adjust handle is specified by the corresponding pos child element. The allowed adjustment of this adjust handle are specified via its min and max type attributes. Based on the adjustment of this adjust handle certain corresponding guides are updated to contain these values.

Attributes	Description
gdRefX (Horizontal Adjustment Guide)	<p>Specifies the name of the guide that is updated with the adjustment x position from this adjust handle.</p> <p>The possible values for this attribute are defined by the ST_GeomGuideName simple type (§20.1.10.28).</p>
gdRefY (Vertical Adjustment Guide)	<p>Specifies the name of the guide that is updated with the adjustment y position from this adjust handle.</p> <p>The possible values for this attribute are defined by the ST_GeomGuideName simple type (§20.1.10.28).</p>
maxX (Maximum Horizontal Adjustment)	<p>Specifies the maximum horizontal position that is allowed for this adjustment handle. If this attribute is omitted, then it is assumed that this adjust handle cannot move in the x direction. That is the maxX and minX are equal.</p> <p>The possible values for this attribute are defined by the ST_AdjCoordinate simple type (§20.1.10.2).</p>
maxY (Maximum Vertical Adjustment)	<p>Specifies the maximum vertical position that is allowed for this adjustment handle. If this attribute is omitted, then it is assumed that this adjust handle cannot move in the y direction. That is the maxY and minY are equal.</p> <p>The possible values for this attribute are defined by the ST_AdjCoordinate simple type (§20.1.10.2).</p>
minX (Minimum Horizontal Adjustment)	<p>Specifies the minimum horizontal position that is allowed for this adjustment handle. If this attribute is omitted, then it is assumed that this adjust handle cannot move in the x direction. That is the maxX and minX are equal.</p> <p>The possible values for this attribute are defined by the ST_AdjCoordinate simple type (§20.1.10.2).</p>
minY (Minimum Vertical Adjustment)	<p>Specifies the minimum vertical position that is allowed for this adjustment handle. If this attribute is omitted, then it is assumed that this adjust handle cannot move in the y direction. That is the maxY and minY are equal.</p> <p>The possible values for this attribute are defined by the ST_AdjCoordinate simple type (§20.1.10.2).</p>

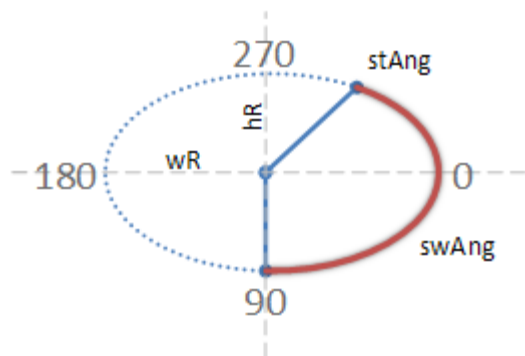
[Note: The W3C XML Schema definition of this element's content model ([CT_XYAdjustHandle](#)) is located in §A.4.1. *end note*]

20.1.9.4 [arcTo \(Draw Arc To\)](#)

This element specifies the existence of an arc within a shape path. It draws an arc with the specified parameters from the current pen position to the new point specified. An arc is a line that is bent based on the shape of a

supposed circle. The length of this arc is determined by specifying both a start angle and an ending angle that act together to effectively specify an end point for the arc.

[Example: The diagram shown below represents a single arc that has a start angle of 300 degrees and a swing angle of 150 degrees. This arc is drawn using the supposed circle that is described using the hR and wR attributes as shown below. The degrees by which the stAng must abide is shown along the circumference of the circle. These degrees are to be specified in 60,000ths of a degree. If this arc were part of a shape the start angle point along the circle would be the starting point along the path and the ending point would be the ending of the angle swing along this supposed circle. That is any shape geometry coming before this arc in the shape path would be joined with the upper point of this arc and consequently any geometry coming after this arc in the path would be joined with the lower point of this arc.



end example]

Attributes	Description
hR (Shape Arc Height Radius)	<p>This attribute specifies the height radius of the supposed circle being used to draw the arc. This gives the circle a total height of (2 * hR). This total height could also be called it's vertical diameter as it is the diameter for the y axis only.</p> <p>The possible values for this attribute are defined by the ST_AdjCoordinate simple type (§20.1.10.2).</p>
stAng (Shape Arc Start Angle)	<p>Specifies the start angle for an arc. This angle specifies what angle along the supposed circle path is used as the start position for drawing the arc. This start angle is locked to the last known pen position in the shape path. Thus guaranteeing a continuos shape path.</p> <p>The possible values for this attribute are defined by the ST_AdjAngle simple type (§20.1.10.1).</p>
swAng (Shape Arc Swing Angle)	<p>Specifies the swing angle for an arc. This angle specifies how far angle-wise along the supposed cicle path the arc is extended. The extension from the start angle is always in the clockwise direction around the supposed circle.</p> <p>The possible values for this attribute are defined by the ST_AdjAngle simple type (§20.1.10.1).</p>

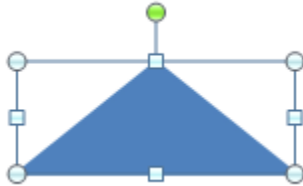
Attributes	Description
wR (Shape Arc Width Radius)	<p>This attribute specifies the width radius of the supposed circle being used to draw the arc. This gives the circle a total width of $(2 * wR)$. This total width could also be called it's horizontal diameter as it is the diameter for the x axis only.</p> <p>The possible values for this attribute are defined by the ST_AdjCoordinate simple type (§20.1.10.2).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Path2DArcTo](#)) is located in §A.4.1. end note]

20.1.9.5 avLst (List of Shape Adjust Values)

This element specifies the adjust values that are applied to the specified shape. An adjust value is simply a guide that has a value based formula specified. That is, no calculation takes place for an adjust value guide. Instead, this guide specifies a parameter value that is used for calculations within the shape guides.

[Example: Consider the case where the user would like to specify a triangle with it's bottom edge defined not by static points but by using a varying parameter, namely an adjust value. Consider the diagrams and DrawingML shown below. This first triangle has been drawn with a bottom edge that is equal to the height, namely 2. Thus we see in the figure below that the bottom of the triangle matches the bottom of the shape bounding box.



```

<a:xfrm>
  <a:off x="3200400" y="1600200"/>
  <a:ext cx="1705233" cy="679622"/>
</a:xfrm>
<a:custGeom>
  <a:avLst>
    <a:gd name="myGuide" fmla="val 2"/>
  </a:avLst>
  <a:gdLst/>
  <a:ahLst/>
  <a:cxnLst/>
  <a:rect l="0" t="0" r="0" b="0"/>

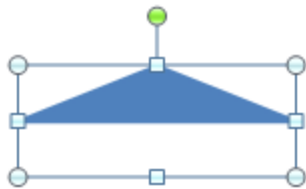
```

```

<a:pathLst>
  <a:path w="2" h="2">
    <a:moveTo>
      <a:pt x="0" y="myGuide"/>
    </a:moveTo>
    <a:lnTo>
      <a:pt x="2" y="myGuide"/>
    </a:lnTo>
    <a:lnTo>
      <a:pt x="1" y="0"/>
    </a:lnTo>
    <a:close/>
  </a:path>
</a:pathLst>
</a:custGeom>

```

If however we change the adjust value to half that, namely 1. Then we see the entire bottom edge of the triangle move to now be placed along the vertical midpoint within the shape bounding box. This is because both of the bottom points in this triangle depend on this adjust value for their coordinate positions. The triangle and corresponding DrawingML shown below illustrate this point.



```

<a:avLst>
  <a:gd name="myGuide" fmla="val 1"/>
</a:avLst>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_GeomGuideList](#)) is located in §A.4.1. *end note*]

20.1.9.6 close (Close Shape Path)

This element specifies the ending of a series of lines and curves in the creation path of a custom geometric shape. When this element is encountered, the generating application should consider the corresponding path closed. That is, any further lines or curves that follow this element should be ignored.

[*Note:* A path can be specified and not closed. A path such as this cannot however have any fill associated with it as it has not been considered a closed geometric path. *end note*]

[Example: Consider the following DrawingML.

```
<a:custGeom>
  <a:pathLst>
    <a:path w="2824222" h="590309">
      <a:moveTo>
        <a:pt x="0" y="428263"/>
      </a:moveTo>
      <a:lnTo>
        <a:pt x="1620455" y="590309"/>
      </a:lnTo>
      <a:lnTo>
        <a:pt x="2824222" y="173620"/>
      </a:lnTo>
      <a:lnTo>
        <a:pt x="1562582" y="0"/>
      </a:lnTo>
      <a:close/>
    </a:path>
  </a:pathLst>
</a:custGeom>
```

In the above example there is specified a four sided geometric shape that has all straight sides. While we only see three lines being drawn via the lnTo element there are actually four sides because the last point of (x=1562585, y=0) is connected to the first point in the creation path via a lnTo element. *end example*]

[Note: When the last point in the creation path does not meet with the first point in the creation path the generating application should connect the last point with the first via a straight line, thus creating a closed shape geometry. *end note*]

[Note: The W3C XML Schema definition of this element's content model ([CT_Path2DClose](#)) is located in §A.4.1. *end note*]

20.1.9.7 [cubicBezTo \(Draw Cubic Bezier Curve To\)](#)

This element specifies to draw a cubic bezier curve along the specified points. To specify a cubic bezier curve there needs to be 3 points specified. The first two are control points used in the cubic bezier calculation and the last is the ending point for the curve. The coordinate system used for this kind of curve is the path coordinate system as this element is path specific.

[Note: The W3C XML Schema definition of this element's content model ([CT_Path2DCubicBezierTo](#)) is located in §A.4.1. *end note*]

20.1.9.8 custGeom (Custom Geometry)

This element specifies the existence of a custom geometric shape. This shape consists of a series of lines and curves described within a creation path. In addition to this there can also be adjust values, guides, adjust handles, connection sites and an inscribed rectangle specified for this custom geometric shape.

[*Example:* Consider the scenario when a preset geometry does not accurately depict what must be displayed in the document. For this a custom geometry can be used to define most any 2-dimensional geometric shape. Shown below is an example of such a custom geometry.

```
<a:custGeom>
  <a:avLst/>
  <a:gdLst/>
  <a:ahLst/>
  <a:cxnLst/>
  <a:rect l="0" t="0" r="0" b="0"/>
  <a:pathLst>
    <a:path w="2650602" h="1261641">
      <a:moveTo>
        <a:pt x="0" y="1261641"/>
      </a:moveTo>
      <a:lnTo>
        <a:pt x="2650602" y="1261641"/>
      </a:lnTo>
      <a:lnTo>
        <a:pt x="1226916" y="0"/>
      </a:lnTo>
      <a:close/>
    </a:path>
  </a:pathLst>
</a:custGeom>
```



The custom geometry above is drawn by first moving to a specific starting point with the `moveTo` element. Then a series of `lnTo` elements in the creation path specify the lines that make up the borders of the shape and finally a `close` element is used to specify the end of the creation path. The resulting shape is shown above. *end example]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CustomGeometry2D](#)) is located in §A.4.1. *end note*]

20.1.9.9 cxn (Shape Connection Site)

This element specifies the existence of a connection site on a custom shape. A connection site allows a `cxnSp` to be attached to this shape. This connection is maintained when the shape is repositioned within the document. It should be noted that this connection is placed within the shape bounding box using the transform coordinate system which is also called the shape coordinate system, as it encompasses the entire shape. The width and height for this coordinate system are specified within the `ext` transform element.

[*Note:* The transform coordinate system is different from a path coordinate system as it is per shape instead of per path within the shape. *end note*]

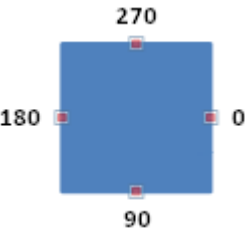
[*Example:* Consider the following custom geometry that has two connection sites specified. One connection is located at the bottom left of the shape and the other at the bottom right. The following DrawingML would describe such a custom geometry.



```
<a:xfrm>
  <a:off x="3200400" y="1600200"/>
  <a:ext cx="1705233" cy="679622"/>
</a:xfrm>
<a:custGeom>
  <a:avLst/>
  <a:gdLst/>
  <a:ahLst/>
  <a:cxnLst>
    <a:cxn ang="0">
      <a:pos x="0" y="679622"/>
    </a:cxn>
    <a:cxn ang="0">
      <a:pos x="1705233" y="679622"/>
    </a:cxn>
  </a:cxnLst>
```

```
<a:rect l="0" t="0" r="0" b="0"/>
<a:pathLst>
  <a:path w="2" h="2">
    <a:moveTo>
      <a:pt x="0" y="2"/>
    </a:moveTo>
    <a:lnTo>
      <a:pt x="2" y="2"/>
    </a:lnTo>
    <a:lnTo>
      <a:pt x="1" y="0"/>
    </a:lnTo>
    <a:close/>
  </a:path>
</a:pathLst>
</a:custGeom>
```

end example]

Attributes	Description
ang (Connection Site Angle)	<p>Specifies the incoming connector angle. This angle is the angle around the connection site that an incoming connector tries to be routed to. This allows connectors to know where the shape is in relation to the connection site and route connectors so as to avoid any overlap with the shape.</p> <p>[<i>Example:</i> Consider a simple square. In order to not have any connectors routed over the shape, the collowing angles would be specified for their respective connection sites.</p> <div data-bbox="435 1226 678 1453" data-label="Image"></div> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_AdjAngle simple type (§20.1.10.1).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_ConnectionSite](#)) is located in §A.4.1. *end note]*

20.1.9.10 cxnLst (List of Shape Connection Sites)

This element specifies all the connection sites that are used for this shape. A connection site is specified by defining a point within the shape bounding box that can have a cxnSp element attached to it. These connection sites are specified using the shape coordinate system that is specified within the ext transform element.

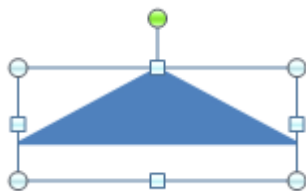
[Note: The W3C XML Schema definition of this element's content model ([CT_ConnectionSiteList](#)) is located in §A.4.1. *end note*]

20.1.9.11 gd (Shape Guide)

This element specifies the presence of a shape guide that is used to govern the geometry of the specified shape. A shape guide consists of a formula and a name that the result of the formula is assigned to. Recognized formulas are listed with the fmla attribute documentation for this element.

[Note: The order in which guides are specified determines the order in which their values are calculated. For instance it is not possible to specify a guide that uses another guides result when that guide has not yet been calculated. *end note*]

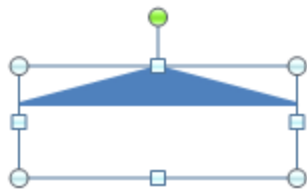
[Example: Consider the case where the user would like to specify a triangle with it's bottom edge defined not by static points but by using a varying parameter, namely an guide. Consider the diagrams and DrawingML shown below. This first triangle has been drawn with a bottom edge that is equal to the $\frac{2}{3}$ the value of the shape height. Thus we see in the figure below that the triangle appears to occupy $\frac{2}{3}$ of the vertical space within the shape bounding box.



```
<a:xfrm>
  <a:off x="3200400" y="1600200"/>
  <a:ext cx="1705233" cy="679622"/>
</a:xfrm>
<a:custGeom>
  <a:avLst/>
  <a:gdLst>
    <a:gd name="myGuide" fmla="*/ h 2 3"/>
  </a:gdLst>
  <a:ahLst/>
  <a:cxnLst/>
  <a:rect l="0" t="0" r="0" b="0"/>
  <a:pathLst>
```

```
<a:path w="1705233" h="679622">
  <a:moveTo>
    <a:pt x="0" y="myGuide"/>
  </a:moveTo>
  <a:lnTo>
    <a:pt x="1705233" y="myGuide"/>
  </a:lnTo>
  <a:lnTo>
    <a:pt x="852616" y="0"/>
  </a:lnTo>
  <a:close/>
</a:path>
</a:pathLst>
</a:custGeom>
```

If however we change the guide to half that, namely 1/3. Then we see the entire bottom edge of the triangle move to now only occupy 1/3 of the total space within the shape bounding box. This is because both of the bottom points in this triangle depend on this guide for their coordinate positions. The triangle and corresponding DrawingML shown below illustrate this point.



```
<a:gdLst>
  <a:gd name="myGuide" fmla="*/ h 1 3"/>
</a:gdLst>
```

end example]

Attributes	Description
fmla (Shape Guide Formula)	<p>Specifies the formula that is used to calculate the value for a guide. Each formula has a certain number of arguments and a specific set of operations to perform on these arguments in order to generate a value for a guide. There are a total of 17 different formulas available. These are shown below with the usage for each defined.</p> <p>(<i>*/</i>) - Multiply Divide Formula Arguments: 3 (fmla="<i>*/</i> x y z") Usage: "<i>*/</i> x y z" = ((x * y) / z) = value of this guide</p> <p>(<i>+ -</i>) - Add Subtract Formula Arguments: 3 (fmla="<i>+ -</i> x y z") Usage: "<i>+ -</i> x y z" = ((x + y) - z) = value of this guide</p>

Attributes	Description
	<p>('+/') - Add Divide Formula Arguments: 3 (fmla="+ / x y z") Usage: "+ / x y z" = $((x + y) / z)$ = value of this guide</p> <p>('?:') - If Else Formula Arguments: 3 (fmla="?: x y z") Usage: "?: x y z" = if $(x > 0)$, then y = value of this guide, else z = value of this guide</p> <p>('abs') - Absolute Value Formula Arguments: 1 (fmla="abs x") Usage: "abs x" = if $(x < 0)$, then $(-1) * x$ = value of this guide else x = value of this guide</p> <p>('at2') - ArcTan Formula Arguments: 2 (fmla="at2 x y") Usage: "at2 x y" = $\arctan(y / x)$ = value of this guide</p> <p>('cat2') - Cosine ArcTan Formula Arguments: 3 (fmla="cat2 x y z") Usage: "cat2 x y z" = $(x * (\cos(\arctan(z / y))))$ = value of this guide</p> <p>('cos') - Cosine Formula Arguments: 2 (fmla="cos x y") Usage: "cos x y" = $(x * \cos(y))$ = value of this guide</p> <p>('max') - Maximum Value Formula Arguments: 2 (fmla="max x y") Usage: "max x y" = if $(x > y)$, then x = value of this guide else y = value of this guide</p> <p>('min') - Minimum Value Formula Arguments: 2 (fmla="min x y") Usage: "min x y" = if $(x < y)$, then x = value of this guide else y = value of this guide</p> <p>('mod') - Modulo Formula Arguments: 3 (fmla="mod x y z") Usage: "mod x y z" = $\sqrt{x^2 + b^2 + c^2}$ = value of this guide</p> <p>('pin') - Pin To Formula Arguments: 3 (fmla="pin x y z") Usage: "pin x y z" = if $(y < x)$, then x = value of this guide else if $(y > z)$, then z = value of this guide else y = value of this guide</p> <p>('sat2') - Sine ArcTan Formula Arguments: 3 (fmla="sat2 x y z") Usage: "sat2 x y z" = $(x * \sin(\arctan(z / y)))$ = value of this guide</p> <p>('sin') - Sine Formula Arguments: 2 (fmla="sin x y")</p>

Attributes	Description
	<p>Usage: "sin x y" = $(x * \sin(y))$ = value of this guide</p> <p>('sqrt') - Square Root Formula Arguments: 1 (fm1a="sqrt x") Usage: "sqrt x" = \sqrt{x} = value of this guide</p> <p>('tan') - Tangent Formula Arguments: 2 (fm1a="tan x y") Usage: "tan x y" = $(x * \tan(y))$ = value of this guide</p> <p>('val') - Literal Value Formula Arguments: 1 (fm1a="val x") Usage: "val x" = x = value of this guide</p> <p>[<i>Note</i>: Guides that have a literal value formula specified via fm1a="val x" above should only be used within the avLst as an adjust value for the shape. This however is not strictly enforced. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_GeomGuideFormula simple type (§20.1.10.27).</p>
name (Shape Guide Name)	<p>Specifies the name that is used to reference to this guide. This name can be used just as a variable would within an equation. That is this name can be substituted for literal values within other guides or the specification of the shape path.</p> <p>The possible values for this attribute are defined by the ST_GeomGuideName simple type (§20.1.10.28).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_GeomGuide](#)) is located in §A.4.1. *end note*]

20.1.9.12 [gdLst \(List of Shape Guides\)](#)

This element specifies all the guides that are used for this shape. A guide is specified by the gd element and defines a calculated value that can be used for the construction of the corresponding shape.

[*Note*: Guides that have a literal value formula specified via fm1a="val x" above should only be used within the avLst as an adjust value for the shape. This however is not strictly enforced. *end note*]

[*Note*: The W3C XML Schema definition of this element's content model ([CT_GeomGuideList](#)) is located in §A.4.1. *end note*]

20.1.9.13 [lnTo \(Draw Line To\)](#)

This element specifies the drawing of a straight line from the current pen position to the new point specified. This line becomes part of the shape geometry, representing a side of the shape. The coordinate system used when specifying this line is the path coordinate system.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Path2DLineTo](#)) is located in §A.4.1. *end note*]

20.1.9.14 moveTo (Move Path To)

This element specifies a set of new coordinates to move the shape cursor to. This element is only used for drawing a custom geometry. When this element is utilized the pt element is used to specify a new set of shape coordinates that the shape cursor should be moved to. This does not draw a line or curve to this new position from the old position but simply move the cursor to a new starting position. It is only when a path drawing element such as lnTo is used that a portion of the path is drawn.

[*Example:* Consider the case where a user wishes to begin drawing a custom geometry not at the default starting coordinates of x=0 , y=0 but at coordinates further inset into the shape coordinate space. The following DrawingML would specify such a case.

```
<a:custGeom>
  <a:pathLst>
    <a:path w="2824222" h="590309">
      <a:moveTo>
        <a:pt x="0" y="428263"/>
      </a:moveTo>
      <a:lnTo>
        <a:pt x="1620455" y="590309"/>
      </a:lnTo>
      <a:lnTo>
        <a:pt x="2824222" y="173620"/>
      </a:lnTo>
      <a:lnTo>
        <a:pt x="1562582" y="0"/>
      </a:lnTo>
      <a:close/>
    </a:path>
  </a:pathLst>
</a:custGeom>
```

Notice the moveTo element advances the y coordinates before any actual lines are drawn. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Path2DMoveTo](#)) is located in §A.4.1. *end note*]

20.1.9.15 path (Shape Path)

This element specifies a creation path consisting of a series of moves, lines and curves that when combined forms a geometric shape. This element is only utilized if a custom geometry is specified.

[*Note:* Since multiple paths are allowed the rules for drawing are that the path specified later in the pathLst is drawn on top of all previous paths. *end note*]

[*Example:* Consider the following DrawingML.

```
<a:custGeom>
  <a:pathLst>
    <a:path w="2824222" h="590309">
      <a:moveTo>
        <a:pt x="0" y="428263"/>
      </a:moveTo>
      <a:lnTo>
        <a:pt x="1620455" y="590309"/>
      </a:lnTo>
      <a:lnTo>
        <a:pt x="2824222" y="173620"/>
      </a:lnTo>
      <a:lnTo>
        <a:pt x="1562582" y="0"/>
      </a:lnTo>
      <a:close/>
    </a:path>
  </a:pathLst>
</a:custGeom>
```

In the above example there is specified a four sided geometric shape that has all straight sides. While we only see three lines being drawn via the lnTo element there are actually four sides because the last point of (x=1562585, y=0) is connected to the first point in the creation path via a lnTo element. *end example*]

Attributes	Description
extrusionOk (3D Extrusion Allowed)	<p>Specifies that the use of 3D extrusions are possible on this path. This allows the generating application to know whether 3D extrusion can be applied in any form. If this attribute is omitted then a value of 0, or false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fill (Path Fill)	<p>Specifies how the corresponding path should be filled. If this attribute is omitted, a value of "norm" is assumed.</p> <p>The possible values for this attribute are defined by the ST_PathFillMode simple type (§20.1.10.37).</p>
h (Path Height)	<p>Specifies the height, or maximum y coordinate that should be used for within the path coordinate system. This value determines the vertical placement of all points within the corresponding path as they are all calculated using this height attribute as the max y</p>

Attributes	Description
	coordinate. The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).
stroke (Path Stroke)	Specifies if the corresponding path should have a path stroke shown. This is a boolean value that affect the outline of the path. If this attribute is omitted, a value of true is assumed. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
w (Path Width)	Specifies the width, or maximum x coordinate that should be used for within the path coordinate system. This value determines the horizontal placement of all points within the corresponding path as they are all calculated using this width attribute as the max x coordinate. The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).

[Note: The W3C XML Schema definition of this element's content model ([CT_Path2D](#)) is located in §A.4.1. *end note*]

20.1.9.16 pathLst (List of Shape Paths)

This element specifies the entire path that is to make up a single geometric shape. The pathLst can consist of many individual paths within it.

[Example: Consider the following DrawingML.

```
<a:custGeom>
  <a:pathLst>
    <a:path w="2824222" h="590309">
      <a:moveTo>
        <a:pt x="0" y="428263"/>
      </a:moveTo>
      <a:lnTo>
        <a:pt x="1620455" y="590309"/>
      </a:lnTo>
      <a:lnTo>
        <a:pt x="2824222" y="173620"/>
      </a:lnTo>
      <a:lnTo>
        <a:pt x="1562582" y="0"/>
      </a:lnTo>
    </a:path>
  </a:pathLst>
</a:custGeom>
```

```
<a:close/>
</a:path>
</a:pathLst>
</a:custGeom>
```

In the above example there is specified a four sided geometric shape that has all straight sides. While we only see three lines being drawn via the `lnTo` element there are actually four sides because the last point of ($x=1562585, y=0$) is connected to the first point in the creation path via a `lnTo` element. *end example*

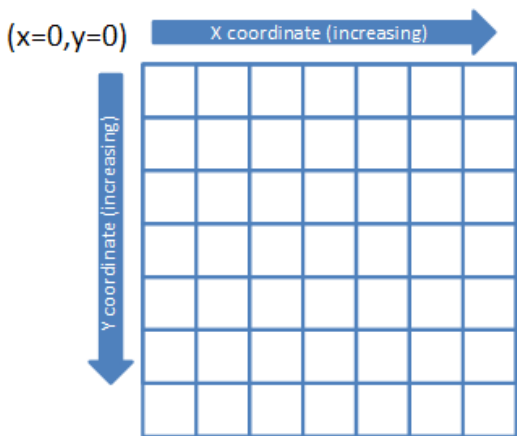
[*Note*: A geometry with multiple paths within it should be treated visually as if each path were a distinct shape. That is each creation path has its first point and last point joined to form a closed shape. However, the generating application should then connect the last point to the first point of the new shape. If a `close` element is encountered at the end of the previous creation path then this joining line should not be rendered by the generating application. The rendering should resume with the first line or curve on the new creation path. *end note*]

[*Note*: The W3C XML Schema definition of this element's content model ([CT_Path2DList](#)) is located in §A.4.1. *end note*]

20.1.9.17 pos (Shape Position Coordinate)

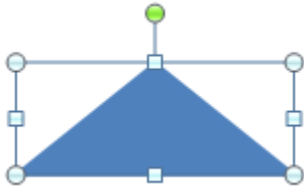
Specifies a position coordinate within the shape bounding box. It should be noted that this coordinate is placed within the shape bounding box using the transform coordinate system which is also called the shape coordinate system, as it encompasses the entire shape. The width and height for this coordinate system are specified within the `ext transform` element.

[*Note*: When specifying a point coordinate in path coordinate space it should be noted that the top left of the coordinate space is $x=0, y=0$ and the coordinate points for x grow to the right and for y grow down. This is illustrated in the diagram below.



end note]

[*Example:* To highlight the differences in the coordinate systems consider the drawing of the following triangle. Notice that the dimensions of the triangle are specified using the shape coordinate system with EMUs as the units via the ext transform element. Thus we see this shape is 1705233 EMUs wide by 679622 EMUs tall. However when looking at how the path for this shape is drawn we see that the x and y values fall between 0 and 2. This is because the path coordinate system has the arbitrary dimensions of 2 for the width and 2 for the height. Thus we see that a y coordinate of 2 within the path coordinate system specifies a y coordinate of 679622 within the shape coordinate system for this particular case.



```
<a:xfrm>
  <a:off x="3200400" y="1600200"/>
  <a:ext cx="1705233" cy="679622"/>
</a:xfrm>
<a:custGeom>
  <a:avLst/>
  <a:gdLst/>
  <a:ahLst/>
  <a:cxnLst/>
  <a:rect l="0" t="0" r="0" b="0"/>
  <a:pathLst>
    <a:path w="2" h="2">
      <a:moveTo>
        <a:pt x="0" y="2"/>
      </a:moveTo>
      <a:lnTo>
        <a:pt x="2" y="2"/>
      </a:lnTo>
      <a:lnTo>
        <a:pt x="1" y="0"/>
      </a:lnTo>
      <a:close/>
    </a:path>
  </a:pathLst>
</a:custGeom>
```

end example]

Attributes	Description
x (X-Coordinate)	<p>Specifies the x coordinate for this position coordinate. The units for this coordinate space are defined by the width of the path coordinate system. This coordinate system is overlayed on top of the shape coordinate system thus occupying the entire shape bounding box. Because the units for within this coordinate space are determined by the path width and height an exact measurement unit cannot be specified here.</p> <p>The possible values for this attribute are defined by the ST_AdjCoordinate simple type (§20.1.10.2).</p>
y (Y-Coordinate)	<p>Specifies the y coordinate for this position coordinate. The units for this coordinate space are defined by the height of the path coordinate system. This coordinate system is overlayed on top of the shape coordinate system thus occupying the entire shape bounding box. Because the units for within this coordinate space are determined by the path width and height an exact measurement unit cannot be specified here.</p> <p>The possible values for this attribute are defined by the ST_AdjCoordinate simple type (§20.1.10.2).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_AdjPoint2D](#)) is located in §A.4.1.
end note]

20.1.9.18 prstGeom (Preset geometry)

This element specifies when a preset geometric shape should be used instead of a custom geometric shape. The generating application should be able to render all preset geometries enumerated in the ST_ShapeType list.

[Example: Consider the scenario when a user does not wish to specify all the lines and curves that make up the desired shape but instead chooses to use a preset geometry. The following DrawingML would specify such a case.

```

<p:sp>
  <p:nvSpPr>
    <p:cNvPr id="4" name="My Preset Shape"/>
    <p:cNvSpPr/>
    <p:nvPr/>
  </p:nvSpPr>
  <p:spPr>
    <a:xfrm>
      <a:off x="1981200" y="533400"/>
      <a:ext cx="1143000" cy="1066800"/>
    </a:xfrm>
    <a:prstGeom prst="heart">
      </a:prstGeom>
    </p:spPr>
  </p:sp>

```



The output shape rendered by this DrawingML is shown above. *end example*]

Attributes	Description
prst (Preset Shape)	<p>Specifies the preset geometry that is used for this shape. This preset can have any of the values in the enumerated list for ST_ShapeType. This attribute is required in order for a preset geometry to be rendered.</p> <p>[Example: Consider the sample DrawingML below.</p> <pre><p:sp> <p:nvSpPr> <p:cNvPr id="4" name="Sun 3"/> <p:cNvSpPr/> <p:nvPr/> </p:nvSpPr> <p:spPr> <a:xfrm> <a:off x="1981200" y="533400"/> <a:ext cx="1143000" cy="1066800"/> </a:xfrm> <a:prstGeom prst="sun"> </a:prstGeom> </p:spPr> </p:sp></pre> <p>In the above example a preset geometry has been used to define a shape. The shape utilized here is the sun shape. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ShapeType simple type (§20.1.10.55).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_PresetGeometry2D](#)) is located in §A.4.1. *end note*]

20.1.9.19 prstTxWarp (Preset Text Warp)

This element specifies when a preset geometric shape should be used to transform a piece of text. This operation is known formally as a text warp. The generating application should be able to render all preset geometries enumerated in the ST_TextShapeType list.

[*Example:* Consider the case where the user wishes to accent a piece of text by warping it's shape. For this to occur a preset shape is chosen from the ST_TextShapeType list and applied to the entire body of text.

```
<p:sp>
  <p:txBody>
    <a:bodyPr wrap="none" rtlCol="0">
      <a:prstTxWarp prst="textInflate">
        </a:prstTxWarp>
        <a:spAutoFit/>
      </a:bodyPr>
      <a:l1stStyle/>
      <a:p>
...
        <a:t>Sample Text</a:t>
...
      </a:p>
    </p:txBody>
  </p:sp>
```

No Warp: Sample Text Inflate Warp: Sample Text

The resulting text that has now had the Inflate text warp applied to it is shown above. *end example]*

Using any of the presets listed under the ST_TextShapeType list below it is possible to apply a text warp to a run of DrawingML text via the following steps.

If you look at any of the text warps in the file format you notice that each consists of two paths. This corresponds to a top path (first one specified) and a bottom path (second one specified). Now the top path and the bottom path represent the top line and base line that the text needs to be warped to. This is done in the following way:

1. Compute the rectangle that the unwarped text resides in. (tightest possible rectangle around text, no white space except for "space characters")
2. Take each of the quadratic and cubic Bezier curves that are used to calculate the original character and change their end points and control points by the following method...
3. Move a vertical line horizontally along the original text rectangle and find the horizontal percentage that a given end point or control point lives at. (.5 for the middle for instance)
4. Now do the same thing for this point vertically. Find the vertical percentage that this point lives at with the top and bottom of this text rectangle being the respective top and bottom bounds. (0.0 and 1.0 respectively)

5. Now that we have the percentages for a given point in a Bezier equation we can map that to the new point in the warped text environment.
6. Going back to the top and bottom paths specified in the file format we can take these and flatten them out to a straight arc (top and bottom might be different lengths)
7. After they are straight we can measure them both horizontally to find the same percentage point that we found within the original text rectangle. (0.5 let's say)
8. So then we measure 50% along the top path and 50% along the bottom path, putting the paths back to their original curvy shapes.
9. Once we have these two points we can draw a line between them that serves as our vertical line in the original text rectangle [*Note: This might not be truly vertical as 50% on the top does not always line up with 50% on the bottom. end note*]
10. Taking this new line we then follow it from top to bottom the vertical percentage amount that we got from step 4.
11. This is then the new point that should be used in place of the old point in the original text rectangle.
12. We then continue doing these same steps for each of the end points and control points within the body of text. (is applied to a whole body of text only)

[*Note: Horizontal percentages begin at 0.0 and continue to 1.0, left to right. Vertical percentages begin at 0.0 and continue to 1.0, top to bottom. end note*]

[*Note: Since this is a shape it does have both a shape coordinate system and a path coordinate system. end note*]

Attributes	Description
prst (Preset Warp Shape)	<p>Specifies the preset geometry that is used for a shape warp on a piece of text. This preset can have any of the values in the enumerated list for ST_TextShapeType. This attribute is required in order for a text warp to be rendered.</p> <p>[<i>Example: Consider the sample DrawingML below.</i></p> <pre> <p:sp> <p:txBody> <a:bodyPr wrap="none" rtlCol="0"> <a:prstTxWarp prst="textInflate"> </a:prstTxWarp> <a:spAutoFit/> </a:bodyPr> <a:lstStyle/> <a:p> ... <a:t>Sample Text</a:t> ... </a:p> </p:txBody> </p:sp> </pre> <p>In the above example a preset text shape geometry has been used to define the warping</p>

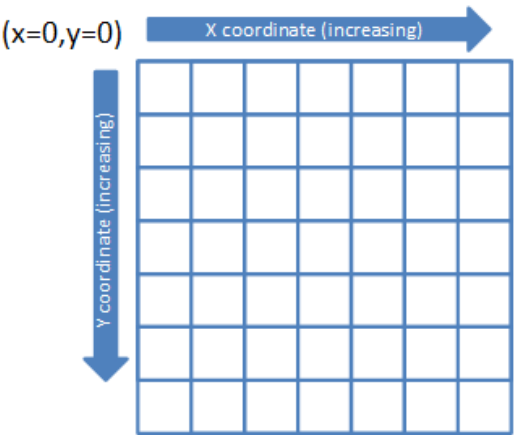
Attributes	Description
	shape. The shape utilized here is the sun shape. <i>end example</i> The possible values for this attribute are defined by the ST_TextShapeType simple type (§20.1.10.75).

[Note: The W3C XML Schema definition of this element’s content model ([CT_PresetTextShape](#)) is located in §A.4.1. *end note*]

20.1.9.20 pt (Shape Path Point)

This element specifies an x-y coordinate within the path coordinate space. This coordinate space is determined by the width and height attributes defined within the path element. A point is utilized by one of it's parent elements to specify the next point of interest in custom geometry shape. Depending on the parent element used the point can either have a line drawn to it or the cursor can simply be moved to this new location.

[Note: When specifying a point coordinate in path coordinate space it should be noted that the top left of the coordinate space is x=0, y=0 and the coordinate points for x grow to the right and for y grow down. This is illustrated in the diagram below.

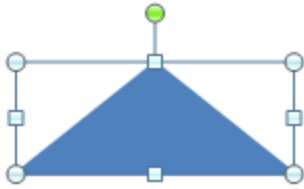


end note]

Specifies a position coordinate within the shape bounding box. It should be noted that this coordinate is placed within the shape bounding box using the transform coordinate system which is also called the shape coordinate system, as it encompasses the entire shape. The width and height for this coordinate system are specified within the ext transform element.

[Example: To highlight the differences in the coordinate systems consider the drawing of the following triangle. Notice that the dimensions of the triangle are specified using the shape coordinate system with EMUs as the units via the ext transform element. Thus we see this shape is 1705233 EMUs wide by 679622 EMUs tall. However when looking at how the path for this shape is drawn we see that the x and y values fall between 0 and

2. This is because the path coordinate system has the arbitrary dimensions of 2 for the width and 2 for the height. Thus we see that a y coordinate of 2 within the path coordinate system specifies a y coordinate of 679622 within the shape coordinate system for this particular case.



```
<a:xfrm>
  <a:off x="3200400" y="1600200"/>
  <a:ext cx="1705233" cy="679622"/>
</a:xfrm>
<a:custGeom>
  <a:avLst/>
  <a:gdLst/>
  <a:ahLst/>
  <a:cxnLst/>
  <a:rect l="0" t="0" r="0" b="0"/>
  <a:pathLst>
    <a:path w="2" h="2">
      <a:moveTo>
        <a:pt x="0" y="2"/>
      </a:moveTo>
      <a:lnTo>
        <a:pt x="2" y="2"/>
      </a:lnTo>
      <a:lnTo>
        <a:pt x="1" y="0"/>
      </a:lnTo>
      <a:close/>
    </a:path>
  </a:pathLst>
</a:custGeom>
```

end example]

Attributes	Description
x (X-Coordinate)	Specifies the x coordinate for this position coordinate. The units for this coordinate space are defined by the width of the path coordinate system. This coordinate system is overlaid on top of the shape coordinate system thus occupying the entire shape bounding box. Because the units for within this coordinate space are determined by the path width and height an exact measurement unit cannot be specified here.

Attributes	Description
	The possible values for this attribute are defined by the ST_AdjCoordinate simple type (§20.1.10.2).
y (Y-Coordinate)	<p>Specifies the y coordinate for this position coordinate. The units for this coordinate space are defined by the height of the path coordinate system. This coordinate system is overlayed on top of the shape coordinate system thus occupying the entire shape bounding box. Because the units for within this coordinate space are determined by the path width and height an exact measurement unit cannot be specified here.</p> <p>The possible values for this attribute are defined by the ST_AdjCoordinate simple type (§20.1.10.2).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_AdjPoint2D](#)) is located in §A.4.1. *end note*]

20.1.9.21 [quadBezTo \(Draw Quadratic Bezier Curve To\)](#)

This element specifies to draw a quadratic bezier curve along the specified points. To specify a quadratic bezier curve there needs to be 2 points specified. The first is a control point used in the quadratic bezier calculation and the last is the ending point for the curve. The coordinate system used for this type of curve is the path coordinate system as this element is path specific.

[Note: The W3C XML Schema definition of this element's content model ([CT_Path2DQuadBezierTo](#)) is located in §A.4.1. *end note*]

20.1.9.22 [rect \(Shape Text Rectangle\)](#)

This element specifies the rectangular bounding box for text within a custGeom shape. The default for this rectangle is the bounding box for the shape. This can be modified using this elements four attributes to inset or extend the text bounding box.

[Note: Text specified to reside within this shape text rectangle can flow outside this bounding box. Depending on the autofit options within the txBody element the text might not entirely reside within this shape text rectangle. *end note*]

Attributes	Description
b (Bottom Position)	<p>Specifies the y coordinate of the bottom edge for a shape text rectangle. The units for this edge is specified in EMUs as the positioning here is based on the shape coordinate system. The width and height for this coordinate system are specified within the ext transform element.</p> <p>The possible values for this attribute are defined by the ST_AdjCoordinate simple type (§20.1.10.2).</p>
l (Left)	Specifies the x coordinate of the left edge for a shape text rectangle. The units for this

Attributes	Description
	<p>edge is specified in EMUs as the positioning here is based on the shape coordinate system. The width and height for this coordinate system are specified within the ext transform element.</p> <p>The possible values for this attribute are defined by the ST_AdjCoordinate simple type (§20.1.10.2).</p>
r (Right)	<p>Specifies the x coordinate of the right edge for a shape text rectangle. The units for this edge is specified in EMUs as the positioning here is based on the shape coordinate system. The width and height for this coordinate system are specified within the ext transform element.</p> <p>The possible values for this attribute are defined by the ST_AdjCoordinate simple type (§20.1.10.2).</p>
t (Top)	<p>Specifies the y coordinate of the top edge for a shape text rectangle. The units for this edge is specified in EMUs as the positioning here is based on the shape coordinate system. The width and height for this coordinate system are specified within the ext transform element.</p> <p>The possible values for this attribute are defined by the ST_AdjCoordinate simple type (§20.1.10.2).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_GeomRect](#)) is located in §A.4.1. *end note*]

20.1.10 Simple Types

This is the complete list of simple types dedicated to DrawingML framework.

20.1.10.1 ST_AdjAngle (Adjustable Angle Methods)

This simple type is an adjustable angle, either an absolute angle or a reference to a geometry guide. The units for an adjustable angle are 60,000ths of a degree.

This simple type is a union of the following types:

- The ST_Angle simple type (§20.1.10.3).
- The ST_GeomGuideName simple type (§20.1.10.28).

[Note: The W3C XML Schema definition of this simple type's content model ([ST_AdjAngle](#)) is located in §A.4.1. *end note*]

20.1.10.2 ST_AdjCoordinate (Adjustable Coordinate Methods)

This simple type is an adjustable coordinate is either an absolute coordinate position or a reference to a geometry guide.

This simple type is a union of the following types:

- The ST_Coordinate simple type (§20.1.10.16).
- The ST_GeomGuideName simple type (§20.1.10.28).

[*Note*: The W3C XML Schema definition of this simple type’s content model ([ST_AdjCoordinate](#)) is located in §A.4.1. *end note*]

20.1.10.3 ST_Angle (Angle)

This simple type represents an angle in 60,000ths of a degree. Positive angles are clockwise (i.e., towards the positive y axis); negative angles are counter-clockwise (i.e., towards the negative y axis).

This simple type's contents are a restriction of the W3C XML Schema int datatype.

[*Note*: The W3C XML Schema definition of this simple type’s content model ([ST_Angle](#)) is located in §A.4.1. *end note*]

20.1.10.4 ST_AnimationBuildType (Animation Build Type)

This simple type specifies the ways that an animation can be built, or animated.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
allAtOnce (Animate At Once)	Animate all objects as one.

[*Note*: The W3C XML Schema definition of this simple type’s content model ([ST_AnimationBuildType](#)) is located in §A.4.1. *end note*]

20.1.10.5 ST_AnimationChartBuildType (Chart Animation Build Type)

This simple type specifies the ways that a chart animation can be built. That is, it specifies the way in which the objects within the chart should be animated.

This simple type is a union of the following types:

- The ST_AnimationBuildType simple type (§20.1.10.4).
- The ST_AnimationChartOnlyBuildType simple type (§20.1.10.6).

[*Note*: The W3C XML Schema definition of this simple type’s content model ([ST_AnimationChartBuildType](#)) is located in §A.4.1. *end note*]

20.1.10.6 ST_AnimationChartOnlyBuildType (Chart only Animation Types)

This simple type specifies the build options available only for animating a chart. These options specify the manner in which the objects within the chart should be grouped and animated.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
category (Category)	Animate by each category
categoryEl (Category Element)	Animate by each element within the category
series (Series)	Animate by each series.
seriesEl (Series Element)	Animate by each element within the series

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_AnimationChartOnlyBuildType](#)) is located in §A.4.1. *end note*]

20.1.10.7 ST_AnimationDgmBuildType (Diagram Animation Build Type)

This simple type specifies the ways that a diagram animation can be built. That is, it specifies the way in which the objects within the diagram graphical object should be animated.

This simple type is a union of the following types:

- The ST_AnimationBuildType simple type (§20.1.10.4).
- The ST_AnimationDgmOnlyBuildType simple type (§20.1.10.8).

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_AnimationDgmBuildType](#)) is located in §A.4.1. *end note*]

20.1.10.8 ST_AnimationDgmOnlyBuildType (Diagram only Animation Types)

This simple type specifies the build options available only for animating a diagram. These options specify the manner in which the objects within the chart should be grouped and animated.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
lvlAtOnce (Each Level at Once)	Animate the diagram one level at a time, animating the whole level as one object
lvlOne (Level One-by-One)	Animate the diagram by the elements within a level, animating them one level element at a time.
one (Elements One-by-One)	Animate the diagram by elements. For a tree diagram the animation occurs by branch within the diagram tree.



[*Note*: The W3C XML Schema definition of this simple type’s content model ([ST_AnimationDgmOnlyBuildType](#)) is located in §A.4.1. *end note*]




20.1.10.9 [ST_BevelPresetType \(Bevel Presets\)](#)




Represents a preset for a type of bevel which can be applied to a shape in 3D. The bevel properties are applied differently depending on the type of bevel defined for a shape.




This simple type's contents are a restriction of the W3C XML Schema token datatype.


This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
angle (Angle)	<p>[<i>Example</i>: Consider the following example of an angle bevel type applied to a shape:</p>  <p><i>end example</i>]</p>
artDeco (Art Deco)	<p>[<i>Example</i>: Consider the following example of an artDeco bevel type applied to a shape:</p>  <p><i>end example</i>]</p>
circle (Circle)	<p>[<i>Example</i>: Consider the following example of an circle bevel type applied to a shape:</p>

Enumeration Value	Description
	 <i>end example]</i>
convex (Convex)	<p>[Example: Consider the following example of an convex bevel type applied to a shape:</p>  <i>end example]</i>
coolSlant (Cool Slant)	<p>[Example: Consider the following example of an coolSlant bevel type applied to a shape:</p>  <i>end example]</i>
cross (Cross)	<p>[Example: Consider the following example of an cross bevel type applied to a shape:</p>

Enumeration Value	Description
	 <i>end example]</i>
divot (Divot)	<p data-bbox="824 730 1403 802"><i>[Example:</i> Consider the following example of an divot bevel type applied to a shape:</p>  <i>end example]</i>
hardEdge (Hard Edge)	<p data-bbox="824 1285 1403 1356"><i>[Example:</i> Consider the following example of an hardEdge bevel type applied to a shape:</p>  <i>end example]</i>
relaxedInset (Relaxed Inset)	<p data-bbox="824 1839 1403 1873"><i>[Example:</i> Consider the following example of an</p>

Enumeration Value	Description
	<p>relaxedInset bevel type applied to a shape:</p>  <p><i>end example]</i></p>
ribblet (Ribblet)	<p>[<i>Example:</i> Consider the following example of an ribblet bevel type applied to a shape:</p>  <p><i>end example]</i></p>
slope (Slope)	<p>[<i>Example:</i> Consider the following example of an slope bevel type applied to a shape:</p>  <p><i>end example]</i></p>

Enumeration Value	Description
softRound (Soft Round)	<p>[<i>Example:</i> Consider the following example of an softRound bevel type applied to a shape:</p>  <p><i>end example]</i></p>

[*Note:* The W3C XML Schema definition of this simple type’s content model ([ST_BevelPresetType](#)) is located in §A.4.1. *end note*]

20.1.10.10 ST_BlackWhiteMode (Black and White Mode)

This simple type specifies how an object should be rendered when specified to be in black and white mode.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
auto (Automatic)	Object rendered with automatic coloring
black (Black)	Object rendered with black-only coloring
blackGray (Black and Gray)	Object rendered with black and gray coloring
blackWhite (Black and White)	Object rendered within black and white coloring
clr (Color)	Object rendered with normal coloring
gray (Gray)	Object rendered with gray coloring
grayWhite (Gray and White)	Object rendered within gray and white coloring
hidden (Hidden)	Object rendered with hidden coloring
invGray (Inverse Gray)	Object rendered with inverse gray coloring
ltGray (Light Gray)	Object rendered with light gray coloring
white (White)	Object rendered within white coloring

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_BlackWhiteMode](#)) is located in §A.4.1. end note*]

20.1.10.11 [ST_BlendMode \(Blend Mode\)](#)

This simple type describes how to render effects one on top of another.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
darken (Darken)	Darken
lighten (Lighten)	Lighten
mult (Multiply)	Multiply
over (Overlay)	Overlay
screen (Screen)	Screen

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_BlendMode](#)) is located in §A.4.1. end note*]

20.1.10.12 [ST_BlipCompression \(Blip Compression Type\)](#)

This type specifies the amount of compression that has been used for a particular binary large image or picture (blip).

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
email (Email Compression)	Compression size suitable for inclusion with email
hqprint (High Quality Printing Compression)	Compression size suitable for high quality printing
none (No Compression)	No compression was used
print (Printing Compression)	Compression size suitable for printing
screen (Screen Viewing Compression)	Compression size suitable for viewing on screen

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_BlipCompression](#)) is located in §A.4.1. end note*]

20.1.10.13 [ST_ChartBuildStep \(Chart Animation Build Step\)](#)

This simple type specifies an animation build step within a chart animation.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
allPts (All Points)	Animate all points within the chart for this animation build step
category (Category)	Animate a chart category for this animation build step
gridLegend (Grid and Legend)	Animate the chart grid and legend for this animation build step
ptInCategory (Category Points)	Animate a point in a chart category for this animation build step
ptInSeries (Series Points)	Animate a point in a chart series for this animation build step
series (Series)	Animate a chart series for this animation build step

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ChartBuildStep](#)) is located in §A.4.1. *end note*]

20.1.10.14 [ST_ColorSchemeIndex](#) (Theme Color Reference)

A reference to a color in the color scheme.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
accent1 (Accent 1)	Represents the accent 1 color.
accent2 (Accent 2)	Represents the accent 2 color.
accent3 (Accent 3)	Represents the accent 3 color.
accent4 (Accent 4)	Represents the accent 4 color.
accent5 (Accent 5)	Represents the accent 5 color.
accent6 (Accent 6)	Represents the accent 6 color.
dk1 (Dark 1)	Represents the first dark color.
dk2 (Dark 2)	Represents the second dark color.
folHlink (Followed Hyperlink)	Represents the followed hyperlink color.
hlink (Hyperlink)	Represents the hyperlink color.
lt1 (Light 1)	Represents the first light color.
lt2 (Light 2)	Represents the second light color.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ColorSchemeIndex](#)) is located in §A.4.1. *end note*]

20.1.10.15 ST_CompoundLine (Compound Line Type)

This simple type specifies the compound line type that is to be used for lines with text such as underlines.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
dbl (Double Lines)	Double lines of equal width
sng (Single Line)	Single line: one normal width
thickThin (Thick Thin Double Lines)	Double lines: one thick, one thin
thinThick (Thin Thick Double Lines)	Double lines: one thin, one thick
tri (Thin Thick Thin Triple Lines)	Three lines: thin, thick, thin

[Note: The W3C XML Schema definition of this simple type's content model ([ST_CompoundLine](#)) is located in §A.4.1. *end note*]

20.1.10.16 ST_Coordinate (Coordinate)

This simple type represents a one dimensional position or length as either:

- EMUs.
- A number followed immediately by a unit identifier.

This simple type is a union of the following types:

- The ST_CoordinateUnqualified simple type (§20.1.10.19).
- The ST_UniversalMeasure simple type (§22.9.2.15).

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Coordinate](#)) is located in §A.4.1. *end note*]

20.1.10.17 ST_Coordinate32 (Coordinate Point)

This simple type specifies a coordinate within the document. This can be used for measurements or spacing; its maximum size is 2147483647 EMUs.

Its contents can contain either:

- A whole number, whose contents consist of a measurement in EMUs (English Metric Units)
- A number immediately followed by a unit identifier

This simple type is a union of the following types:

- The ST_Coordinate32Unqualified simple type (§20.1.10.18).
- The ST_UniversalMeasure simple type (§22.9.2.15).

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_Coordinate32](#)) is located in §A.4.1. *end note*]

20.1.10.18 ST_Coordinate32Unqualified (Coordinate Point)

This simple type specifies a coordinate within the document. This can be used for measurements or spacing with the maximum size requirement being a 32 bit integer.

The units of measurement used here are EMUs (English Metric Units).

This simple type's contents are a restriction of the W3C XML Schema int datatype.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_Coordinate32Unqualified](#)) is located in §A.4.1. *end note*]

20.1.10.19 ST_CoordinateUnqualified (Coordinate)

This simple type represents a one dimensional position or length in EMUs.

This simple type's contents are a restriction of the W3C XML Schema long datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to -27273042329600.
- This simple type has a maximum value of less than or equal to 27273042316900.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_CoordinateUnqualified](#)) is located in §A.4.1. *end note*]

20.1.10.20 ST_DgmBuildStep (Diagram Animation Build Steps)

This simple type specifies an animation build step within a diagram animation.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
bg (Background)	Animate the diagram background for this animation build step
sp (Shape)	Animate a diagram shape for this animation build step

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_DgmBuildStep](#)) is located in §A.4.1. *end note*]

20.1.10.21 ST_DrawingElementId (Drawing Element ID)

This simple type specifies a unique integer identifier for each drawing element.

This simple type's contents are a restriction of the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_DrawingElementId](#)) is located in §A.4.1. *end note*]

20.1.10.22 ST_EffectContainerType (Effect Container Type)

This simple type determines the relationship between effects in a container, either sibling or tree.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
sib (Sibling)	Each effect is separately applied to the parent object. [Example: If the parent element contains an outer shadow and a reflection, the resulting effect is a shadow around the parent object and a reflection of the object. The reflection does not have a shadow. <i>end example</i>]
tree (Tree)	Each effect is applied to the result of the previous effect. [Example: If the parent element contains an outer shadow followed by a glow, the shadow is first applied to the parent object. Then, the glow is applied to the shadow (rather than the original object). The resulting effect would be a glowing shadow. <i>end example</i>]

[Note: The W3C XML Schema definition of this simple type's content model ([ST_EffectContainerType](#)) is located in §A.4.1. *end note*]

20.1.10.23 ST_FixedAngle (Fixed Angle)

This simple type represents a fixed range angle in 60000ths of a degree. Range from (-90, 90 degrees).

This simple type's contents are a restriction of the ST_Angle datatype (§20.1.10.3).

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than -5400000.
- This simple type has a maximum value of less than 5400000.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_FixedAngle](#)) is located in §A.4.1. *end note*]

20.1.10.24 [ST_FixedPercentage \(Fixed Percentage\)](#)

This simple type represents a fixed percentage from negative one hundred to positive one hundred percent. See the union's member types for details.

This simple type is a union of the following types:

- The ST_FixedPercentage simple type (§22.9.2.3).

[Note: The W3C XML Schema definition of this simple type's content model ([ST_FixedPercentage](#)) is located in §A.4.1. *end note*]

20.1.10.25 [ST_FontCollectionIndex \(Font Collection Index\)](#)

This simple type represents one of the fonts associated with the style.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
major (Major Font)	The major font of the style's font scheme.
minor (Minor Font)	The minor font of the style's font scheme.
none (None)	No font reference.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_FontCollectionIndex](#)) is located in §A.4.1. *end note*]

20.1.10.26 [ST_FOVAngle \(Field of View Angle\)](#)

Represents a positive angle in 60000ths of a degree. Range from [0, 180] degrees.

This simple type's contents are a restriction of the ST_Angle datatype (§20.1.10.3).

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 0.
- This simple type has a maximum value of less than or equal to 10800000.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_FOVAngle](#)) is located in §A.4.1. *end note*]

20.1.10.27 [ST_GeomGuideFormula \(Geometry Guide Formula Properties\)](#)

This simple type specifies a geometry guide formula.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_GeomGuideFormula](#)) is located in §A.4.1. *end note*]

20.1.10.28 ST_GeomGuideName (Geometry Guide Name Properties)

This simple type specifies a geometry guide name.

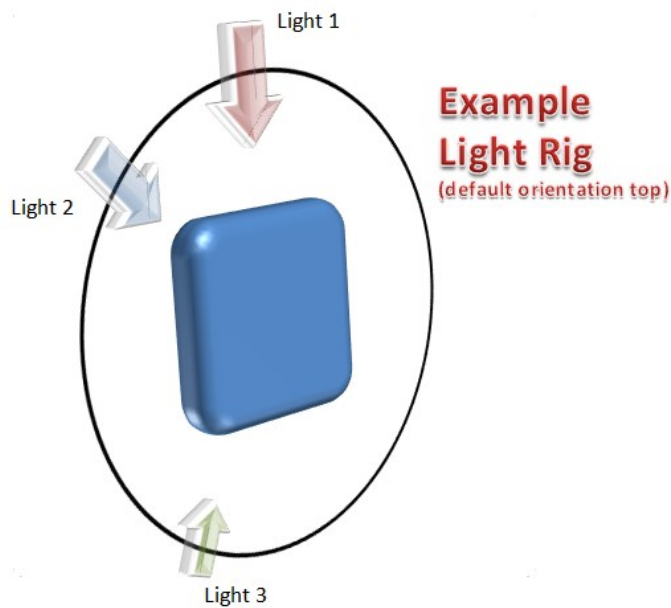
This simple type's contents are a restriction of the W3C XML Schema token datatype.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_GeomGuideName](#)) is located in §A.4.1. *end note*]

20.1.10.29 ST_LightRigDirection (Light Rig Direction)

Represents the direction from which the light rig is positioned relative to the scene. The light rig, itself, can be made up of multiple lights in any orientation around a given shape. This simple type defines the orientation of the light rig as a whole, and not the individual lights within the rig. This means that because the direction of the light rig is left, that does not guarantee the light is coming from the left side of the shape, but rather the orientation of the rig as a whole is rotated to the left.

[Example: Consider the following example as a visual representation of a light rig oriented from the top of the shape in the center:





In this example we see that the light rig defines three lights (all in a single plane as represented by the black circular line). The lights defined in this representation can all have different intensities, which means, for this example, Light 3 and Light 2 look to have a more intense effect (or could even be a different color) than Light 1. One can imagine rotating this rig so that Light 1 is to the right of the shape when the light rig direction is defined to be right. *end example*]


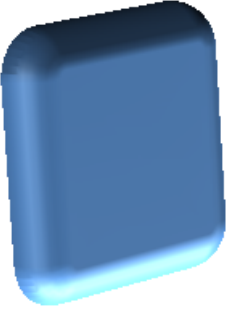

The following properties were used to define the shape used in the image examples below:




- Rounded rectangle shape
- Three Point light rig type
- Circle bevel type
- Plastic material type
- Camera type defined by the orthographicFront preset
- Bevel width and height each equal to 190500

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
b (Bottom)	<p>[<i>Example:</i> Consider the following example of a light direction from the bottom:</p>  <p><i>end example]</i></p>
bl (Bottom Left)	<p>[<i>Example:</i> Consider the following example of a light direction from the bottom left:</p>  <p><i>end example]</i></p>
br (Bottom Right)	<p>[<i>Example:</i> Consider the following example of a light direction from the bottom right:</p>

Enumeration Value	Description
	 <i>end example]</i>
l (Left)	<p data-bbox="824 730 1446 800"><i>[Example:</i> Consider the following example of a light direction from the left:</p>  <i>end example]</i>
r (Right)	<p data-bbox="824 1287 1446 1356"><i>[Example:</i> Consider the following example of a light direction from the right:</p>  <i>end example]</i>
t (Top)	<p data-bbox="824 1843 1446 1877"><i>[Example:</i> Consider the following example of a light</p>

Enumeration Value	Description
	<p>direction from the top:</p>  <p><i>end example]</i></p>
tl (Top Left)	<p>[<i>Example:</i> Consider the following example of a light direction from the top left:</p>  <p><i>end example]</i></p>
tr (Top Right)	<p>[<i>Example:</i> Consider the following example of a light direction from the top right:</p>  <p><i>end example]</i></p>

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_LightRigDirection](#)) is located in §A.4.1. *end note*]


20.1.10.30 ST_LightRigType (Light Rig Type)




Represents a preset light right that can be applied to a shape. The light rig represents a group of lights oriented in a specific way relative to a 3D scene. The following properties were used to define the shape used in the image examples below:




- Rounded rectangle shape
- Circle bevel type
- Warm Matte material type
- Camera type defined by the perspectiveContrastingRightFacing preset
- Bevel width and height each equal to 190500




This simple type's contents are a restriction of the W3C XML Schema token datatype.




This simple type is restricted to the values listed in the following table:



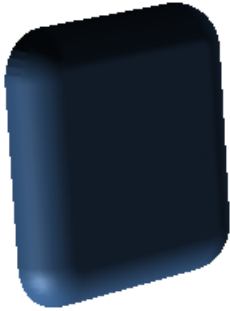
Enumeration Value	Description
balanced (Light Rig Enum (Balanced))	Balanced
brightRoom (Bright Room)	<p>[<i>Example:</i> Consider the following example of the brightRoom light rig applied to a basic shape:</p>  <p><i>end example</i>]</p>
chilly (Chilly)	<p>[<i>Example:</i> Consider the following example of the chilly light rig applied to a basic shape:</p>

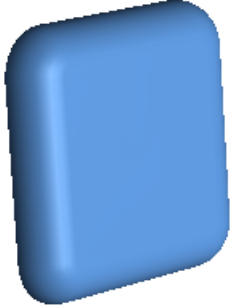


Enumeration Value	Description
	 <i>end example]</i>
contrasting (Contrasting)	<p>[Example: Consider the following example of the contrasting light rig applied to a basic shape:</p>  <i>end example]</i>
flat (Flat)	<p>[Example: Consider the following example of the flat light rig applied to a basic shape:</p>  <i>end example]</i>
flood (Flood)	<p>[Example: Consider the following example of the flood light rig applied to a basic shape:</p>


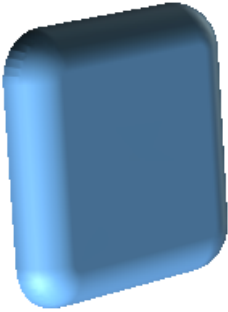

Enumeration Value	Description
	 <i>end example]</i>
freezing (Freezing)	<p>[<i>Example:</i> Consider the following example of the freezing light rig applied to a basic shape:</p>  <i>end example]</i>
glow (Glow)	<p>[<i>Example:</i> Consider the following example of the glow light rig applied to a basic shape:</p>  <i>end example]</i>
harsh (Harsh)	<p>[<i>Example:</i> Consider the following example of the</p>

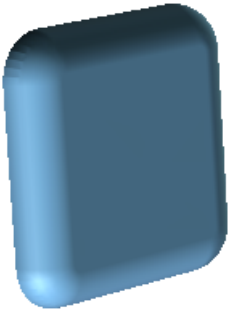


Enumeration Value	Description
	<p>harsh light rig applied to a basic shape:</p>  <p><i>end example]</i></p>
legacyFlat1 (Legacy Flat 1)	<p>[<i>Example:</i> Consider the following example of the legacyFlat1 light rig applied to a basic shape:</p>  <p><i>end example]</i></p>
legacyFlat2 (Legacy Flat 2)	<p>[<i>Example:</i> Consider the following example of the legacyFlat2 light rig applied to a basic shape:</p>  <p><i>end example]</i></p>
legacyFlat3 (Legacy Flat 3)	<p>[<i>Example:</i> Consider the following example of the</p>


Enumeration Value	Description
	<p>legacyFlat3 light rig applied to a basic shape:</p>  <p><i>end example]</i></p>
legacyFlat4 (Legacy Flat 4)	<p>[<i>Example:</i> Consider the following example of the legacyFlat4 light rig applied to a basic shape:</p>  <p><i>end example]</i></p>
legacyHarsh1 (Legacy Harsh 1)	<p>[<i>Example:</i> Consider the following example of the legacyHarsh1 light rig applied to a basic shape:</p>  <p><i>end example]</i></p>

Enumeration Value	Description
legacyHarsh2 (Legacy Harsh 2)	<p>[Example: Consider the following example of the legacyHarsh2 light rig applied to a basic shape:</p>  <p>end example]</p>
legacyHarsh3 (Legacy Harsh 3)	<p>[Example: Consider the following example of the legacyHarsh3 light rig applied to a basic shape:</p>  <p>end example]</p>
legacyHarsh4 (Legacy Harsh 4)	<p>[Example: Consider the following example of the legacyHarsh4 light rig applied to a basic shape:</p>  <p>end example]</p>

Enumeration Value	Description
legacyNormal1 (Legacy Normal 1)	<p>[<i>Example:</i> Consider the following example of the legacyNormal1 light rig applied to a basic shape:</p>  <p><i>end example]</i></p>
legacyNormal2 (Legacy Normal 2)	<p>[<i>Example:</i> Consider the following example of the legacyNormal2 light rig applied to a basic shape:</p>  <p><i>end example]</i></p>
legacyNormal3 (Legacy Normal 3)	<p>[<i>Example:</i> Consider the following example of the legacyNormal3 light rig applied to a basic shape:</p>  <p><i>end example]</i></p>

Enumeration Value	Description
legacyNormal4 (Legacy Normal 4)	<p data-bbox="824 247 1430 317"><i>[Example:</i> Consider the following example of the legacyNormal4 light rig applied to a basic shape:</p>  <p data-bbox="824 720 987 751"><i>end example]</i></p>
morning (Morning)	<p data-bbox="824 804 1409 873"><i>[Example:</i> Consider the following example of the morning light rig applied to a basic shape:</p>  <p data-bbox="824 1276 987 1308"><i>end example]</i></p>
soft (Soft)	<p data-bbox="824 1360 1479 1430"><i>[Example:</i> Consider the following example of the soft light rig applied to a basic shape:</p>  <p data-bbox="824 1833 987 1864"><i>end example]</i></p>

Enumeration Value	Description
sunrise (Sunrise)	<p data-bbox="824 247 1409 317"><i>[Example: Consider the following example of the sunrise light rig applied to a basic shape:</i></p>  <p data-bbox="824 720 987 751"><i>end example]</i></p>
sunset (Sunset)	<p data-bbox="824 804 1409 873"><i>[Example: Consider the following example of the sunset light rig applied to a basic shape:</i></p>  <p data-bbox="824 1276 987 1308"><i>end example]</i></p>
threePt (Three Point)	<p data-bbox="824 1360 1409 1430"><i>[Example: Consider the following example of the threePt light rig applied to a basic shape:</i></p>  <p data-bbox="824 1833 987 1864"><i>end example]</i></p>

Enumeration Value	Description
twoPt (Two Point)	<p>[<i>Example:</i> Consider the following example of the twoPt light rig applied to a basic shape:</p>  <p><i>end example]</i></p>

[*Note:* The W3C XML Schema definition of this simple type’s content model ([ST_LightRigType](#)) is located in §A.4.1. *end note]*

20.1.10.31 [ST_LineCap \(End Line Cap\)](#)

This simple type specifies how to cap the ends of lines. This also affects the ends of line segments for dashed lines.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
flat (Flat Line Cap)	Line ends at end point.
rnd (Round Line Cap)	Rounded ends. Semi-circle protrudes by half line width.
sq (Square Line Cap)	Square protrudes by half line width.

[*Note:* The W3C XML Schema definition of this simple type’s content model ([ST_LineCap](#)) is located in §A.4.1. *end note]*




20.1.10.32 [ST_LineEndLength \(Line End Length\)](#)

This simple type represents the length of the line end decoration (e.g., arrowhead) relative to the width of the line itself.

[*Example:* See the example images below. These samples have an arrow line end type and medium line end width. *end example]*

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
lg (Large)	 Large
med (Medium)	 Medium
sm (Small)	 Small







[Note: The W3C XML Schema definition of this simple type's content model ([ST_LineEndLength](#)) is located in §A.4.1. *end note*]

20.1.10.33 ST_LineEndType (Line End Type)

This simple type represents the shape decoration that appears at the ends of lines. For example, one choice is an arrow head.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
arrow (Arrow Head)	 Line arrow head
diamond (Diamond)	 Diamond
none (None)	 No end
oval (Oval)	 Oval
stealth (Stealth Arrow)	 Stealth arrow head
triangle (Triangle Arrow Head)	 Triangle arrow head

[Note: The W3C XML Schema definition of this simple type's content model ([ST_LineEndType](#)) is located in §A.4.1. *end note*]

20.1.10.34 ST_LineEndWidth (Line End Width)

This simple type represents the width of the line end decoration (e.g., arrowhead) relative to the width of the line itself.

[Example: See the example images below. These samples have an arrow line end type and medium line end length. *end example*]

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
lg (Large)	→ Large
med (Medium)	→ Medium
sm (Small)	→ Small

[Note: The W3C XML Schema definition of this simple type's content model ([ST_LineEndWidth](#)) is located in §A.4.1. *end note*]

20.1.10.35 ST_LineWidth (Line Width)

This simple type specifies the width of a line in EMUs. 1 pt = 12700 EMUs.

This simple type's contents are a restriction of the ST_Coordinate32Unqualified datatype (§20.1.10.18).

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 0.
- This simple type has a maximum value of less than or equal to 20116800.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_LineWidth](#)) is located in §A.4.1. *end note*]

20.1.10.36 ST_OnOffStyleType (On/Off Style Type)

This simple type represents whether a style property should be applied.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
def (Default)	Follow parent settings. For a themed property, follow the theme settings. For an unthemed property, follow the parent setting in the property inheritance chain.
off (Off)	Property is off.
on (On)	Property is on.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_OnOffStyleType](#)) is located in §A.4.1. *end note*]

20.1.10.37 ST_PathFillMode (Path Fill Mode)

This simple type specifies the manner in which a path should be filled. The lightening and darkening of a path allow for certain parts of the shape to be colored lighter or darker depending on user preference.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
darken (Darken Path Fill)	This specifies that the corresponding path should have a darker shaded color applied to its fill.
darkenLess (Darken Path Fill Less)	This specifies that the corresponding path should have a slightly darker shaded color applied to its fill.
lighten (Lighten Path Fill)	This specifies that the corresponding path should have a lightly shaded color applied to its fill.
lightenLess (Lighten Path Fill Less)	This specifies that the corresponding path should have a slightly lighter shaded color applied to its fill.
none (No Path Fill)	This specifies that the corresponding path should have no fill.
norm (Normal Path Fill)	This specifies that the corresponding path should have a normally shaded color applied to its fill.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_PathFillMode](#)) is located in §A.4.1. *end note*]

20.1.10.38 ST_PathShadeType (Path Shade Type)

This simple type describes the shape of path to follow for a path gradient shade.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
circle (Circle)	Gradient follows a circular path
rect (Rectangle)	Gradient follows a rectangular path
shape (Shape)	Gradient follows the shape

[Note: The W3C XML Schema definition of this simple type's content model ([ST_PathShadeType](#)) is located in §A.4.1. *end note*]

20.1.10.39 ST_PenAlignment (Alignment Type)

This simple type specifies the Pen Alignment type for use within a text body.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
ctr (Center Alignment)	Center pen (line drawn at center of path stroke).
in (Inset Alignment)	Inset pen (the pen is aligned on the inside of the edge of the path).

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_PenAlignment](#)) is located in §A.4.1. *end note*]

20.1.10.40 ST_Percentage (Percentage)

This simple type specifies that its contents will contain a percentage value. See the union's member types for details.

This simple type is a union of the following types:

- The ST_Percentage simple type (§22.9.2.9).

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_Percentage](#)) is located in §A.4.1. *end note*]

20.1.10.41 ST_PositiveCoordinate (Positive Coordinate)

This simple type represents a positive position or length in EMUs.

This simple type's contents are a restriction of the W3C XML Schema long datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 0.
- This simple type has a maximum value of less than or equal to 27273042316900.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_PositiveCoordinate](#)) is located in §A.4.1. *end note*]

20.1.10.42 ST_PositiveCoordinate32 (Positive Coordinate Point)

This simple type specifies the a positive coordinate point that has a maximum size of 32 bits.

The units of measurement used here are EMUs (English Metric Units).

This simple type's contents are a restriction of the ST_Coordinate32Unqualified datatype (§20.1.10.18).

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 0.

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_PositiveCoordinate32](#)) is located in §A.4.1. end note*]

20.1.10.43 ST_PositiveFixedAngle (Positive Fixed Angle)

This simple type represents a positive angle in 60000ths of a degree. Range from [0, 360 degrees).

This simple type's contents are a restriction of the ST_Angle datatype (§20.1.10.3).

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 0.
- This simple type has a maximum value of less than 21600000.

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_PositiveFixedAngle](#)) is located in §A.4.1. end note*]

20.1.10.44 ST_PositiveFixedPercentage (Positive Fixed Percentage)

This simple type specifies that its contents will contain a positive percentage value from zero through one hundred percent. See the union's member types for details.

This simple type is a union of the following types:

- The ST_PositiveFixedPercentage simple type (§22.9.2.10).

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_PositiveFixedPercentage](#)) is located in §A.4.1. end note*]

20.1.10.45 ST_PositivePercentage (Positive Percentage Value with Sign)

This simple type specifies that its contents will contain a positive percentage value. See the union's member types for details.

This simple type is a union of the following types:

- The ST_PositivePercentage simple type (§22.9.2.11).

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_PositivePercentage](#)) is located in §A.4.1. end note*]

20.1.10.46 ST_PresetCameraType (Preset Camera Type)



These enumeration values represent different algorithmic methods for setting all camera properties, including position. The following example images below are all based off the following shape:









In this image, we can see the shape has a camera pointing directly at the front face.




This simple type's contents are a restriction of the W3C XML Schema token datatype.




This simple type is restricted to the values listed in the following table:




Enumeration Value	Description
isometricBottomDown (Isometric Bottom Down)	<div><p>[<i>Example:</i> Consider the following example of the camera preset type:</p><p><i>end example]</i></p></div>
isometricBottomUp (Isometric Bottom Up)	<div><p>[<i>Example:</i> Consider the following example of the camera preset type:</p><p><i>end example]</i></p></div>
isometricLeftDown (Isometric Left Down)	<div><p>[<i>Example:</i> Consider the following example of the camera preset type:</p></div>




Enumeration Value	Description
	 <i>end example]</i>
isometricLeftUp (Isometric Left Up)	<p>[Example: Consider the following example of the camera preset type:</p>  <i>end example]</i>
isometricOffAxis1Left (Isometric Off Axis 1 Left)	<p>[Example: Consider the following example of the camera preset type:</p>  <i>end example]</i>




Enumeration Value	Description
isometricOffAxis1Right (Isometric Off Axis 1 Right)	<p data-bbox="824 296 1409 363"><i>[Example: Consider the following example of the camera preset type:</i></p>  <p data-bbox="824 768 987 800"><i>end example]</i></p>
isometricOffAxis1Top (Isometric Off Axis 1 Top)	<p data-bbox="824 852 1409 919"><i>[Example: Consider the following example of the camera preset type:</i></p>  <p data-bbox="824 1171 987 1203"><i>end example]</i></p>
isometricOffAxis2Left (Isometric Off Axis 2 Left)	<p data-bbox="824 1255 1409 1323"><i>[Example: Consider the following example of the camera preset type:</i></p>  <p data-bbox="824 1724 987 1755"><i>end example]</i></p>
isometricOffAxis2Right (Isometric Off Axis 2 Right)	<p data-bbox="824 1812 1409 1879"><i>[Example: Consider the following example of the camera preset type:</i></p>

Enumeration Value	Description
	 <p><i>end example]</i></p>
isometricOffAxis2Top (Isometric Off Axis 2 Top)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
isometricOffAxis3Bottom (Isometric Off Axis 3 Bottom)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
isometricOffAxis3Left (Isometric Off Axis 3 Left)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>




Enumeration Value	Description
	 <i>end example]</i>
isometricOffAxis3Right (Isometric Off Axis 3 Right)	<p>[Example: Consider the following example of the camera preset type:</p>  <i>end example]</i>
isometricOffAxis4Bottom (Isometric Off Axis 4 Bottom)	<p>[Example: Consider the following example of the camera preset type:</p>  <i>end example]</i>
isometricOffAxis4Left (Isometric Off Axis 4 Left)	<p>[Example: Consider the following example of the camera preset type:</p>




Enumeration Value	Description
	 <i>end example]</i>
isometricOffAxis4Right (Isometric Off Axis 4 Right)	<p>[Example: Consider the following example of the camera preset type:</p>  <i>end example]</i>
isometricRightDown (Isometric Right Down)	<p>[Example: Consider the following example of the camera preset type:</p>  <i>end example]</i>




Enumeration Value	Description
isometricRightUp (Isometric Right Up)	<p data-bbox="824 247 1409 317"><i>[Example: Consider the following example of the camera preset type:</i></p>  <p data-bbox="824 764 987 795"><i>end example]</i></p>
isometricTopDown (Isometric Top Down)	<p data-bbox="824 846 1409 915"><i>[Example: Consider the following example of the camera preset type:</i></p>  <p data-bbox="824 1272 987 1304"><i>end example]</i></p>
isometricTopUp (Isometric Top Up)	<p data-bbox="824 1356 1409 1425"><i>[Example: Consider the following example of the camera preset type:</i></p>  <p data-bbox="824 1782 987 1814"><i>end example]</i></p>
legacyObliqueBottom (Legacy Oblique Bottom)	<p data-bbox="824 1866 1409 1898"><i>[Example: Consider the following example of the</i></p>




Enumeration Value	Description
	<p>camera preset type:</p>  <p><i>end example]</i></p>
legacyObliqueBottomLeft (Legacy Oblique Bottom Left)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
legacyObliqueBottomRight (Legacy Oblique Bottom Right)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
legacyObliqueFront (Legacy Oblique Front)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>




Enumeration Value	Description
	<div>A blue rounded square icon with the text "Front Face" in white.</div> <div>end example]</div>
legacyObliqueLeft (Legacy Oblique Left)	<div><p>[Example: Consider the following example of the camera preset type:</p></div> <div>A blue rounded square icon with the text "Front Face" in white. It has a white shadow on its left side, indicating an oblique perspective from the left.</div> <div>end example]</div>
legacyObliqueRight (Legacy Oblique Right)	<div><p>[Example: Consider the following example of the camera preset type:</p></div> <div>A blue rounded square icon with the text "Front Face" in white. It has a white shadow on its right side, indicating an oblique perspective from the right.</div> <div>end example]</div>
legacyObliqueTop (Legacy Oblique Top)	<div><p>[Example: Consider the following example of the camera preset type:</p></div>




Enumeration Value	Description
	 <p><i>end example]</i></p>
legacyObliqueTopLeft (Legacy Oblique Top Left)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
legacyObliqueTopRight (Legacy Oblique Top Right)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
legacyPerspectiveBottom (Legacy Perspective Bottom)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>




Enumeration Value	Description
	 <p><i>end example]</i></p>
legacyPerspectiveBottomLeft (Legacy Perspective Bottom Left)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
legacyPerspectiveBottomRight (Legacy Perspective Bottom Right)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
legacyPerspectiveFront (Legacy Perspective Front)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>




Enumeration Value	Description
	 <p><i>end example]</i></p>
legacyPerspectiveLeft (Legacy Perspective Left)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
legacyPerspectiveRight (Legacy Perspective Right)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
legacyPerspectiveTop (Legacy Perspective Top)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>




Enumeration Value	Description
	 <p><i>end example]</i></p>
legacyPerspectiveTopLeft (Legacy Perspective Top Left)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
legacyPerspectiveTopRight (Legacy Perspective Top Right)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
obliqueBottom (Oblique Bottom)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>




Enumeration Value	Description
	 <p><i>end example]</i></p>
obliqueBottomLeft (Oblique Bottom Left)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
obliqueBottomRight (Oblique Bottom Right)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
obliqueLeft (Oblique Left)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>




Enumeration Value	Description
	 <p><i>end example]</i></p>
obliqueRight (Oblique Right)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
obliqueTop (Oblique Top)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
obliqueTopLeft (Oblique Top Left)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>




Enumeration Value	Description
	 <p><i>end example]</i></p>
obliqueTopRight (Oblique Top Right)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
orthographicFront (Orthographic Front)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
perspectiveAbove (Orthographic Above)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>

Enumeration Value	Description
	 <p><i>end example]</i></p>
perspectiveAboveLeftFacing (Perspective Above Left Facing)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
perspectiveAboveRightFacing (Perspective Above Right Facing)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
perspectiveBelow (Perspective Below)	<p>[<i>Example:</i> Consider the following example of the</p>

Enumeration Value	Description
	<p>camera preset type:</p>  <p><i>end example]</i></p>
<p>perspectiveContrastingLeftFacing (Perspective Contrasting Left Facing)</p>	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
<p>perspectiveContrastingRightFacing (Perspective Contrasting Right Facing)</p>	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
<p>perspectiveFront (Perspective Front)</p>	<p>[<i>Example:</i> Consider the following example of the</p>

Enumeration Value	Description
	<p>camera preset type:</p>  <p><i>end example]</i></p>
<p>perspectiveHeroicExtremeLeftFacing (Perspective Heroic Extreme Left Facing)</p>	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
<p>perspectiveHeroicExtremeRightFacing (Perspective Heroic Extreme Right Facing)</p>	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
<p>perspectiveHeroicLeftFacing (Perspective Heroic Left Facing)</p>	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>

Enumeration Value	Description
	 <p><i>end example]</i></p>
perspectiveHeroicRightFacing (Perspective Heroic Right Facing)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
perspectiveLeft (Perspective Left)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>  <p><i>end example]</i></p>
perspectiveRelaxed (Perspective Relaxed)	<p>[<i>Example:</i> Consider the following example of the camera preset type:</p>

Enumeration Value	Description
	<div><p><i>end example]</i></p></div>
perspectiveRelaxedModerately (Perspective Relaxed Moderately)	<div><p>[<i>Example:</i> Consider the following example of the camera preset type:</p><div><p><i>end example]</i></p></div></div>
perspectiveRight (Perspective Right)	<div><p>[<i>Example:</i> Consider the following example of the camera preset type:</p><div><p><i>end example]</i></p></div></div>

[*Note:* The W3C XML Schema definition of this simple type’s content model ([ST_PresetCameraType](#)) is located in §A.4.1. *end note*]

20.1.10.47 [ST_PresetColorVal](#) (Preset Color Value)

This simple type represents a preset color value.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
aliceBlue (Alice Blue Preset Color)	Specifies a color with RGB value (240,248,255)
antiqueWhite (Antique White Preset Color)	Specifies a color with RGB value (250,235,215)
aqua (Aqua Preset Color)	Specifies a color with RGB value (0,255,255)
aquamarine (Aquamarine Preset Color)	Specifies a color with RGB value (127,255,212)
azure (Azure Preset Color)	Specifies a color with RGB value (240,255,255)
beige (Beige Preset Color)	Specifies a color with RGB value (245,245,220)
bisque (Bisque Preset Color)	Specifies a color with RGB value (255,228,196)
black (Black Preset Color)	Specifies a color with RGB value (0,0,0)
blanchedAlmond (Blanched Almond Preset Color)	Specifies a color with RGB value (255,235,205)
blue (Blue Preset Color)	Specifies a color with RGB value (0,0,255)
blueViolet (Blue Violet Preset Color)	Specifies a color with RGB value (138,43,226)
brown (Brown Preset Color)	Specifies a color with RGB value (165,42,42)
burlyWood (Burly Wood Preset Color)	Specifies a color with RGB value (222,184,135)
cadetBlue (Cadet Blue Preset Color)	Specifies a color with RGB value (95,158,160)
chartreuse (Chartreuse Preset Color)	Specifies a color with RGB value (127,255,0)
chocolate (Chocolate Preset Color)	Specifies a color with RGB value (210,105,30)
coral (Coral Preset Color)	Specifies a color with RGB value (255,127,80)
cornflowerBlue (Cornflower Blue Preset Color)	Specifies a color with RGB value (100,149,237)
cornsilk (Cornsilk Preset Color)	Specifies a color with RGB value (255,248,220)
crimson (Crimson Preset Color)	Specifies a color with RGB value (220,20,60)
cyan (Cyan Preset Color)	Specifies a color with RGB value (0,255,255)
darkBlue (Dark Blue Preset Color)	Specifies a color with RGB value (0,0,139)
darkCyan (Dark Cyan Preset Color)	Specifies a color with RGB value (0,139,139)
darkGoldenrod (Dark Goldenrod Preset Color)	Specifies a color with RGB value (184,134,11)
darkGray (Dark Gray Preset Color)	Specifies a color with RGB value (169,169,169)
darkGreen (Dark Green Preset Color)	Specifies a color with RGB value (0,100,0)
darkGrey (Dark Gray Preset Color)	Specifies a color with RGB value (169,169,169)
darkKhaki (Dark Khaki Preset Color)	Specifies a color with RGB value (189,183,107)
darkMagenta (Dark Magenta Preset Color)	Specifies a color with RGB value (139,0,139)
darkOliveGreen (Dark Olive Green Preset Color)	Specifies a color with RGB value (85,107,47)
darkOrange (Dark Orange Preset Color)	Specifies a color with RGB value (255,140,0)
darkOrchid (Dark Orchid Preset Color)	Specifies a color with RGB value (153,50,204)

Enumeration Value	Description
darkRed (Dark Red Preset Color)	Specifies a color with RGB value (139,0,0)
darkSalmon (Dark Salmon Preset Color)	Specifies a color with RGB value (233,150,122)
darkSeaGreen (Dark Sea Green Preset Color)	Specifies a color with RGB value (143,188,143)
darkSlateBlue (Dark Slate Blue Preset Color)	Specifies a color with RGB value (72,61,139)
darkSlateGray (Dark Slate Gray Preset Color)	Specifies a color with RGB value (47,79,79)
darkSlateGrey (Dark Slate Gray Preset Color)	Specifies a color with RGB value (47,79,79)
darkTurquoise (Dark Turquoise Preset Color)	Specifies a color with RGB value (0,206,209)
darkViolet (Dark Violet Preset Color)	Specifies a color with RGB value (148,0,211)
deepPink (Deep Pink Preset Color)	Specifies a color with RGB value (255,20,147)
deepSkyBlue (Deep Sky Blue Preset Color)	Specifies a color with RGB value (0,191,255)
dimGray (Dim Gray Preset Color)	Specifies a color with RGB value (105,105,105)
dimGrey (Dim Gray Preset Color)	Specifies a color with RGB value (105,105,105)
dkBlue (Dark Blue Preset Color)	Specifies a color with RGB value (0,0,139)
dkCyan (Dark Cyan Preset Color)	Specifies a color with RGB value (0,139,139)
dkGoldenrod (Dark Goldenrod Preset Color)	Specifies a color with RGB value (184,134,11)
dkGray (Dark Gray Preset Color)	Specifies a color with RGB value (169,169,169)
dkGreen (Dark Green Preset Color)	Specifies a color with RGB value (0,100,0)
dkGrey (Dark Gray Preset Color)	Specifies a color with RGB value (169,169,169)
dkKhaki (Dark Khaki Preset Color)	Specifies a color with RGB value (189,183,107)
dkMagenta (Dark Magenta Preset Color)	Specifies a color with RGB value (139,0,139)
dkOliveGreen (Dark Olive Green Preset Color)	Specifies a color with RGB value (85,107,47)
dkOrange (Dark Orange Preset Color)	Specifies a color with RGB value (255,140,0)
dkOrchid (Dark Orchid Preset Color)	Specifies a color with RGB value (153,50,204)
dkRed (Dark Red Preset Color)	Specifies a color with RGB value (139,0,0)
dkSalmon (Dark Salmon Preset Color)	Specifies a color with RGB value (233,150,122)
dkSeaGreen (Dark Sea Green Preset Color)	Specifies a color with RGB value (143,188,139)
dkSlateBlue (Dark Slate Blue Preset Color)	Specifies a color with RGB value (72,61,139)
dkSlateGray (Dark Slate Gray Preset Color)	Specifies a color with RGB value (47,79,79)
dkSlateGrey (Dark Slate Gray Preset Color)	Specifies a color with RGB value (47,79,79)
dkTurquoise (Dark Turquoise Preset Color)	Specifies a color with RGB value (0,206,209)
dkViolet (Dark Violet Preset Color)	Specifies a color with RGB value (148,0,211)
dodgerBlue (Dodger Blue Preset Color)	Specifies a color with RGB value (30,144,255)
firebrick (Firebrick Preset Color)	Specifies a color with RGB value (178,34,34)
floralWhite (Floral White Preset Color)	Specifies a color with RGB value (255,250,240)

Enumeration Value	Description
forestGreen (Forest Green Preset Color)	Specifies a color with RGB value (34,139,34)
fuchsia (Fuchsia Preset Color)	Specifies a color with RGB value (255,0,255)
gainsboro (Gainsboro Preset Color)	Specifies a color with RGB value (220,220,220)
ghostWhite (Ghost White Preset Color)	Specifies a color with RGB value (248,248,255)
gold (Gold Preset Color)	Specifies a color with RGB value (255,215,0)
goldenrod (Goldenrod Preset Color)	Specifies a color with RGB value (218,165,32)
gray (Gray Preset Color)	Specifies a color with RGB value (128,128,128)
green (Green Preset Color)	Specifies a color with RGB value (0,128,0)
greenYellow (Green Yellow Preset Color)	Specifies a color with RGB value (173,255,47)
grey (Gray Preset Color)	Specifies a color with RGB value (128,128,128)
honeydew (Honeydew Preset Color)	Specifies a color with RGB value (240,255,240)
hotPink (Hot Pink Preset Color)	Specifies a color with RGB value (255,105,180)
indianRed (Indian Red Preset Color)	Specifies a color with RGB value (205,92,92)
indigo (Indigo Preset Color)	Specifies a color with RGB value (75,0,130)
ivory (Ivory Preset Color)	Specifies a color with RGB value (255,255,240)
khaki (Khaki Preset Color)	Specifies a color with RGB value (240,230,140)
lavender (Lavender Preset Color)	Specifies a color with RGB value (230,230,250)
lavenderBlush (Lavender Blush Preset Color)	Specifies a color with RGB value (255,240,245)
lawnGreen (Lawn Green Preset Color)	Specifies a color with RGB value (124,252,0)
lemonChiffon (Lemon Chiffon Preset Color)	Specifies a color with RGB value (255,250,205)
lightBlue (Light Blue Preset Color)	Specifies a color with RGB value (173,216,230)
lightCoral (Light Coral Preset Color)	Specifies a color with RGB value (240,128,128)
lightCyan (Light Cyan Preset Color)	Specifies a color with RGB value (224,255,255)
lightGoldenrodYellow (Light Goldenrod Yellow Preset Color)	Specifies a color with RGB value (250,250,210)
lightGray (Light Gray Preset Color)	Specifies a color with RGB value (211,211,211)
lightGreen (Light Green Preset Color)	Specifies a color with RGB value (144,238,144)
lightGrey (Light Gray Preset Color)	Specifies a color with RGB value (211,211,211)
lightPink (Light Pink Preset Color)	Specifies a color with RGB value (255,182,193)
lightSalmon (Light Salmon Preset Color)	Specifies a color with RGB value (255,160,122)
lightSeaGreen (Light Sea Green Preset Color)	Specifies a color with RGB value (32,178,170)
lightSkyBlue (Light Sky Blue Preset Color)	Specifies a color with RGB value (135,206,250)
lightSlateGray (Light Slate Gray Preset Color)	Specifies a color with RGB value (119,136,153)
lightSlateGrey (Light Slate Gray Preset Color)	Specifies a color with RGB value (119,136,153)

Enumeration Value	Description
lightSteelBlue (Light Steel Blue Preset Color)	Specifies a color with RGB value (176,196,222)
lightYellow (Light Yellow Preset Color)	Specifies a color with RGB value (255,255,224)
lime (Lime Preset Color)	Specifies a color with RGB value (0,255,0)
limeGreen (Lime Green Preset Color)	Specifies a color with RGB value (50,205,50)
linen (Linen Preset Color)	Specifies a color with RGB value (250,240,230)
ltBlue (Light Blue Preset Color)	Specifies a color with RGB value (173,216,230)
ltCoral (Light Coral Preset Color)	Specifies a color with RGB value (240,128,128)
ltCyan (Light Cyan Preset Color)	Specifies a color with RGB value (224,255,255)
ltGoldenrodYellow (Light Goldenrod Yellow Preset Color)	Specifies a color with RGB value (250,250,120)
ltGray (Light Gray Preset Color)	Specifies a color with RGB value (211,211,211)
ltGreen (Light Green Preset Color)	Specifies a color with RGB value (144,238,144)
ltGrey (Light Gray Preset Color)	Specifies a color with RGB value (211,211,211)
ltPink (Light Pink Preset Color)	Specifies a color with RGB value (255,182,193)
ltSalmon (Light Salmon Preset Color)	Specifies a color with RGB value (255,160,122)
ltSeaGreen (Light Sea Green Preset Color)	Specifies a color with RGB value (32,178,170)
ltSkyBlue (Light Sky Blue Preset Color)	Specifies a color with RGB value (135,206,250)
ltSlateGray (Light Slate Gray Preset Color)	Specifies a color with RGB value (119,136,153)
ltSlateGrey (Light Slate Gray Preset Color)	Specifies a color with RGB value (119,136,153)
ltSteelBlue (Light Steel Blue Preset Color)	Specifies a color with RGB value (176,196,222)
ltYellow (Light Yellow Preset Color)	Specifies a color with RGB value (255,255,224)
magenta (Magenta Preset Color)	Specifies a color with RGB value (255,0,255)
maroon (Maroon Preset Color)	Specifies a color with RGB value (128,0,0)
medAquamarine (Medium Aquamarine Preset Color)	Specifies a color with RGB value (102,205,170)
medBlue (Medium Blue Preset Color)	Specifies a color with RGB value (0,0,205)
mediumAquamarine (Medium Aquamarine Preset Color)	Specifies a color with RGB value (102,205,170)
mediumBlue (Medium Blue Preset Color)	Specifies a color with RGB value (0,0,205)
mediumOrchid (Medium Orchid Preset Color)	Specifies a color with RGB value (186,85,211)
mediumPurple (Medium Purple Preset Color)	Specifies a color with RGB value (147,112,219)
mediumSeaGreen (Medium Sea Green Preset Color)	Specifies a color with RGB value (60,179,113)
mediumSlateBlue (Medium Slate Blue Preset Color)	Specifies a color with RGB value (123,104,238)
mediumSpringGreen (Medium Spring Green Preset Color)	Specifies a color with RGB value (0,250,154)
mediumTurquoise (Medium Turquoise Preset Color)	Specifies a color with RGB value (72,209,204)

Enumeration Value	Description
mediumVioletRed (Medium Violet Red Preset Color)	Specifies a color with RGB value (199,21,133)
medOrchid (Medium Orchid Preset Color)	Specifies a color with RGB value (186,85,211)
medPurple (Medium Purple Preset Color)	Specifies a color with RGB value (147,112,219)
medSeaGreen (Medium Sea Green Preset Color)	Specifies a color with RGB value (60,179,113)
medSlateBlue (Medium Slate Blue Preset Color)	Specifies a color with RGB value (123,104,238)
medSpringGreen (Medium Spring Green Preset Color)	Specifies a color with RGB value (0,250,154)
medTurquoise (Medium Turquoise Preset Color)	Specifies a color with RGB value (72,209,204)
medVioletRed (Medium Violet Red Preset Color)	Specifies a color with RGB value (199,21,133)
midnightBlue (Midnight Blue Preset Color)	Specifies a color with RGB value (25,25,112)
mintCream (Mint Cream Preset Color)	Specifies a color with RGB value (245,255,250)
mistyRose (Misty Rose Preset Color)	Specifies a color with RGB value (255,228,225)
moccasin (Moccasin Preset Color)	Specifies a color with RGB value (255,228,181)
navajoWhite (Navajo White Preset Color)	Specifies a color with RGB value (255,222,173)
navy (Navy Preset Color)	Specifies a color with RGB value (0,0,128)
oldLace (Old Lace Preset Color)	Specifies a color with RGB value (253,245,230)
olive (Olive Preset Color)	Specifies a color with RGB value (128,128,0)
oliveDrab (Olive Drab Preset Color)	Specifies a color with RGB value (107,142,35)
orange (Orange Preset Color)	Specifies a color with RGB value (255,165,0)
orangeRed (Orange Red Preset Color)	Specifies a color with RGB value (255,69,0)
orchid (Orchid Preset Color)	Specifies a color with RGB value (218,112,214)
paleGoldenrod (Pale Goldenrod Preset Color)	Specifies a color with RGB value (238,232,170)
paleGreen (Pale Green Preset Color)	Specifies a color with RGB value (152,251,152)
paleTurquoise (Pale Turquoise Preset Color)	Specifies a color with RGB value (175,238,238)
paleVioletRed (Pale Violet Red Preset Color)	Specifies a color with RGB value (219,112,147)
papayaWhip (Papaya Whip Preset Color)	Specifies a color with RGB value (255,239,213)
peachPuff (Peach Puff Preset Color)	Specifies a color with RGB value (255,218,185)
peru (Peru Preset Color)	Specifies a color with RGB value (205,133,63)
pink (Pink Preset Color)	Specifies a color with RGB value (255,192,203)
plum (Plum Preset Color)	Specifies a color with RGB value (221,160,221)
powderBlue (Powder Blue Preset Color)	Specifies a color with RGB value (176,224,230)
purple (Purple Preset Color)	Specifies a color with RGB value (128,0,128)
red (Red Preset Color)	Specifies a color with RGB value (255,0,0)
rosyBrown (Rosy Brown Preset Color)	Specifies a color with RGB value (188,143,143)
royalBlue (Royal Blue Preset Color)	Specifies a color with RGB value (65,105,225)

Enumeration Value	Description
saddleBrown (Saddle Brown Preset Color)	Specifies a color with RGB value (139,69,19)
salmon (Salmon Preset Color)	Specifies a color with RGB value (250,128,114)
sandyBrown (Sandy Brown Preset Color)	Specifies a color with RGB value (244,164,96)
seaGreen (Sea Green Preset Color)	Specifies a color with RGB value (46,139,87)
seaShell (Sea Shell Preset Color)	Specifies a color with RGB value (255,245,238)
sienna (Sienna Preset Color)	Specifies a color with RGB value (160,82,45)
silver (Silver Preset Color)	Specifies a color with RGB value (192,192,192)
skyBlue (Sky Blue Preset Color)	Specifies a color with RGB value (135,206,235)
slateBlue (Slate Blue Preset Color)	Specifies a color with RGB value (106,90,205)
slateGray (Slate Gray Preset Color)	Specifies a color with RGB value (112,128,144)
slateGrey (Slate Gray Preset Color)	Specifies a color with RGB value (112,128,144)
snow (Snow Preset Color)	Specifies a color with RGB value (255,250,250)
springGreen (Spring Green Preset Color)	Specifies a color with RGB value (0,255,127)
steelBlue (Steel Blue Preset Color)	Specifies a color with RGB value (70,130,180)
tan (Tan Preset Color)	Specifies a color with RGB value (210,180,140)
teal (Teal Preset Color)	Specifies a color with RGB value (0,128,128)
thistle (Thistle Preset Color)	Specifies a color with RGB value (216,191,216)
tomato (Tomato Preset Color)	Specifies a color with RGB value (255,99,71)
turquoise (Turquoise Preset Color)	Specifies a color with RGB value (64,224,208)
violet (Violet Preset Color)	Specifies a color with RGB value (238,130,238)
wheat (Wheat Preset Color)	Specifies a color with RGB value (245,222,179)
white (White Preset Color)	Specifies a color with RGB value (255,255,255)
whiteSmoke (White Smoke Preset Color)	Specifies a color with RGB value (245,245,245)
yellow (Yellow Preset Color)	Specifies a color with RGB value (255,255,0)
yellowGreen (Yellow Green Preset Color)	Specifies a color with RGB value (154,205,50)












[Note: The W3C XML Schema definition of this simple type's content model ([ST_PresetColorVal](#)) is located in §A.4.1. *end note*]

20.1.10.48 ST_PresetLineDashVal (Preset Line Dash Value)

This simple type represents preset line dash values. The description for each style shows an illustration of the line style. Each style also contains a precise binary representation of the repeating dash style. Each 1 corresponds to a line segment of the same length as the line width, and each 0 corresponds to a space of the same length as the line width.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
dash (Dash)	 1111000
dashDot (Dash Dot)	 11110001000
dot (Dot)	 1000
lgDash (Large Dash)	 11111111000
lgDashDot (Large Dash Dot)	 111111110001000
lgDashDotDot (Large Dash Dot Dot)	 1111111100010001000
solid (Solid)	 1
sysDash (System Dash)	 1110
sysDashDot (System Dash Dot)	 111010
sysDashDotDot (System Dash Dot Dot)	 11101010
sysDot (System Dot)	 10

[Note: The W3C XML Schema definition of this simple type's content model ([ST_PresetLineDashVal](#)) is located in §A.4.1. *end note*]

20.1.10.49 ST_PresetMaterialType (Preset Material Type)

Describes surface appearance of a shape. The material type combines with lighting characteristics to create the final look and feel of a shape. The set of material properties which can be combined together to create the presets below consist of the following characteristics:

- Specular color – This defines the color of the highlight associated with the material.
- Specular power – This defines the size and how intense the highlight is. Smaller values provide a larger, but less intense highlight, while larger values provide a smaller, but more intense highlight.
- Diffuse color – This defines the perceived color of the material where an object is directly illuminated by a light source. Generally speaking, the default color here would be based on the shape fill color.

- Ambient color – This defines the perceived color of the material where an object is not directly illuminated by a light source. Generally speaking, the default color here would be based on the shape fill color.
- Emissive color – This defines the color of a light which is perceived to be given off by an object.
- Diffuse Fresnel effect – This is an effect that either darkens (approaches black) or lightens (approaches white) the diffuse color of the material type at glancing angles. Positive values cause the material to become brighter, negative values cause the material to become darker.
- Alpha Fresnel effect – This is an effect that either makes the material more opaque or more transparent at glancing angles. Positive values cause the material to become more opaque, negative values cause the material to become more transparent.



In the following examples, the exact values given for certain properties should be understood to be relative values in order to provide a reference. These values could be different depending upon technologies used to render the material types. The following properties were used to define the shape used in the image examples below:


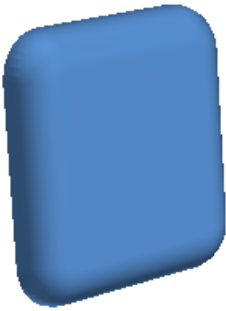
- Rounded rectangle shape
- Circle bevel type
- Three Point light rig type
- Camera type defined by the perspectiveContrastingRightFacing preset
- Bevel width and height each equal to 190500



This simple type's contents are a restriction of the W3C XML Schema token datatype.

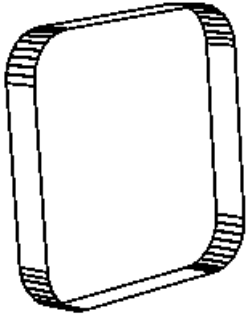

This simple type is restricted to the values listed in the following table:


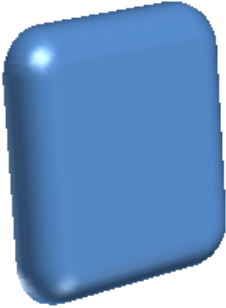
Enumeration Value	Description
clear (Clear)	<p>The <code>clear</code> material type has the following characteristics:</p> <ul style="list-style-type: none">• Specular Color: light gray• Diffuse Color: shape fill color with 90% alpha• Ambient Color: shape fill color with 90% alpha• Emissive Color: black• Diffuse Fresnel value: -8• Alpha Fresnel value: 1 <p>[Example: Consider the following example of the <code>clear</code> material type:</p>



Enumeration Value	Description
	 <p><i>end example]</i></p>
dkEdge (Dark Edge)	<p>The dkEdge material type has the following characteristics:</p> <ul style="list-style-type: none"> • Specular Color: white • Specular Power value: 35 • Ambient Color: shape fill color • Emissive Color: black • Diffuse Fresnel value: -2 <p>[Example: Consider the following example of the dkEdge material type:</p>  <p><i>end example]</i></p>
flat (Flat)	<p>The flat material type has the following characteristics:</p> <ul style="list-style-type: none"> • Specular Color: very light gray • Specular Power value: 50 • Diffuse Color: black • Ambient Color: black • Emissive Color: shape fill color • Diffuse Fresnel value: -4



Enumeration Value	Description
	<p>[<i>Example:</i> Consider the following example of the flat material type:</p>  <p><i>end example]</i></p>
legacyMatte (Legacy Matte)	<p>The legacyMatte material type has the following characteristics:</p> <ul style="list-style-type: none"> • Specular Color: black • Ambient Color: shape fill color • Emissive Color: black • Diffuse Fresnel value: -4 <p>[<i>Example:</i> Consider the following example of the legacyMatte material type:</p>  <p><i>end example]</i></p>
legacyMetal (Legacy Metal)	<p>The legacyMetal material type has the following characteristics:</p> <ul style="list-style-type: none"> • Specular Color: shape fill color • Specular Power value: 32 • Diffuse Color: shape fill color darkened by adding black • Ambient Color: shape fill color darkened by adding black


Enumeration Value	Description
	<ul style="list-style-type: none"> Emissive Color: black <p>[Example: Consider the following example of the legacyMetal material type:</p>  <p>end example]</p>
legacyPlastic (Legacy Plastic)	<p>The legacyPlastic material type has the following characteristics:</p> <ul style="list-style-type: none"> Specular Color: white Specular Power value: 32 Ambient Color: shape fill color Emissive Color: black <p>[Example: Consider the following example of the legacyPlastic material type:</p>  <p>end example]</p>
legacyWireframe (Legacy Wireframe)	<p>The legacyWireframe material type has none of the associated material properties and is based on a wireframe interpretation of the shape.</p> <p>[Example: Consider the following example of the legacyWireframe material type:</p>

Enumeration Value	Description
	 <p><i>end example]</i></p>
matte (Matte)	<p>The matte material type has the following characteristics:</p> <ul style="list-style-type: none">• Specular Color: black• Ambient Color: shape fill color• Emissive Color: black <p>[<i>Example:</i> Consider the following example of the matte material type:</p>  <p><i>end example]</i></p>
metal (Metal)	<p>The metal material type has the following characteristics:</p> <ul style="list-style-type: none">• Specular Color: shape fill color plus white, which is brightened by 1.5 times the normal value• Specular Power value: 12• Ambient Color: shape fill color• Emissive Color: black• Diffuse Fresnel value: 4 <p>[<i>Example:</i> Consider the following example of the</p>

Enumeration Value	Description
	<p>metal material type:</p>  <p><i>end example]</i></p>
plastic (Plastic)	<p>The plastic material type has the following characteristics:</p> <ul style="list-style-type: none"> • Specular Color: light gray • Specular Power value: 12 • Ambient Color: shape fill color • Emissive Color: black <p>[<i>Example:</i> Consider the following example of the plastic material type:</p>  <p><i>end example]</i></p>
powder (Powder)	<p>The powder material type has the following characteristics:</p> <ul style="list-style-type: none"> • Specular Color: dark gray • Specular Power value: 10 • Diffuse Color: gray • Ambient Color: gray • Emissive Color: black • Diffuse Fresnel value: 2

Enumeration Value	Description
	<p>[Example: Consider the following example of the powder material type:</p>  <p>end example]</p>
softEdge (Soft Edge)	<p>The softEdge material type has the following characteristics:</p> <ul style="list-style-type: none">• Specular Color: white• Specular Power value: 35• Ambient Color: shape fill color• Emissive Color: black• Diffuse Fresnel value: 4• Alpha Fresnel value: -10 <p>[Example: Consider the following example of the softEdge material type:</p>  <p>end example]</p>
softmetal (Soft Metal)	<p>The softMetal material type has the following characteristics:</p> <ul style="list-style-type: none">• Specular Color: shape fill color lightened with white by 50%• Specular Power value: 8

Enumeration Value	Description
	<ul style="list-style-type: none"> • Ambient Color: shape fill color • Emissive Color: black <p>[Example: Consider the following example of the <code>softmetal</code> material type:</p>  <p><i>end example]</i></p>
translucentPowder (Translucent Powder)	<p>The <code>translucentPowder</code> material type has the following characteristics:</p> <ul style="list-style-type: none"> • Specular Color: dark gray • Specular Power value: 10 • Diffuse Color: shape fill color with 30% transparency • Ambient Color: shape fill color with 30% transparency • Emissive Color: black • Diffuse Fresnel value: 2 • Alpha Fresnel value: -1 <p>[Example: Consider the following example of the <code>translucentPowder</code> material type:</p>  <p><i>end example]</i></p>

Enumeration Value	Description
warmMatte (Warm Matte)	<p>The warmMatte material type has the following characteristics:</p> <ul style="list-style-type: none">• Specular Color: dark gray• Specular Power value: 8• Ambient Color: shape fill color• Emissive Color: black <p>[Example: Consider the following example of the warmMatte material type:</p>  <p>end example]</p>

[Note: The W3C XML Schema definition of this simple type’s content model (ST_PresetMaterialType) is located in §A.4.1. end note]



20.1.10.50 ST_PresetPatternVal (Preset Pattern Value)





















This simple type indicates a preset type of pattern fill. The description of each value contains an illustration of the fill type.





















[Note: These presets correspond to members of the HatchStyle enumeration in the Microsoft .NET Framework. A reference for this type can be found at <http://msdn2.microsoft.com/en-us/library/system.drawing.drawing2d.hatchstyle.aspx>. end note]













This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
cross (Cross)	
dashDnDiag (Dashed Downward Diagonal)	

Enumeration Value	Description
dashHorz (Dashed Horizontal)	
dashUpDiag (Dashed Upward Diagonal)	
dashVert (Dashed Vertical)	
diagBrick (Diagonal Brick)	
diagCross (Diagonal Cross)	
divot (Divot)	
dkDnDiag (Dark Downward Diagonal)	
dkHorz (Dark Horizontal)	
dkUpDiag (Dark Upward Diagonal)	
dkVert (Dark Vertical)	
dnDiag (Downward Diagonal)	
dotDmnd (Dotted Diamond)	
dotGrid (Dotted Grid)	
horz (Horizontal)	
horzBrick (Horizontal Brick)	
lgCheck (Large Checker Board)	
lgConfetti (Large Confetti)	
lgGrid (Large Grid)	
ltDnDiag (Light Downward Diagonal)	
ltHorz (Light Horizontal)	

Enumeration Value	Description
ltUpDiag (Light Upward Diagonal)	
ltVert (Light Vertical)	
narHorz (Narrow Horizontal)	
narVert (Narrow Vertical)	
openDmnd (Open Diamond)	
pct10 (10%)	
pct20 (20%)	
pct25 (25%)	
pct30 (30%)	
pct40 (40%)	
pct5 (5%)	
pct50 (50%)	
pct60 (60%)	
pct70 (70%)	
pct75 (75%)	
pct80 (80%)	
pct90 (90%)	
plaid (Plaid)	
shingle (Shingle)	
smCheck (Small Checker Board)	

Enumeration Value	Description
smConfetti (Small Confetti)	
smGrid (Small Grid)	
solidDmnd (Solid Diamond)	
sphere (Sphere)	
trellis (Trellis)	
upDiag (Upward Diagonal)	
vert (Vertical)	
wave (Wave)	
wdDnDiag (Wide Downward Diagonal)	
wdUpDiag (Wide Upward Diagonal)	
weave (Weave)	
zigZag (Zig Zag)	


[Note: The W3C XML Schema definition of this simple type's content model ([ST_PresetPatternVal](#)) is located in §A.4.1. *end note*]









20.1.10.51 ST_PresetShadowVal (Preset Shadow Type)










This simple type indicates one of 20 preset shadow types. Each enumeration value description illustrates the type of shadow represented by the value. Each description contains the parameters to the outer shadow effect represented by the preset, in addition to those attributes common to all `prstShdw` effects.



This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
shdw1 (Top Left Drop Shadow)	 No additional attributes specified.

Enumeration Value	Description
shdw10 (Top Left Large Drop Shadow)	 align = "br" sx = 125% sy = 125%
shdw11 (Back Left Long Perspective Shadow)	 align = "b" kx = 40.89° sy = 50%
shdw12 (Back Right Long Perspective Shadow)	 align = "b" kx = -40.89° sy = 50%
shdw13 (Top Left Double Drop Shadow)	 Equivalent to two outer shadow effects. Shadow 1: No additional attributes specified. Shadow 2: color = min(1, shadow 1's color (0 <= r, g, b <= 1) + 102/255), per r, g, b component dist = 2 * shadow 1's distance
shdw14 (Bottom Right Small Drop Shadow)	 No additional attributes specified.
shdw15 (Front Left Long Perspective Shadow)	 align = "b" kx = 40.89° sy = -50%
shdw16 (Front Right Long Perspective Shadow)	 align = "b" kx = -40.89° sy = -50%
shdw17 (3D Outer Box Shadow)	 Equivalent to two outer shadow effects. Shadow 1: No additional attributes specified.

Enumeration Value	Description
	Shadow 2: $\text{color} = \min(1, \text{shadow 1's color } (0 \leq r, g, b \leq 1) + 102/255)$, per r, g, b component $\text{dir} = \text{shadow 1's direction} + 180^\circ$
shdw18 (3D Inner Box Shadow)	 <p>Equivalent to two outer shadow effects.</p> <p>Shadow 1: No additional attributes specified.</p> <p>Shadow 2: $\text{color} = \min(1, \text{shadow 1's color } (0 \leq r, g, b \leq 1) + 102/255)$, per r, g, b component $\text{dir} = \text{shadow 1's direction} + 180^\circ$ </p>
shdw19 (Back Center Perspective Shadow)	 <p>align = "b" sy = 50°</p>
shdw2 (Top Right Drop Shadow)	 <p>No additional attributes specified.</p>
shdw20 (Front Bottom Shadow)	 <p>align = "b" sy = -100°</p>
shdw3 (Back Left Perspective Shadow)	 <p>align = "b" ky = 40.89° sy = 50%</p>
shdw4 (Back Right Perspective Shadow)	 <p>align = "b" kx = -40.89° sy = 50%</p>
shdw5 (Bottom Left Drop Shadow)	 <p>No additional attributes specified.</p>
shdw6 (Bottom Right Drop Shadow)	 <p>No additional attributes specified.</p>
shdw7 (Front Left Perspective Shadow)	

Enumeration Value	Description
	align = "b" kx = 40.89° sy = -50%
shdw8 (Front Right Perspective Shadow)	 align = "b" kx = -40.89° sy = -50%
shdw9 (Top Left Small Drop Shadow)	 align = "tl" sx = 75% sy = 75%

[Note: The W3C XML Schema definition of this simple type's content model ([ST_PresetShadowVal](#)) is located in §A.4.1. *end note*]

20.1.10.52 ST_RectAlignment (Rectangle Alignments)

This simple type describes how to position two rectangles relative to each other.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
b (Rectangle Alignment Enum (Bottom))	Bottom
bl (Rectangle Alignment Enum (Bottom Left))	Bottom Left
br (Rectangle Alignment Enum (Bottom Right))	Bottom Right
ctr (Rectangle Alignment Enum (Center))	Center
l (Rectangle Alignment Enum (Left))	Left
r (Rectangle Alignment Enum (Right))	Right
t (Rectangle Alignment Enum (Top))	Top
tl (Rectangle Alignment Enum (Top Left))	Top Left
tr (Rectangle Alignment Enum (Top Right))	Top Right

[Note: The W3C XML Schema definition of this simple type's content model ([ST_RectAlignment](#)) is located in §A.4.1. *end note*]

20.1.10.53 ST_SchemeColorVal (Scheme Color)

This simple type represents a scheme color value.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
accent1 (Accent Color 1)	Extra scheme color 1
accent2 (Accent Color 2)	Extra scheme color 2
accent3 (Accent Color 3)	Extra scheme color 3
accent4 (Accent Color 4)	Extra scheme color 4
accent5 (Accent Color 5)	Extra scheme color 5
accent6 (Accent Color 6)	Extra scheme color 6
bg1 (Background Color 1)	Semantic background color
bg2 (Background Color 2)	Semantic additional background color
dk1 (Dark Color 1)	Main dark color 1
dk2 (Dark Color 2)	Main dark color 2
folHlink (Followed Hyperlink Color)	Followed Hyperlink Color
hlink (Hyperlink Color)	Regular Hyperlink Color
lt1 (Light Color 1)	Main Light Color 1
lt2 (Light Color 2)	Main Light Color 2
phClr (Style Color)	A color used in theme definitions which means to use the color of the style.
tx1 (Text Color 1)	Semantic text color
tx2 (Text Color 2)	Semantic additional text color

[Note: The W3C XML Schema definition of this simple type's content model ([ST_SchemeColorVal](#)) is located in §A.4.1. *end note*]

20.1.10.54 ST_ShapeID (Shape ID)

Specifies the shape ID for legacy shape identification purposes.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ShapeID](#)) is located in §A.4.1. *end note*]

20.1.10.55 ST_ShapeType (Preset Shape Types)

This simple type specifies the preset shape geometry that is to be used for a shape. An enumeration of this simple type is used so that a custom geometry does not have to be specified but instead can be constructed automatically by the generating application. For each enumeration listed there is also the corresponding DrawingML code that would be used to construct this shape were it a custom geometry. Within the construction

code for each of these preset shapes there are predefined guides that the generating application shall maintain for calculation purposes at all times. The necessary guides should have the following values.

3/4 of a Circle ('3cd4') - Constant value of "16200000.0"

The units here are in 60,000ths of a degree. This is equivalent to 270 degrees.

3/8 of a Circle ('3cd8') - Constant value of "8100000.0"

The units here are in 60,000ths of a degree. This is equivalent to 135 degrees.

5/8 of a Circle ('5cd8') - Constant value of "13500000.0"

The units here are in 60,000ths of a degree. This is equivalent to 225 degrees.

7/8 of a Circle ('7cd8') - Constant value of "18900000.0"

The units here are in 60,000ths of a degree. This is equivalent to 315 degrees.

Shape Bottom Edge ('b') - Constant value of "h"

This is the bottom edge of the shape and since the top edge of the shape is considered the 0 point, the bottom edge is thus the shape height.

1/2 of a Circle ('cd2') - Constant value of "10800000.0"

The units here are in 60,000ths of a degree. This is equivalent to 180 degrees.

1/4 of a Circle ('cd4') - Constant value of "5400000.0"

The units here are in 60,000ths of a degree. This is equivalent to 90 degrees.

1/8 of a Circle ('cd8') - Constant value of "2700000.0"

The units here are in 60,000ths of a degree. This is equivalent to 45 degrees.

Shape Height ('h')

This is the variable height of the shape defined in the shape properties. This value is received from the shape transform listed within the <spPr> element.

Horizontal Center ('hc') - Calculated value of "*" / w 1.0 2.0"

This is the horizontal center of the shape which is just the width divided by 2.

1/2 of Shape Height ('hd2') - Calculated value of "*" / h 1.0 2.0"

This is 1/2 the shape height.

1/4 of Shape Height ('hd4') - Calculated value of "*" / h 1.0 4.0"

This is 1/4 the shape height.

1/5 of Shape Height ('hd5') - Calculated value of "*" / h 1.0 5.0"

This is 1/5 the shape height.

1/6 of Shape Height ('hd6') - Calculated value of "*" / h 1.0 6.0"

This is 1/6 the shape height.

1/8 of Shape Height ('hd8') - Calculated value of "*" / h 1.0 8.0"

This is 1/8 the shape height.

Shape Left Edge ('l') - Constant value of "0"

This is the left edge of the shape and the left edge of the shape is considered the horizontal 0 point.

Longest Side of Shape ('ls') - Calculated value of "max w h"

This is the longest side of the shape. This value is either the width or the height depending on which is greater.

Shape Right Edge ('r') - Constant value of "w"

This is the right edge of the shape and since the left edge of the shape is considered the 0 point, the right edge is thus the shape width.

Shortest Side of Shape ('ss') - Calculated value of "min w h"

This is the shortest side of the shape. This value is either the width or the height depending on which is smaller.

1/2 Shortest Side of Shape ('ssd2') - Calculated value of "*/ ss 1.0 2.0"

This is 1/2 the shortest side of the shape.

1/4 Shortest Side of Shape ('ssd4') - Calculated value of "*/ ss 1.0 4.0"

This is 1/4 the shortest side of the shape.

1/6 Shortest Side of Shape ('ssd6') - Calculated value of "*/ ss 1.0 6.0"

This is 1/6 the shortest side of the shape.

1/8 Shortest Side of Shape ('ssd8') - Calculated value of "*/ ss 1.0 8.0"

This is 1/8 the shortest side of the shape.

Shape Top Edge ('t') - Constant value of "0"

This is the top edge of the shape and the top edge of the shape is considered the vertical 0 point.

Vertical Center of Shape ('vc') - Calculated value of "*/ h 1.0 2.0"

This is the vertical center of the shape which is just the height divided by 2.

Shape Width ('w')

This is the variable width of the shape defined in the shape properties. This value is received from the shape transform listed within the <spPr> element.

1/2 of Shape Width ('wd2') - Calculated value of "*/ w 1.0 2.0"

This is 1/2 the shape width.

1/4 of Shape Width ('wd4') - Calculated value of "*/ w 1.0 4.0"

This is 1/4 the shape width.

1/5 of Shape Width ('wd5') - Calculated value of "*/ w 1.0 5.0"

This is 1/5 the shape width.

1/6 of Shape Width ('wd6') - Calculated value of "*/ w 1.0 6.0"

This is 1/6 the shape width.

1/8 of Shape Width ('wd8') - Calculated value of "*/ w 1.0 8.0"



This is 1/8 the shape width.




1/10 of Shape Width ('wd10') - Calculated value of "*/ w 1.0 10.0"




This is 1/10 the shape width.




This simple type's contents are a restriction of the W3C XML Schema token datatype.



This simple type is restricted to the values listed in the following table:




Enumeration Value	Description
accentBorderCallout1 (Callout 1 with Border and Accent Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the accentBorderCallout1 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
accentBorderCallout2 (Callout 2 with Border and Accent Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the accentBorderCallout2 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
accentBorderCallout3 (Callout 3 with Border and Accent Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the accentBorderCallout3 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>




Enumeration Value	Description
	
accentCallout1 (Callout 1 Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the accentCallout1 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
accentCallout2 (Callout 2 Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the accentCallout2 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
accentCallout3 (Callout 3 Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the accentCallout3 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>



Enumeration Value	Description
	
<p>actionButtonBackPrevious (Back or Previous Button Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the actionButtonBackPrevious element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>actionButtonBeginning (Beginning Button Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the actionButtonBeginning element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>actionButtonBlank (Blank Button Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in</p>




Enumeration Value	Description
	<p>the actionButtonBlank element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i></p> 
actionButtonDocument (Document Button Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the actionButtonDocument element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
actionButtonEnd (End Button Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the actionButtonEnd element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 




Enumeration Value	Description
<p>actionButtonForwardNext (Forward or Next Button Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the actionButtonForwardNext element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>actionButtonHelp (Help Button Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the actionButtonHelp element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>actionButtonHome (Home Button Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the actionButtonHome element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>




Enumeration Value	Description
	
actionBarInformation (Information Button Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the actionBarInformation element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
actionBarMovie (Movie Button Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the actionBarMovie element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
actionBarReturn (Return Button Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to</p>




Enumeration Value	Description
	<p>generate this preset shape definition is contained in the <code>actionButtonReturn</code> element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i></p> 
actionButtonSound (Sound Button Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the <code>actionButtonSound</code> element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
arc (Curved Arc Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the <code>arc</code> element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
bentArrow (Bent Arrow Shape)	Specifies a preset shape geometry. This geometry shall




Enumeration Value	Description
	<p>be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the bentArrow element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
bentConnector2 (Bent Connector 2 Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the bentConnector2 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
bentConnector3 (Bent Connector 3 Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the bentConnector3 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>




Enumeration Value	Description
	
bentConnector4 (Bent Connector 4 Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the bentConnector4 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
bentConnector5 (Bent Connector 5 Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the bentConnector5 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
bentUpArrow (Bent Up Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the bentUpArrow element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are</p>




Enumeration Value	Description
	<p>described in further detail above. <i>end note</i>]</p> 
bevel (Bevel Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the bevel element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
blockArc (Block Arc Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the blockArc element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
borderCallout1 (Callout 1 with Border Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the borderCallout1 element in the preset shape geometries electronic addenda of Annex D. The</p>



Enumeration Value	Description
	<p>constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
borderCallout2 (Callout 2 with Border Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the borderCallout2 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
borderCallout3 (Callout 3 with Border Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the borderCallout3 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
bracePair (Brace Pair Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the bracePair element in the preset shape geometries</p>


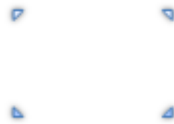

Enumeration Value	Description
	<p>electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i></p> 
<p>bracketPair (Bracket Pair Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the bracketPair element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>callout1 (Callout 1 Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the callout1 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>callout2 (Callout 2 Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p>




Enumeration Value	Description
	<p>[Note: An example of DrawingML which can be used to generate this preset shape definition is contained in the callout2 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
callout3 (Callout 3 Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[Note: An example of DrawingML which can be used to generate this preset shape definition is contained in the callout3 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
can (Can Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[Note: An example of DrawingML which can be used to generate this preset shape definition is contained in the can element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 




Enumeration Value	Description
chartPlus (Chart Plus Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the chartPlus element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
chartStar (Chart Star Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the chartStar element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
chartX (Chart X Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the chartX element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 



Enumeration Value	Description
chevron (Chevron Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the chevron element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
chord (Chord Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the chord element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
circularArrow (Circular Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the circularArrow element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 




Enumeration Value	Description
cloud (Cloud Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the cloud element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
cloudCallout (Callout Cloud Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the cloudCallout element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
corner (Corner Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the corner element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>




Enumeration Value	Description
	
cornerTabs (Corner Tabs Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[Note: An example of DrawingML which can be used to generate this preset shape definition is contained in the cornerTabs element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
cube (Cube Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[Note: An example of DrawingML which can be used to generate this preset shape definition is contained in the cube element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
curvedConnector2 (Curved Connector 2 Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[Note: An example of DrawingML which can be used to generate this preset shape definition is contained in the curvedConnector2 element in the preset shape</p>



Enumeration Value	Description
	<p>geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>curvedConnector3 (Curved Connector 3 Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the curvedConnector3 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>curvedConnector4 (Curved Connector 4 Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the curvedConnector4 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>curvedConnector5 (Curved Connector 5 Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to</p>




Enumeration Value	Description
	<p>generate this preset shape definition is contained in the curvedConnector5 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
curvedDownArrow (Curved Down Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the curvedDownArrow element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
curvedLeftArrow (Curved Left Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the curvedLeftArrow element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
curvedRightArrow (Curved Right Arrow Shape)	Specifies a preset shape geometry. This geometry shall

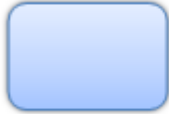


Enumeration Value	Description
	<p>be designed to match the normative image below.</p> <p>[Note: An example of DrawingML which can be used to generate this preset shape definition is contained in the curvedRightArrow element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
curvedUpArrow (Curved Up Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[Note: An example of DrawingML which can be used to generate this preset shape definition is contained in the curvedUpArrow element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
decagon (Decagon Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[Note: An example of DrawingML which can be used to generate this preset shape definition is contained in the decagon element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>




Enumeration Value	Description
	
diagStripe (Diagonal Stripe Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the diagStripe element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
diamond (Diamond Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the diamond element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
dodecagon (Dodecagon Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the dodecagon element in the preset shape</p>




Enumeration Value	Description
	<p>geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
donut (Donut Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the donut element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
doubleWave (Double Wave Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the doubleWave element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
downArrow (Down Arrow Shape)	Specifies a preset shape geometry. This geometry shall




Enumeration Value	Description
	<p>be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the downArrow element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
downArrowCallout (Callout Down Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the downArrowCallout element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
ellipse (Ellipse Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the ellipse element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>




Enumeration Value	Description
	
ellipseRibbon (Ellipse Ribbon Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the ellipseRibbon element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
ellipseRibbon2 (Ellipse Ribbon 2 Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the ellipseRibbon2 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
flowChartAlternateProcess (Alternate Process Flow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartAlternateProcess element in the preset shape geometries electronic addenda of Annex D. The</p>




Enumeration Value	Description
	<p>constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
flowChartCollate (Collate Flow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartCollate element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
flowChartConnector (Connector Flow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartConnector element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
flowChartDecision (Decision Flow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartDecision element in the preset shape geometries electronic addenda of Annex D. The</p>




Enumeration Value	Description
	<p>constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>flowChartDelay (Delay Flow Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartDelay element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>flowChartDisplay (Display Flow Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartDisplay element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>flowChartDocument (Document Flow Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartDocument element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are</p>



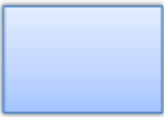
Enumeration Value	Description
	<p>described in further detail above. <i>end note</i>]</p> 
flowChartExtract (Extract Flow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartExtract element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
flowChartInputOutput (Input Output Flow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartInputOutput element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
flowChartInternalStorage (Internal Storage Flow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartInternalStorage element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are</p>




Enumeration Value	Description
	<p>described in further detail above. <i>end note</i>]</p> 
flowChartMagneticDisk (Magnetic Disk Flow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartMagneticDisk element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
flowChartMagneticDrum (Magnetic Drum Flow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartMagneticDrum element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
flowChartMagneticTape (Magnetic Tape Flow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartMagneticTape element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are</p>


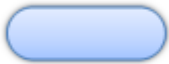

Enumeration Value	Description
	<p>described in further detail above. <i>end note</i>]</p> 
<p>flowChartManualInput (Manual Input Flow Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartManualInput element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>flowChartManualOperation (Manual Operation Flow Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartManualOperation element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>flowChartMerge (Merge Flow Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartMerge element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>




Enumeration Value	Description
	
flowChartMultidocument (Multi-Document Flow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the <code>flowChartMultidocument</code> element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
flowChartOfflineStorage (Offline Storage Flow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the <code>flowChartOfflineStorage</code> element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
flowChartOffpageConnector (Off-Page Connector Flow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the <code>flowChartOffpageConnector</code> element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that</p>




Enumeration Value	Description
	<p>are described in further detail above. <i>end note</i>]</p> 
<p>flowChartOnlineStorage (Online Storage Flow Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartOnlineStorage element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>flowChartOr (Or Flow Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartOr element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>flowChartPredefinedProcess (Predefined Process Flow Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartPredefinedProcess element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that</p>



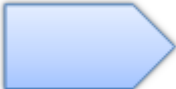
Enumeration Value	Description
	<p>are described in further detail above. <i>end note</i>]</p> 
flowChartPreparation (Preparation Flow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartPreparation element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
flowChartProcess (Process Flow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartProcess element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
flowChartPunchedCard (Punched Card Flow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartPunchedCard element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are</p>



Enumeration Value	Description
	<p>described in further detail above. <i>end note</i>]</p> 
<p>flowChartPunchedTape (Punched Tape Flow Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartPunchedTape element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>flowChartSort (Sort Flow Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartSort element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>flowChartSummingJunction (Summing Junction Flow Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in</p>




Enumeration Value	Description
	<p>the flowChartSummingJunction element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i></p> 
flowChartTerminator (Terminator Flow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[Note: An example of DrawingML which can be used to generate this preset shape definition is contained in the flowChartTerminator element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
foldedCorner (Folded Corner Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[Note: An example of DrawingML which can be used to generate this preset shape definition is contained in the foldedCorner element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
frame (Frame Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[Note: An example of DrawingML which can be used to generate this preset shape definition is contained in the frame element in the preset shape geometries</p>




Enumeration Value	Description
	<p>electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i></p> 
funnel (Funnel Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the funnel element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
gear6 (Gear 6 Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the gear6 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
gear9 (Gear 9 Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in</p>

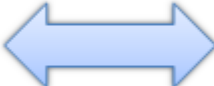


Enumeration Value	Description
	<p>the gear9 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i></p> 
halfFrame (Half Frame Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the halfFrame element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
heart (Heart Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the heart element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
heptagon (Heptagon Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p>




Enumeration Value	Description
	<p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the heptagon element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
hexagon (Hexagon Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the hexagon element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
homePlate (Home Plate Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the homePlate element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 




Enumeration Value	Description
horizontalScroll (Horizontal Scroll Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the horizontalScroll element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
irregularSeal1 (Irregular Seal 1 Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the irregularSeal1 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
irregularSeal2 (Irregular Seal 2 Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the irregularSeal2 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>


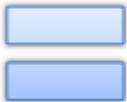
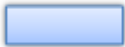
Enumeration Value	Description
	
leftArrow (Left Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the leftArrow element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
leftArrowCallout (Callout Left Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the leftArrowCallout element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
leftBrace (Left Brace Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the leftBrace element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>




Enumeration Value	Description
	
leftBracket (Left Bracket Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the leftBracket element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
leftCircularArrow (Left Circular Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the leftCircularArrow element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
leftRightArrow (Left Right Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the leftRightArrow element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are</p>




Enumeration Value	Description
	<p>described in further detail above. <i>end note</i>]</p> 
<p>leftRightArrowCallout (Callout Left Right Arrow Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the leftRightArrowCallout element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>leftRightCircularArrow (Left Right Circular Arrow Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the leftRightCircularArrow element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>leftRightRibbon (Left Right Ribbon Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the leftRightRibbon element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>




Enumeration Value	Description
	
leftRightUpArrow (Left Right Up Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the leftRightUpArrow element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
leftUpArrow (Left Up Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the leftUpArrow element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
lightningBolt (Lightning Bolt Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the lightningBolt element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>



Enumeration Value	Description
	
line (Line Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[Note: An example of DrawingML which can be used to generate this preset shape definition is contained in the line element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
lineInv (Line Inverse Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[Note: An example of DrawingML which can be used to generate this preset shape definition is contained in the lineInv element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
mathDivide (Divide Math Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[Note: An example of DrawingML which can be used to generate this preset shape definition is contained in</p>



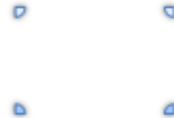
Enumeration Value	Description
	<p>the mathDivide element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i></p> 
mathEqual (Equal Math Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the mathEqual element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
mathMinus (Minus Math Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the mathMinus element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
mathMultiply (Multiply Math Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the mathMultiply element in the preset shape geometries electronic addenda of Annex D. The</p>




Enumeration Value	Description
	<p>constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
mathNotEqual (Not Equal Math Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the mathNotEqual element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
mathPlus (Plus Math Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the mathPlus element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
moon (Moon Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the moon element in the preset shape geometries</p>




Enumeration Value	Description
	<p>electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>nonIsoscelesTrapezoid (Non-Isosceles Trapezoid Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the nonIsoscelesTrapezoid element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>noSmoking (No Smoking Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the noSmoking element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>notchedRightArrow (Notched Right Arrow Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to</p>

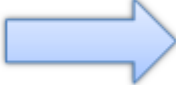

Enumeration Value	Description
	<p>generate this preset shape definition is contained in the notchedRightArrow element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
octagon (Octagon Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the octagon element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
parallelogram (Parallelogram Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the parallelogram element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
pentagon (Pentagon Shape)	Specifies a preset shape geometry. This geometry shall



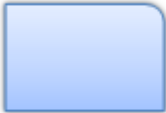
Enumeration Value	Description
	<p>be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the pentagon element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
pie (Pie Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the pie element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
pieWedge (Pie Wedge Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the pieWedge element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>

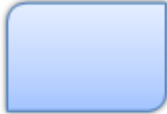
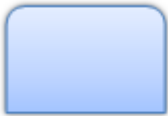

Enumeration Value	Description
	
plaque (Plaque Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the plaque element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
plaqueTabs (Plaque Tabs Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the plaqueTabs element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
plus (Plus Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the plus element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>




Enumeration Value	Description
	
quadArrow (Quad-Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the quadArrow element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
quadArrowCallout (Callout Quad-Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the quadArrowCallout element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
rect (Rectangle Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p>




Enumeration Value	Description
	<p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the rect element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
ribbon (Ribbon Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the ribbon element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
ribbon2 (Ribbon 2 Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the ribbon2 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
rightArrow (Right Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall</p>

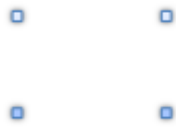

Enumeration Value	Description
	<p>be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the rightArrow element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
rightArrowCallout (Callout Right Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the rightArrowCallout element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
rightBrace (Right Brace Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the rightBrace element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>




Enumeration Value	Description
	
rightBracket (Right Bracket Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the rightBracket element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
round1Rect (One Round Corner Rectangle Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the round1Rect element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
round2DiagRect (Two Diagonal Round Corner Rectangle Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the round2DiagRect element in the preset shape geometries electronic addenda of Annex D. The</p>

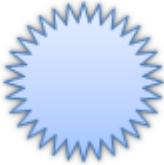


Enumeration Value	Description
	<p>constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>round2SameRect (Two Same-side Round Corner Rectangle Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the round2SameRect element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>roundRect (Round Corner Rectangle Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the roundRect element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p>rtTriangle (Right Triangle Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the rtTriangle element in the preset shape geometries</p>




Enumeration Value	Description
	<p>electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
smileyFace (Smiley Face Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the smileyFace element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
snip1Rect (One Snip Corner Rectangle Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the snip1Rect element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
snip2DiagRect (Two Diagonal Snip Corner Rectangle Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p>



Enumeration Value	Description
	<p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the <code>snip2DiagRect</code> element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p><code>snip2SameRect</code> (Two Same-side Snip Corner Rectangle Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the <code>snip2SameRect</code> element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
<p><code>snipRoundRect</code> (One Snip One Round Corner Rectangle Shape)</p>	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the <code>snipRoundRect</code> element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 




Enumeration Value	Description
squareTabs (Square Tabs Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the squareTabs element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
star10 (Ten Pointed Star Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the star10 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
star12 (Twelve Pointed Star Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the star12 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>




Enumeration Value	Description
	
star16 (Sixteen Pointed Star Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the star16 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
star24 (Twenty Four Pointed Star Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the star24 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
star32 (Thirty Two Pointed Star Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the star32 element in the preset shape geometries electronic addenda of Annex D. The constants used in</p>



Enumeration Value	Description
	<p>that markup are guides that are described in further detail above. <i>end note</i>]</p> 
star4 (Four Pointed Star Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the star4 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
star5 (Five Pointed Star Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the star5 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
star6 (Six Pointed Star Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p>




Enumeration Value	Description
	<p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the star6 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
star7 (Seven Pointed Star Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the star7 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
star8 (Eight Pointed Star Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the star8 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 




Enumeration Value	Description
straightConnector1 (Straight Connector 1 Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the straightConnector1 element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
stripedRightArrow (Striped Right Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the stripedRightArrow element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
sun (Sun Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the sun element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>


Enumeration Value	Description
	
swooshArrow (Swoosh Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the swooshArrow element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
teardrop (Teardrop Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the teardrop element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
trapezoid (Trapezoid Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the trapezoid element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further</p>

Enumeration Value	Description
	<p>detail above. <i>end note</i>]</p> 
triangle (Triangle Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the triangle element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
upArrow (Up Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the upArrow element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
upArrowCallout (Callout Up Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p>

Enumeration Value	Description
	<p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the upArrowCallout element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
upDownArrow (Up Down Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the upDownArrow element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
upDownArrowCallout (Callout Up Down Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note</i>: An example of DrawingML which can be used to generate this preset shape definition is contained in the upDownArrowCallout element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>

Enumeration Value	Description
	
uturnArrow (U-Turn Arrow Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the uturnArrow element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
verticalScroll (Vertical Scroll Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the verticalScroll element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
wave (Wave Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the wave element in the preset shape geometries</p>

Enumeration Value	Description
	<p>electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
wedgeEllipseCallout (Callout Wedge Ellipse Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the wedgeEllipseCallout element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
wedgeRectCallout (Callout Wedge Rectangle Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to generate this preset shape definition is contained in the wedgeRectCallout element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p> 
wedgeRoundRectCallout (Callout Wedge Round Rectangle Shape)	<p>Specifies a preset shape geometry. This geometry shall be designed to match the normative image below.</p> <p>[<i>Note:</i> An example of DrawingML which can be used to</p>

Enumeration Value	Description
	<p>generate this preset shape definition is contained in the wedgeRoundRectCallout element in the preset shape geometries electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i></p> 

[*Note*: The W3C XML Schema definition of this simple type’s content model ([ST_ShapeType](#)) is located in §A.4.1. *end note*]

20.1.10.56 [ST_StyleMatrixColumnIndex](#) ([Style Matrix Column Index](#))

This simple type specifies an index into one of the lists in the style matrix specified by the fmtScheme element (bgFillStyleLst, effectStyleLst, fillStyleLst, or lnStyleLst).

This simple type's contents are a restriction of the W3C XML Schema unsignedInt datatype.

[*Note*: The W3C XML Schema definition of this simple type’s content model ([ST_StyleMatrixColumnIndex](#)) is located in §A.4.1. *end note*]

20.1.10.57 [ST_SystemColorVal](#) ([System Color Value](#))

This simple type specifies a system color value. This color is based upon the value that this color currently has within the system on which the document is being viewed.

Applications shall use the lastClr attribute to determine the absolute value of the last color used if system colors are not supported.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
3dDkShadow (3D Dark System Color)	Specifies a Dark shadow color for three-dimensional display elements.
3dLight (3D Light System Color)	Specifies a Light color for three-dimensional display elements (for edges facing the light source).
activeBorder (Active Border System Color)	Specifies an Active Window Border Color.
activeCaption (Active Caption System Color)	Specifies the active window title bar color. In particular the left side color in the color gradient of an active

Enumeration Value	Description
	window's title bar if the gradient effect is enabled.
appWorkspace (Application Workspace System Color)	Specifies the Background color of multiple document interface (MDI) applications.
background (Background System Color)	Specifies the desktop background color.
btnFace (Button Face System Color)	Specifies the face color for three-dimensional display elements and for dialog box backgrounds.
btnHighlight (Button Highlight System Color)	Specifies the highlight color for three-dimensional display elements (for edges facing the light source).
btnShadow (Button Shadow System Color)	Specifies the shadow color for three-dimensional display elements (for edges facing away from the light source).
btnText (Button Text System Color)	Specifies the color of text on push buttons.
captionText (Caption Text System Color)	Specifies the color of text in the caption, size box, and scroll bar arrow box.
gradientActiveCaption (Gradient Active Caption System Color)	Specifies the right side color in the color gradient of an active window's title bar.
gradientInactiveCaption (Gradient Inactive Caption System Color)	Specifies the right side color in the color gradient of an inactive window's title bar.
grayText (Gray Text System Color)	Specifies a grayed (disabled) text. This color is set to 0 if the current display driver does not support a solid gray color.
highlight (Highlight System Color)	Specifies the color of Item(s) selected in a control.
highlightText (Highlight Text System Color)	Specifies the text color of item(s) selected in a control.
hotLight (Hot Light System Color)	Specifies the color for a hyperlink or hot-tracked item.
inactiveBorder (Inactive Border System Color)	Specifies the color of the Inactive window border.
inactiveCaption (Inactive Caption System Color)	Specifies the color of the Inactive window caption. Specifies the left side color in the color gradient of an inactive window's title bar if the gradient effect is enabled.
inactiveCaptionText (Inactive Caption Text System Color)	Specifies the color of text in an inactive caption.
infoBk (Info Back System Color)	Specifies the background color for tooltip controls.
infoText (Info Text System Color)	Specifies the text color for tooltip controls.
menu (Menu System Color)	Specifies the menu background color.
menuBar (Menu Bar System Color)	Specifies the background color for the menu bar when menus appear as flat menus.
menuHighlight (Menu Highlight System Color)	Specifies the color used to highlight menu items when the menu appears as a flat menu.

Enumeration Value	Description
menuText (Menu Text System Color)	Specifies the color of Text in menus.
scrollBar (Scroll Bar System Color)	Specifies the scroll bar gray area color.
window (Window System Color)	Specifies window background color.
windowFrame (Window Frame System Color)	Specifies the window frame color.
windowText (Window Text System Color)	Specifies the color of text in windows.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_SystemColorVal](#)) is located in §A.4.1. *end note*]

20.1.10.58 ST_TextAlignType (Text Alignment Types)

This simple type specifies the text alignment types

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
ctr (Text Alignment Enum (Center))	Align text in the center.
dist (Text Alignment Enum (Distributed))	Distributes the text words across an entire text line.
just (Text Alignment Enum (Justified))	Align text so that it is justified across the whole line. It is smart in the sense that it does not justify sentences which are short.
justLow (Text Alignment Enum (Justified Low))	Aligns the text with an adjusted kashida length for Arabic text.
l (Text Alignment Enum (Left))	Align text to the left margin.
r (Text Alignment Enum (Right))	Align text to the right margin.
thaiDist (Text Alignment Enum (Thai Distributed))	Distributes Thai text specially, because each character is treated as a word.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TextAlignType](#)) is located in §A.4.1. *end note*]

20.1.10.59 ST_TextAnchoringType (Text Anchoring Types)

This simple type specifies a list of available anchoring types for text.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
b (Text Anchor Enum (Bottom))	Anchor the text at the bottom of the bounding rectangle.
ctr (Text Anchor Enum (Center))	Anchor the text at the middle of the bounding rectangle.
dist (Text Anchor Enum (Distributed))	Anchor the text so that it is distributed vertically. When text is horizontal, this spaces out the actual lines of text and is almost always identical in behavior to anchorJustified (special case: if only 1 line, then anchored in middle). When text is vertical, then it distributes the letters vertically. This is different than anchorJustified, because it always forces distribution of the words, even if there are only one or two words in a line.
just (Text Anchor Enum (Justified))	Anchor the text so that it is justified vertically. When text is horizontal, this spaces out the actual lines of text and is almost always identical in behavior to 'distrib' (special case: if only 1 line, then anchored at top). When text is vertical, then it justifies the letters vertically. This is different than anchorDistributed, because in some cases such as very little text in a line, it does not justify.
t (Text Anchoring Type Enum (Top))	Anchor the text at the top of the bounding rectangle.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TextAnchoringType](#)) is located in §A.4.1. *end note*]

20.1.10.60 ST_TextAutonumberScheme (Text Auto-number Schemes)

This simple type specifies a list of automatic numbering schemes.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
alphaLcParenBoth (Autonumber Enum (alphaLcParenBoth))	(a), (b), (c), ...
alphaLcParenR (Autonumbering Enum (alphaLcParenR))	a), b), c), ...
alphaLcPeriod (Autonumbering Enum (alphaLcPeriod))	a., b., c., ...
alphaUcParenBoth (Autonumbering Enum ((A), (B), (C), ...

Enumeration Value	Description
alphaUcParenBoth))	
alphaUcParenR (Autonumbering Enum (alphaUcParenR))	A), B), C), ...
alphaUcPeriod (Autonumbering Enum (alphaUcPeriod))	A., B., C., ...
arabic1Minus (Autonumbering Enum (arabic1Minus))	Bidi Arabic 1 (AraAlpha) with ANSI minus symbol
arabic2Minus (Autonumbering Enum (arabic2Minus))	Bidi Arabic 2 (AraAbjad) with ANSI minus symbol
arabicDbPeriod (Autonumbering Enum (arabicDbPeriod))	Dbl-byte Arabic numbers w/ double-byte period
arabicDbPlain (Autonumbering Enum (arabicDbPlain))	Dbl-byte Arabic numbers
arabicParenBoth (Autonumbering Enum (arabicParenBoth))	(1), (2), (3), ...
arabicParenR (Autonumbering Enum (arabicParenR))	1), 2), 3), ...
arabicPeriod (Autonumbering Enum (arabicPeriod))	1., 2., 3., ...
arabicPlain (Autonumbering Enum (arabicPlain))	1, 2, 3, ...
circleNumDbPlain (Autonumbering Enum (circleNumDbPlain))	Dbl-byte circle numbers (1-10 circle[0x2460-], 11- arabic numbers)
circleNumWdBlackPlain (Autonumbering Enum (circleNumWdBlackPlain))	Wingdings black circle numbers
circleNumWdWhitePlain (Autonumbering Enum (circleNumWdWhitePlain))	Wingdings white circle numbers (0-10 circle[0x0080-], 11- arabic numbers)
ea1ChsPeriod (Autonumbering Enum (ea1ChsPeriod))	EA: Simplified Chinese w/ single-byte period
ea1ChsPlain (Autonumbering Enum (ea1ChsPlain))	EA: Simplified Chinese (TypeA 1-99, TypeC 100-)
ea1ChtPeriod (Autonumbering Enum (ea1ChtPeriod))	EA: Traditional Chinese w/ single-byte period
ea1ChtPlain (Autonumbering Enum (ea1ChtPlain))	EA: Traditional Chinese (TypeA 1-19, TypeC 20-)
ea1JpnChsDbPeriod (Autonumbering Enum (ea1JpnChsDbPeriod))	EA: Japanese w/ double-byte period
ea1JpnKorPeriod (Autonumbering Enum (ea1JpnKorPeriod))	EA: Japanese/Korean w/ single-byte period
ea1JpnKorPlain (Autonumbering Enum (ea1JpnKorPlain))	EA: Japanese/Korean (TypeC 1-)
hebrew2Minus (Autonumbering Enum (hebrew2Minus))	Bidi Hebrew 2 with ANSI minus symbol

Enumeration Value	Description
hindiAlpha1Period (Autonumbering Enum (hindiAlpha1Period))	Hindi alphabet period - consonants
hindiAlphaPeriod (Autonumbering Enum (hindiAlphaPeriod))	Hindi alphabet period - vowels
hindiNumParenR (Autonumbering Enum (hindiNumParenR))	Hindi numerical parentheses - right
hindiNumPeriod (Autonumbering Enum (hindiNumPeriod))	Hindi numerical period
romanLcParenBoth (Autonumbering Enum (romanLcParenBoth))	(i), (ii), (iii), ...
romanLcParenR (Autonumbering Enum (romanLcParenR))	i), ii), iii), ...
romanLcPeriod (Autonumbering Enum (romanLcPeriod))	i., ii., iii., ...
romanUcParenBoth (Autonumbering Enum (romanUcParenBoth))	(I), (II), (III), ...
romanUcParenR (Autonumbering Enum (romanUcParenR))	I), II), III), ...
romanUcPeriod (Autonumbering Enum (romanUcPeriod))	I., II., III., ...
thaiAlphaParenBoth (Autonumbering Enum (thaiAlphaParenBoth))	Thai alphabet parentheses - both
thaiAlphaParenR (Autonumbering Enum (thaiAlphaParenR))	Thai alphabet parentheses - right
thaiAlphaPeriod (Autonumbering Enum (thaiAlphaPeriod))	Thai alphabet period
thaiNumParenBoth (Autonumbering Enum (thaiNumParenBoth))	Thai numerical parentheses - both
thaiNumParenR (Autonumbering Enum (thaiNumParenR))	Thai numerical parentheses - right
thaiNumPeriod (Autonumbering Enum (thaiNumPeriod))	Thai numerical period

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TextAutonumberScheme](#)) is located in §A.4.1. *end note*]

20.1.10.61 ST_TextBulletSizePercent (Bullet Size Percentage)

This simple type specifies the range that the bullet percent can be. A bullet percent is the size of the bullet with respect to the text that should follow it.

This simple type also specifies the following restrictions:

- This simple type's contents shall match the following regular expression pattern:
`0*((2[5-9])|([3-9][0-9])|([1-3][0-9][0-9])|400)%`.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TextBulletSizePercent](#)) is located in §A.4.1. *end note*]

20.1.10.62 [ST_TextBulletStartAtNum](#) (Start Bullet At Number)

This simple type specifies the range that the start at number for a bullet's auto-numbering sequence can begin at. When the numbering is alphabetical, then the numbers map to the appropriate letter. 1->a, 2->b, etc. If the numbers go above 26, then the numbers begin to double up. For example, 27->aa and 53->aaa.

This simple type's contents are a restriction of the W3C XML Schema `int` datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 1.
- This simple type has a maximum value of less than or equal to 32767.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TextBulletStartAtNum](#)) is located in §A.4.1. *end note*]

20.1.10.63 [ST_TextCapsType](#) (Text Cap Types)

This simple type specifies the cap types of the text.

This simple type's contents are a restriction of the W3C XML Schema `token` datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
all (Text Caps Enum (All))	Apply all caps on the text. All lower case letters are converted to upper case even though they are stored differently in the backing store.
none (Text Caps Enum (None))	The reason we cannot implicitly have noCaps be the scenario where capitalization is not specified is because not being specified implies deriving from a particular style and the user might want to override that and make some text not have a capitalization scheme even though the style says otherwise.
small (Text Caps Enum (Small))	Apply small caps to the text. All letters are converted to lower case.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TextCapsType](#)) is located in §A.4.1. *end note*]

20.1.10.64 ST_TextColumnCount (Text Column Count)

This simple type specifies the number of columns.

This simple type's contents are a restriction of the W3C XML Schema `int` datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 1.
- This simple type has a maximum value of less than or equal to 16.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TextColumnCount](#)) is located in §A.4.1. *end note*]

20.1.10.65 ST_TextFontAlignType (Font Alignment Types)

This simple type specifies the different kinds of font alignment.

This simple type's contents are a restriction of the W3C XML Schema `token` datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
auto (Font Alignment Enum (Automatic))	When the text flow is horizontal or simple vertical same as fontBaseline but for other vertical modes same as fontCenter.
b (Font Alignment Enum (Bottom))	The letters are anchored to the very bottom of a single line. This is different than the bottom baseline because of letters such as "g," "q," "y," etc.
base (Font Alignment Enum (Baseline))	The letters are anchored to the bottom baseline of a single line.
ctr (Font Alignment Enum (Center))	The letters are anchored between the two baselines of a single line.
t (Font Alignment Enum (Top))	The letters are anchored to the top baseline of a single line.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TextFontAlignType](#)) is located in §A.4.1. *end note*]

20.1.10.66 ST_TextFontScalePercentOrPercentString (Text Font Scale Percentage)

This simple type specifies that its contents will contain a text font scale percent percentage. See the union's member types for details.

This simple type is a union of the following types:

- The `ST_Percentage` simple type (§22.9.2.9).

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_TextFontScalePercentOrPercentString](#)) is located in §A.4.1. *end note*]

20.1.10.67 ST_TextFontSize (Text Font Size)

This simple type specifies the size of any text in hundredths of a point. Shall be at least 1 point.

This simple type's contents are a restriction of the W3C XML Schema int datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 100.
- This simple type has a maximum value of less than or equal to 400000.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_TextFontSize](#)) is located in §A.4.1. *end note*]

20.1.10.68 ST_TextHorzOverflowType (Text Horizontal Overflow Types)

This simple type specifies the text horizontal overflow types

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
clip (Text Horizontal Overflow Enum (Clip))	When a big character does not fit into a line, clip it at the proper horizontal overflow.
overflow (Text Horizontal Overflow Enum (Overflow))	When a big character does not fit into a line, allow a horizontal overflow.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_TextHorzOverflowType](#)) is located in §A.4.1. *end note*]

20.1.10.69 ST_TextIndent (Text Indentation)

This simple type specifies the text indentation amount to be used.

The units of measurement used here are EMUs (English Metric Units).

This simple type's contents are a restriction of the ST_Coordinate32Unqualified datatype (§20.1.10.18).

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to -51206400.
- This simple type has a maximum value of less than or equal to 51206400.

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_TextIndent](#)) is located in §A.4.1. end note*]

20.1.10.70 [ST_TextIndentLevelType \(Text Indent Level Type\)](#)

This simple type specifies the indent level type. We support list level 0 to 8, and we use -1 and -2 for outline mode levels that should only exist in memory.

This simple type's contents are a restriction of the W3C XML Schema int datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 0.
- This simple type has a maximum value of less than or equal to 8.

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_TextIndentLevelType](#)) is located in §A.4.1. end note*]

20.1.10.71 [ST_TextMargin \(Text Margin\)](#)

This simple type specifies the margin that is used and its corresponding size.

This simple type's contents are a restriction of the ST_Coordinate32Unqualified datatype (§20.1.10.18).

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 0.
- This simple type has a maximum value of less than or equal to 51206400.

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_TextMargin](#)) is located in §A.4.1. end note*]

20.1.10.72 [ST_TextNonNegativePoint \(Text Non-Negative Point\)](#)

This simple type specifies a non-negative font size in hundredths of a point. This is restricted to the range [0, 400000].

This simple type's contents are a restriction of the W3C XML Schema int datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 0.
- This simple type has a maximum value of less than or equal to 400000.

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_TextNonNegativePoint](#)) is located in §A.4.1. end note*]

20.1.10.73 ST_TextPoint (Text Point)

This simple type specifies a coordinate within the document. This can be used for measurements or spacing; its maximum size is +/- 4000 points.

Its contents can contain either:

- A whole number, whose contents consist of a measurement in hundredths of a point
- A number immediately followed by a unit identifier

This simple type is a union of the following types:

- The ST_TextPointUnqualified simple type (§20.1.10.74).
- The ST_UniversalMeasure simple type (§22.9.2.15).

[Note: The W3C XML Schema definition of this simple type's content model (ST_TextPoint) is located in §A.4.1. *end note*]

20.1.10.74 ST_TextPointUnqualified (Text Point)

This simple type specifies a font size in hundredths of a point. This is restricted to the range [-400000, 400000], i.e from -4000 pt to 4000 pt.

This simple type's contents are a restriction of the W3C XML Schema int datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to -400000.
- This simple type has a maximum value of less than or equal to 400000.

[Note: The W3C XML Schema definition of this simple type's content model (ST_TextPointUnqualified) is located in §A.4.1. *end note*]

20.1.10.75 ST_TextShapeType (Preset Text Shape Types)

This simple type specifies the preset text shape geometry that is to be used for a shape. An enumeration of this simple type is used so that a custom geometry does not have to be specified but instead can be constructed automatically by the generating application. For each enumeration listed there is also the corresponding DrawingML code that would be used to construct this shape were it a custom geometry. Within the construction code for each of these preset text shapes there are predefined guides that the generating application shall maintain for calculation purposes at all times. The necessary guides should have the following values.

3/4 of a Circle ('3cd4') - Constant value of "16200000.0"

The units here are in 60,000ths of a degree. This is equivalent to 270 degrees.

3/8 of a Circle ('3cd8') - Constant value of "8100000.0"

The units here are in 60,000ths of a degree. This is equivalent to 135 degrees.

5/8 of a Circle ('5cd8') - Constant value of "13500000.0"

The units here are in 60,000ths of a degree. This is equivalent to 225 degrees.

7/8 of a Circle ('7cd8') - Constant value of "18900000.0"

The units here are in 60,000ths of a degree. This is equivalent to 315 degrees.

Shape Bottom Edge ('b') - Constant value of "h"

This is the bottom edge of the shape and since the top edge of the shape is considered the 0 point, the bottom edge is thus the shape height.

1/2 of a Circle ('cd2') - Constant value of "10800000.0"

The units here are in 60,000ths of a degree. This is equivalent to 180 degrees.

1/4 of a Circle ('cd4') - Constant value of "5400000.0"

The units here are in 60,000ths of a degree. This is equivalent to 90 degrees.

1/8 of a Circle ('cd8') - Constant value of "2700000.0"

The units here are in 60,000ths of a degree. This is equivalent to 45 degrees.

Shape Height ('h')

This is the variable height of the shape defined in the shape properties. This value is received from the shape transform listed within the <spPr> element.

Horizontal Center ('hc') - Calculated value of "*/ w 1.0 2.0"

This is the horizontal center of the shape which is just the width divided by 2.

1/2 of Shape Height ('hd2') - Calculated value of "*/ h 1.0 2.0"

This is 1/2 the shape height.

1/4 of Shape Height ('hd4') - Calculated value of "*/ h 1.0 4.0"

This is 1/4 the shape height.

1/5 of Shape Height ('hd5') - Calculated value of "*/ h 1.0 5.0"

This is 1/5 the shape height.

1/6 of Shape Height ('hd6') - Calculated value of "*/ h 1.0 6.0"

This is 1/6 the shape height.

1/8 of Shape Height ('hd8') - Calculated value of "*/ h 1.0 8.0"

This is 1/8 the shape height.

Shape Left Edge ('l') - Constant value of "0"

This is the left edge of the shape and the left edge of the shape is considered the horizontal 0 point.

Longest Side of Shape ('ls') - Calculated value of "max w h"

This is the longest side of the shape. This value is either the width or the height depending on which is greater.

Shape Right Edge ('r') - Constant value of "w"

This is the right edge of the shape and since the left edge of the shape is considered the 0 point, the right edge is thus the shape width.

Shortest Side of Shape ('ss') - Calculated value of "min w h"

This is the shortest side of the shape. This value is either the width or the height depending on which is smaller.

1/2 Shortest Side of Shape ('ssd2') - Calculated value of "*/ ss 1.0 2.0"

This is 1/2 the shortest side of the shape.

1/4 Shortest Side of Shape ('ssd4') - Calculated value of `"*/ ss 1.0 4.0"`

This is 1/4 the shortest side of the shape.

1/6 Shortest Side of Shape ('ssd6') - Calculated value of `"*/ ss 1.0 6.0"`

This is 1/6 the shortest side of the shape.

1/8 Shortest Side of Shape ('ssd8') - Calculated value of `"*/ ss 1.0 8.0"`

This is 1/8 the shortest side of the shape.

Shape Top Edge ('t') - Constant value of `"0"`

This is the top edge of the shape and the top edge of the shape is considered the vertical 0 point.

Vertical Center of Shape ('vc') - Calculated value of `"*/ h 1.0 2.0"`

This is the vertical center of the shape which is just the height divided by 2.

Shape Width ('w')

This is the variable width of the shape defined in the shape properties. This value is received from the shape transform listed within the `<spPr>` element.

1/2 of Shape Width ('wd2') - Calculated value of `"*/ w 1.0 2.0"`

This is 1/2 the shape width.

1/4 of Shape Width ('wd4') - Calculated value of `"*/ w 1.0 4.0"`

This is 1/4 the shape width.

1/5 of Shape Width ('wd5') - Calculated value of `"*/ w 1.0 5.0"`

This is 1/5 the shape width.

1/6 of Shape Width ('wd6') - Calculated value of `"*/ w 1.0 6.0"`

This is 1/6 the shape width.

1/8 of Shape Width ('wd8') - Calculated value of `"*/ w 1.0 8.0"`


This is 1/8 the shape width.


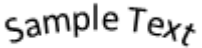
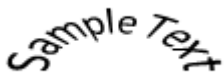
1/10 of Shape Width ('wd10') - Calculated value of `"*/ w 1.0 10.0"`



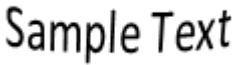
This is 1/10 the shape width.

This simple type's contents are a restriction of the W3C XML Schema token datatype.


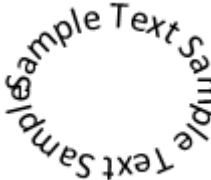
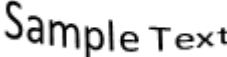
This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
textArchDown (Downward Arch Text Shape)	<div></div> <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[Note: An example of DrawingML markup which can</p>



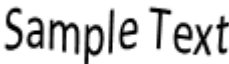
Enumeration Value	Description
	<p>be used to achieve this effect is contained in the textArchDown element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textArchDownPour (Downward Pour Arch Text Shape)	 <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note</i>: An example of DrawingML markup which can be used to achieve this effect is contained in the textArchDownPour element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textArchUp (Upward Arch Text Shape)	 <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note</i>: An example of DrawingML markup which can be used to achieve this effect is contained in the textArchUp element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textArchUpPour (Upward Pour Arch Text Shape)	 <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note</i>: An example of DrawingML markup which can be used to achieve this effect is contained in the textArchUpPour element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>


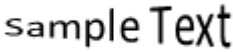
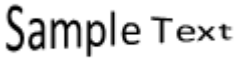
Enumeration Value	Description
textButton (Button Text Shape)	 <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note:</i> An example of DrawingML markup which can be used to achieve this effect is contained in the textButton element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textButtonPour (Button Pour Text Shape)	 <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note:</i> An example of DrawingML markup which can be used to achieve this effect is contained in the textButtonPour element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textCanDown (Downward Can Text Shape)	 <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note:</i> An example of DrawingML markup which can be used to achieve this effect is contained in the textCanDown element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>





Enumeration Value	Description
textCanUp (Upward Can Text Shape)	<p data-bbox="852 275 1084 331">Sample Text</p> <p data-bbox="824 369 1455 436">Specifies a text shape that shall match the normative shape shown above.</p> <p data-bbox="824 474 1468 684">[Note: An example of DrawingML markup which can be used to achieve this effect is contained in the textCanUp element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textCascadeDown (Downward Cascade Text Shape)	<p data-bbox="852 732 1084 789">Sample Text</p> <p data-bbox="824 827 1455 894">Specifies a text shape that shall match the normative shape shown above.</p> <p data-bbox="824 932 1468 1142">[Note: An example of DrawingML markup which can be used to achieve this effect is contained in the textCascadeDown element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textCascadeUp (Upward Cascade Text Shape)	<p data-bbox="852 1180 1084 1236">Sample Text</p> <p data-bbox="824 1274 1455 1341">Specifies a text shape that shall match the normative shape shown above.</p> <p data-bbox="824 1379 1468 1589">[Note: An example of DrawingML markup which can be used to achieve this effect is contained in the textCascadeUp element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textChevron (Chevron Text Shape)	<p data-bbox="852 1629 1084 1686">Sample Text</p> <p data-bbox="824 1724 1455 1791">Specifies a text shape that shall match the normative shape shown above.</p> <p data-bbox="824 1829 1455 1896">[Note: An example of DrawingML markup which can be used to achieve this effect is contained in the</p>



Enumeration Value	Description
	textChevron element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]
textChevronInverted (Inverted Chevron Text Shape)	 <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note:</i> An example of DrawingML markup which can be used to achieve this effect is contained in the textChevronInverted element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textCircle (Circle Text Shape)	<p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note:</i> An example of DrawingML markup which can be used to achieve this effect is contained in the textCircle element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textCirclePour (Circle Pour Text Shape)	 <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note:</i> An example of DrawingML markup which can be used to achieve this effect is contained in the textCirclePour element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textCurveDown (Downward Curve Text Shape)	

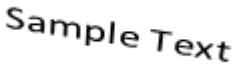
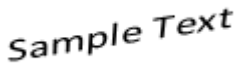


Enumeration Value	Description
	<p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note:</i> An example of DrawingML markup which can be used to achieve this effect is contained in the textCurveDown element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textCurveUp (Upward Curve Text Shape)	<p style="text-align: center;">Sample Text</p> <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note:</i> An example of DrawingML markup which can be used to achieve this effect is contained in the textCurveUp element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textDeflate (Deflate Text Shape)	<p style="text-align: center;">Sample Text</p> <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note:</i> An example of DrawingML markup which can be used to achieve this effect is contained in the textDeflate element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textDeflateBottom (Bottom Deflate Text Shape)	<p style="text-align: center;">Sample Text</p> <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note:</i> An example of DrawingML markup which can be used to achieve this effect is contained in the textDeflateBottom element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further</p>

Enumeration Value	Description
	detail above. <i>end note</i>]
textDeflateInflate (Deflate-Inflate Text Shape)	 <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note:</i> An example of DrawingML markup which can be used to achieve this effect is contained in the textDeflateInflate element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textDeflateInflateDeflate (Deflate-Inflate-Deflate Text Shape)	 <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note:</i> An example of DrawingML markup which can be used to achieve this effect is contained in the textDeflateInflateDeflate element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textDeflateTop (Top Deflate Text Shape)	<p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note:</i> An example of DrawingML markup which can be used to achieve this effect is contained in the textDeflateTop element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textDoubleWave1 (Double Wave 1 Text Shape)	 <p>Specifies a text shape that shall match the normative shape shown above.</p>

Enumeration Value	Description
	<p>[Note: An example of DrawingML markup which can be used to achieve this effect is contained in the textDoubleWave1 element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textFadeDown (Downward Fade Text Shape)	 <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[Note: An example of DrawingML markup which can be used to achieve this effect is contained in the textFadeDown element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textFadeLeft (Left Fade Text Shape)	 <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[Note: An example of DrawingML markup which can be used to achieve this effect is contained in the textFadeLeft element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textFadeRight (Right Fade Text Shape)	 <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[Note: An example of DrawingML markup which can be used to achieve this effect is contained in the textFadeRight element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>

Enumeration Value	Description
textFadeUp (Upward Fade Text Shape)	 <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note:</i> An example of DrawingML markup which can be used to achieve this effect is contained in the textFadeUp element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textInflate (Inflate Text Shape)	 <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note:</i> An example of DrawingML markup which can be used to achieve this effect is contained in the textInflate element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textInflateBottom (Bottom Inflate Text Shape)	 <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note:</i> An example of DrawingML markup which can be used to achieve this effect is contained in the textInflateBottom element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textInflateTop (Top Inflate Text Shape)	 <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note:</i> An example of DrawingML markup which can be used to achieve this effect is contained in the</p>

Enumeration Value	Description
	textInflateTop element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>
textNoShape (No Text Shape)	Specifies that the text has no associated shape with it and thus the text should not be warped but instead be constrained by the normal text bounding box.
textPlain (Plain Text Shape)	<p data-bbox="857 548 1089 617">Sample Text</p> <p data-bbox="824 657 1456 720">Specifies a text shape that shall match the normative shape shown above.</p> <p data-bbox="824 762 1463 968">[Note: An example of DrawingML markup which can be used to achieve this effect is contained in the textPlain element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textRingInside (Inside Ring Text Shape)	<p data-bbox="852 1014 1084 1077"></p> <p data-bbox="824 1104 1456 1167">Specifies a text shape that shall match the normative shape shown above.</p> <p data-bbox="824 1209 1463 1415">[Note: An example of DrawingML markup which can be used to achieve this effect is contained in the textRingInside element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textRingOutside (Outside Ring Text Shape)	<p data-bbox="852 1461 1084 1524"></p> <p data-bbox="824 1551 1456 1614">Specifies a text shape that shall match the normative shape shown above.</p> <p data-bbox="824 1656 1446 1793">[Note: An example of DrawingML markup which can be used to achieve this effect is contained in the textRingOutside element in the preset text warp electronic addenda of Annex D.</p> <p data-bbox="824 1835 1463 1866">The constants used in that markup are guides that are</p>

Enumeration Value	Description
	described in further detail above. <i>end note</i>]
textSlantDown (Downward Slant Text Shape)	 <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note</i>: An example of DrawingML markup which can be used to achieve this effect is contained in the textSlantDown element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textSlantUp (Upward Slant Text Shape)	 <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note</i>: An example of DrawingML markup which can be used to achieve this effect is contained in the textSlantUp element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textStop (Stop Sign Text Shape)	 <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note</i>: An example of DrawingML markup which can be used to achieve this effect is contained in the textStop element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textTriangle (Triangle Text Shape)	 <p>Specifies a text shape that shall match the normative shape shown above.</p>

Enumeration Value	Description
	<p>[<i>Note</i>: An example of DrawingML markup which can be used to achieve this effect is contained in the textTriangle element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textTriangleInverted (Inverted Triangle Text Shape)	<p style="text-align: center;">Sample Text</p> <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note</i>: An example of DrawingML markup which can be used to achieve this effect is contained in the textTriangleInverted element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textWave1 (Wave 1 Text Shape)	<p style="text-align: center;">Sample Text</p> <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note</i>: An example of DrawingML markup which can be used to achieve this effect is contained in the textWave1 element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>
textWave2 (Wave 2 Text Shape)	<p style="text-align: center;">Sample Text</p> <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note</i>: An example of DrawingML markup which can be used to achieve this effect is contained in the textWave2 element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>

Enumeration Value	Description
textWave4 (Wave 4 Text Shape)	<div>Sample Text</div> <p>Specifies a text shape that shall match the normative shape shown above.</p> <p>[<i>Note</i>: An example of DrawingML markup which can be used to achieve this effect is contained in the textWave4 element in the preset text warp electronic addenda of Annex D. The constants used in that markup are guides that are described in further detail above. <i>end note</i>]</p>

[*Note*: The W3C XML Schema definition of this simple type’s content model ([ST_TextShapeType](#)) is located in §A.4.1. *end note*]

20.1.10.76 [ST_TextSpacingPercentOrPercentString \(Text Spacing Percent\)](#)

This simple type specifies that its contents will contain a text font spacing percentage. See the union's member types for details.

This simple type is a union of the following types:

- The ST_Percentage simple type (§22.9.2.9).

[*Note*: The W3C XML Schema definition of this simple type’s content model ([ST_TextSpacingPercentOrPercentString](#)) is located in §A.4.1. *end note*]

20.1.10.77 [ST_TextSpacingPoint \(Text Spacing Point\)](#)

This simple type specifies the Text Spacing that is used in terms of font point size.

This simple type's contents are a restriction of the W3C XML Schema int datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 0.
- This simple type has a maximum value of less than or equal to 158400.

[*Note*: The W3C XML Schema definition of this simple type’s content model ([ST_TextSpacingPoint](#)) is located in §A.4.1. *end note*]

20.1.10.78 [ST_TextStrikeType \(Text Strike Type\)](#)

This simple type specifies the strike type.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
dblStrike (Text Strike Enum (Double Strike))	A double strikethrough applied on the text
noStrike (Text Strike Enum (No Strike))	No strike is applied to the text
sngStrike (Text Strike Enum (Single Strike))	A single strikethrough is applied to the text

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TextStrikeType](#)) is located in §A.4.1. *end note*]

20.1.10.79 ST_TextTabAlignType (Text Tab Alignment Types)

This simple type specifies the text tab alignment types.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
ctr (Text Tab Alignment Enum (Center))	The text at this tab stop is center aligned.
dec (Text Tab Alignment Enum (Decimal))	At this tab stop, the decimals are lined up. From a user's point of view, the text here behaves as right aligned until the decimal, and then as left aligned after the decimal.
l (Text Tab Alignment Enum (Left))	The text at this tab stop is left aligned.
r (Text Tab Alignment Enum (Right))	The text at this tab stop is right aligned.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TextTabAlignType](#)) is located in §A.4.1. *end note*]

20.1.10.80 ST_TextTypeface (Text Typeface)

This simple type specifies the way we represent a font typeface.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TextTypeface](#)) is located in §A.4.1. *end note*]

20.1.10.81 ST_TextUnderlineType (Text Underline Types)

This simple type specifies the text underline types that is used.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
dash (Text Underline Enum (Dashed))	Underline the text with a single, dashed line of normal thickness.
dashHeavy (Text Underline Enum (Heavy Dashed))	Underline the text with a single, dashed, thick line.
dashLong (Text Underline Enum (Long Dashed))	Underline the text with a single line consisting of long dashes of normal thickness.
dashLongHeavy (Text Underline Enum (Heavy Long Dashed))	Underline the text with a single line consisting of long, thick dashes.
dbl (Text Underline Enum (Double))	Underline the text with two lines of normal thickness.
dotDash (Text Underline Enum (Dot Dash))	Underline the text with a single line of normal thickness consisting of repeating dots and dashes.
dotDashHeavy (Text Underline Enum (Heavy Dot Dash))	Underline the text with a single, thick line consisting of repeating dots and dashes.
dotDotDash (Text Underline Enum (Dot Dot Dash))	Underline the text with a single line of normal thickness consisting of repeating two dots and dashes.
dotDotDashHeavy (Text Underline Enum (Heavy Dot Dot Dash))	Underline the text with a single, thick line consisting of repeating two dots and dashes.
dotted (Text Underline Enum (Dotted))	Underline the text with a single, dotted line of normal thickness.
dottedHeavy (Text Underline Enum (Heavy Dotted))	Underline the text with a single, thick, dotted line.
heavy (Text Underline Enum (Heavy))	Underline the text with a single, thick line.
none (Text Underline Enum (None))	The reason we cannot implicitly have noUnderline be the scenario where underline is not specified is because not being specified implies deriving from a particular style and the user might want to override that and make some text not be underlined even though the style says otherwise.
sng (Text Underline Enum (Single))	Underline the text with a single line of normal thickness.
wavy (Text Underline Enum (Wavy))	Underline the text with a single wavy line of normal thickness.
wavyDbl (Text Underline Enum (Double Wavy))	Underline the text with two wavy lines of normal thickness.
wavyHeavy (Text Underline Enum (Heavy Wavy))	Underline the text with a single, thick wavy line.
words (Text Underline Enum (Words))	Underline just the words and not the spaces between them.

[Note: The W3C XML Schema definition of this simple type's content model ([ST TextUnderlineType](#)) is located in §A.4.1. *end note*]

20.1.10.82 [ST_TextVerticalType](#) (Vertical Text Types)

If there is vertical text, determines what kind of vertical text is going to be used.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
eaVert (Vertical Text Type Enum (East Asian Vertical))	A special version of vertical text, where some fonts are displayed as if rotated by 90 degrees while some fonts (mostly East Asian) are displayed vertical.
horz (Vertical Text Type Enum (Horizontal))	Horizontal text. This should be default.
mongolianVert (Vertical Text Type Enum (Mongolian Vertical))	A special version of vertical text, where some fonts are displayed as if rotated by 90 degrees while some fonts (mostly East Asian) are displayed vertical. The difference between this and the eastAsianVertical is the text flows top down then LEFT RIGHT, instead of RIGHT LEFT
vert (Vertical Text Type Enum (Vertical))	Determines if all of the text is vertical orientation (each line is 90 degrees rotated clockwise, so it goes from top to bottom; each next line is to the left from the previous one).
vert270 (Vertical Text Type Enum (Vertical 270))	Determines if all of the text is vertical orientation (each line is 270 degrees rotated clockwise, so it goes from bottom to top; each next line is to the right from the previous one).
wordArtVert (Vertical Text Type Enum (WordArt Vertical))	Determines if all of the text is vertical ("one letter on top of another").
wordArtVertRtl (Vertical WordArt Right to Left)	Specifies that vertical WordArt should be shown from right to left rather than left to right.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TextVerticalType](#)) is located in §A.4.1. *end note*]

20.1.10.83 [ST_TextVertOverflowType](#) (Text Vertical Overflow)

This simple type specifies the text vertical overflow.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
clip (Text Overflow Enum (Clip))	Pay attention to top and bottom barriers. Provide no indication that there is text which is not visible.

Enumeration Value	Description
ellipsis (Text Overflow Enum (Ellipsis))	Pay attention to top and bottom barriers. Use an ellipsis to denote that there is text which is not visible.
overflow (Text Overflow Enum (Overflow))	Overflow the text and pay no attention to top and bottom barriers.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_TextVertOverflowType](#)) is located in §A.4.1. *end note*]

20.1.10.84 ST_TextWrappingType (Text Wrapping Types)

Text Wrapping Types

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
none (Text Wrapping Type Enum (None))	No wrapping occurs on this text body. Words spill out without paying attention to the bounding rectangle boundaries.
square (Text Wrapping Type Enum (Square))	Determines whether we wrap words within the bounding rectangle.

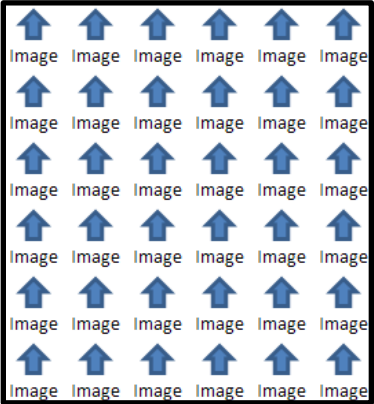
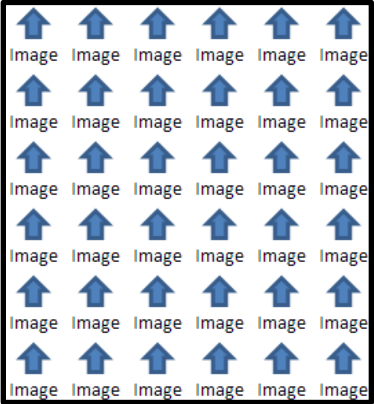
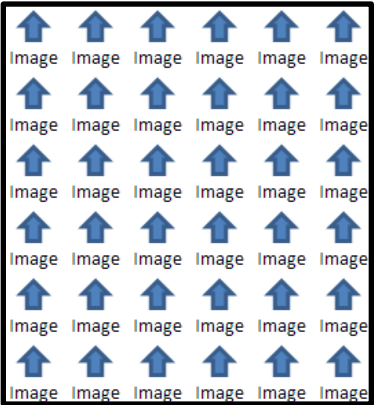
[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_TextWrappingType](#)) is located in §A.4.1. *end note*]

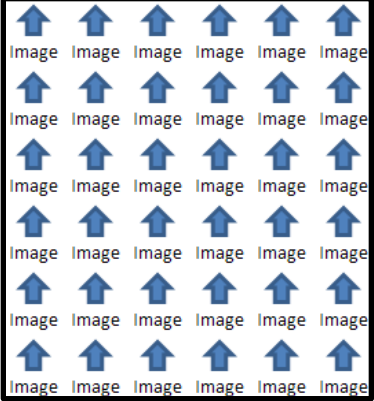
20.1.10.85 ST_TileFlipMode (Tile Flip Mode)

This simple type indicates whether/how to flip the contents of a tile region when using it to fill a larger fill region.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
none (None)	<div></div> <p>Tiles are not flipped.</p>
x (Horizontal)	<div></div> <p>Tiles are flipped horizontally.</p>
xy (Horizontal and Vertical)	<div></div> <p>Tiles are flipped both horizontally and vertically.</p>

Enumeration Value	Description
y (Vertical)	<div></div> <p>Tiles are flipped vertically.</p>

[Note: The W3C XML Schema definition of this simple type’s content model ([ST_TileFlipMode](#)) is located in §A.4.1. *end note*]

20.1.10.86 **ST_TextBulletSize (Bullet Size Percentage)**

This simple type specifies the range that the bullet percent can be. A bullet percent is the size of the bullet with respect to the text that should follow it, with a minimum size of 25% and maximum size of 400%.

This simple type is a union of the following types:

- The ST_TextBulletSizePercent simple type (§20.1.10.62)

[Note: The W3C XML Schema definition of this simple type’s content model (ST_TextBulletSize) is located in §A.4.1. *end note*]

20.2 **DrawingML - Picture**

These elements encompass the definition of pictures within the DrawingML framework. While pictures are in many ways very similar to shapes they have specific properties that are unique in order to optimize for picture-specific scenarios. Some of these properties include Fill behavior, Border behavior and Resize behavior.



20.2.1 Table of Contents

This subclause is informative.

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End of informative text.

20.2.2 Elements

The following section defines the Picture portion of the DrawingML framework.

20.2.2.1 blipFill (Picture Fill)

This element specifies the type of picture fill that the picture object has. Because a picture has a picture fill already by default, it is possible to have two fills specified for a picture object. An example of this is shown below.

[Example: Consider the picture below that has a blip fill applied to it. The image used to fill this picture object has transparent pixels instead of white pixels.

```
<pic:pic>
...
<pic:blipFill>
  <a:blip r:embed="rId2"/>
  <a:stretch>
    <a:fillRect/>
  </a:stretch>
</pic:blipFill>
...
</pic:pic>
```



The above picture object is shown as an example of this fill type. *end example*]

[*Example:* Consider now the same picture object but with an additional gradient fill applied within the shape properties portion of the picture.

```
<pic:pic>
...
<pic:blipFill>
  <a:blip r:embed="rId2"/>
  <a:stretch>
    <a:fillRect/>
  </a:stretch>
</pic:blipFill>
<pic:spPr>
  <a:gradFill>
    <a:gsLst>
      <a:gs pos="0">
        <a:schemeClr val="tx2">
          <a:shade val="50000"/>
        </a:schemeClr>
      </a:gs>
      <a:gs pos="39999">
        <a:schemeClr val="tx2">
          <a:tint val="20000"/>
        </a:schemeClr>
      </a:gs>
      <a:gs pos="70000">
        <a:srgbClr val="C4D6EB"/>
      </a:gs>
      <a:gs pos="100000">
        <a:schemeClr val="bg1"/>
      </a:gs>
    </a:gsLst>
  </a:gradFill>
</pic:spPr>
```

```

        </a:gs>
    </a:gsLst>
    </a:gradFill>
</pic:spPr>
...
</pic:pic>

```



The above picture object is shown as an example of this double fill type. *end example*]

Attributes	Description
dpi (DPI Setting) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies the DPI (dots per inch) used to calculate the size of the blip. If not present or zero, the DPI in the blip is used. [Note: This attribute is primarily used to keep track of the picture quality within a document. There are different levels of quality needed for print than on-screen viewing and thus a need to track this information. <i>end note</i>] The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
rotWithShape (Rotate With Shape) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies that the fill should rotate with the shape. That is, when the shape that has been filled with a picture and the containing shape (say a rectangle) is transformed with a rotation then the fill is transformed with the same rotation. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_BlipFillProperties](#)) is located in §A.4.1. *end note*]

20.2.2.2 cNvPicPr (Non-Visual Picture Drawing Properties)

This element specifies the non-visual properties for the picture canvas. These properties are to be used by the generating application to determine how certain properties are to be changed for the picture object in question.

[Example: Consider the following DrawingML.

```
<pic:pic>
...
<pic:nvPicPr>
  <pic:cNvPr id="4" name="Lilly.jpg"/>
  <pic:cNvPicPr>
    <a:picLocks noChangeAspect="1"/>
  </p:cNvPicPr>
  <pic:nvPr/>
</pic:nvPicPr>
...
</pic:pic>
```

end example]

Attributes	Description
preferRelativeResi ze (Relative Resize Preferred) Namespace: http://purl.oclc.or g/ooxml/drawing ml/main	<p>Specifies if the user interface should show the resizing of the picture based on the picture's current size or its original size. If this attribute is set to true, then scaling is relative to the original picture size as opposed to the current picture size.</p> <p>[Example: Consider the case where a picture has been resized within a document and is now 50% of the originally inserted picture size. Now if the user chooses to make a later adjustment to the size of this picture within the generating application, then the value of this attribute should be checked.</p> <p>If this attribute is set to true then a value of 50% is shown. Similarly, if this attribute is set to false, then a value of 100% should be shown because the picture has not yet been resized from its current (smaller) size. end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_NonVisualPictureProperties](#)) is located in §A.4.1. end note]

20.2.2.3 cNvPr (Non-Visual Drawing Properties)

This element specifies non-visual canvas properties. This allows for additional information that does not affect the appearance of the picture to be stored.

[*Example*: Consider the following DrawingML.

```
<pic:pic>
...
<pic:nvPicPr>
  <p:cNvPr id="4" name="Lilly.jpg"/>
</pic:nvPicPr>
...
</pic:pic>
```

end example]

Attributes	Description
<p>descr (Alternative Text for Object)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies alternative text for the current DrawingML object, for use by assistive technologies or applications which do not display the current object.</p> <p>If this element is omitted, then no alternative text is present for the parent object.</p> <p>[<i>Example</i>: Consider a DrawingML object defined as follows:</p> <pre><... descr="A picture of a bowl of fruit"></pre> <p>The descr attribute contains alternative text which can be used in place of the actual DrawingML object. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
<p>hidden (Hidden)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies whether this DrawingML object is displayed. When a DrawingML object is displayed within a document, that object can be hidden (i.e., present, but not visible). This attribute determines whether the object is rendered or made hidden. [<i>Note</i>: An application can have settings which allow this object to be viewed. <i>end note</i>]</p> <p>If this attribute is omitted, then the parent DrawingML object shall be displayed (i.e., not hidden).</p> <p>[<i>Example</i>: Consider an inline DrawingML object which must be hidden within the document's content. This setting would be specified as follows:</p> <pre><... hidden="true" /></pre> <p>The hidden attribute has a value of true, which specifies that the DrawingML object is hidden and not displayed when the document is displayed. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
id (Unique	Specifies a unique identifier for the current DrawingML object within the current

Attributes	Description
<p>Identifier)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>document. This ID can be used to assist in uniquely identifying this object so that it can be referred to by other parts of the document.</p> <p>If multiple objects within the same document share the same id attribute value, then the document shall be considered non-conformant.</p> <p>[<i>Example</i>: Consider a DrawingML object defined as follows:</p> <pre data-bbox="456 533 678 562"><... id="10" ... ></pre> <p>The id attribute has a value of 10, which is the unique identifier for this DrawingML object. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DrawingElementId simple type (§20.1.10.21).</p>
<p>name (Name)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies the name of the object. [<i>Note</i>: Typically, this is used to store the original file name of a picture object. <i>end note</i>]</p> <p>[<i>Example</i>: Consider a DrawingML object defined as follows:</p> <pre data-bbox="456 972 776 1001">< ... name="foo.jpg" ></pre> <p>The name attribute has a value of foo.jpg, which is the name of this DrawingML object. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
<p>title (Title)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies the title (caption) of the current DrawingML object.</p> <p>If this attribute is omitted, then no title text is present for the parent object.</p> <p>[<i>Example</i>: Consider a DrawingML object defined as follows:</p> <pre data-bbox="456 1446 967 1476"><... title="Process Flow Diagram"></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_NonVisualDrawingProps](#)) is located in §A.4.1. *end note*]

20.2.2.4 `nvPicPr` (Non-Visual Picture Properties)

This element specifies the non visual properties for a picture. This allows for additional information that does not affect the appearance of the picture to be stored.

[*Example:* Consider the following DrawingML.

```
<pic:pic>
  ...
  <pic:nvPicPr>
    ...
  </pic:nvPicPr>
  ...
</pic:pic>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_PictureNonVisual](#)) is located in §A.4.2. *end note*]

20.2.2.5 `pic` (Picture)

This element specifies the existence of a picture object within the document.

[*Example:* Consider the following DrawingML that specifies the existence of a picture within a document. This picture can have non-visual properties, a picture fill as well as shape properties attached to it.

```
<pic:pic>
  <pic:nvPicPr>
    <pic:cNvPr id="4" name="lake.JPG" descr="Picture of a Lake" />
    <pic:cNvPicPr>
      <a:picLocks noChangeAspect="1"/>
    </pic:cNvPicPr>
    <pic:nvPr/>
  </pic:nvPicPr>
  <pic:blipFill>
    ...
  </pic:blipFill>
  <pic:spPr>
    ...
  </pic:spPr>
</pic:pic>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Picture](#)) is located in §A.4.2. *end note*]

20.2.2.6 spPr (Shape Properties)

This element specifies the visual shape properties that can be applied to a picture. These are the same properties that are allowed to describe the visual properties of a shape but are used here to describe the visual appearance of a picture within a document. This allows for a picture to have both the properties of a shape as well as picture specific properties that are allowed under the pic element.

Attributes	Description
bwMode (Black and White Mode) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies that the picture should be rendered using only black and white coloring. That is the coloring information for the picture should be converted to either black or white when rendering the picture.</p> <p>No gray is to be used in rendering this image, only stark black and stark white.</p> <p>[<i>Note</i>: This does not mean that the picture itself that is stored within the file is necessarily a black and white picture. This attribute instead sets the rendering mode that the picture has applied to when rendering. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_BlackWhiteMode simple type (§20.1.10.10).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_ShapeProperties](#)) is located in §A.4.1. *end note*]

20.3 DrawingML - Locked Canvas

Within a DrawingML object, a *locked canvas* allows DrawingML objects to be placed in a format where they can be viewed but not edited by the hosting application. This allows DrawingML objects not supported by an application to be included and viewed in applications where they cannot be edited.

20.3.1 Table of Contents

This subclause is informative.

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End of informative text.

20.3.2 Basics

This section specifies a locked canvas within the basic DrawingML framework.

20.3.2.1 lockedCanvas (Locked Canvas Container)

The locked canvas element acts as a container for more advanced drawing objects. The notion of a locked canvas comes from the fact that the generating application opening the file cannot create this object and can

thus not perform edits either. Thus the drawing object is locked from all UI adjustments that would normally take place.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_GvmlGroupShape](#)) is located in §A.4.1. *end note*]

20.4 DrawingML - WordprocessingML Drawing

Within a WordprocessingML document, it is possible to include graphical DrawingML objects:

- Pictures (§20.2)
- Locked Canvases (§20.3)
- Diagrams (§21.4)
- Charts (§21.2)

When these objects are present in a word processing document, it is necessary to include information which specifies how the objects shall be positioned relative to the paginated document. [*Example:* Whether the object is displayed in line with text. *end example*]

The WordprocessingML Drawing namespace acts in this capacity, specifying all information necessary to anchor and display DrawingML objects within a word processing document.

[*Example:* Consider a DrawingML picture which must be displayed in the center of the printed page on which it appears, modifying the flow of text as necessary. This object would be specified as follows:

```
<w:r>
  <w:drawing>
    <wp:anchor relativeHeight="10" allowOverlap="true">
      <wp:positionH relativeFrom="margin">
        <wp:align>center</wp:align>
      </wp:positionH>
      <wp:positionV relativeFrom="margin">
        <wp:align>center</wp:align>
      </wp:positionV>
      <wp:extent cx="2441542" cy="1828800"/>
      <wp:wrapSquare wrapText="bothSides"/>
      <a:graphic>
        ...
      </a:graphic>
    </wp:anchor>
  </w:drawing>
</w:r>
```

The anchor element (§20.4.2.3) specifies that this object is not positioned in line with text, and its child elements specify that the object is centered on the page horizontally and vertically (§20.4.2.10; §20.4.2.11), and that text can wrap around it in a square (§20.4.2.17). *end example*

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This subclause is informative.

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End of informative text.

20.4.2 Elements

The following elements define the contents of the WordprocessingML Drawing namespace:

20.4.2.1 align (Relative Horizontal Alignment)

This element specifies how a DrawingML object shall be horizontally aligned relative to the horizontal alignment base defined by the parent element. Once an alignment base is defined, this element shall determine how the DrawingML object shall be aligned relative to that location.

[*Example:* Consider a picture in a WordprocessingML document which has been aligned relative to the edge of the page - the left of the page horizontally, and the top of the page vertically. This alignment would be specified as follows:

```
<wp:anchor ... >
  <wp:positionH relativeFrom="page">
    <wp:align>left</wp:align>
  </wp:positionH>
  ...
</wp:anchor>
```

The align element with a value of `left` specifies that for the horizontal positioning defined by the parent element (in this case, positioning relative to the page), the picture must be aligned to the left edge of the page. *end example]*

The possible values for this element are defined by the ST_AlignH simple type (§20.4.3.1).

[*Note:* The W3C XML Schema definition of this element's content model ([ST_AlignH](#)) is located in §A.4.4. *end note]*

20.4.2.2 align (Relative Vertical Alignment)

This element specifies how a DrawingML object shall be vertically aligned relative to the vertical alignment base defined by the parent element. Once an alignment base is defined, this element shall determine how the DrawingML object shall be aligned relative to that location.

[*Example:* Consider a picture in a WordprocessingML document which has been aligned relative to the edge of the page - the left of the page horizontally, and the top of the page vertically. This alignment would be specified as follows:

```
<wp:anchor ... >
  <wp:positionV relativeFrom="page">
    <wp:align>top</wp:align>
  </wp:positionH>
  ...
</wp:anchor>
```

The align element with a value of top specifies that for the vertical positioning defined by the parent element (in this case, positioning relative to the page), the picture must be aligned to the top edge of the page. *end example]*

The possible values for this element are defined by the ST_AlignV simple type (§20.4.3.2).

[*Note:* The W3C XML Schema definition of this element's content model ([ST_AlignV](#)) is located in §A.4.4. *end note]*

20.4.2.3 anchor (Anchor for Floating DrawingML Object)

This element specifies that the DrawingML object located at this position in the document is a floating object. Within a WordprocessingML document, drawing objects can exist in two states:

- *Inline* - The drawing object is in line with the text, and affects the line height and layout of its line (like a character glyph of similar size).
- *Floating* - The drawing object is anchored within the text, but can be absolutely positioned in the document relative to the page.

When this element encapsulates the DrawingML object's information, then all child elements shall dictate the positioning of this object as a floating object on the page.

[*Example:* Consider a WordprocessingML document where the anchor for a floating DrawingML object must be the first piece of run content within a paragraph. That paragraph's content would be specified as follows:


```

<w:p>
  <w:r>
    <w:drawing>
      <wp:anchor ... >
        ...
      </wp:anchor>
    </w:drawing>
  </w:r>
</w:p>

```







The anchor element, when present as the child element of the drawing element, specifies that this DrawingML object must be positioned as a floating object based on the values of its child elements. *end example*

Attributes	Description
allowOverlap (Allow Objects to Overlap)	<p>Specifies whether a DrawingML object which intersects another DrawingML object at display time is allowed to overlap the contents of the other DrawingML object. If a DrawingML object cannot overlap other DrawingML object, it shall be repositioned when displayed to prevent this overlap as needed.</p> <p>[<i>Example:</i> Consider a document with two DrawingML objects which are allowed to overlap each other. This would be specified as follows within each object's anchor markup:</p> <pre> <wp:anchor allowOverlap="true" ... > ... </wp:anchor> </pre> <p>The allowOverlap attribute has a value of true, which specifies that this object must be allowed to overlap other objects when it is displayed on the document. <i>end example</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
behindDoc (Display Behind Document Text)	<p>Specifies whether this floating DrawingML object is displayed behind the text of the document when the document is displayed. When a DrawingML object is displayed within a WordprocessingML document, that object can intersect with text in the document. This attribute shall determine whether the text or the object is rendered on top in case of overlapping.</p> <p>[<i>Example:</i> Consider a floating DrawingML object which must be displayed above any text which it intersects within the document's content. This setting would be specified as follows:</p> <pre> <wp:anchor behindDoc="false" ... > ... </wp:anchor> </pre>

Attributes	Description
	<p>The behindDoc attribute has a value of <code>false</code>, which specifies that the DrawingML object is displayed above the text of the document in z-order. <i>end example</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>distB (Distance From Text on Bottom Edge)</p>	<p>Specifies the minimum distance which shall be maintained between the bottom edge of this drawing object and any subsequent text within the document when this graphical object is displayed within the document's contents.</p> <p>The distance shall be measured in EMUs (English Metric Units).</p> <p>If this object is an inline object (i.e. has a parent element of <code>inline</code>), then this value shall not have any effect when displaying the object in line with text, but can be maintained and used if the object is subsequently changed to floating. If the wrapping element [<i>Example: wrapThrough or wrapSquare end example</i>] present as a child element also has a distance from text, then this value shall be ignored.</p> <p>[<i>Example: Consider a floating DrawingML object which must have one-half of an inch of padding between its bottom edge and the nearest text. This setting would be specified as follows:</i></p> <pre data-bbox="451 1003 922 1108"><wp:anchor distB="457200" ... > ... </wp:anchor></pre> <p>The distB attribute specifies that the padding distance must be 457200 EMUs or one-half of an inch. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_WrapDistance simple type (§20.4.3.6).</p>
<p>distL (Distance From Text on Left Edge)</p>	<p>Specifies the minimum distance which shall be maintained between the left edge of this drawing object and any subsequent text within the document when this graphical object is displayed within the document's contents.</p> <p>The distance shall be measured in EMUs (English Metric Units).</p> <p>If this object is an inline object (i.e. has a parent element of <code>inline</code>), then this value shall not have any effect when displaying the object in line with text, but can be maintained and used if the object is subsequently changed to floating. If the wrapping element [<i>Example: wrapThrough or wrapSquare end example</i>] present as a child element also has a distance from text, then this value shall be ignored.</p> <p>[<i>Example: Consider a floating DrawingML object which must have one-quarter of an inch of padding between its left edge and the nearest text. This setting would be specified as follows:</i></p>

Attributes	Description
	<pre data-bbox="456 285 919 380"><wp:anchor distL="228600" ... > ... </wp:anchor></pre> <p data-bbox="415 422 1425 489">The distL attribute specifies that the padding distance must be 228600 EMUs or one-quarter of an inch. <i>end example</i>]</p> <p data-bbox="415 531 1442 598">The possible values for this attribute are defined by the ST_WrapDistance simple type (§20.4.3.6).</p>
distR (Distance From Text on Right Edge)	<p data-bbox="415 615 1474 716">Specifies the minimum distance which shall be maintained between the right edge of this drawing object and any subsequent text within the document when this graphical object is displayed within the document's contents.</p> <p data-bbox="415 758 1162 787">The distance shall be measured in EMUs (English Metric Units).</p> <p data-bbox="415 829 1455 1001">If this object is an inline object (i.e. has a parent element of inline), then this value shall not have any effect when displaying the object in line with text, but can be maintained and used if the object is subsequently changed to floating. If the wrapping element [<i>Example: wrapThrough or wrapSquare end example</i>] present as a child element also has a distance from text, then this value shall be ignored.</p> <p data-bbox="415 1043 1474 1144">[<i>Example: Consider a floating DrawingML object which must have one-quarter of an inch of padding between its right edge and the nearest text. This setting would be specified as follows:</i></p> <pre data-bbox="456 1186 919 1281"><wp:anchor distR="228600" ... > ... </wp:anchor></pre> <p data-bbox="415 1323 1425 1390">The distR attribute specifies that the padding distance must be 228600 EMUs or one-quarter of an inch. <i>end example</i>]</p> <p data-bbox="415 1432 1442 1499">The possible values for this attribute are defined by the ST_WrapDistance simple type (§20.4.3.6).</p>
distT (Distance From Text on Top Edge)	<p data-bbox="415 1514 1474 1614">Specifies the minimum distance which shall be maintained between the top edge of this drawing object and any subsequent text within the document when this graphical object is displayed within the document's contents.</p> <p data-bbox="415 1656 1162 1686">The distance shall be measured in EMUs (English Metric Units).</p> <p data-bbox="415 1728 1455 1900">If this object is an inline object (i.e. has a parent element of inline), then this value shall not have any effect when displaying the object in line with text, but can be maintained and used if the object is subsequently changed to floating. If the wrapping element [<i>Example: wrapThrough or wrapSquare end example</i>] present as a child element also has a distance from text, then this value shall be ignored.</p>

Attributes	Description
	<p>[<i>Example</i>: Consider a floating DrawingML object which must have one-half of an inch of padding between its top edge and the nearest text. This setting would be specified as follows:</p> <pre><wp:anchor distT="457200" ... > ... </wp:anchor></pre> <p>The distT attribute specifies that the padding distance must be 457200 EMUs or one-half of an inch. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_WrapDistance simple type (§20.4.3.6).</p>
hidden (Hidden)	<p>Specifies whether this floating DrawingML object is displayed. When a DrawingML object is displayed within a WordprocessingML document, that object can be hidden (i.e. present, but not visible). This attribute shall determine whether the object is rendered or made hidden. [<i>Note</i>: An application can have settings which allow this object to be viewed. <i>end note</i>]</p> <p>If this attribute is omitted, then the parent DrawingML object shall be displayed (i.e. not hidden).</p> <p>[<i>Example</i>: Consider a floating DrawingML object which must be hidden within the document's content. This setting would be specified as follows:</p> <pre><wp:anchor hidden="true" ... > ... </wp:anchor></pre> <p>The hidden attribute has a value of true, which specifies that the DrawingML object is hidden and not displayed when the document is displayed. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
layoutInCell (Layout In Table Cell)	<p>Specifies how this DrawingML object behaves when its anchor is located in a table cell; and its specified position would cause it to intersect with a table cell displayed in the document. That behavior shall be as follows:</p> <ul style="list-style-type: none"> • When this attribute has a value of true, then the object shall be positioned within the existing table cell, causing the cell to be resized as needed. This means that all positioning shall be relative to the cell and not the line on which the table appears. • When this attribute has a value of false, then the object shall be positioned as specified, but the table shall be resized and/or relocated within the document as needed to accommodate the object. This means that all positioning shall be

Attributes	Description																								
	<p>relative to the line on which the table appears and not the cell in which the anchor is present.</p> <p>[Example: Consider a DrawingML picture which must be displayed in the center of the document. If the object is contained within a table and is defined as follows:</p> <pre><wp:anchor layoutInCell="true" ... > ... </wp:anchor></pre> <p>The layoutInCell attribute has a value of true, which specifies that the object can be placed within the cell if needed, for example:</p> <table><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr></table> <p>If the layoutInCell attribute was now set to false, the object must be laid out outside of the cell, causing the table to be repositioned:</p> <table><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr></table> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>																								
																									
																									
locked (Lock	Specifies that the anchor location for this object shall not be modified at runtime when																								

Attributes	Description
Anchor)	<p>an application edits the contents of this document. [<i>Guidance</i>: An application might have automatic behaviors which reposition the anchor for a DrawingML object based on user interaction - for example, moving it from one page to another as needed. This element must tell applications not to perform any such behaviors. <i>end guidance</i>]</p> <p>[<i>Example</i>: Consider a floating DrawingML object which must have its anchor locked at the current location. This setting would be specified as follows:</p> <pre><wp:anchor locked="true" ... > ... </wp:anchor></pre> <p>The locked attribute has a value of <code>true</code>, which specifies that the DrawingML object's current anchor location must not be changed by applications editing this content. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
relativeHeight (Relative Z-Ordering Position)	<p>Specifies the relative Z-ordering of all DrawingML objects in this document. Each floating DrawingML object shall have a Z-ordering value, which determines which object is displayed when any two objects intersect. Higher values shall indicate higher Z-order; lower values shall indicate lower Z-order.</p> <p>This attribute shall only indicate the Z-order with respect to other objects in the document which have an identical <code>behindDoc</code> attribute value. All objects with a <code>behindDoc</code> value of <code>false</code> shall be displayed above elements with a value of <code>true</code>.</p> <p>[<i>Example</i>: Consider two floating DrawingML objects as follows:</p> <pre><wp:anchor relativeHeight="5" ... > ... </wp:anchor> ... <wp:anchor relativeHeight="8" ... > ... </wp:anchor></pre> <p>The <code>relativeHeight</code> attribute of the second object is 8, which specifies that the second DrawingML object must be at a higher Z-order than the first and must be displayed whenever the two overlap. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema <code>unsignedInt</code> datatype.</p>
simplePos (Page	Specifies that this object shall be positioned using the positioning information in the

Attributes	Description
Positioning)	<p>simplePos child element (§20.4.2.13). This positioning, when specified, positions the object on the page by placing its top left point at the x-y coordinates specified by that element.</p> <p>If this element is omitted, then this object shall not use the simple positioning information in the simplePos element, even when present.</p> <p>[<i>Example</i>: Consider a floating DrawingML object which must be positioned at the top left corner of the page using simple positioning. This setting would be specified as follows:</p> <pre><wp:anchor simplePos="true" ... > <wp:simplePos x="0" y="0" /> ... </wp:anchor></pre> <p>The simplePos attribute has a value of true, which specifies that the DrawingML object's current position must be dictated by the simplePos element, and hence placed at 0,0. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_Anchor](#)) is located in §A.4.4. *end note*]

20.4.2.4 cNvGraphicFramePr (Common DrawingML Non-Visual Properties)

This element specifies common non-visual DrawingML object properties for the parent DrawingML object. These properties are specified as child elements of this element.

[*Example*: Consider a DrawingML object in a WordprocessingML document defined as follows:

```
<wp:inline>
  ...
  <wp:cNvGraphicFramePr>
    <a:graphicFrameLocks ... />
  </wp:cNvGraphicFramePr>
</wp:inline>
```

The cNvGraphicFramePr element contains a set of common non-visual properties as defined by DrawingML. *end example*]

[*Note*: The W3C XML Schema definition of this element's content model ([CT_NonVisualGraphicFrameProperties](#)) is located in §A.4.1. *end note*]

20.4.2.5 docPr (Drawing Object Non-Visual Properties)

This element specifies non-visual object properties for the parent DrawingML object. These properties are specified as child elements of this element.

[Example: Consider a DrawingML object in a WordprocessingML document defined as follows:

```
<wp:inline>
...
<wp:docPr id="1" name="Example Object">
  <a:hlinkClick ... />
  <a:hlinkHover ... />
</wp:docPr>
</wp:inline>
```

The docPr element contains a set of common non-visual properties for this object. *end example]*

Attributes	Description
descr (Alternative Text for Object) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies alternative text for the current DrawingML object, for use by assistive technologies or applications which do not display the current object.</p> <p>If this element is omitted, then no alternative text is present for the parent object.</p> <p>[Example: Consider a DrawingML object defined as follows:</p> <pre><... descr="A picture of a bowl of fruit"></pre> <p>The descr attribute contains alternative text which can be used in place of the actual DrawingML object. <i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
hidden (Hidden) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies whether this DrawingML object is displayed. When a DrawingML object is displayed within a document, that object can be hidden (i.e., present, but not visible). This attribute determines whether the object is rendered or made hidden. [Note: An application can have settings which allow this object to be viewed. <i>end note]</i></p> <p>If this attribute is omitted, then the parent DrawingML object shall be displayed (i.e., not hidden).</p> <p>[Example: Consider an inline DrawingML object which must be hidden within the document's content. This setting would be specified as follows:</p> <pre><... hidden="true" /></pre> <p>The hidden attribute has a value of true, which specifies that the DrawingML object is hidden and not displayed when the document is displayed. <i>end example]</i></p>

Attributes	Description
	<p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>id (Unique Identifier)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies a unique identifier for the current DrawingML object within the current document. This ID can be used to assist in uniquely identifying this object so that it can be referred to by other parts of the document.</p> <p>If multiple objects within the same document share the same id attribute value, then the document shall be considered non-conformant.</p> <p>[Example: Consider a DrawingML object defined as follows:</p> <pre><... id="10" ... ></pre> <p>The id attribute has a value of 10, which is the unique identifier for this DrawingML object. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DrawingElementId simple type (§20.1.10.21).</p>
<p>name (Name)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies the name of the object. [Note: Typically, this is used to store the original file name of a picture object. <i>end note</i>]</p> <p>[Example: Consider a DrawingML object defined as follows:</p> <pre>< ... name="foo.jpg" ></pre> <p>The name attribute has a value of foo.jpg, which is the name of this DrawingML object. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
<p>title (Title)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies the title (caption) of the current DrawingML object.</p> <p>If this attribute is omitted, then no title text is present for the parent object.</p> <p>[Example: Consider a DrawingML object defined as follows:</p> <pre><... title="Process Flow Diagram"></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

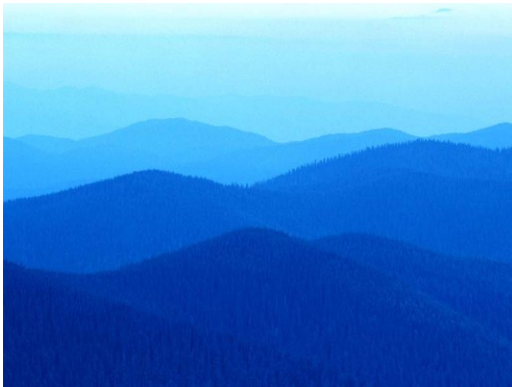
[*Note:* The W3C XML Schema definition of this element's content model ([CT_NonVisualDrawingProps](#)) is located in §A.4.1. *end note*]

20.4.2.6 `effectExtent` (Object Extents Including Effects)

This element specifies the additional extent which shall be added to each edge of the image (top, bottom, left, right) in order to compensate for any drawing effects applied to the DrawingML object.

The extent element (§20.4.2.7) specifies the size of the actual DrawingML object; however, an object can have effects applied which change its overall size [*Example:* A reflection and/or shadow effect. *end example*]. The additional size for each edge of the shape shall be stored on this element, and used to calculate the appropriate wrapping for wrap types without a wrapping polygon and the appropriate line height for inline objects.

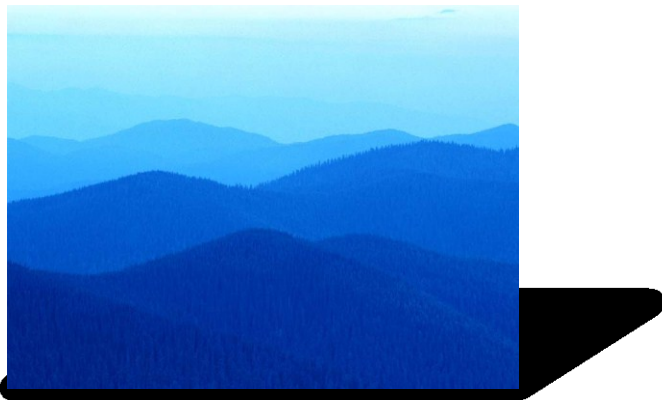
[*Example:* Consider the following DrawingML image:



This object has no effects, and hence would have the following effect extents:

```
<wp:effectExtents b="0" t="0" l="0" r="0" />
```

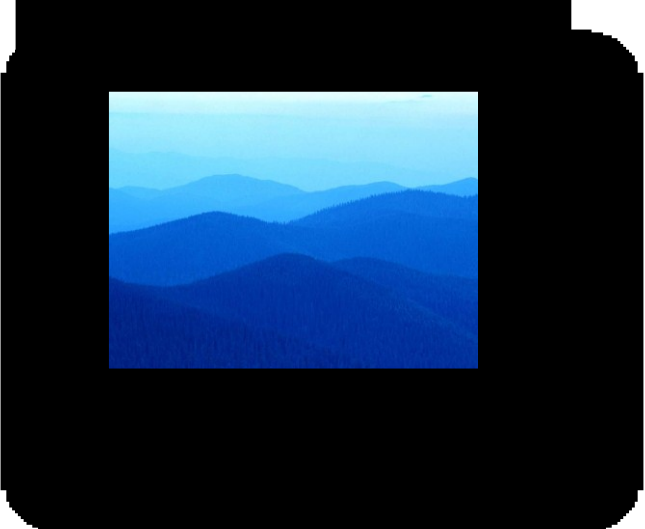
However, if a shadow effect was applied which added effects to the right of the image:






Then the additional extent the right side would be specified in the `r` attribute on this element:

```
<wp:effectExtents b="0" t="0" l="0" r="695325" />
```

The *r* attribute has a value of 695325, specifying that that 695325 EMUs must be added to the right side of the image. *end example*]

Attributes	Description
<p>b (Additional Extent on Bottom Edge)</p>	<p>Specifies the additional length, in EMUs, which shall be added to the bottom edge of the DrawingML object to determine its actual bottom edge including effects.</p> <p>[<i>Example</i>: Consider the following DrawingML image:</p>  <p>This image has an effect on all four sides, resulting in the following markup:</p> <pre><wp:effectExtent l="504825" t="447675" r="771525" b="809625" /></pre> <p>The <i>b</i> attribute value of 809625 specifies that 809625 additional EMUs must be added to the bottom of the image to compensate for the effects on the image. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>
<p>l (Additional Extent on Left Edge)</p>	<p>Specifies the additional length, in EMUs, which shall be added to the bottom edge of the DrawingML object to determine its actual bottom edge including effects.</p> <p>[<i>Example</i>: Consider the following DrawingML image:</p>

Attributes	Description
	<div data-bbox="414 239 1052 779"></div> <p data-bbox="414 785 1310 816">This image has an effect on all four sides, resulting in the following markup:</p> <pre data-bbox="453 856 1463 888"><wp:effectExtent l="504825" t="447675" r="771525" b="809625" /></pre> <p data-bbox="414 928 1463 993">The l attribute value of 504825 specifies that 504825 additional EMUs must be added to the bottom of the image to compensate for the effects on the image. <i>end example</i>]</p> <p data-bbox="414 1033 1406 1098">The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>
<p data-bbox="142 1119 378 1184">r (Additional Extent on Right Edge)</p>	<p data-bbox="414 1119 1463 1184">Specifies the additional length, in EMUs, which shall be added to the bottom edge of the DrawingML object to determine its actual bottom edge including effects.</p> <p data-bbox="414 1224 1036 1255"><i>[Example: Consider the following DrawingML image:</i></p> <div data-bbox="414 1289 1052 1829"></div> <p data-bbox="414 1835 1310 1866">This image has an effect on all four sides, resulting in the following markup:</p>

Attributes	Description
	<p><code><wp:effectExtent l="504825" t="447675" r="771525" b="809625" /></code></p> <p>The r attribute value of 771525 specifies that 771525 additional EMUs must be added to the bottom of the image to compensate for the effects on the image. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>
t (Additional Extent on Top Edge)	<p>Specifies the additional length, in EMUs, which shall be added to the bottom edge of the DrawingML object to determine its actual bottom edge including effects.</p> <p>[Example: Consider the following DrawingML image:</p>  <p>This image has an effect on all four sides, resulting in the following markup:</p> <p><code><wp:effectExtent l="504825" t="447675" r="771525" b="809625" /></code></p> <p>The t attribute value of 447675 specifies that 447675 additional EMUs must be added to the bottom of the image to compensate for the effects on the image. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_EffectExtent](#)) is located in §A.4.4. *end note]*

20.4.2.7 extent (Drawing Object Size)

This element specifies the extents of the parent DrawingML object within the document (i.e. its final height and width).

[*Example*: Consider a DrawingML picture which is present in a WordprocessingML document and has an equal height and width. This object would be specified as follows:

```
<wp:anchor relativeHeight="10" allowOverlap="true">
...
  <wp:extent cx="1828800" cy="1828800"/>
...
</wp:anchor>
```

The extent element specifies via its attributes that this object has a height and width of 1828800 EMUs (English Metric Units). *end example*]

Attributes	Description
cx (Extent Length) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies the length of the extents rectangle in EMUs. This rectangle shall dictate the size of the object as displayed (the result of any scaling to the original object).</p> <p>[<i>Example</i>: Consider a DrawingML object specified as follows:</p> <pre><... cx="1828800" cy="200000"/></pre> <p>The cx attributes specifies that this object has a height of 1828800 EMUs (English Metric Units). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>
cy (Extent Width) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies the width of the extents rectangle in EMUs. This rectangle shall dictate the size of the object as displayed (the result of any scaling to the original object).</p> <p>[<i>Example</i>: Consider a DrawingML object specified as follows:</p> <pre>< ... cx="1828800" cy="200000"/></pre> <p>The cy attribute specifies that this object has a width of 200000 EMUs (English Metric Units). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_PositiveSize2D](#)) is located in §A.4.1. *end note*]

20.4.2.8 inline (Inline DrawingML Object)

This element specifies that the DrawingML object located at this position in the document is an inline object. Within a WordprocessingML document, drawing objects can exist in two states:

- *Inline* - The drawing object is in line with the text, and affects the line height and layout of its line (like a character glyph of similar size).
- *Floating* - The drawing object is anchored within the text, but can be absolutely positioned in the document relative to the page.

When this element encapsulates the DrawingML object's information, then all child elements shall dictate the positioning of this object in line with text.

[*Example*: Consider a WordprocessingML document where an inline DrawingML object must be the first piece of run content within a paragraph. That paragraph's content would be specified as follows:

```
<w:p>
  <w:r>
    <w:drawing>
      <wp:inline>
        ...
      </wp:inline>
    </w:drawing>
  </w:r>
</w:p>
```

The inline element, when present as the child element of the drawing element, specifies that this DrawingML object must be positioned in line with the text of this paragraph, modifying line heights, etc. as necessary. *end example*]

Attributes	Description
distB (Distance From Text on Bottom Edge)	<p>Specifies the minimum distance which shall be maintained between the bottom edge of this drawing object and any subsequent text within the document when this graphical object is displayed within the document's contents.</p> <p>The distance shall be measured in EMUs (English Metric Units).</p> <p>If this object is an inline object (i.e. has a parent element of inline), then this value shall not have any effect when displaying the object in line with text, but can be maintained and used if the object is subsequently changed to floating. If the wrapping element [<i>Example</i>: wrapThrough or wrapSquare <i>end example</i>] present as a child element also has a distance from text, then this value shall be ignored.</p> <p>[<i>Example</i>: Consider a floating DrawingML object which must have one-half of an inch of padding between its bottom edge and the nearest text. This setting would be specified as follows:</p> <pre><wp:anchor distB="457200" ... > ... </wp:anchor></pre>

Attributes	Description
	<p>The distB attribute specifies that the padding distance must be 457200 EMUs or one-half of an inch. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_WrapDistance simple type (§20.4.3.6).</p>
<p>distL (Distance From Text on Left Edge)</p>	<p>Specifies the minimum distance which shall be maintained between the left edge of this drawing object and any subsequent text within the document when this graphical object is displayed within the document's contents.</p> <p>The distance shall be measured in EMUs (English Metric Units).</p> <p>If this object is an inline object (i.e. has a parent element of inline), then this value shall not have any effect when displaying the object in line with text, but can be maintained and used if the object is subsequently changed to floating. If the wrapping element [<i>Example: wrapThrough or wrapSquare end example</i>] present as a child element also has a distance from text, then this value shall be ignored.</p> <p>[<i>Example: Consider a floating DrawingML object which must have one-quarter of an inch of padding between its left edge and the nearest text. This setting would be specified as follows:</i></p> <pre data-bbox="451 1010 922 1108"><wp:anchor distL="228600" ... > ... </wp:anchor></pre> <p>The distL attribute specifies that the padding distance must be 228600 EMUs or one-quarter of an inch. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_WrapDistance simple type (§20.4.3.6).</p>
<p>distR (Distance From Text on Right Edge)</p>	<p>Specifies the minimum distance which shall be maintained between the right edge of this drawing object and any subsequent text within the document when this graphical object is displayed within the document's contents.</p> <p>The distance shall be measured in EMUs (English Metric Units).</p> <p>If this object is an inline object (i.e. has a parent element of inline), then this value shall not have any effect when displaying the object in line with text, but can be maintained and used if the object is subsequently changed to floating. If the wrapping element [<i>Example: wrapThrough or wrapSquare end example</i>] present as a child element also has a distance from text, then this value shall be ignored.</p> <p>[<i>Example: Consider a floating DrawingML object which must have one-quarter of an inch of padding between its right edge and the nearest text. This setting would be specified as follows:</i></p>

Attributes	Description
	<pre data-bbox="451 285 922 386"><wp:anchor distR="228600" ... > ... </wp:anchor></pre> <p data-bbox="415 424 1429 491">The distR attribute specifies that the padding distance must be 228600 EMUs or one-quarter of an inch. <i>end example</i>]</p> <p data-bbox="415 529 1445 596">The possible values for this attribute are defined by the ST_WrapDistance simple type (§20.4.3.6).</p>
distT (Distance From Text on Top Edge)	<p data-bbox="415 617 1468 718">Specifies the minimum distance which shall be maintained between the top edge of this drawing object and any subsequent text within the document when this graphical object is displayed within the document's contents.</p> <p data-bbox="415 756 1162 789">The distance shall be measured in EMUs (English Metric Units).</p> <p data-bbox="415 827 1455 1003">If this object is an inline object (i.e. has a parent element of inline), then this value shall not have any effect when displaying the object in line with text, but can be maintained and used if the object is subsequently changed to floating. If the wrapping element [<i>Example: wrapThrough or wrapSquare end example</i>] present as a child element also has a distance from text, then this value shall be ignored.</p> <p data-bbox="415 1041 1455 1142">[<i>Example: Consider a floating DrawingML object which must have one-half of an inch of padding between its top edge and the nearest text. This setting would be specified as follows:</i></p> <pre data-bbox="451 1180 922 1281"><wp:anchor distT="457200" ... > ... </wp:anchor></pre> <p data-bbox="415 1318 1474 1386">The distT attribute specifies that the padding distance must be 457200 EMUs or one-half of an inch. <i>end example</i>]</p> <p data-bbox="415 1423 1445 1491">The possible values for this attribute are defined by the ST_WrapDistance simple type (§20.4.3.6).</p>

[*Note: The W3C XML Schema definition of this element's content model ([CT Inline](#)) is located in §A.4.4. end note*]

20.4.2.9 [lineTo \(Wrapping Polygon Line End Position\)](#)

This element specifies a single point on the wrapping polygon for a DrawingML object. This point shall be the termination of the edge of the wrapping polygon started by the previous start or lineTo element in document order, and shall be the origin of the next edge on the same polygon.

The attributes on this element shall dictate the position of the point relative to the upper-left corner of the actual object.

[*Example:* Consider the following basic wrapping polygon for a DrawingML object:

```
<wp:wrapPolygon>
  <wp:start x="0" y="0" />
  <wp:lineTo x="0" y="100" />
  <wp:lineTo x="100" y="100" />
  <wp:lineTo x="100" y="0" />
  <wp:lineTo x="0" y="0" />
</wp:wrapPolygon>
```

The lineTo element defines each point of the wrapping polygon (in this case, the four points of the wrapping square). *end example]*

Attributes	Description
<p>x (X-Axis Coordinate)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies a coordinate on the x-axis. The origin point for this coordinate shall be specified by the parent XML element.</p> <p>[<i>Example:</i> Consider the following point on a basic wrapping polygon for a DrawingML object:</p> <pre><... x="0" y="100" /></pre> <p>The x attribute defines an x-coordinate of 0. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>
<p>y (Y-Axis Coordinate)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies a coordinate on the x-axis. The origin point for this coordinate shall be specified by the parent XML element.</p> <p>[<i>Example:</i> Consider the following point on a basic wrapping polygon for a DrawingML object:</p> <pre><... x="0" y="100" /></pre> <p>The y attribute defines a y-coordinate of 100. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>

[*Note:* The W3C XML Schema definition of this element’s content model (CT_Point2D) is located in §A.4.1. *end note]*

20.4.2.10 positionH (Horizontal Positioning)

This element specifies the horizontal positioning of a floating DrawingML object within a WordprocessingML document. This positioning is specified in two parts:

- Positioning Base - The relativeFrom attribute on this element specifies the part of the document from which the positioning shall be calculated.
- Positioning - The child element of this element (align or posOffset) specifies how the object is positioned relative to that base.

[*Example:* Consider a DrawingML picture which must be displayed in the center of the printed page on which it appears, modifying the flow of text as necessary. This object would be specified as follows:

```
<wp:anchor ... >
  <wp:positionH relativeFrom="margin">
    <wp:align>center</wp:align>
  </wp:positionH>
  <wp:positionV relativeFrom="margin">
    <wp:align>center</wp:align>
  </wp:positionV>
</wp:anchor>
```

The positionH element specifies that the object is horizontally positioned relative to the margin via the relativeFrom attribute; and that the alignment relative to the margin is centered via the align element. *end example]*

Attributes	Description
relativeFrom (Horizontal Position Relative Base)	<p>Specifies the base to which the relative horizontal positioning of this object shall be calculated.</p> <p>[<i>Example:</i> Consider a DrawingML picture which must be displayed at the bottom center of the page. This object would be specified as follows:</p> <pre><wp:anchor ... > <wp:positionH relativeFrom="page"> <wp:align>center</wp:align> </wp:positionH> ... </wp:anchor></pre> <p>The relativeFrom attribute specifies that the object is horizontally positioned relative to the page. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_RelFromH simple type (§20.4.3.4).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_PosH](#)) is located in §A.4.4. *end note*]

20.4.2.11 **positionV (Vertical Positioning)**

This element specifies the vertical positioning of a floating DrawingML object within a WordprocessingML document. This positioning is specified in two parts:

- **Positioning Base** - The `relativeFrom` attribute on this element specifies the part of the document from which the positioning shall be calculated.
- **Positioning** - The child element of this element (`align` or `posOffset`) specifies how the object is positioned relative to that base.

[*Example:* Consider a DrawingML picture which must be displayed in the center of the printed page on which it appears, modifying the flow of text as necessary. This object would be specified as follows:

```
<wp:anchor ... >
  <wp:positionH relativeFrom="margin">
    <wp:align>center</wp:align>
  </wp:positionH>
  <wp:positionV relativeFrom="margin">
    <wp:align>center</wp:align>
  </wp:positionV>
</wp:anchor>
```

The `positionV` element specifies that the object is vertically positioned relative to the margin via the `relativeFrom` attribute; and that the alignment relative to the margin is centered via the `align` element. *end example*]

Attributes	Description
<code>relativeFrom</code> (Vertical Position Relative Base)	<p>Specifies the base to which the relative vertical positioning of this object shall be calculated.</p> <p>[<i>Example:</i> Consider a DrawingML picture which must be displayed at the bottom center of the page margins. This object would be specified as follows:</p> <pre><wp:anchor ... > ... <wp:positionV relativeFrom="margin"> <wp:align>bottom</wp:align> </wp:positionV> </wp:anchor></pre> <p>The <code>relativeFrom</code> attribute specifies that the object is horizontally positioned relative to the margin. <i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_RelFromV simple type (§20.4.3.5).

[Note: The W3C XML Schema definition of this element's content model ([CT_PosV](#)) is located in §A.4.4. *end note*]

20.4.2.12 posOffset (Absolute Position Offset)

This element specifies an absolute measurement for the positioning of a floating DrawingML object within a WordprocessingML document. This measurement shall be calculated relative to the top left edge of the positioning base specified by the parent element's relativeFrom attribute.

[Example: Consider a DrawingML picture which must be displayed one inch from the top of the page, and one-half of an inch from the left edge of the page. This object would be specified as follows:

```
<wp:anchor ... >
  <wp:positionH relativeFrom="page">
    <wp:posOffset>914400</wp:posOffset>
  </wp:positionH>
  <wp:positionV relativeFrom="page">
    <wp:posOffset>457200</wp:posOffset>
  </wp:positionV>
</wp:anchor>
```

The posOffset element specifies the absolute positioning of the object relative to the top-left edge of the page in EMUs. *end example*]

The possible values for this element are defined by the ST_PositionOffset simple type (§20.4.3.3).

[Note: The W3C XML Schema definition of this element's content model ([ST_PositionOffset](#)) is located in §A.4.4. *end note*]

20.4.2.13 simplePos (Simple Positioning Coordinates)

This element specifies the coordinates at which a DrawingML object shall be positioned relative to the top-left edge of its page, when the simplePos attribute is specified on the anchor element (§20.4.2.3).

[Example: Consider a floating DrawingML object which must be positioned at the top left corner of the page using simple positioning. This setting would be specified as follows:

```
<wp:anchor simplePos="true" ... >
  <wp:simplePos x="0" y="0" />
  ...
</wp:anchor>
```

The simplePos attribute has a value of true, which specifies that the DrawingML object's current position must be dictated by the simplePos element, and hence placed at 0,0. *end example*]

Attributes	Description
<p>x (X-Axis Coordinate)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies a coordinate on the x-axis. The origin point for this coordinate shall be specified by the parent XML element.</p> <p>[<i>Example</i>: Consider the following point on a basic wrapping polygon for a DrawingML object:</p> <p style="text-align: center;"><... x="0" y="100" /></p> <p>The x attribute defines an x-coordinate of 0. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>
<p>y (Y-Axis Coordinate)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies a coordinate on the x-axis. The origin point for this coordinate shall be specified by the parent XML element.</p> <p>[<i>Example</i>: Consider the following point on a basic wrapping polygon for a DrawingML object:</p> <p style="text-align: center;"><... x="0" y="100" /></p> <p>The y attribute defines a y-coordinate of 100. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_Point2D](#)) is located in §A.4.1. *end note*]

20.4.2.14 start (Wrapping Polygon Start)

This element specifies the starting point on the wrapping polygon for a DrawingML object. This point shall be the start and termination of the wrapping polygon for the parent object.

The attributes on this element shall dictate the position of the point relative to the upper-left corner of the actual object.

[*Example*: Consider the following basic wrapping polygon for a DrawingML object:

```

<wp:wrapPolygon>
  <wp:start x="0" y="0" />
  <wp:lineTo x="0" y="100" />
  <wp:lineTo x="100" y="100" />
  <wp:lineTo x="100" y="0" />
  <wp:lineTo x="0" y="0" />
</wp:wrapPolygon>

```

The start element defines the start and end of the wrapping polygon (in this case, the four points of the wrapping square). *end example*

Attributes	Description
x (X-Axis Coordinate) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies a coordinate on the x-axis. The origin point for this coordinate shall be specified by the parent XML element.</p> <p>[<i>Example:</i> Consider the following point on a basic wrapping polygon for a DrawingML object:</p> <pre><... x="0" y="100" /></pre> <p>The x attribute defines an x-coordinate of 0. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>
y (Y-Axis Coordinate) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies a coordinate on the x-axis. The origin point for this coordinate shall be specified by the parent XML element.</p> <p>[<i>Example:</i> Consider the following point on a basic wrapping polygon for a DrawingML object:</p> <pre><... x="0" y="100" /></pre> <p>The y attribute defines a y-coordinate of 100. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Point2D](#)) is located in §A.4.1. *end note*]

20.4.2.15 wrapNone (No Text Wrapping)

This element specifies that the parent DrawingML object shall not cause any text wrapping within the contents of the host WordprocessingML document based on its display location. In effect, this setting shall place the object in one of two locations:

- If the `behindDoc` attribute on the parent element is `true`, then the object shall be positioned behind the text as it is normally displayed.
- If the `behindDoc` attribute on the parent element is `false`, then the object shall be positioned in front of the text as it is normally displayed.

[*Example:* Consider a `DrawingML` picture which must be displayed in front of any text on the page. This object would be specified as follows:

```
<wp:anchor relativeHeight="10" behindDoc="false">
...
  <wp:wrapNone/>
</wp:anchor>
```

The `wrapNone` element specifies that the `DrawingML` object must not cause any text wrapping, and since the `behindDoc` attribute is `false`, the object must be displayed in front of the text of the document. *end example]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_WrapNone](#)) is located in §A.4.4. *end note]*

20.4.2.16 `wrapPolygon` (Wrapping Polygon)

This element specifies the wrapping polygon which shall be used to determine the extents to which text can wrap around the specified object in the document. This polygon shall be defined by the following:

- The `start` element defines the coordinates of the origin of the wrap polygon
- Two or more `lineTo` elements define the point of the wrap polygon

If the set of child elements does not result in a closed polygon (the last `lineTo` element does not return to the position specified by the `start` element), then a single additional line shall be inferred as needed to close the wrapping polygon.

[*Example:* Consider the following basic wrapping polygon for a `DrawingML` object:

```
<wp:wrapPolygon>
  <wp:start x="0" y="0" />
  <wp:lineTo x="0" y="100" />
  <wp:lineTo x="100" y="100" />
  <wp:lineTo x="100" y="0" />
  <wp:lineTo x="0" y="0" />
</wp:wrapPolygon>
```

The `wrapPolygon` element defines the object's text wrapping polygon (in this case, the four points of a square). *end example]*

Attributes	Description
edited (Wrapping	Specifies that the wrap points for the wrapping polygon have been edited, and the

Attributes	Description
Points Modified)	<p>resulting extents shall be recalculated to compensate when the document is next opened.</p> <p>[<i>Example:</i> Consider the following basic wrapping polygon for a DrawingML object:</p> <pre><wp:wrapPolygon edited="true"> <wp:start x="0" y="0" /> <wp:lineTo x="0" y="100" /> <wp:lineTo x="50" y="50" /> <wp:lineTo x="0" y="0" /> </wp:wrapPolygon></pre> <p>The edited attribute specifies that these wrap points have been changed since the document was last rendered. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_WrapPath](#)) is located in §A.4.4. *end note*]

20.4.2.17 wrapSquare (Square Wrapping)

This element specifies that text shall wrap around a virtual rectangle bounding this object. The bounds of the wrapping rectangle shall be dictated by the extents including the addition of the effectExtent element as a child of this element (if present) or the effectExtent present on the parent element.

[*Example:* Consider a DrawingML object using square wrapping and defined as follows:

```
<wp:anchor ... >
  ...
  <wp:wrapSquare wrapText="bothSides" />
</wp:anchor>
```

The wrapSquare element specifies that text must wrap around both sides of a rectangle around this object which includes its effect extents. *end example*]

Attributes	Description
distB (Distance From Text on Bottom Edge)	<p>Specifies the minimum distance which shall be maintained between the bottom edge of this drawing object and any subsequent text within the document when this graphical object is displayed within the document's contents.</p> <p>The distance shall be measured in EMUs (English Metric Units).</p> <p>[<i>Example:</i> Consider a floating DrawingML object which must have one-half of an inch of</p>

Attributes	Description
	<p>padding between its bottom edge and the nearest text. This setting would be specified as follows:</p> <pre><wp:anchor ... > ... <wp:wrapSquare distB="457200" ... /> </wp:anchor></pre> <p>The distB attribute specifies that the padding distance must be 457200 EMUs or one-half of an inch. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_WrapDistance simple type (§20.4.3.6).</p>
distL (Distance From Text on Left Edge)	<p>Specifies the minimum distance which shall be maintained between the left edge of this drawing object and any subsequent text within the document when this graphical object is displayed within the document's contents.</p> <p>The distance shall be measured in EMUs (English Metric Units).</p> <p>[<i>Example:</i> Consider a floating DrawingML object which must have one-half of an inch of padding between its left edge and the nearest text. This setting would be specified as follows:</p> <pre><wp:anchor ... > ... <wp:wrapSquare distL="457200" ... /> </wp:anchor></pre> <p>The distL attribute specifies that the padding distance must be 457200 EMUs or one-half of an inch. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_WrapDistance simple type (§20.4.3.6).</p>
distR (Distance From Text on Right Edge)	<p>Specifies the minimum distance which shall be maintained between the right edge of this drawing object and any subsequent text within the document when this graphical object is displayed within the document's contents.</p> <p>The distance shall be measured in EMUs (English Metric Units).</p> <p>[<i>Example:</i> Consider a floating DrawingML object which must have one-half of an inch of padding between its right edge and the nearest text. This setting would be specified as follows:</p> <pre><wp:anchor ... > ... <wp:wrapSquare distR="457200" ... /></pre>

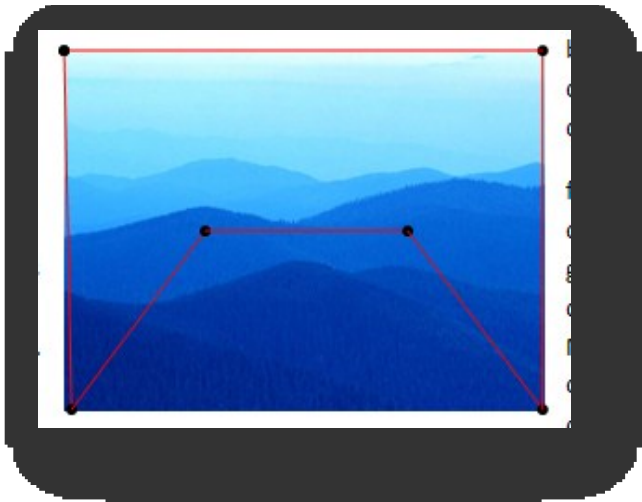
Attributes	Description
	<p><code></wp:anchor></code></p> <p>The distR attribute specifies that the padding distance must be 457200 EMUs or one-half of an inch. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_WrapDistance simple type (§20.4.3.6).</p>
distT (Distance From Text (Top))	<p>Specifies the minimum distance which shall be maintained between the top edge of this drawing object and any subsequent text within the document when this graphical object is displayed within the document's contents.</p> <p>The distance shall be measured in EMUs (English Metric Units).</p> <p>[<i>Example:</i> Consider a floating DrawingML object which must have one-half of an inch of padding between its top edge and the nearest text. This setting would be specified as follows:</p> <pre data-bbox="451 867 1031 997"><wp:anchor ... > ... <wp:wrapSquare distT="457200" ... /> </wp:anchor></pre> <p>The distT attribute specifies that the padding distance must be 457200 EMUs or one-half of an inch. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_WrapDistance simple type (§20.4.3.6).</p>
wrapText (Text Wrapping Location)	<p>Specifies how text shall wrap around the object's left and right sides.</p> <p>[<i>Example:</i> Consider a floating DrawingML object which must allow text to wrap around its left side only. This setting would be specified as follows:</p> <pre data-bbox="451 1409 1047 1539"><wp:anchor ... > ... <wp:wrapSquare wrapText="left" ... /> </wp:anchor></pre> <p>The wrapText attribute value of <code>left</code> specifies that text must only wrap around the left side of the object. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_WrapText simple type (§20.4.3.7).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_WrapSquare](#)) is located in §A.4.4. *end note*]

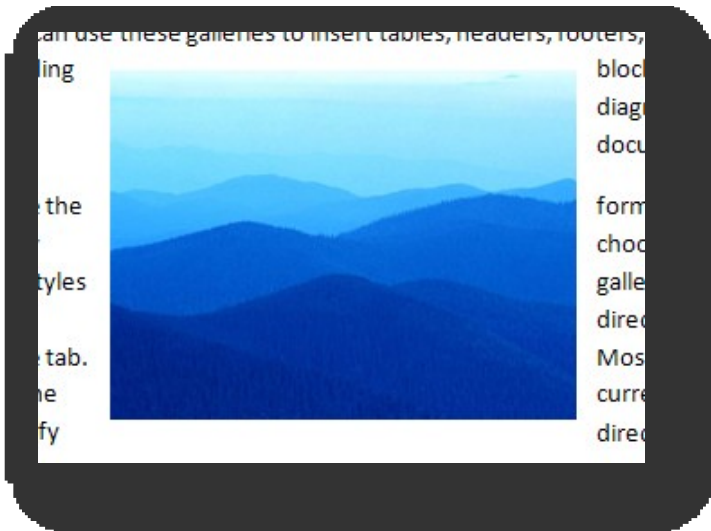
20.4.2.18 wrapThrough (Through Wrapping)

This element specifies that text shall wrap around the wrapping polygon bounding this object as defined by the child wrapPolygon element. When this element specifies a wrapping polygon, it shall allow text to wrap within the object's maximum left and right extents.

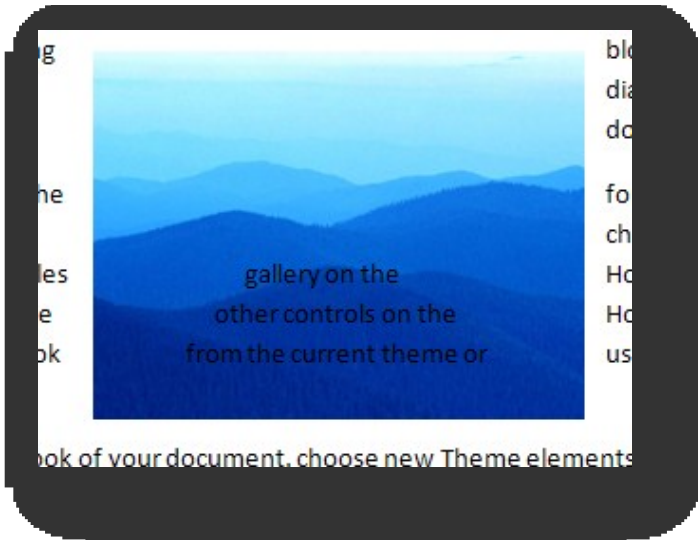
[Example: Consider an object with the following wrap points:



If this object uses tight wrapping, then text cannot be placed within the maximum left and right extents of the wrap polygon at any location:



However, with through wrapping:



end example]

[*Example:* Consider a DrawingML object using through wrapping and defined as follows:

```
<wp:anchor ... >
...
<wp:wrapThrough wrapText="bothSides">
...
</wp:wrapThrough>
</wp:anchor>
```

The wrapThrough element specifies that text must wrap through this object as defined by its wrap polygon. *end example]*

Attributes	Description
distL (Distance From Text on Left Edge)	<p>Specifies the minimum distance which shall be maintained between the left edge of this drawing object and any subsequent text within the document when this graphical object is displayed within the document's contents.</p> <p>The distance shall be measured in EMUs (English Metric Units).</p> <p>[<i>Example:</i> Consider a floating DrawingML object which must have one-half of an inch of padding between its left edge and the nearest text. This setting would be specified as follows:</p> <pre><wp:anchor ... > ... <wp:wrapThrough distL="457200" ... /> </wp:anchor></pre> <p>The distL attribute specifies that the padding distance must be 457200 EMUs or one-half</p>

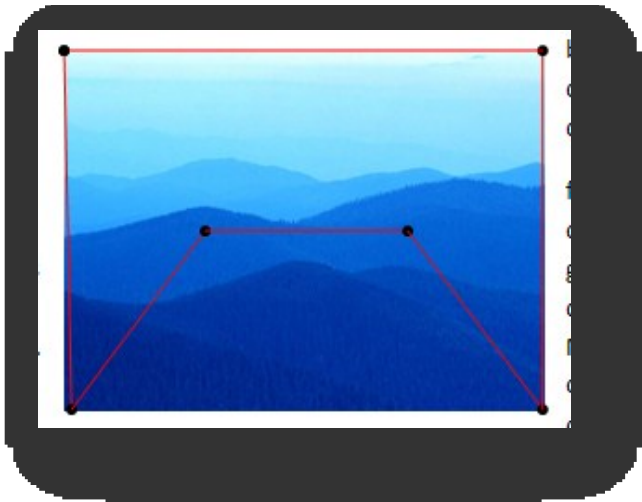
Attributes	Description
	<p>of an inch. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_WrapDistance simple type (§20.4.3.6).</p>
<p>distR (Distance From Text on Right Edge)</p>	<p>Specifies the minimum distance which shall be maintained between the right edge of this drawing object and any subsequent text within the document when this graphical object is displayed within the document's contents.</p> <p>The distance shall be measured in EMUs (English Metric Units).</p> <p>[<i>Example:</i> Consider a floating DrawingML object which must have one-half of an inch of padding between its right edge and the nearest text. This setting would be specified as follows:</p> <pre data-bbox="451 762 1047 894"><wp:anchor ... > ... <wp:wrapThrough distR="457200" ... /> </wp:anchor></pre> <p>The distR attribute specifies that the padding distance must be 457200 EMUs or one-half of an inch. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_WrapDistance simple type (§20.4.3.6).</p>
<p>wrapText (Text Wrapping Location)</p>	<p>Specifies how text shall wrap around the object's left and right sides.</p> <p>[<i>Example:</i> Consider a floating DrawingML object which must allow text to wrap around its left side only. This setting would be specified as follows:</p> <pre data-bbox="451 1304 1063 1436"><wp:anchor ... > ... <wp:wrapThrough wrapText="left" ... /> </wp:anchor></pre> <p>The wrapText attribute value of left specifies that text must only wrap around the left side of the object. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_WrapText simple type (§20.4.3.7).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_WrapThrough](#)) is located in §A.4.4. *end note*]

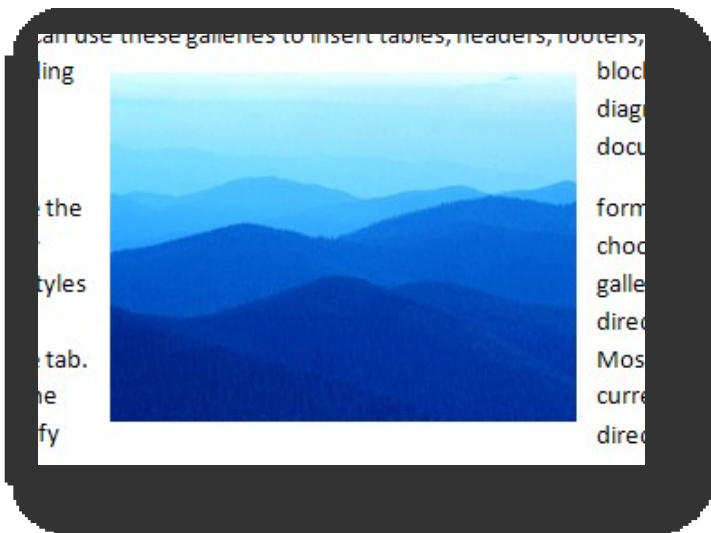
20.4.2.19 wrapTight (Tight Wrapping)

This element specifies that text shall wrap around the wrapping polygon bounding this object as defined by the child wrapPolygon element. When this element specifies a wrapping polygon, it shall not allow text to wrap within the object's maximum left and right extents.

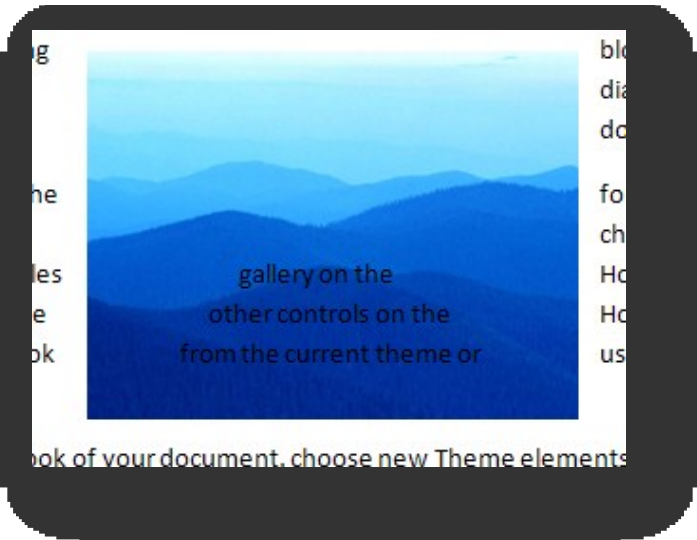
[Example: Consider an object with the following wrap points:



If this object uses tight wrapping, then text cannot be placed within the maximum left and right extents of the wrap polygon at any location:



However, with through wrapping:



end example]

[*Example:* Consider a DrawingML object using tight wrapping and defined as follows:

```
<wp:anchor ... >
...
<wp:wrapTight wrapText="bothSides">
...
</wp:wrapTight>
</wp:anchor>
```

The wrapTight element specifies that text must wrap through this object as defined by its wrap polygon. *end example]*

Attributes	Description
distL (Distance From Text on Left Edge)	<p>Specifies the minimum distance which shall be maintained between the left edge of this drawing object and any subsequent text within the document when this graphical object is displayed within the document's contents.</p> <p>The distance shall be measured in EMUs (English Metric Units).</p> <p>[<i>Example:</i> Consider a floating DrawingML object which must have one-half of an inch of padding between its left edge and the nearest text. This setting would be specified as follows:</p> <pre><wp:anchor ... > ... <wp:wrapTight distL="457200" ... /> </wp:anchor></pre> <p>The distL attribute specifies that the padding distance must be 457200 EMUs or one-half</p>

Attributes	Description
	<p>of an inch. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_WrapDistance simple type (§20.4.3.6).</p>
<p>distR (Distance From Text on Right Edge)</p>	<p>Specifies the minimum distance which shall be maintained between the right edge of this drawing object and any subsequent text within the document when this graphical object is displayed within the document's contents.</p> <p>The distance shall be measured in EMUs (English Metric Units).</p> <p>[<i>Example:</i> Consider a floating DrawingML object which must have one-half of an inch of padding between its right edge and the nearest text. This setting would be specified as follows:</p> <pre data-bbox="451 758 1015 892"><wp:anchor ... > ... <wp:wrapTight distR="457200" ... /> </wp:anchor></pre> <p>The distR attribute specifies that the padding distance must be 457200 EMUs or one-half of an inch. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_WrapDistance simple type (§20.4.3.6).</p>
<p>wrapText (Text Wrapping Location)</p>	<p>Specifies how text shall wrap around the object's left and right sides.</p> <p>[<i>Example:</i> Consider a floating DrawingML object which must allow text to wrap around its left side only. This setting would be specified as follows:</p> <pre data-bbox="451 1297 1031 1432"><wp:anchor ... > ... <wp:wrapTight wrapText="left" ... /> </wp:anchor></pre> <p>The wrapText attribute value of left specifies that text must only wrap around the left side of the object. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_WrapText simple type (§20.4.3.7).</p>

[*Note:* The W3C XML Schema definition of this element's content model (CT_WrapTight) is located in §A.4.4. *end note*]

20.4.2.20 wrapTopAndBottom (Top and Bottom Wrapping)

This element specifies that text shall wrap around the top and bottom of this object, but not its left or right edges.

[*Example*: Consider a DrawingML object using top and bottom wrapping and defined as follows:

```
<wp:anchor ... >
...
<wp:wrapTopAndBottom />
</wp:anchor>
```

The wrapTopAndBottom element specifies that text must wrap around neither side of this object. *end example*]

Attributes	Description
distB (Distance From Text on Bottom Edge)	<p>Specifies the minimum distance which shall be maintained between the bottom edge of this drawing object and any subsequent text within the document when this graphical object is displayed within the document's contents.</p> <p>The distance shall be measured in EMUs (English Metric Units).</p> <p>[<i>Example</i>: Consider a floating DrawingML object which must have one-half of an inch of padding between its bottom edge and the nearest text. This setting would be specified as follows:</p> <pre><wp:anchor ... > ... <wp:wrapTopAndBottom distB="457200" ... /> </wp:anchor></pre> <p>The distB attribute specifies that the padding distance must be 457200 EMUs or one-half of an inch. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_WrapDistance simple type (§20.4.3.6).</p>
distT (Distance From Text on Top Edge)	<p>Specifies the minimum distance which shall be maintained between the top edge of this drawing object and any subsequent text within the document when this graphical object is displayed within the document's contents.</p> <p>The distance shall be measured in EMUs (English Metric Units).</p> <p>[<i>Example</i>: Consider a floating DrawingML object which must have one-half of an inch of padding between its top edge and the nearest text. This setting would be specified as follows:</p> <pre><wp:anchor ... ></pre>

Attributes	Description
	<pre>... <wp:wrapTopAndBottom distT="457200" ... /> </wp:anchor></pre> <p>The distT attribute specifies that the padding distance must be 457200 EMUs or one-half of an inch. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_WrapDistance simple type (§20.4.3.6).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_WrapTopBottom](#)) is located in §A.4.4. *end note*]

20.4.2.21 [bg \(Background Formatting\)](#)

This element defines formatting that can be applied to the background shape of the document. The background shape can hold formatting options just as a normal shape can hold within DrawingML.

20.4.2.22 [bodyPr \(Body Properties\)](#)

This element defines the body properties for the text body within a shape.

Attributes	Description
anchor (Anchor)	<p>Specifies the anchoring position of the txBody within the shape. If this attribute is omitted, then a value of t, or top is implied.</p> <p>The possible values for this attribute are defined by the ST_TextAnchoringType simple type (§20.1.10.59).</p>
anchorCtr (Anchor Center)	<p>Specifies the centering of the text box. The way it works fundamentally is to determine the smallest possible "bounds box" for the text and then to center that "bounds box" accordingly. This is different than paragraph alignment, which aligns the text within the "bounds box" for the text. This flag is compatible with all of the different kinds of anchoring. If this attribute is omitted, then a value of 0 or false is implied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
bIns (Bottom Inset)	<p>Specifies the bottom inset of the bounding rectangle. Insets are used just as internal margins for text boxes within shapes. If this attribute is omitted, a value of 45720 or 0.05 inches is implied.</p> <p>The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</p>
compatLnSpc (Compatible Line)	<p>Specifies that the line spacing for this text body is decided in a simplistic manner using the font scene. If this attribute is omitted, a value of 0 or false is implied.</p>

Attributes	Description
Spacing)	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
forceAA (Force Anti-Alias)	<p>Forces the text to be rendered anti-aliased regardless of the font size. Certain fonts can appear grainy around their edges unless they are anti-aliased. Therefore this attribute allows for the specifying of which bodies of text should always be anti-aliased and which ones should not. If this attribute is omitted, then a value of 0 or false is implied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fromWordArt (From WordArt)	<p>Specifies that text within this textbox is converted text from a WordArt object. This is more of a backwards compatibility attribute that is useful to the application from a tracking perspective. WordArt was the former way to apply text effects and therefore this attribute is useful in document conversion scenarios. If this attribute is omitted, then a value of 0 or false is implied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
horzOverflow (Text Horizontal Overflow)	<p>Determines whether the text can flow out of the bounding box horizontally. This is used to determine what happens in the event that the text within a shape is too large for the bounding box it is contained within. If this attribute is omitted, then a value of overflow is implied.</p> <p>The possible values for this attribute are defined by the ST_TextHorzOverflowType simple type (§20.1.10.68).</p>
lIns (Left Inset)	<p>Specifies the left inset of the bounding rectangle. Insets are used just as internal margins for text boxes within shapes. If this attribute is omitted, then a value of 91440 or 0.1 inches is implied.</p> <p>The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</p>
numCol (Number of Columns)	<p>Specifies the number of columns of text in the bounding rectangle. When applied to a text run this property takes the width of the bounding box for the text and divides it by the number of columns specified. These columns are then treated as overflow containers in that when the previous column has been filled with text the next column acts as the repository for additional text. When all columns have been filled and text still remains then the overflow properties set for this text body are used and the text is reflowed to make room for additional text. If this attribute is omitted, then a value of 1 is implied.</p> <p>The possible values for this attribute are defined by the ST_TextColumnCount simple type (§20.1.10.64).</p>
rIns (Right Inset)	Specifies the right inset of the bounding rectangle. Insets are used just as internal margins for text boxes within shapes. If this attribute is omitted, then a value of 91440 or 0.1 inches is implied.

Attributes	Description
	<p>The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</p>
rot (Rotation)	<p>Specifies the rotation that is being applied to the text within the bounding box. If it not specified, the rotation of the accompanying shape is used. If it is specified, then this is applied independently from the shape. That is the shape can have a rotation applied in addition to the text itself having a rotation applied to it. If this attribute is omitted, then a value of 0, is implied.</p> <p>The possible values for this attribute are defined by the ST_Angle simple type (§20.1.10.3).</p>
rtlCol (Columns Right-To-Left)	<p>Specifies whether columns are used in a right-to-left or left-to-right order. The usage of this attribute only sets the column order that is used to determine which column overflow text should go to next. If this attribute is omitted, then a value of 0 or false is implied in which case text starts in the leftmost column and flow to the right.</p> <p>[<i>Note</i>: This attribute in no way determines the direction of text but merely the direction in which multiple columns are used. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
spcCol (Space Between Columns)	<p>Specifies the space between text columns in the text area. This should only apply when there is more than 1 column present. If this attribute is omitted, then a value of 0 is implied.</p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate32 simple type (§20.1.10.42).</p>
spcFirstLastPara (Paragraph Spacing)	<p>Specifies whether the before and after paragraph spacing defined by the user is to be respected. While the spacing between paragraphs is helpful, it is additionally useful to be able to set a flag as to whether this spacing is to be followed at the edges of the text body, in other words the first and last paragraphs in the text body. More precisely since this is a text body level property it should only effect the before paragraph spacing of the first paragraph and the after paragraph spacing of the last paragraph for a given text body. If this attribute is omitted, then a value of 0, or false is implied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
tIns (Top Inset)	<p>Specifies the top inset of the bounding rectangle. Insets are used just as internal margins for text boxes within shapes. If this attribute is omitted, then a value of 45720 or 0.05 inches is implied.</p> <p>The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</p>
upright (Text	<p>Specifies whether text should remain upright, regardless of the transform applied to it</p>

Attributes	Description
Upright)	and the accompanying shape transform. If this attribute is omitted, then a value of 0, or false is implied. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
vert (Vertical Text)	Determines if the text within the given text body should be displayed vertically. If this attribute is omitted, then a value of horz, or no vertical text is implied. The possible values for this attribute are defined by the ST_TextVerticalType simple type (§20.1.10.82).
vertOverflow (Text Vertical Overflow)	Determines whether the text can flow out of the bounding box vertically. This is used to determine what happens in the event that the text within a shape is too large for the bounding box it is contained within. If this attribute is omitted, then a value of overflow is implied. The possible values for this attribute are defined by the ST_TextVertOverflowType simple type (§20.1.10.83).
wrap (Text Wrapping Type)	Specifies the wrapping options to be used for this text body. If this attribute is omitted, then a value of square is implied which wraps the text using the bounding text box. The possible values for this attribute are defined by the ST_TextWrappingType simple type (§20.1.10.84).

20.4.2.23 cNvCnPr (Non-Visual Connector Shape Drawing Properties)

This element specifies the non-visual drawing properties specific to a connector shape. This includes information specifying the shapes to which the connector shape is connected.

[Note: The W3C XML Schema definition of this element's content model (CT_NonVisualConnectorProperties) is located in §A.4.4. *end note*]

20.4.2.24 cNvContentPartPr (Non-Visual Content Part Drawing Properties)

This element specifies the non-visual drawing properties for a content part. This allows for additional information that does not affect the appearance of the content part to be stored.

Attributes	Description
isComment (Is a Comment)	Specifies whether the content part is a comment or an annotation. If true, it is a comment; otherwise, it is a general annotation.
Namespace: http://purl.oclc.org/ooxml/drawingml/main	The default value for this attribute is true. [Example: Consider a WordprocessingDrawingML object defined as follows: <... isComment="false">

Attributes	Description
	<p>The content part shape does not represent a comment. <i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model (CT_NonVisualContentPartProperties) is located in §A.4.1. *end note*]

20.4.2.25 [cNvFrPr \(Non-Visual Graphic Frame Drawing Properties\)](#)

This element specifies the non-visual drawing properties for a graphic frame. These non-visual properties are properties that the generating application would utilize when rendering.

[*Note:* The W3C XML Schema definition of this element's content model (CT_NonVisualGraphicFrameProperties) is located in §A.4.1. *end note*]

20.4.2.26 [cNvGrpSpPr \(Non-Visual Group Shape Drawing Properties\)](#)

This element specifies the non-visual drawing properties for a group shape. These non-visual properties are properties that the generating application would utilize when rendering.

20.4.2.27 [cNvPr \(Non-Visual Drawing Properties\)](#)

This element specifies non-visual canvas properties. This allows for additional information that does not affect the appearance of the picture to be stored.

[*Example:* Consider the following WordprocessingDrawingML:

```
<wsp>
...
<cNvPr id="4" name="Lilly_by_Lisher.jpg"/>
...
</wsp>
```

end example]

Attributes	Description
descr (Alternative Text for Object)	Specifies alternative text for the current DrawingML object, for use by assistive technologies or applications that do not display the current object.
Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>If this element is omitted, then no alternative text is present for the parent object.</p> <p>[<i>Example:</i> Consider a DrawingML object defined as follows:</p>

Attributes	Description
	<p><... descr="A picture of a bowl of fruit"></p> <p>The descr attribute contains alternative text that can be used in place of the actual DrawingML object. <i>end example</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
<p>hidden (Hidden)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies whether this DrawingML object is displayed. When a DrawingML object is displayed within a document, that object can be hidden (i.e., present, but not visible). This attribute determines whether the object is rendered or made hidden. [Note: An application can have settings which allow this object to be viewed. <i>end note</i>]</p> <p>If this attribute is omitted, then the parent DrawingML object shall be displayed (i.e., not hidden).</p> <p>[Example: Consider an inline DrawingML object that must be hidden within the document's content. This setting would be specified as follows:</p> <p><... hidden="true" /></p> <p>The hidden attribute has a value of true, which specifies that the DrawingML object is hidden and not displayed when the document is displayed. <i>end example</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>id (Unique Identifier)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies a unique identifier for the current DrawingML object within the current document. This ID can be used to assist in uniquely identifying this object so that it can be referred to by other parts of the document.</p> <p>If multiple objects within the same document share the same id attribute value, then the document shall be considered non-conformant.</p> <p>[Example: Consider a DrawingML object defined as follows:</p> <p><... id="10" ... ></p> <p>The id attribute has a value of 10, which is the unique identifier for this DrawingML object. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_DrawingElementId simple type (§20.1.10.21).</p>
<p>name (Name)</p> <p>Namespace: http://purl.oclc.org</p>	<p>Specifies the name of the object. [Note: Typically, this is used to store the original file name of a picture object. <i>end note</i>]</p> <p>[Example: Consider a DrawingML object defined as follows:</p>

Attributes	Description
g/ooxml/drawing ml/main	<p>< ... name="foo.jpg" ></p> <p>The name attribute has a value of foo.jpg, which is the name of this DrawingML object. <i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
title (Title) Namespace: http://purl.oclc.org/ooxml/drawing ml/main	<p>Specifies the title (caption) of the current DrawingML object.</p> <p>If this attribute is omitted, then no title text is present for the parent object.</p> <p>[Example: Consider a DrawingML object defined as follows:</p> <p><... title="Process Flow Diagram"></p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[Note: The W3C XML Schema definition of this element's content model (CT_NonVisualDrawingProps) is located in §A.4.1. *end note]*

20.4.2.28 [cNvSpPr \(Non-Visual Drawing Properties for a Shape\)](#)

This element specifies the non-visual drawing properties for a shape. These properties are to be used by the generating application to determine how the shape should be dealt with.

Attributes	Description
txBox (Text Box) Namespace: http://purl.oclc.org/ooxml/drawing ml/main	<p>Specifies that the corresponding shape is a text box and thus should be treated as such by the generating application. If this attribute is omitted then it is assumed that the corresponding shape is not specifically a text box.</p> <p>[Note: Because a shape is not specified to be a text box does not mean that it cannot have text attached to it. A text box is merely a specialized shape with specific properties. <i>end note]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

20.4.2.29 [contentPart \(Content Part\)](#)

This element specifies a reference to XML content in a format not defined by ECMA-376. [Note: This part allows the native use of other commonly used interchange formats, such as:

- MathML (<http://www.w3.org/TR/MathML2/>)
- SMIL (<http://www.w3.org/TR/REC-smil/>)
- SVG (<http://www.w3.org/TR/SVG11/>)

end note]

The relationship type of the explicit relationship specified by this element shall be <http://purl.oclc.org/ooxml/officeDocument/relationships/customXml> and have a TargetMode attribute value of Internal. If an application cannot process content of the content type specified by the targeted part, then it should continue to process the file. If possible, it should also provide some indication that unknown content was not imported.

Attributes	Description
bwMode (Black and White Mode)	<p>Specifies how to interpret color information contained within a content part to achieve a color, black and white, or grayscale rendering of the content part. This attribute specifies only the rendering mode applied to the content part; it does not affect how the actual color information is persisted.</p> <p>The possible values for this attribute are defined by the ST_BlackWhiteMode simple type (§20.1.10.10).</p>
<p>id (Relationship to Part)</p> <p>Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships</p>	<p>Specifies the relationship ID to a specified part.</p> <p>The specified relationship shall match the relationship type required by the parent element:</p> <ul style="list-style-type: none"> • http://purl.oclc.org/ooxml/officeDocument/customXml for the contentPart element • http://purl.oclc.org/ooxml/officeDocument/relationships/footer for the footerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/header for the headerReference element • http://purl.oclc.org/ooxml/officeDocument/relationships/font for the embedBold, embedBoldItalic, embedItalic, or embedRegular elements • http://purl.oclc.org/ooxml/officeDocument/relationships/printerSettings for the printerSettings element • http://purl.oclc.org/ooxml/officeDocument/relationships/hyperlink for the longDesc or hyperlink element <p>[<i>Example:</i> Consider an XML element which has the following id attribute:</p> <pre><... r:id="rld10" /></pre> <p>The markup specifies the associated relationship part with relationship ID rld1 contains the corresponding relationship information for the parent XML element. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>

[*Note: The W3C XML Schema definition of this element's content model (CT_WordprocessingContentPart) is located in §A.4.4. end note*]

20.4.2.30 `extLst` (Extension List)

This element specifies an extension list, within which all future extensions are defined within `ext` elements.

The extension list along with corresponding future extensions is used to extend the storage capabilities of the DrawingML framework. This allows for various new types of data to be stored natively within the existing diagram syntax.

20.4.2.31 `graphicFrame` (Graphical object container)

This element specifies a container for a graphical object in WordprocessingML.

[*Note: The W3C XML Schema definition of this element's content model (CT_GraphicFrame) is located in §A.4.5. end note*]

20.4.2.32 `grpSp` (Group Shape)

This element specifies a group shape that represents many shapes grouped together. This shape is to be treated just as if it were a regular shape but instead of being described by a single geometry it is made up of all the shape geometries encompassed within it. Within a group shape each of the shapes that make up the group are specified just as they normally would. The idea behind grouping elements however is that a single transform can apply to many shapes at the same time.

20.4.2.33 `grpSpPr` (Group Shape Properties)

This element specifies the properties that are to be common across all of the shapes within the corresponding group. If there are any conflicting properties within the group shape properties and the individual shape properties then the individual shape properties should take precedence.

Attributes	Description
bwMode (Black and White Mode) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies that the group shape should be rendered using only black and white coloring. That is the coloring information for the group shape should be converted to either black or white when rendering the corresponding shapes.</p> <p>No gray is to be used in rendering this image, only stark black and stark white.</p> <p>[<i>Note: This does not mean that the group shapes themselves are stored with only black and white color information. This attribute instead sets the rendering mode that the shapes use when rendering. end note</i>]</p> <p>The possible values for this attribute are defined by the ST_BlackWhiteMode simple type (§20.1.10.10).</p>

20.4.2.34 linkedTxbx (Textual contents of shape)

This element specifies the textual contents of a shape that is not the first in the series of shapes for the same text box story.

Attributes	Description
id (ID)	Specifies the identity of the text box story begun by a txbx element. This value shall be unique across a document for each txbx element. The possible values for this attribute are defined by the W3C XML Schema unsignedShort datatype.
seq (sequence index)	Specifies the position of the owning shape in the given text box story. The possible values for this attribute are defined by the W3C XML Schema unsignedShort datatype.

[Note: The W3C XML Schema definition of this element's content model (CT_LinkedTextboxInformation) is located in §A.4.4. *end note*]

20.4.2.35 spPr (Shape Properties)

This element specifies the visual shape properties that can be applied to a shape. These properties include the shape fill, outline, geometry, effects, and 3D orientation.

Attributes	Description
bwMode (Black and White Mode) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies that the picture should be rendered using only black and white coloring. That is the coloring information for the picture should be converted to either black or white when rendering the picture. No gray is to be used in rendering this image, only stark black and stark white. [Note: This does not mean that the picture itself that is stored within the file is necessarily a black and white picture. This attribute instead sets the rendering mode that the picture has applied to when rendering. <i>end note</i>] The possible values for this attribute are defined by the ST_BlackWhiteMode simple type (§20.1.10.10).

20.4.2.36 style (Shape Style)

This element specifies the style information for a shape. This is used to define a shape's appearance in terms of the preset styles defined by the style matrix for the theme.

20.4.2.37 **txbx** (Textual contents of shape)

This element specifies the textual contents of a shape which is the first in the series of shapes for the same text box story. This element shall be present only in the CT_WordprocessingShape element that is the first in a series of CT_WordprocessingShape elements that refer to the same text box story.

Attributes	Description
id (ID)	<p>Specifies the identity of the text box story begun by a txbx element. This value shall be unique across a document for each txbx element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedShort datatype.</p>

[Note: The W3C XML Schema definition of this element's content model (CT_TextboxInfo) is located in §A.4.4. *end note*]

20.4.2.38 **txbxContent** (Rich Text Box Content Container)

This element specifies that its contents shall be any rich WordprocessingML content, and that this content is the rich contents of a drawing object defined using DrawingML syntax.

If this element contains within any of its contents any of the following content, then the document shall be considered non-conformant:

- References to other WordprocessingML document stories (comments, footnotes, endnotes)
- Vector Markup Language (VML)
- Additional txbxContent elements (as part of nested DrawingML objects)

20.4.2.39 **wgp** (WordprocessingML Shape Group)

This element specifies a shape group in WordprocessingML.

[Note: The W3C XML Schema definition of this element's content model (CT_WordprocessingGroup) is located in §A.4.5. *end note*]

20.4.2.40 **whole** (Whole E2O Formatting)

Formatting that applies to the entire diagram object, and not just the background, includes line and effect properties.

20.4.2.41 **wpc** (WordprocessingML Drawing Canvas)

This element specifies a drawing canvas in WordprocessingML. A drawing canvas is a logical grouping of shapes.

[Note: A Drawing Canvas is typically used to allow grouping of shapes together for bulk operations. *end note*]

[Note: The W3C XML Schema definition of this element's content model (CT_WordprocessingCanvas) is located in §A.4.5. *end note*]

20.4.2.42 [wsp \(WordprocessingML Shape\)](#)



This element specifies a shape in WordprocessingML.

Attributes	Description
normalEastAsianFlow (East Asian Flow)	<p>Specifies that the text flow of the text contents of the shape shall ignore the text flow value specified by the vert attribute of the bodyPr element.</p> <p>If this attribute is set to TRUE then the text flows in the manner specified by the value "tbV" for ST_TextDirection (§17.18.93).</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element’s content model (CT_ WordprocessingShape) is located in §A.4.5. *end note*]

20.4.2.43 [xfrm \(2D Transform for Graphic Frames\)](#)

This element specifies a two dimensional transform for a Graphic Frame.

Attributes	Description
<p>flipH (Horizontal Flip)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies a horizontal flip. When true, this attribute defines that the shape is flipped horizontally about the center of its bounding box.</p> <p>[Example: The following illustrates the effect of a horizontal flip.</p> <div></div> <p><i>end example</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>flipV (Vertical Flip)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies a vertical flip. When true, this attribute defines that the group is flipped vertically about the center of its bounding box.</p> <p>[Example: The following illustrates the effect of a vertical flip.</p> <div></div> <p><i>end example</i></p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
rot (Rotation) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies the rotation of the Graphic Frame. The units for which this attribute is specified in reside within the simple type definition referenced below. The possible values for this attribute are defined by the ST_Angle simple type (§20.1.10.3).

20.4.3 Simple Types

This is the complete list of simple types dedicated to DrawingML – WordprocessingML Drawing.

20.4.3.1 ST_AlignH (Relative Horizontal Alignment Positions)

This simple type contains the possible settings specifying how a DrawingML object can be horizontally aligned relative to the horizontal alignment base defined by the parent element.

[*Example:* Consider a picture in a WordprocessingML document which has been aligned relative to the edge of the page - the left of the page horizontally, and the top of the page vertically. This alignment would be specified as follows:

```
<wp:anchor ... >
  <wp:positionH relativeFrom="page">
    <wp:align>left</wp:align>
  </wp:positionH>
  ...
</wp:anchor>
```

The align element with a value of `left` specifies that for the horizontal positioning defined by the parent element (in this case, positioning relative to the page), the picture must be aligned to the left edge of the page.
end example]

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
center (Center Alignment)	Specifies that the object shall be centered with respect to the horizontal alignment base. <i>[Example: Centered on the page. end example]</i>
inside (Inside)	Specifies that the object shall be inside of the horizontal alignment base.

Enumeration Value	Description
	<i>[Example: Inside the outside margin. end example]</i>
left (Left Alignment)	Specifies that the object shall be left aligned to the horizontal alignment base. <i>[Example: Left aligned relative to the margins. end example]</i>
outside (Outside)	Specifies that the object shall be outside of the horizontal alignment base. <i>[Example: Outside the left margin. end example]</i>
right (Right Alignment)	Specifies that the object shall be right aligned to the horizontal alignment base. <i>[Example: Right aligned relative to the margins. end example]</i>

[Note: The W3C XML Schema definition of this simple type's content model ([ST_AlignH](#)) is located in §A.4.4. end note]

20.4.3.2 [ST_AlignV \(Vertical Alignment Definition\)](#)

This simple type contains the possible settings specifying how a DrawingML object can be vertically aligned relative to the vertical alignment base defined by the parent element.

[Example: Consider a picture in a WordprocessingML document which has been aligned relative to the edge of the page - the left of the page horizontally, and the top of the page vertically. This alignment would be specified as follows:

```
<wp:anchor ... >
  <wp:positionV relativeFrom="page">
    <wp:align>top</wp:align>
  </wp:positionH>
  ...
</wp:anchor>
```

The align element with a value of top specifies that for the vertical positioning defined by the parent element (in this case, positioning relative to the page), the picture must be aligned to the top edge of the page. *end example]*

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
bottom (Bottom)	Specifies that the object shall be at the bottom of the vertical alignment base. <i>[Example: Bottom of the page. end example]</i>
center (Center Alignment)	Specifies that the object shall be centered with respect to the vertical alignment base. <i>[Example: Centered on the page. end example]</i>
inside (Inside)	Specifies that the object shall be inside of the horizontal alignment base. <i>[Example: Inside the top margin. end example]</i>
outside (Outside)	Specifies that the object shall be outside of the vertical alignment base. <i>[Example: Outside the top margin. end example]</i>
top (Top)	Specifies that the object shall be at the top of the vertical alignment base. <i>[Example: Top of the page. end example]</i>

[Note: The W3C XML Schema definition of this simple type's content model ([ST_AlignV](#)) is located in §A.4.4. end note]

20.4.3.3 [ST_PositionOffset](#) (Absolute Position Offset Value)

This simple type represents a one dimensional distance which shall be used to offset an object from its base positioning location stored in EMUs.

[Example: Consider a DrawingML picture which must be displayed one inch from the top of the page, and one-half of an inch from the left edge of the page. This object would be specified as follows:

```
<wp:anchor ... >
  <wp:positionH relativeFrom="page">
    <wp:posOffset>914400</wp:posOffset>
  </wp:positionH>
  <wp:positionV relativeFrom="page">
    <wp:posOffset>457200</wp:posOffset>
  </wp:positionV>
</wp:anchor>
```

The posOffset element specifies the absolute positioning of the object relative to the top-left edge of the page in EMUs. *end example*]

This simple type's contents are a restriction of the W3C XML Schema int datatype.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_PositionOffset](#)) is located in §A.4.4. *end note*]

20.4.3.4 ST_RelFromH (Horizontal Relative Positioning)

This simple type specifies the possible values for the base from which the relative horizontal positioning of an object shall be calculated.

[*Example:* Consider a DrawingML picture which must be displayed at the bottom center of the page. This object would be specified as follows:

```
<wp:anchor ... >
  <wp:positionH relativeFrom="page">
    <wp:align>center</wp:align>
  </wp:positionH>
  ...
</wp:anchor>
```

The relativeFrom attribute specifies that the object is horizontally positioned relative to the page. *end example*]

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
character (Character)	Specifies that the horizontal positioning shall be relative to the position of the anchor within its run content.
column (Column)	Specifies that the horizontal positioning shall be relative to the extents of the column which contains its anchor.
insideMargin (Inside Margin)	Specifies that the horizontal positioning shall be relative to the inside margin of the current page (the left margin on odd pages, right on even pages).
leftMargin (Left Margin)	Specifies that the horizontal positioning shall be relative to the left margin of the page.
margin (Page Margin)	Specifies that the horizontal positioning shall be relative to the page margins.
outsideMargin (Outside Margin)	Specifies that the horizontal positioning shall be relative to the outside margin of the current page (the

Enumeration Value	Description
	right margin on odd pages, left on even pages).
page (Page Edge)	Specifies that the horizontal positioning shall be relative to the edge of the page.
rightMargin (Right Margin)	Specifies that the horizontal positioning shall be relative to the right margin of the page.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_RelFromH](#)) is located in §A.4.4. *end note*]

20.4.3.5 ST_RelFromV (Vertical Relative Positioning)

This simple type specifies the possible values for the base from which the relative vertical positioning of an object shall be calculated.

[*Example:* Consider a DrawingML picture which must be displayed at the bottom center of the page. This object would be specified as follows:

```
<wp:anchor ... >
  <wp:positionV relativeFrom="page">
    <wp:align>bottom</wp:align>
  </wp:positionV>
  ...
</wp:anchor>
```

The relativeFrom attribute specifies that the object is horizontally positioned relative to the page. *end example*]

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
bottomMargin (Bottom Margin)	Specifies that the vertical positioning shall be relative to the bottom margin of the current page.
insideMargin (Inside Margin)	Specifies that the vertical positioning shall be relative to the inside margin of the current page.
line (Line)	Specifies that the vertical positioning shall be relative to the line containing the anchor character.
margin (Page Margin)	Specifies that the vertical positioning shall be relative to the page margins.
outsideMargin (Outside Margin)	Specifies that the vertical positioning shall be relative to the outside margin of the current page.
page (Page Edge)	Specifies that the vertical positioning shall be relative

Enumeration Value	Description
	to the edge of the page.
paragraph (Paragraph)	Specifies that the vertical positioning shall be relative to the paragraph which contains the drawing anchor.
topMargin (Top Margin)	Specifies that the vertical positioning shall be relative to the top margin of the current page.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_RelFromV](#)) is located in §A.4.4. *end note*]

20.4.3.6 ST_WrapDistance (Distance from Text)

This simple type represents a one dimensional distance which shall be used to offset an object from text, stored in EMUs.

[*Example*: Consider a floating DrawingML object which must have one-half of an inch of padding between its left edge and the nearest text. This setting would be specified as follows:

```
<wp:anchor ... >
...
  <wp:wrapThrough distL="457200" ... />
</wp:anchor>
```

The distL attribute specifies that the padding distance must be 457200 EMUs or one-half of an inch. *end example*]

This simple type's contents are a restriction of the W3C XML Schema unsignedInt datatype.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_WrapDistance](#)) is located in §A.4.4. *end note*]

20.4.3.7 ST_WrapText (Text Wrapping Location)

This simple type specifies the possible settings for how text can wrap around the object's left and right sides.

[*Example*: Consider a floating DrawingML object which must allow text to wrap around its left side only. This setting would be specified as follows:

```
<wp:anchor ... >
...
  <wp:wrapTight wrapText="left" ... />
</wp:anchor>
```

The wrapText attribute value of left specifies that text must only wrap around the left side of the object. *end example*]

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
bothSides (Both Sides)	Specifies that text shall wrap around both sides of the object.
largest (Largest Side Only)	<p>Specifies that text shall only wrap around the largest side of the object.</p> <p>If the object is positioned in the exact center of the page, the text shall wrap around the side on which text is first encountered:</p> <ul style="list-style-type: none"> • If the first line of text intersecting the object is using left-to-right reading order, the text shall wrap to the object's left. • If the first line of text intersecting the object is using right-to-left reading order, the text shall wrap to the object's right.
left (Left Side Only)	Specifies that text shall only wrap around the left side of the object.
right (Right Side Only)	Specifies that text shall only wrap around the right side of the object.

[Note: The W3C XML Schema definition of this simple type's content model (ST_WrapText) is located in §A.4.4. *end note*]

20.5 DrawingML - SpreadsheetML Drawing

Within a SpreadsheetML document, it is possible to include graphical DrawingML objects:

- Pictures (§20.2)
- Locked Canvases (§20.3)
- Diagrams (§21.4)
- Charts (§21.2)

When these objects are present in a spreadsheet document, it is necessary to include information which specifies how the objects shall be positioned relative to the parent worksheet. [*Example: Whether the object is anchored to a specific row, whether it resizes with cells, and so on. end example*]

The SpreadsheetML Drawing namespace acts in this capacity, specifying all information necessary to anchor and display DrawingML objects within a spreadsheet document.

[*Example: Consider a DrawingML picture which must be anchored to a specific cell for its top left and bottom right corners, resizing as those cells are relocated. This object would be specified as follows:*

```
<xdr:twoCellAnchor>
  <xdr:from>
    ...
  </xdr:from>
  <xdr:to>
    ...
  </xdr:to>
  <xdr:graphicFrame>
    ...
    <a:graphic>
      <a:graphicData
        uri="http://purl.oclc.org/ooxml/drawingml/diagram">
        <dgm:relIds xmlns:dgm="..." xmlns:r="..." r:dm="rId1" r:lo="rId2"
          r:qs="rId3" r:cs="rId4" />
        </a:graphicData>
      </a:graphic>
    </xdr:graphicFrame>
  </xdr:twoCellAnchor>
```

The twoCellAnchor element (§20.5.2.33) specifies that this object anchored to the cells specified by the to (§20.5.2.32) and from (§20.5.2.15) elements. *end example*

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End of informative text.

20.5.2 Elements

The following elements define the contents of the Spreadsheet Drawing namespace:

20.5.2.1 absoluteAnchor (Absolute Anchor Shape Size)

This element is used as an anchor placeholder for a shape or group of shapes. It anchors the object in the same position relative to sheet position and its extents are in EMU units.

[Note: The W3C XML Schema definition of this element's content model ([CT_AbsoluteAnchor](#)) is located in §A.4.5. *end note*]

20.5.2.2 blipFill (Picture Fill)

This element specifies the type of picture fill that the picture object has. Because a picture has a picture fill already by default, it is possible to have two fills specified for a picture object. An example of this is shown below.

[Example: Consider the picture below that has a blip fill applied to it. The image used to fill this picture object has transparent pixels instead of white pixels.

```
<xdr:pic>
  ..
```

```

<xdr:blipFill>
  <a:blip r:embed="rId2"/>
  <a:stretch>
    <a:fillRect/>
  </a:stretch>
</xdr:blipFill>
..
</xdr:pic>

```



The above picture object is shown as an example of this fill type. *end example*]

[*Example:* Consider now the same picture object but with an additional gradient fill applied within the shape properties portion of the picture.

```

<xdr:pic>
..
<xdr:blipFill>
  <a:blip r:embed="rId2"/>
  <a:stretch>
    <a:fillRect/>
  </a:stretch>
</xdr:blipFill>
<xdr:spPr>
  <a:gradFill>
    <a:gsLst>
      <a:gs pos="0">
        <a:schemeClr val="tx2">
          <a:shade val="50000"/>
        </a:schemeClr>
      </a:gs>
      <a:gs pos="39999">
        <a:schemeClr val="tx2">

```



```

        <a:tint val="20000"/>
    </a:schemeClr>
</a:gs>
<a:gs pos="70000">
    <a:srgbClr val="C4D6EB"/>
</a:gs>
<a:gs pos="100000">
    <a:schemeClr val="bg1"/>
</a:gs>
</a:gsLst>
</a:gradFill>
</xdr:spPr>
..
</xdr:pic>

```



The above picture object is shown as an example of this double fill type. *end example*]

Attributes	Description
dpi (DPI Setting) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies the DPI (dots per inch) used to calculate the size of the blip. If not present or zero, the DPI in the blip is used. [Note: This attribute is primarily used to keep track of the picture quality within a document. There are different levels of quality needed for print than on-screen viewing and thus a need to track this information. <i>end note</i>] The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
rotWithShape (Rotate With Shape) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies that the fill should rotate with the shape. That is, when the shape that has been filled with a picture and the containing shape (say a rectangle) is transformed with a rotation then the fill is transformed with the same rotation. The possible values for this attribute are defined by the W3C XML Schema boolean

Attributes	Description
g/ooxml/drawing ml/main	datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_BlipFillProperties](#)) is located in §A.4.1. *end note*]

20.5.2.3 [clientData \(Client Data\)](#)

This element is used to set certain properties related to a drawing element on the client spreadsheet application.

Attributes	Description
fLocksWithSheet (Locks With Sheet Flag)	This attribute indicates whether to disable selection on drawing elements when the sheet is protected. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
fPrintsWithSheet (Prints With Sheet Flag)	This attribute indicates whether to print drawing elements when printing the sheet. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_AnchorClientData](#)) is located in §A.4.5. *end note*]

20.5.2.4 [cNvCxnSpPr \(Non-Visual Connector Shape Drawing Properties\)](#)

This element specifies the non-visual properties for a connector shape. These are the set of properties on a shape which do not affect its display within a spreadsheet.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_NonVisualConnectorProperties](#)) is located in §A.4.1. *end note*]

20.5.2.5 [cNvGraphicFramePr \(Non-Visual Graphic Frame Drawing Properties\)](#)

This element specifies the non-visual properties for a single graphical object frame within a spreadsheet. These are the set of properties of a frame which do not affect its display within a spreadsheet.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_NonVisualGraphicFrameProperties](#)) is located in §A.4.1. *end note*]

20.5.2.6 [cNvGrpSpPr \(Non-Visual Group Shape Drawing Properties\)](#)

This element specifies the non-visual properties of a hierarchical grouping of shapes, graphical object frames, and child groups. These are the set of properties of a group which do not affect its display within a spreadsheet.

[Note: The W3C XML Schema definition of this element's content model ([CT_NonVisualGroupDrawingShapeProps](#)) is located in §A.4.1. *end note*]

20.5.2.7 cNvPicPr (Non-Visual Picture Drawing Properties)

This element describes the non-visual properties of a picture within a spreadsheet. These are the set of properties of a picture which do not affect its display within a spreadsheet.

[Example: Consider the following SpreadsheetDrawingML.

```
<xdr:pic>
  ..
  <xdr:nvPicPr>
    <xdr:cNvPr id="4" name="Lilly_by_Lisher.jpg"/>
    <xdr:cNvPicPr>
      <a:picLocks noChangeAspect="1"/>
    </xdr:cNvPicPr>
    <xdr:nvPr/>
  </xdr:nvPicPr>
  ..
</xdr:pic>
```

The above example defines some non-visual picture drawing properties for the inserted picture. *end example*]

Attributes	Description
preferRelativeResize (Relative Resize Preferred)	Specifies if the user interface should show the resizing of the picture based on the picture's current size or its original size. If this attribute is set to true, then scaling is relative to the original picture size as opposed to the current picture size.
Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>[Example: Consider the case where a picture has been resized within a document and is now 50% of the originally inserted picture size. Now if the user chooses to make a later adjustment to the size of this picture within the generating application, then the value of this attribute should be checked.</p> <p>If this attribute is set to true then a value of 50% is shown. Similarly, if this attribute is set to false, then a value of 100% should be shown because the picture has not yet been resized from its current (smaller) size. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_NonVisualPictureProperties](#)) is located in §A.4.1. *end note*]

20.5.2.8 cNvPr (Non-Visual Drawing Properties)

This element specifies the set of non-visual properties for the parent element. These properties specify all the data about the parent which does not affect its display within the spreadsheet.

[*Example:* Consider the following SpreadSheetDrawingML.

```
<xdr:pic>
  ..
  <xdr:nvPicPr>
    <xdr:cNvPr id="4" name="Lilly_by_Lisher.jpg"/>
  </xdr:nvPicPr>
  ..
</xdr:pic>
```

The above example defines some non-visual drawing properties for the inserted picture. *end example*]

Attributes	Description
<p>descr (Alternative Text for Object)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies alternative text for the current DrawingML object, for use by assistive technologies or applications which do not display the current object.</p> <p>If this element is omitted, then no alternative text is present for the parent object.</p> <p>[<i>Example:</i> Consider a DrawingML object defined as follows:</p> <pre><... descr="A picture of a bowl of fruit"></pre> <p>The descr attribute contains alternative text which can be used in place of the actual DrawingML object. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
<p>hidden (Hidden)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies whether this DrawingML object is displayed. When a DrawingML object is displayed within a document, that object can be hidden (i.e., present, but not visible). This attribute determines whether the object is rendered or made hidden. [<i>Note:</i> An application can have settings which allow this object to be viewed. <i>end note</i>]</p> <p>If this attribute is omitted, then the parent DrawingML object shall be displayed (i.e., not hidden).</p> <p>[<i>Example:</i> Consider an inline DrawingML object which must be hidden within the document's content. This setting would be specified as follows:</p> <pre><... hidden="true" /></pre> <p>The hidden attribute has a value of true, which specifies that the DrawingML object is hidden and not displayed when the document is displayed. <i>end example</i>]</p>

Attributes	Description
	<p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>id (Unique Identifier)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies a unique identifier for the current DrawingML object within the current document. This ID can be used to assist in uniquely identifying this object so that it can be referred to by other parts of the document.</p> <p>If multiple objects within the same document share the same id attribute value, then the document shall be considered non-conformant.</p> <p>[Example: Consider a DrawingML object defined as follows:</p> <pre><... id="10" ... ></pre> <p>The id attribute has a value of 10, which is the unique identifier for this DrawingML object. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DrawingElementId simple type (§20.1.10.21).</p>
<p>name (Name)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies the name of the object. [Note: Typically, this is used to store the original file name of a picture object. <i>end note</i>]</p> <p>[Example: Consider a DrawingML object defined as follows:</p> <pre>< ... name="foo.jpg" ></pre> <p>The name attribute has a value of foo.jpg, which is the name of this DrawingML object. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
<p>title (Title)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies the title (caption) of the current DrawingML object.</p> <p>If this attribute is omitted, then no title text is present for the parent object.</p> <p>[Example: Consider a DrawingML object defined as follows:</p> <pre><... title="Process Flow Diagram"></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_NonVisualDrawingProps](#)) is located in §A.4.1. *end note*]

20.5.2.9 **cNvSpPr (Connection Non-Visual Shape Properties)**

This element specifies the set of non-visual properties for a connection shape. These properties specify all data about the connection shape which do not affect its display within a spreadsheet.

[*Example:* Consider the shape that has a shape lock applied to it.

```
<xdr:sp>
  <xdr:nvSpPr>
    <xdr:cNvPr id="2" name="Rectangle 1"/>
    <xdr:cNvSpPr>
      <a:spLocks noGrp="1"/>
    </xdr:cNvSpPr>
  </xdr:nvSpPr>
  ..
</xdr:sp>
```

This shape lock is stored within the non-visual drawing properties for this shape. *end example*]

Attributes	Description
txBox (Text Box) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies that the corresponding shape is a text box and thus should be treated as such by the generating application. If this attribute is omitted then it is assumed that the corresponding shape is not specifically a text box. [<i>Note:</i> Because a shape is not specified to be a text box does not mean that it cannot have text attached to it. A text box is merely a specialized shape with specific properties. <i>end note</i>] The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_NonVisualDrawingShapeProps](#)) is located in §A.4.1. *end note*]

20.5.2.10 **col (Column))**

This element specifies the column that is used within the from and to elements to specify anchoring information for a shape within a spreadsheet

The possible values for this element are defined by the ST_ColID simple type (§20.5.3.1).

[*Note:* The W3C XML Schema definition of this element’s content model ([ST_ColID](#)) is located in §A.4.5. *end note*]

20.5.2.11 colOff (Column Offset)

This element is used to specify the column offset within a cell. The units for which this attribute is specified in reside within the simple type definition referenced below.

The possible values for this element are defined by the ST_Coordinate simple type (§20.1.10.16).

[*Note:* The W3C XML Schema definition of this element's content model (ST_Coordinate) is located in §A.4.1.
end note]

20.5.2.12 contentPart (Content Part)

This element specifies a reference to XML content in a format not defined by ECMA-376. [*Note:* This part allows the native use of other commonly used interchange formats, such as:

- MathML (<http://www.w3.org/TR/MathML2/>)
- SMIL (<http://www.w3.org/TR/REC-smil/>)
- SVG (<http://www.w3.org/TR/SVG11/>)

end note]

The relationship type of the explicit relationship specified by this element shall be <http://purl.oclc.org/ooxml/officeDocument/relationships/customXml> and have a TargetMode attribute value of Internal. If an application cannot process content of the content type specified by the targeted part, then it should continue to process the file. If possible, it should also provide some indication that unknown content was not imported.

[*Example:* Consider a SpreadsheetML document which includes the following SVG markup in a part named `svg1.xml`:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE svg PUBLIC "-//W3C//DTD SVG 1.1//EN"
"http://www.w3.org/Graphics/SVG/1.1/DTD/svg11.dtd">
<!--=====-->
<!--=  Copyright 2000 World Wide Web Consortium, (Massachusetts      =-->
<!--=  Institute of Technology, Institut National de Recherche en      =-->
<!--=  Informatique et en Automatique, Keio University). All Rights    =-->
<!--=  Reserved. See http://www.w3.org/Consortium/Legal/.      =-->
<!--=====-->
<!-- =====-->
<!--                                     -->
<!-- color-datatypes-BE-01.svg          -->
<!-- renamed for 1.1 suite to color-prop-02-f.svg          -->
<!--                                     -->
<!-- Author : Chris Lilley, 12-Aug-2000                    -->
<!--          1.1 revision by Rick Graham                  -->
```

```

<!--          Revised for SVGT/B: Benoit Bezaire Jul/02/2002          -->
<!--          More revision  CL  -->
<!--=====-->
<svg version="1.1" baseProfile="full" xmlns="http://www.w3.org/2000/svg"
xmlns:xlink="http://www.w3.org/1999/xlink" id="svg-root" width="100%"
height="100%" viewBox="0 0 480 360">
  <title id="test-title">color-prop-02-f.svg</title>
  <desc id="test-desc">Test that viewer has the basic capability to render
X11colors, using any of the equivalent forms.</desc>
  <!--=====-->
  <!--Content of Test Case follows..          =====-->
  <!--=====-->
  <g id="test-body-content">
    <!-- groups of five colors  -->
    <g>
      <circle cx="75" cy="40" r="20" fill="crimson"/>
      <circle cx="115" cy="40" r="20" fill="#DC143C"/>
      <circle cx="75" cy="80" r="20" fill="rgb(220,20,60)"/>
      <circle cx="115" cy="80" r="20"
fill="rgb(86.274509803921568627450980392157%,7.8431372549019607843137254901961%,
23.529411764705882352941176470588%)"/>
    </g>
    <g>
      <circle cx="200" cy="40" r="20" fill="palegreen"/>
      <circle cx="240" cy="40" r="20" fill="#98FB98"/>
      <circle cx="200" cy="80" r="20" fill="rgb(152, 251, 152)"/>
      <circle cx="240" cy="80" r="20"
fill="rgb(59.60784313725490196078431372549%,98.431372549019607843137254901961%,5
9.60784313725490196078431372549%)"/>
    </g>
    <g>
      <circle cx="325" cy="40" r="20" fill="royalblue"/>
      <circle cx="365" cy="40" r="20" fill="#4169E1"/>
      <circle cx="325" cy="80" r="20" fill="rgb(65, 105, 225)"/>
      <circle cx="365" cy="80" r="20"
fill="rgb(25.490196078431372549019607843137%,41.176470588235294117647058823529%,
88.235294117647058823529411764706%)"/>
    </g>
    <g>
      <circle cx="75" cy="135" r="20" fill="firebrick"/>
      <circle cx="115" cy="135" r="20" fill="#B22222"/>
      <circle cx="75" cy="175" r="20" fill="rgb(178,34,34)"/>

```



```

    <circle cx="115" cy="175" r="20"
fill="rgb(69.803921568627450980392156862745%,13.3333333333333333333333333333%,
13.3333333333333333333333333333%)" />
  </g>
  <g>
    <circle cx="200" cy="135" r="20" fill="seagreen" />
    <circle cx="240" cy="135" r="20" fill="#2E8B57" />
    <circle cx="200" cy="175" r="20" fill="rgb(46, 139, 87)" />
    <circle cx="240" cy="175" r="20"
fill="rgb(18.039215686274509803921568627451%,54.509803921568627450980392156863%,
34.117647058823529411764705882353%)" />
  </g>
  <g>
    <circle cx="325" cy="135" r="20" fill="mediumblue" />
    <circle cx="365" cy="135" r="20" fill="#0000CD" />
    <circle cx="325" cy="175" r="20" fill="rgb(0, 0, 205)" />
    <circle cx="365" cy="175" r="20"
fill="rgb(0%,0%,80.39215686274509803921568627451%)" />
  </g>
  <g>
    <circle cx="75" cy="230" r="20" fill="indianred" />
    <circle cx="115" cy="230" r="20" fill="#CD5C5C" />
    <circle cx="75" cy="270" r="20" fill="rgb(205, 92, 92)" />
    <circle cx="115" cy="270" r="20"
fill="rgb(80.39215686274509803921568627451%,36.078431372549019607843137254902%,3
6.078431372549019607843137254902%)" />
  </g>
  <g>
    <circle cx="200" cy="230" r="20" fill="lawngreen" />
    <circle cx="240" cy="230" r="20" fill="#7CFC00" />
    <circle cx="200" cy="270" r="20" fill="rgb(124, 252, 0)" />
    <circle cx="240" cy="270" r="20"
fill="rgb(48.627450980392156862745098039216%,98.823529411764705882352941176471%,
0%)" />
  </g>
  <g>
    <circle cx="325" cy="230" r="20" fill="mediumturquoise" />
    <circle cx="365" cy="230" r="20" fill="#48D1CC" />
    <circle cx="325" cy="270" r="20" fill="rgb(72, 209, 204)" />
    <circle cx="365" cy="270" r="20"
fill="rgb(28.235294117647058823529411764706%,81.960784313725490196078431372549%,
80%)" />
  </g>

```

```
</g>
<text id="revision" x="10" y="340" font-size="40" stroke="none"
fill="black">$Revision: 1.6 $</text>
<rect id="test-frame" x="1" y="1" width="478" height="358" fill="none"
stroke="#000000"/>
</svg>
```

The SpreadsheetML Drawing part would reference this content as follows:

```
<wsDr>
  <twoCellAnchor>
    <from>
      <col>3</col>
      <colOff>152400</colOff>
      <row>5</row>
      <rowOff>123825</rowOff>
    </from>
    <to>
      <col>8</col>
      <colOff>266700</colOff>
      <row>22</row>
      <rowOff>38100</rowOff>
    </to>
  </twoCellAnchor>
  <contentPart r:id="svg1"/>
</wsDr>
```

The contentPart element specifies that the SVG markup targeted by the relationship with an ID of svg1 is part of the SpreadsheetML document. Examining the contents of the corresponding relationship part item, we can see the targets for that relationship:

```
<Relationships ... >
...
  <Relationship Id="svg1" TargetMode="Internal"
Type="http://purl.oclc.org/ooxml/officeDocument/relationships/customXml"
Target="svg1.xml" />
...
</Relationships>
```

The corresponding relationship part item shows that the file to be imported is named `svg1.xml`. *end example*]

Attributes	Description
id (Relationship to Part)	Specifies the relationship ID to a content part. [Example: Consider an XML element which has the following id attribute:

Attributes	Description
Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	<p><code><... r:id="rId1" /></code></p> <p>The markup specifies the associated relationship part with relationship ID rId1 contains the corresponding relationship information for the parent XML element. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Rel](#)) is located in §A.4.5. *end note*]

20.5.2.13 cxnSp (Connection Shape)

This element specifies the properties for a connection shape drawing element. A connection shape is a line, etc. that connects two other shapes in this drawing.

Attributes	Description
fPublished (Publish to Server Flag)	<p>This attribute indicates whether the shape shall be published with the worksheet when sent to the server.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
macro (Reference to Custom Function)	<p>This element specifies the custom function associated with the object. <i>[Example: A macro script, add-in function, and so on. end example]</i></p> <p>The format of this string shall be application-defined, and should be ignored if not understood.</p> <p><i>[Example:</i></p> <p><code>< ... macro="DoWork()" /></code></p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Connector](#)) is located in §A.4.5. *end note*]

20.5.2.14 ext (Shape Extent)

This element describes the length and width properties for how far a drawing element should extend for.

Attributes	Description
cx (Extent Length) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies the length of the extents rectangle in EMUs. This rectangle shall dictate the size of the object as displayed (the result of any scaling to the original object).</p> <p>[<i>Example:</i> Consider a DrawingML object specified as follows:</p> <pre><... cx="1828800" cy="200000"/></pre> <p>The cx attributes specifies that this object has a height of 1828800 EMUs (English Metric Units). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>
cy (Extent Width) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies the width of the extents rectangle in EMUs. This rectangle shall dictate the size of the object as displayed (the result of any scaling to the original object).</p> <p>[<i>Example:</i> Consider a DrawingML object specified as follows:</p> <pre>< ... cx="1828800" cy="200000"/></pre> <p>The cy attribute specifies that this object has a width of 200000 EMUs (English Metric Units). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_PositiveSize2D](#)) is located in §A.4.1. *end note*]

20.5.2.15 from (Starting Anchor Point)

This element specifies the first anchor point for the drawing element. This is used to anchor the top and left sides of the shape within the spreadsheet. That is when the cell that is specified in the from element is adjusted, the shape is also adjusted.

[*Example:* Consider the following SpreadsheetDrawingML

```
<xdr:twoCellAnchor>
  <xdr:from>
    <xdr:col>3</xdr:col>
    <xdr:colOff>447675</xdr:colOff>
    <xdr:row>8</xdr:row>
    <xdr:rowOff>28575</xdr:rowOff>
  </xdr:from>
  <xdr:to>
```

```

<xdr:col>5</xdr:col>
<xdr:colOff>466725</xdr:colOff>
<xdr:row>14</xdr:row>
<xdr:rowOff>9525</xdr:rowOff>
</xdr:to>
<xdr:sp macro="" textlink="">
...
</xdr:sp>
<xdr:clientData/>
</xdr:twoCellAnchor>

```

The above example shows the first anchor point being specified via the from element. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_Marker](#)) is located in §A.4.5. *end note*]

20.5.2.16 [graphicFrame](#) (Graphic Frame)

This element describes a single graphical object frame for a spreadsheet which contains a graphical object.

Attributes	Description
fPublished (Publish to Server Flag)	<p>This attribute indicates whether the shape shall be published with the worksheet when sent to the server.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
macro (Reference To Custom Function)	<p>This element specifies the custom function associated with the object. [<i>Example: A macro script, add-in function, and so on. end example</i>]</p> <p>The format of this string shall be application-defined, and should be ignored if not understood.</p> <p>[<i>Example:</i></p> <pre>< ... macro="DoWork()" /></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_GraphicalObjectFrame](#)) is located in §A.4.5. *end note*]

20.5.2.17 grpSp (Group Shape)

This element specifies a group shape that represents many shapes grouped together. This shape is to be treated just as if it were a regular shape but instead of being described by a single geometry it is made up of all the shape geometries encompassed within it. Within a group shape each of the shapes that make up the group are specified just as they normally would. The idea behind grouping elements however is that a single transform can apply to many shapes at the same time.

[*Example:* Consider the following group shape.

```
<xdr:grpSp>
  <xdr:nvGrpSpPr>
    <xdr:cNvPr id="10" name="Group 9"/>
    <xdr:cNvGrpSpPr/>
    <xdr:nvPr/>
  </xdr:nvGrpSpPr>
  <xdr:grpSpPr>
    <a:xfrm>
      <a:off x="838200" y="990600"/>
      <a:ext cx="2426208" cy="978408"/>
      <a:chOff x="838200" y="990600"/>
      <a:chExt cx="2426208" cy="978408"/>
    </a:xfrm>
  </xdr:grpSpPr>
  <xdr:sp>
    ..
  </xdr:sp>
  <xdr:sp>
    ..
  </xdr:sp>
  <xdr:sp>
    ..
  </xdr:sp>
</xdr:grpSp>
```

In the above example we see three shapes specified within a single group. These three shapes have their position and sizes specified just as they normally would within the shape tree. The generating application should apply the transformation after the bounding box for the group shape has been calculated. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_GroupShape](#)) is located in §A.4.5. *end note*]

20.5.2.18 grpSpPr (Group Shape Properties)

This element specifies the properties that are to be common across all of the shapes within the corresponding group. If there are any conflicting properties within the group shape properties and the individual shape properties then the individual shape properties should take precedence.

Attributes	Description
bwMode (Black and White Mode) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies that the group shape should be rendered using only black and white coloring. That is the coloring information for the group shape should be converted to either black or white when rendering the corresponding shapes.</p> <p>No gray is to be used in rendering this image, only stark black and stark white.</p> <p>[<i>Note</i>: This does not mean that the group shapes themselves are stored with only black and white color information. This attribute instead sets the rendering mode that the shapes use when rendering. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_BlackWhiteMode simple type (§20.1.10.10).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_GroupShapeProperties](#)) is located in §A.4.1. *end note*]

20.5.2.19 nvCxnSpPr (Non-Visual Properties for a Connection Shape)

This element specifies all non-visual properties for a connection shape. This element is a container for the non-visual identification properties, shape properties and application properties that are to be associated with a connection shape. This allows for additional information that does not affect the appearance of the connection shape to be stored.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_ConnectorNonVisual](#)) is located in §A.4.5. *end note*]

20.5.2.20 nvGraphicFramePr (Non-Visual Properties for a Graphic Frame)

This element specifies all non-visual properties for a graphic frame. This element is a container for the non-visual identification properties, shape properties and application properties that are to be associated with a graphic frame. This allows for additional information that does not affect the appearance of the graphic frame to be stored.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_GraphicalObjectFrameNonVisual](#)) is located in §A.4.5. *end note*]

20.5.2.21 nvGrpSpPr (Non-Visual Properties for a Group Shape)

This element specifies all non-visual properties for a group shape. This element is a container for the non-visual identification properties, shape properties and application properties that are to be associated with a group

shape. This allows for additional information that does not affect the appearance of the group shape to be stored.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_GroupShapeNonVisual](#)) is located in §A.4.5. *end note*]

20.5.2.22 [nvPicPr \(Non-Visual Properties for a Picture\)](#)

This element specifies all non-visual properties for a picture. This element is a container for the non-visual identification properties, shape properties and application properties that are to be associated with a picture. This allows for additional information that does not affect the appearance of the picture to be stored.

[*Example:* Consider the following SpreadsheetDrawingML.

```
<xdr:pic>
  ..
  <xdr:nvPicPr>
    ..
  </xdr:nvPicPr>
  ..
</xdr:pic>
```

The above example shows the defining of non-visual picture properties. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_PictureNonVisual](#)) is located in §A.4.5. *end note*]

20.5.2.23 [nvSpPr \(Non-Visual Properties for a Shape\)](#)

This element specifies all non-visual properties for a shape. This element is a container for the non-visual identification properties, shape properties and application properties that are to be associated with a shape. This allows for additional information that does not affect the appearance of the shape to be stored.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ShapeNonVisual](#)) is located in §A.4.5. *end note*]

20.5.2.24 [oneCellAnchor \(One Cell Anchor Shape Size\)](#)

This element specifies a one cell anchor placeholder for a group, a shape, or a drawing element. It moves with the cell and its extents is in EMU units.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_OneCellAnchor](#)) is located in §A.4.5. *end note*]

20.5.2.25 [pic \(Picture\)](#)

This element specifies the existence of a picture object within the spreadsheet.

[*Example:* Consider the following SpreadsheetDrawingML that specifies the existence of a picture within a document. This picture can have non-visual properties, a picture fill as well as shape properties attached to it.

```
<xdr:pic>
  <xdr:nvPicPr>
    <xdr:cNvPr id="4" name="lake.JPG" descr="Picture of a Lake" />
    <xdr:cNvPicPr>
      <a:picLocks noChangeAspect="1" />
    </xdr:cNvPicPr>
    <xdr:nvPr />
  </xdr:nvPicPr>
  <xdr:blipFill>
    ...
  </xdr:blipFill>
  <xdr:spPr>
    ...
  </xdr:spPr>
</xdr:pic>
```

end example]

Attributes	Description
fPublished (Publish to Server Flag)	<p>This attribute indicates whether the shape shall be published with the worksheet when sent to the server.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
macro (Reference To Custom Function)	<p>This element specifies the custom function associated with the object. [<i>Example:</i> A macro script, add-in function, and so on. <i>end example]</i></p> <p>The format of this string shall be application-defined, and should be ignored if not understood.</p> <p>[<i>Example:</i></p> <pre>< ... macro="DoWork()" /></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Picture](#)) is located in §A.4.5. *end note]*

20.5.2.26 pos (Position)

This element describes the position of a drawing element within a spreadsheet.

Attributes	Description
x (X-Axis Coordinate) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies a coordinate on the x-axis. The origin point for this coordinate shall be specified by the parent XML element.</p> <p>[<i>Example:</i> Consider the following point on a basic wrapping polygon for a DrawingML object:</p> <pre><... x="0" y="100" /></pre> <p>The x attribute defines an x-coordinate of 0. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>
y (Y-Axis Coordinate) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies a coordinate on the x-axis. The origin point for this coordinate shall be specified by the parent XML element.</p> <p>[<i>Example:</i> Consider the following point on a basic wrapping polygon for a DrawingML object:</p> <pre><... x="0" y="100" /></pre> <p>The y attribute defines a y-coordinate of 100. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Point2D](#)) is located in §A.4.1. *end note*]

20.5.2.27 row (Row)

This element specifies the row that is used within the from and to elements to specify anchoring information for a shape within a spreadsheet.

The possible values for this element are defined by the ST_RowID simple type (§20.5.3.3).

[*Note:* The W3C XML Schema definition of this element's content model ([ST_RowID](#)) is located in §A.4.5. *end note*]

20.5.2.28 rowOff (Row Offset)

This element is used to specify the row offset within a cell. The units for which this attribute is specified reside within the simple type definition referenced below.

The possible values for this element are defined by the ST_Coordinate simple type (§20.1.10.16).

[*Note:* The W3C XML Schema definition of this element's content model ([ST_Coordinate](#)) is located in §A.4.1. *end note*]

20.5.2.29 [sp](#) (Shape)

This element specifies the existence of a single shape. A shape can either be a preset or a custom geometry, defined using the SpreadsheetDrawingML framework. In addition to a geometry each shape can have both visual and non-visual properties attached. Text and corresponding styling information can also be attached to a shape. This shape is specified along with all other shapes within either the shape tree or group shape elements.

Attributes	Description
fLocksText (Lock Text Flag)	<p>This attribute indicates whether to allow text editing within this drawing object when the parent worksheet is protected.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fPublished (Publish to Server Flag)	<p>This attribute indicates whether the shape shall be published with the worksheet when sent to the server.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
macro (Reference to Custom Function)	<p>This element specifies the custom function associated with the object. [<i>Example:</i> A macro script, add-in function, and so on. <i>end example</i>]</p> <p>The format of this string shall be application-defined, and should be ignored if not understood.</p> <p>[<i>Example:</i></p> <pre>< ... macro="DoWork()" /></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
textlink (Text Link)	<p>This attribute specifies a formula linking to spreadsheet cell data.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Shape](#)) is located in §A.4.5. *end note*]

20.5.2.30 spPr (Shape Properties)

This element specifies the visual shape properties that can be applied to a special shape such as a connector shape or picture. These are the same properties that are allowed to describe the visual properties of a shape but are used here to describe additional object-specific properties within a document. This allows for these shapes to have both the properties of a shape as well as specific properties that are unique to only them.

Attributes	Description
bwMode (Black and White Mode) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies that the picture should be rendered using only black and white coloring. That is the coloring information for the picture should be converted to either black or white when rendering the picture.</p> <p>No gray is to be used in rendering this image, only stark black and stark white.</p> <p>[<i>Note</i>: This does not mean that the picture itself that is stored within the file is necessarily a black and white picture. This attribute instead sets the rendering mode that the picture has applied to when rendering. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_BlackWhiteMode simple type (§20.1.10.10).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_ShapeProperties](#)) is located in §A.4.1. *end note*]

20.5.2.31 style (Shape Style)

The element specifies the style that is applied to a shape and the corresponding references for each of the style components such as lines and fills.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_ShapeStyle](#)) is located in §A.4.1. *end note*]

20.5.2.32 to (Ending Anchor Point)

This element specifies the second anchor point for the drawing element. This is used to anchor the bottom and right sides of the shape within the spreadsheet. That is when the cell that is specified in the to element is adjusted, the shape is also adjusted.

[*Example*: Consider the following SpreadsheetDrawingML

```
<xdr:twoCellAnchor>
  <xdr:from>
    <xdr:col>3</xdr:col>
    <xdr:colOff>447675</xdr:colOff>
    <xdr:row>8</xdr:row>
    <xdr:rowOff>28575</xdr:rowOff>
```

```

</xdr:from>
<xdr:to>
  <xdr:col>5</xdr:col>
  <xdr:colOff>466725</xdr:colOff>
  <xdr:row>14</xdr:row>
  <xdr:rowOff>9525</xdr:rowOff>
</xdr:to>
<xdr:sp macro="" textlink="">
...
</xdr:sp>
<xdr:clientData/>
</xdr:twoCellAnchor>

```

The above example shows the second anchor point being specified via the to element. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Marker](#)) is located in §A.4.5. *end note*]

20.5.2.33 twoCellAnchor (Two Cell Anchor Shape Size)

This element specifies a two cell anchor placeholder for a group, a shape, or a drawing element. It moves with cells and its extents are in EMU units.

Attributes	Description
editAs (Positioning and Resizing Behaviors)	<p>Specifies how the DrawingML contents shall be moved and/or resized when the rows and columns between its start and ending anchor (the from and to child elements) are resized, or have additional rows/columns inserted within them, or additional row/columns are added before them. The behaviors are discussed in the simple type referenced below.</p> <p>If this attribute is omitted, then its default value shall be assumed to be twoCell.</p> <p>[<i>Example:</i> Consider a drawing defined as follows:</p> <pre> <ws:twoCellAnchor editAs="absolute"> ... </ws:twoCellAnchor> </pre> <p>The editAs attribute has a value of absolute, which specifies that the sizing of this object must not change, instead the anchor locations should be moved as needed to maintain the same size and position. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_EditAs simple type (§20.5.3.2).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_TwoCellAnchor](#)) is located in §A.4.5. *end note*]

20.5.2.34 **txBody (Shape Text Body)**

This element specifies the existence of text to be contained within the corresponding shape. All visible text and visible text related properties are contained within this element. There can be multiple paragraphs and within paragraphs multiple runs of text.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_TextBody](#)) is located in §A.4.1. *end note*]


20.5.2.35 **wsDr (Worksheet Drawing)**


This element specifies all drawing objects within the worksheet. It acts much like the spTree element within the DrawingML framework. Allowing for the specification of all shapes for a given part of a document, in this case a single Worksheet.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_Drawing](#)) is located in §A.4.5. *end note*]

20.5.2.36 **xfrm (2D Transform for Graphic Frames)**

This element specifies a two dimensional transform for a Graphic Frame.

Attributes	Description
<p>flipH (Horizontal Flip)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies a horizontal flip. When true, this attribute defines that the shape is flipped horizontally about the center of its bounding box.</p> <p>[<i>Example</i>: The following illustrates the effect of a horizontal flip.</p> <div></div> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>flipV (Vertical Flip)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies a vertical flip. When true, this attribute defines that the group is flipped vertically about the center of its bounding box.</p> <p>[<i>Example</i>: The following illustrates the effect of a vertical flip.</p>

Attributes	Description
	 <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
rot (Rotation) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies the rotation of the Graphic Frame. The units for which this attribute is specified in reside within the simple type definition referenced below.</p> <p>The possible values for this attribute are defined by the ST_Angle simple type (§20.1.10.3).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Transform2D](#)) is located in §A.4.1. *end note]*

20.5.3 Simple Types

This is the complete list of simple types dedicated to DrawingML – SpreadsheetML Drawing.

20.5.3.1 ST_ColID (Column ID)

This simple type specifies a column identification. The numerical value used for the column id should be non-negative and never exceed the number of total columns within the spreadsheet document.

This simple type's contents are a restriction of the W3C XML Schema int datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 0.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ColID](#)) is located in §A.4.5. *end note]*

20.5.3.2 ST_EditAs (Resizing Behaviors)

This simple type specifies all possible settings for how DrawingML contents shall be resized when the rows and columns between its start and ending anchor (the from and to child elements) are resized, or have additional rows/columns inserted within them.

[Example: Consider a drawing defined as follows:

```
<ws:twoCellAnchor editAs="absolute">
...
</ws:twoCellAnchor>
```

The editAs attribute has a value of absolute, which specifies that the sizing of this object must not change, instead the anchor locations should be moved as needed to maintain the same size. *end example*]

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
absolute (Do Not Move or Resize With Underlying Rows/Columns)	<p>Specifies that the current start and end positions shall be maintained with respect to the distances from the absolute start point of the worksheet.</p> <p>If additional rows/columns are added before the drawing, the drawing shall move its anchors as needed to maintain this same absolute position.</p>
oneCell (Move With Cells but Do Not Resize)	<p>Specifies that the current drawing shall move with its row and column (i.e. the object is anchored to the actual from row and column), but that the size shall remain absolute.</p> <p>If additional rows/columns are added between the from and to locations of the drawing, the drawing shall move its to anchors as needed to maintain this same absolute size.</p>
twoCell (Move and Resize With Anchor Cells)	<p>Specifies that the current drawing shall move and resize to maintain its row and column anchors (i.e. the object is anchored to the actual from and to row and column).</p>

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_EditAs](#)) is located in §A.4.5. *end note*]

20.5.3.3 ST_RowID (Row ID)

This simple type specifies a row identification. The numerical value used for the row id should be non-negative and never exceed the number of total rows within the spreadsheet document.

This simple type's contents are a restriction of the W3C XML Schema int datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 0.

[*Note*: The W3C XML Schema definition of this simple type's content model (ST_RowID) is located in §A.4.5. *end note*]

21. DrawingML - Components Reference Material

The subordinate subclauses specify the semantics for the XML markup comprising DrawingML content, which can be used within the contents of WordprocessingML, SpreadsheetML, or PresentationML documents.

This portion of DrawingML describes components built on top of the previously defined framework to create charts, diagrams, etc..

21.1 DrawingML - Main

The following parts of the DrawingML Main namespace define additional base constructs for all kinds of DrawingML objects (e.g., paragraphs, text, tables, etc.).

21.1.1 Table of Contents

This subclause is informative.

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End of informative text.

21.1.2 Paragraphs and Rich Formatting

The Paragraphs and Rich Formatting portion of the DrawingML framework stores text and related formatting information for a text body contained within a shape. Formatting for text within a shape can be broken down into three levels of precision, namely body, paragraph, and run formatting properties.

21.1.2.1 Body Formatting

Being the highest level of formatting available within a shape, the body properties allow for the manipulation of the text area as a whole. This means that all paragraphs and runs of text for the shape in question would be encompassed within here and, therefore, follow the text body style defined here.

[*Example:* Consider a shape that has three paragraphs within it, each with a different sized text. If this shape is resized to be smaller, then the text no longer fits the same way within the shape. Thus, we see that to maintain visual quality the size must be changed.

Rather than try to change each of the paragraphs to a smaller font size to fit in the shape, just use a body-level format property such as the normAutofit. This applies to all text within the shape and scale the text by a certain percentage in order to fit within the shape.

```
<p:txBody>
  <a:bodyPr>
    <a:normAutofit fontScale="20.000%" lnSpcReduction="20.000%"/>
  </a:bodyPr>
  ...
  <a:p>
  ...
</a:p>
<a:p>
  ...
</a:p>
<a:p>
  ...
</a:p>
</p:txBody>
```

end example]

21.1.2.1.1 bodyPr (Body Properties)

This element defines the body properties for the text body within a shape.

[*Example:* Consider a shape with a text body that has some formatting properties associated with it. For the formatting of text body properties, the bodyPr element should be used as follows:

```
<p:sp>
...
<p:txBody>
  <a:bodyPr>
    (text body properties)
  </a:bodyPr>
...
</p:txBody>
</p:sp>
```

end example]

Attributes	Description
anchor (Anchor)	<p>Specifies the anchoring position of the txBody within the shape. If this attribute is omitted, then a value of t, or top is implied.</p> <p>[<i>Example:</i> Consider the following DrawingML:</p> <pre><p:txBody> <a:bodyPr anchor="ctr" ... /> ... </p:txBody></pre> <p>Here the text is vertically aligned in the center of the shape within which it is contained. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_TextAnchoringType simple type (§20.1.10.59).</p>
anchorCtr (Anchor Center)	<p>Specifies the centering of the text box. The way it works fundamentally is to determine the smallest possible "bounds box" for the text and then to center that "bounds box" accordingly. This is different than paragraph alignment, which aligns the text within the "bounds box" for the text. This flag is compatible with all of the different kinds of anchoring. If this attribute is omitted, then a value of 0 or false is implied.</p> <p>[<i>Example:</i> The text within this shape has been both vertically centered with the anchor attribute and horizontally centered with the anchorCtr attribute.</p> <pre><p:txBody> <a:bodyPr anchor="ctr" anchorCtr="1" ... /> ... </pre>

Attributes	Description
	<p><code></p:txBody></code> <i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
bIns (Bottom Inset)	<p>Specifies the bottom inset of the bounding rectangle. Insets are used just as internal margins for text boxes within shapes. If this attribute is omitted, a value of 45720 or 0.05 inches is implied.</p> <p>[Example: Consider the following DrawingML:</p> <pre> <p:txBody> <a:bodyPr lIns="91440" tIns="91440" rIns="91440" bIns="91440" ... /> ... </p:txBody> </pre> <p>The text box having the above body properties has inset margins of 91440 or 0.1 inches on all four sides. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</p>
compatLnSpc (Compatible Line Spacing)	<p>Specifies that the line spacing for this text body is decided in a simplistic manner using the font scene. If this attribute is omitted, a value of 0 or false is implied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
forceAA (Force Anti-Alias)	<p>Forces the text to be rendered anti-aliased regardless of the font size. Certain fonts can appear grainy around their edges unless they are anti-aliased. Therefore this attribute allows for the specifying of which bodies of text should always be anti-aliased and which ones should not. If this attribute is omitted, then a value of 0 or false is implied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fromWordArt (From WordArt)	<p>Specifies that text within this textbox is converted text from a WordArt object. This is more of a backwards compatibility attribute that is useful to the application from a tracking perspective. WordArt was the former way to apply text effects and therefore this attribute is useful in document conversion scenarios. If this attribute is omitted, then a value of 0 or false is implied.</p> <p>[Example: Consider the following DrawingML:</p> <pre> <p:txBody> <a:bodyPr wrap="none" fromWordArt="1" ... /> ... </p:txBody> </pre>

Attributes	Description
	<p><i>end example]</i></p> <p>Because of the presence of the fromWordArt attribute the text within this shape can be mapped back to the corresponding WordArt during document conversion. <i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>horzOverflow (Text Horizontal Overflow)</p>	<p>Determines whether the text can flow out of the bounding box horizontally. This is used to determine what happens in the event that the text within a shape is too large for the bounding box it is contained within. If this attribute is omitted, then a value of overflow is implied.</p> <p>[<i>Example:</i> Consider the case where we have multiply paragraphs within a shape and the second is greater in length and causes text to flow outside the shape. By applying the clip value of the horzOverflow attribute as a body property this overflowing text now is cut off instead of extending beyond the bounds of the shape.</p> <pre> <p:txBody> <a:bodyPr horzOverflow="clip" ... /> ... <a:p> ... (Some text) </a:p> <a:p> ... (Some more text) </a:p> </p:txBody> </pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_TextHorzOverflowType simple type (§20.1.10.68).</p>
<p>lIns (Left Inset)</p>	<p>Specifies the left inset of the bounding rectangle. Insets are used just as internal margins for text boxes within shapes. If this attribute is omitted, then a value of 91440 or 0.1 inches is implied.</p> <p>[<i>Example:</i> Consider the following DrawingML:</p> <pre> <p:txBody> <a:bodyPr lIns="91440" tIns="91440" rIns="91440" bIns="91440" ... /> ... </p:txBody> </pre>

Attributes	Description
	<p>The text box having the above body properties has inset margins of 91440 or 0.1 inches on all four sides. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</p>
numCol (Number of Columns)	<p>Specifies the number of columns of text in the bounding rectangle. When applied to a text run this property takes the width of the bounding box for the text and divides it by the number of columns specified. These columns are then treated as overflow containers in that when the previous column has been filled with text the next column acts as the repository for additional text. When all columns have been filled and text still remains then the overflow properties set for this text body are used and the text is reflowed to make room for additional text. If this attribute is omitted, then a value of 1 is implied.</p> <p>[<i>Example</i>: Consider the case where a text area would need to be split up into four separate columns. Then simply specifying one paragraph with one run of text is enough to describe four columns of text here.</p> <pre> <p:txBody> <a:bodyPr numCol="4" ... /> <a:p> <a:r> ... (Some text) </a:r> </a:p> </p:txBody> </pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TextColumnCount simple type (§20.1.10.64).</p>
rIns (Right Inset)	<p>Specifies the right inset of the bounding rectangle. Insets are used just as internal margins for text boxes within shapes. If this attribute is omitted, then a value of 91440 or 0.1 inches is implied.</p> <p>[<i>Example</i>: Consider the following DrawingML:</p> <pre> <p:txBody> <a:bodyPr lIns="91440" tIns="91440" rIns="91440" bIns="91440" ... /> ... </p:txBody> </pre> <p>The text box having the above body properties has inset margins of 91440 or 0.1 inches</p>

Attributes	Description
	<p>on all four sides. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</p>
rot (Rotation)	<p>Specifies the rotation that is being applied to the text within the bounding box. If it not specified, the rotation of the accompanying shape is used. If it is specified, then this is applied independently from the shape. That is the shape can have a rotation applied in addition to the text itself having a rotation applied to it. If this attribute is omitted, then a value of 0, is implied.</p> <p>[<i>Example</i>: Consider the case where a shape has a rotation of 5400000, or 90 degrees clockwise applied to it. In addition to this, the text body itself has a rotation of -5400000, or 90 degrees counter-clockwise applied to it. Then the resulting shape would appear to be rotated but the text within it would appear as though it had not been rotated at all. The DrawingML specifying this would look like the following:</p> <pre> <p:sp> <p:spPr> <a:xfrm rot="5400000"> ... </a:xfrm> </p:spPr> ... <p:txBody> <a:bodyPr rot="-5400000" ... /> ... (Some text) ... </p:txBody> </p:sp> </pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Angle simple type (§20.1.10.3).</p>
rtlCol (Columns Right-To-Left)	<p>Specifies whether columns are used in a right-to-left or left-to-right order. The usage of this attribute only sets the column order that is used to determine which column overflow text should go to next. If this attribute is omitted, then a value of 0 or false is implied in which case text starts in the leftmost column and flow to the right.</p> <p>[<i>Note</i>: This attribute in no way determines the direction of text but merely the direction in which multiple columns are used. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
spcCol (Space	Specifies the space between text columns in the text area. This should only apply when

Attributes	Description
Between Columns)	<p>there is more than 1 column present. If this attribute is omitted, then a value of 0 is implied.</p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate32 simple type (§20.1.10.42).</p>
spcFirstLastPara (Paragraph Spacing)	<p>Specifies whether the before and after paragraph spacing defined by the user is to be respected. While the spacing between paragraphs is helpful, it is additionally useful to be able to set a flag as to whether this spacing is to be followed at the edges of the text body, in other words the first and last paragraphs in the text body. More precisely since this is a text body level property it should only effect the before paragraph spacing of the first paragraph and the after paragraph spacing of the last paragraph for a given text body. If this attribute is omitted, then a value of 0, or false is implied.</p> <p>[Example: Consider the case where spacing has been defined between multiple paragraphs within a text body using the spcBef and spcAft paragraph spacing attributes. For this text body however the user would like to not have this followed for the edge paragraphs and thus we have the following DrawingML.</p> <pre> <p:txBody> <a:bodyPr spcFirstLastPara="0" ... /> ... <a:p> <a:pPr> <a:spcBef> <a:spcPts val="1800"/> </a:spcBef> <a:spcAft> <a:spcPts val="600"/> </a:spcAft> </a:pPr> ... (Some text) </a:p> <a:p> <a:pPr> <a:spcBef> <a:spcPts val="1800"/> </a:spcBef> <a:spcAft> <a:spcPts val="600"/> </a:spcAft> </a:pPr> ... (Some text) </a:p> </pre>

Attributes	Description
	<p>... </p:txBody> <i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
tIns (Top Inset)	<p>Specifies the top inset of the bounding rectangle. Insets are used just as internal margins for text boxes within shapes. If this attribute is omitted, then a value of 45720 or 0.05 inches is implied.</p> <p>[<i>Example:</i> Consider the following DrawingML:</p> <pre><p:txBody> <a:bodyPr lIns="91440" tIns="91440" rIns="91440" bIns="91440" ... /> ... </p:txBody></pre> <p>The text box having the above body properties has inset margins of 91440 or 0.1 inches on all four sides. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</p>
upright (Text Upright)	<p>Specifies whether text should remain upright, regardless of the transform applied to it and the accompanying shape transform. If this attribute is omitted, then a value of 0, or false is implied.</p> <p>[<i>Example:</i> Consider text that has been rotated within the text body but has the upright flag set.</p> <pre><p:txBody> <a:bodyPr upright="1" rot="5400000" .../> ... (Some text) ... </p:txBody></pre> <p>This text appears as though no transform has been applied to it. <i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
vert (Vertical Text)	<p>Determines if the text within the given text body should be displayed vertically. If this attribute is omitted, then a value of horz, or no vertical text is implied.</p> <p>[<i>Example:</i> Consider the case where the user needs to display text that appears vertical and has a right to left flow with respect to its columns.</p>

Attributes	Description
	<pre> <p:txBody> <a:bodyPr vert="wordArtVertRtl" ... /> ... <a:p> ... <a:t>This is</a:t> ... </a:p> <a:p> ... <a:t>some text.</a:t> ... </a:p> </p:txBody> </pre> <p>In the above sample DrawingML there are two paragraphs denoting a separation between the text otherwise which are known as either a line or paragraph break. Because wordArtVertRtl is used here this text is not only displayed in a stacked manner flowing from top to bottom but also have the first paragraph be displayed to the right of the second. This is because it is both vertical text and right to left. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_TextVerticalType simple type (§20.1.10.82).</p>
vertOverflow (Text Vertical Overflow)	<p>Determines whether the text can flow out of the bounding box vertically. This is used to determine what happens in the event that the text within a shape is too large for the bounding box it is contained within. If this attribute is omitted, then a value of overflow is implied.</p> <p>[<i>Example:</i> Consider the case where we have multiply paragraphs within a shape and the second causes text to flow outside the shape. By applying the clip value of the vertOverflow attribute as a body property this overflowing text is now cut off instead of extending beyond the bounds of the shape.</p> <pre> <p:txBody> <a:bodyPr vertOverflow="clip" ... /> ... <a:p> ... (Some text) ... </a:p> <a:p> ... (Some longer text) ... </a:p> </pre>

Attributes	Description
	<p data-bbox="456 247 630 279"></p:txBody></p> <p data-bbox="415 317 574 348"><i>end example]</i></p> <p data-bbox="415 390 1409 457">The possible values for this attribute are defined by the ST_TextVertOverflowType simple type (§20.1.10.83).</p>
wrap (Text Wrapping Type)	<p data-bbox="415 472 1446 539">Specifies the wrapping options to be used for this text body. If this attribute is omitted, then a value of square is implied which wraps the text using the bounding text box.</p> <p data-bbox="415 581 1446 648">The possible values for this attribute are defined by the ST_TextWrappingType simple type (§20.1.10.84).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TextBodyProperties](#)) is located in §A.4.1. *end note*]

21.1.2.1.2 noAutofit (No AutoFit)

This element specifies that text within the text body should not be auto-fit to the bounding box. Auto-fitting is when text within a text box is scaled in order to remain inside the text box. If this element is omitted, then noAutofit or auto-fit off is implied.

[Example: Consider a text box where the user wishes to have the text extend outside the bounding box. The following DrawingML would describe this.

```

<p:txBody>
  <a:bodyPr wrap="none" rtlCol="0">
    <a:noAutofit/>
  </a:bodyPr>
  <a:p>
    ...
    <a:t>Some text</a:t>
    ...
  </a:p>
</p:txBody>

```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_TextNoAutofit](#)) is located in §A.4.1. *end note*]

21.1.2.1.3 normAutofit (Normal AutoFit)

This element specifies that text within the text body should be normally auto-fit to the bounding box. Auto-fitting is when text within a text box is scaled in order to remain inside the text box. If this element is omitted, then noAutofit or auto-fit off is implied.

[Example: Consider the situation where a user is building a diagram and needs to have the text for each shape that they are using stay within the bounds of the shape. An easy way this might be done is by using normAutofit. The following DrawingML illustrates how this might be accomplished.

```
<p:sp>
  <p:txBody>
    <a:bodyPr rtlCol="0" anchor="ctr">
      <a:normAutofit fontScale="92.000%" lnSpcReduction="20.000%"/>
    </a:bodyPr>
    ...
    <a:p>
      ...
      <a:t>Diagram Object 1</a:t>
      ...
    </a:p>
  </p:txBody>
</p:sp>
<p:sp>
  <p:txBody>
    <a:bodyPr rtlCol="0" anchor="ctr">
      <a:normAutofit fontScale="92.000%" lnSpcReduction="20.000%"/>
    </a:bodyPr>
    ...
    <a:p>
      ...
      <a:t>Diagram Object 2</a:t>
      ...
    </a:p>
  </p:txBody>
</p:sp>
```

In the above example there are two shapes that have normAutofit turned on so that when the user types more text within the shape that the text actually resizes to accommodate the new data. For the application to know how and to what degree the text should be resized two attributes are set for the auto-fit resize logic. *end example]*

Attributes	Description
fontScale (Font	Specifies the percentage of the original font size to which each run in the text body is

Attributes	Description
Scale)	<p>scaled. In order to auto-fit text within a bounding box it is sometimes necessary to decrease the font size by a certain percentage. Using this attribute the font within a text box can be scaled based on the value provided. A value of 100% scales the text to 100%, while a value of 1% scales the text to 1%. If this attribute is omitted, then a value of 100% is implied.</p> <p>The possible values for this attribute are defined by the ST_TextFontScalePercentOrPercentString simple type (§20.1.10.66).</p>
InSpcReduction (Line Space Reduction)	<p>Specifies the percentage amount by which the line spacing of each paragraph in the text body is reduced. The reduction is applied by subtracting it from the original line spacing value. Using this attribute the vertical spacing between the lines of text can be scaled by a percent amount. A value of 100% reduces the line spacing by 100%, while a value of 1% reduces the line spacing by one percent. If this attribute is omitted, then a value of 0% is implied.</p> <p>[<i>Note</i>: This attribute applies only to paragraphs with percentage line spacing. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_TextSpacingPercentOrPercentString simple type (§20.1.10.76).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_TextNormalAutofit](#)) is located in §A.4.1. *end note*]

21.1.2.1.4 spAutoFit (Shape AutoFit)

This element specifies that a shape should be auto-fit to fully contain the text described within it. Auto-fitting is when text within a shape is scaled in order to contain all the text inside. If this element is omitted, then noAutofit or auto-fit off is implied.

[*Example*: Consider the situation where a user is building a diagram and needs to have the text for each shape that they are using stay within the bounds of the shape. An easy way this might be done is by using spAutofit. The following DrawingML illustrates how this might be accomplished.

```

<p:sp>
  <p:txBody>
    <a:bodyPr rtlCol="0" anchor="ctr">
      <a:spAutoFit/>
    </a:bodyPr>
    ...
    <a:p>
      ...
      <a:t>Diagram Object 1</a:t>
      ...
    </a:p>
  </p:txBody>
</p:sp>
<p:sp>
  <p:txBody>
    <a:bodyPr rtlCol="0" anchor="ctr">
      <a:spAutoFit/>
    </a:bodyPr>
    ...
    <a:p>
      ...
      <a:t>Diagram Object 2</a:t>
      ...
    </a:p>
  </p:txBody>
</p:sp>

```

In the above example there are two shapes that have `spAutoFit` turned on so that when the user types more text within the shape that the shape actually resizes to accommodate the new data. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TextShapeAutofit](#)) is located in §A.4.1. *end note*]

21.1.2.2 Paragraph Formatting

This level of formatting allows for more granular control of text within a shape. Properties here apply to all text residing within the corresponding paragraph. This intermediate property level allows freedom to assign what would seem like lower level properties to a larger group of text. Along with this the paragraph property level also allows what would seem like larger group properties to a more granular set of text. This makes for a property level that is quite versatile in its ability to define formatting on text within a shape.

[*Example:* For instance consider the case where a paragraph of text would need to have bullets applied to it. At first one might think that this formatting must be done at the text run level as it can seem run specific. Much to the contrary this is a paragraph level property and is applied to multiple runs of text. As an example we have once again our three paragraphs with the second having bullets applied to it.


```

<a:p>
...
</a:p>
<a:p>
  <a:pPr>
    <a:buFont typeface="Wingdings"/>
    <a:buChar typeface="ü"/>
  <a:pPr>
  <a:r>
    <a:rPr lang="en-US" dirty="0" smtClean="0"/>
    <a:t>This Paragraph of Text Will Have a Bullet.</a:t>
  </a:r>
</a:p>
<a:p>
...
</a:p>

```

Here we see that the paragraph is formatted to have character bullets for each new line of text that is encountered. In particular this paragraph has the "ü" character applied which in the "Wingdings" font is the checkmark character. The other paragraphs are not effected by this paragraph's bullet formatting and should have their text remain unformatted.

end example]

21.1.2.2.1 br (Text Line Break)

This element specifies the existence of a vertical line break between two runs of text within a paragraph. In addition to specifying a vertical space between two runs of text, this element can also have run properties specified via the rPr child element. This sets the formatting of text for the line break so that if text is later inserted there that a new run can be generated with the correct formatting.

[*Example:* Consider the DrawingML shown below.

```

<p:txBody>
...
<a:p>
  <a:r>
    ...
    <a:t>Text Run 1.</a:t>
    ...
  </a:r>

```

```
<a:br/>
<a:r>
...
<a:t>Text Run 2.</a:t>
...
</a:r>
</a:p>
</p:txBody>
```

This paragraph has two runs of text laid out in a vertical fashion with a line break in between them. This line break acts much like a carriage return would within a normal run of text. *end example*

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_TextLineBreak](#)) is located in §A.4.1. *end note*]

21.1.2.2.2 defPPr (Default Paragraph Style)

This element specifies the paragraph properties that are to be applied when no other paragraph properties have been specified. If this attribute is omitted, then it is left to the application to decide the set of default paragraph properties that should be applied.

[*Example:* Consider the DrawingML shown below.

```
<p:txBody>
...
<a:lstStyle>
  <a:defPPr>
    <a:buNone/>
  </a:defPPr>
</a:lstStyle>
<a:p>
...
  <a:t>Sample Text</a:t>
...
</a:p>
</p:txBody>
```

The above paragraph follows the properties described in defPPr if no overriding properties are specified within the pPr element. *end example*

Attributes	Description
align (Alignment)	Specifies the alignment that is to be applied to the paragraph. Possible values for this include left, right, centered, justified and distributed. If this attribute is omitted, then a value of left is implied.

Attributes	Description																								
	<div data-bbox="451 285 977 667"> <table> <tr><td>Sample text</td><td>Sample text</td></tr> <tr><td>text Sample</td><td>text Sample</td></tr> <tr><td>Sample text</td><td>Sample text</td></tr> <tr><td>text Sample</td><td>text Sample</td></tr> <tr><td>Sample text</td><td>Sample text</td></tr> <tr><td>text Sample</td><td>text Sample</td></tr> <tr><td>Sample text</td><td>Sample text</td></tr> <tr><td>text Sample</td><td>text Sample</td></tr> <tr><td>Sample text</td><td>Sample text</td></tr> <tr><td>text Sample</td><td>text Sample</td></tr> <tr><td>Sample text</td><td>Sample text</td></tr> <tr><td>text Sample</td><td>text Sample</td></tr> </table> </div> <hr/> <p>[<i>Example:</i> Consider the case where the user wishes to have two columns of text that have a justified alignment, much like text within a book. The following DrawingML could describe this.</p> <pre> <p:txBody> <a:bodyPr numCol="2" spcCol="914400".../> <a:normAutofit/> </a:bodyPr> ... <a:p> <a:pPr marL="0" algn="just"> <a:buNone/> </a:pPr> ... <a:t>Sample Text ...</a:t> ... </a:p> </p:txBody> </pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_TextAlignType simple type (§20.1.10.58).</p>	Sample text	Sample text	text Sample	text Sample	Sample text	Sample text	text Sample	text Sample	Sample text	Sample text	text Sample	text Sample	Sample text	Sample text	text Sample	text Sample	Sample text	Sample text	text Sample	text Sample	Sample text	Sample text	text Sample	text Sample
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Sample text	Sample text																								
text Sample	text Sample																								
defTabSz (Default Tab Size)	<p>Specifies the default size for a tab character within this paragraph. This attribute should be used to describe the spacing of tabs within the paragraph instead of a leading indentation tab. For indentation tabs there are the marL and indent attributes to assist with this.</p> <p>[<i>Example:</i> Consider the case where a paragraph contains numerous tabs that need to be of a specific size. The following DrawingML would describe this.</p> <pre> <p:txBody> ... </pre>																								


Attributes	Description
	<pre><a:p> <a:pPr defTabSz="376300" .../> ... <a:t>Sample Text ...</a:t> ... </a:p> </p:txBody></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</p>
eaLnBrk (East Asian Line Break)	<p>Specifies whether an East Asian word can be broken in half and wrapped onto the next line without a hyphen being added. To determine whether an East Asian word can be broken the presentation application would use the kinsoku settings here. This attribute is to be used specifically when there is a word that cannot be broken into multiple pieces without a hyphen. That is it is not present within the existence of normal breakable East Asian words but is when a special case word arises that should not be broken for a line break. If this attribute is omitted, then a value of 1 or true is implied.</p> <p>[<i>Example:</i> Consider the case where the presentation contains a long word that must not be divided with a line break. Instead it should be placed, in whole on a new line so that it can fit. The picture below shows a normal paragraph where a long word has been broken for a line break. The second picture shown below shows that same paragraph with the long word specified to not allow a line break. The resulting DrawingML is as follows.</p> <pre><p:txBody> ... <a:p> <a:pPr eaLnBrk="0" .../> ... <a:t>Sample text (Long word)</a:t> ... </a:p> </p:txBody></pre> <p>Sample text Sample text Sample text supercalifr agilisticxpialidocious</p> <p>Sample text Sample text Sample text supercalifragilisticxpialidocious</p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

Attributes	Description
fontAlgn (Font Alignment)	<p>Determines where vertically on a line of text the actual words are positioned. This deals with vertical placement of the characters with respect to the baselines. For instance having text anchored to the top baseline, anchored to the bottom baseline, centered in between, etc. To understand this attribute and it's use it is helpful to understand what baselines are. A diagram describing these different cases is shown below. If this attribute is omitted, then a value of base is implied.</p> <p>[Example: Consider the case where the user wishes to represent the chemical compound of a water molecule. For this they need to make sure the H, the 2, and the O are all in the correct position and are of the correct size. The results below can be achieved through the DrawingML shown below.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> H^2O <p>fontAlgn="t"</p> </div> <div style="text-align: center;"> H^2O <p>fontAlgn="ctr"</p> </div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-start; margin-top: 20px;"> <div style="text-align: center;"> H_2O <p>fontAlgn="base"</p> </div> <div style="text-align: center;"> H_2O <p>fontAlgn="b"</p> </div> </div> <pre> <a:txtBody> ... <a:pPr fontAlgn="b" .../> ... <a:r> <a:rPr .../> <a:t>H </a:t> </a:r> <a:r> <a:rPr sz="1200" .../> <a:t>2</a:t> </a:r> <a:r> <a:rPr .../> <a:t>O</a:t> </a:r> ... </p:txBody> </pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_TextFontAlignType simple type (§20.1.10.65).</p>

Attributes	Description
hangingPunct (Hanging Punctuation)	<p>Specifies whether punctuation is to be forcefully laid out on a line of text or put on a different line of text. That is, if there is punctuation at the end of a run of text that should be carried over to a separate line does it actually get carried over. A true value allows for hanging punctuation forcing the punctuation to not be carried over and a value of false allows the punctuation to be carried onto the next text line. If this attribute is omitted, then a value of 0, or false is implied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
indent (Indent)	<p>Specifies the indent size that is applied to the first line of text in the paragraph. An indentation of 0 is considered to be at the same location as marL attribute. If this attribute is omitted, then a value of -342900 is implied.</p> <div><div>Here is some text</div><div>Sample text</div></div> <p>[Example: Consider the scenario where the user now wanted to add a paragraph indentation to the first line of text in their two column format book.</p> <pre><p:txBody> <a:bodyPr numCol="2" spcCol="914400".../> <a:normAutofit/> </a:bodyPr> ... <a:p> <a:pPr marL="0" indent="571500" algn="just"> <a:buNone/> </a:pPr> ... <a:t>Here is some...</a:t> ... </a:p> </p:txBody></pre> <p>By adding the indent attribute the user has effectively added a first line indent to this paragraph of text. <i>end example]</i></p>

Attributes	Description
	<p>The possible values for this attribute are defined by the ST_TextIndent simple type (§20.1.10.69).</p>
<p>latinLnBrk (Latin Line Break)</p>	<p>Specifies whether a Latin word can be broken in half and wrapped onto the next line without a hyphen being added. This attribute is to be used specifically when there is a word that cannot be broken into multiple pieces without a hyphen. It is not present within the existence of normal breakable Latin words but is when a special case word arises that should not be broken for a line break. If this attribute is omitted, then a value of 1 or true is implied.</p> <p>[<i>Example:</i> Consider the case where the presentation contains a long word that must not be divided with a line break. Instead it should be placed, in whole on a new line so that it can fit. The picture below shows a normal paragraph where a long word has been broken for a line break. The second picture shown below shows that same paragraph with the long word specified to not allow a line break. The resulting DrawingML is as follows.</p> <pre> <p:txBody> ... <a:p> <a:pPr latinLnBrk="0" .../> ... <a:t>Sample text (Long word)</a:t> ... </a:p> </p:txBody> </pre> <p>Sample text Sample text Sample text supercalifr agilisticxpialidocious</p> <p>Sample text Sample text Sample text supercalifragilisticxpialidocious</p> <p style="text-align: right;"><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>lvl (Level)</p>	<p>Specifies the particular level text properties that this paragraph follows. The value for this attribute is numerical and formats the text according to the corresponding level paragraph properties that are listed within the lstStyle element. Since there are nine separate level properties defined, this tag has an effective range of 0-8 = 9 available values.</p> <p>[<i>Example:</i> Consider the following DrawingML. This would specify that this paragraph should follow the lvl2pPr formatting style because once again lvl="1" is considered to be level 2.</p>

Attributes	Description
	<pre> <p:txBody> ... <a:p> <a:pPr lvl="1" .../> ... <a:t>Sample text</a:t> ... </a:p> </p:txBody> </pre> <p><i>end example]</i></p> <p>[<i>Note:</i> To resolve conflicting paragraph properties the linear hierarchy of paragraph properties should be examined starting first with the pPr element. The rule here is that properties that are defined at a level closer to the actual text should take precedence. That is if there is a conflicting property between the pPr and lvl1pPr elements then the pPr property should take precedence because in the property hierarchy it is closer to the actual text being represented. <i>end note]</i></p> <p>The possible values for this attribute are defined by the ST_TextIndentLevelType simple type (§20.1.10.70).</p>
marL (Left Margin)	<p>Specifies the left margin of the paragraph. This is specified in addition to the text body inset and applies only to this text paragraph. That is the text body inset and the marL attributes are additive with respect to the text position. If this attribute is omitted, then a value of 347663 is implied.</p> <p>The possible values for this attribute are defined by the ST_TextMargin simple type (§20.1.10.71).</p>
marR (Right Margin)	<p>Specifies the right margin of the paragraph. This is specified in addition to the text body inset and applies only to this text paragraph. That is the text body inset and the marR attributes are additive with respect to the text position. If this attribute is omitted, then a value of 0 is implied.</p> <p>The possible values for this attribute are defined by the ST_TextMargin simple type (§20.1.10.71).</p>
rtl (Right To Left)	<p>Specifies whether the text is right-to-left or left-to-right in its flow direction. If this attribute is omitted, then a value of 0, or left-to-right is implied.</p> <p>[<i>Example:</i> Consider the following example of a text body with two lines of text. In this example, both lines contain English and Arabic text, however, the second line has the rtl attribute set to true whereas the first line does not set the rtl attribute.</p>

Attributes	Description
	<p>  </p> <pre> <p:txBody> ... <a:p> <a:r> <a:t>Test </a:t> </a:r> <a:r> <a:rPr> <a:rtl w:val="1"/> </a:rPr> <a:t>تجربة</a:t> </a:r> </a:p> <a:p> <a:pPr rtl="1"/> <a:r> <a:rPr> <a:rtl w:val="0"/> </a:rPr> <a:t>Test </a:t> </a:r> <a:r> <a:t>تجربة </a:t> </a:r> </a:p> </p:txBody> </pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TextParagraphProperties](#)) is located in §A.4.1. *end note*]

21.1.2.2.3 endParaRPr (End Paragraph Run Properties)

This element specifies the text run properties that are to be used if another run is inserted after the last run specified. This effectively saves the run property state so that it can be applied when the user enters additional text. If this element is omitted, then the application can determine which default properties to apply. It is

recommended that this element be specified at the end of the list of text runs within the paragraph so that an orderly list is maintained.

Attributes	Description
altLang (Alternative Language)	<p>Specifies the alternate language to use when the generating application is displaying the user interface controls. If this attribute is omitted, than the lang attribute is used here.</p> <p>The possible values for this attribute are defined by the ST_Lang simple type (§22.9.2.6).</p>
b (Bold)	<p>Specifies whether a run of text is formatted as bold text. If this attribute is omitted, than a value of 0, or false is assumed.</p> <p>[Example: Consider the DrawingML shown below.</p> <pre data-bbox="454 619 803 850"><a:p> ... <a:rPr b="1"/> ... <a:t>Some Text</a:t> ... </a:p></pre> <p>The above run of text is formatted as bold text. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
baseline (Baseline)	<p>Specifies the baseline for both the superscript and subscript fonts. The size is specified using a percentage where 1% is equal to 1 percent of the font size and 100% is equal to 100 percent font of the font size.</p> <p>The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).</p>
bmK (Bookmark Link Target)	<p>Specifies the link target name that is used to reference to the proper link properties in a custom XML part within the document.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
cap (Capitalization)	<p>Specifies the capitalization that is to be applied to the text run. This is a render-only modification and does not affect the actual characters stored in the text run. This attribute is also distinct from the toggle function where the actual characters stored in the text run are changed.</p> <p>The possible values for this attribute are defined by the ST_TextCapsType simple type (§20.1.10.63).</p>
dirty (Dirty)	<p>Specifies that the content of a text run has changed since the proofing tools have last been run. Effectively this flags text that is to be checked again by the generating application for mistakes such as spelling, grammar, etc.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean</p>

Attributes	Description
	datatype.
err (Spelling Error)	<p>Specifies that when this run of text was checked for spelling, grammar, etc. that a mistake was indeed found. This allows the generating application to effectively save the state of the mistakes within the document instead of having to perform a full pass check upon opening the document.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
i (Italics)	<p>Specifies whether a run of text is formatted as italic text. If this attribute is omitted, than a value of 0, or false is assumed.</p> <p>[<i>Example</i>: Consider the DrawingML shown below.</p> <pre data-bbox="456 737 808 968"><a:p> ... <a:rPr i="1"/> ... <a:t>Some Text</a:t> ... </a:p></pre> <p>The above run of text is formatted as italic text. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
kern (Kerning)	<p>Specifies the minimum font size at which character kerning occurs for this text run. Whole points are specified in increments of 100 starting with 100 being a point size of 1. For instance a font point size of 12 would be 1200 and a font point size of 12.5 would be 1250. If this attribute is omitted, than kerning occurs for all font sizes down to a 0 point font.</p> <p>The possible values for this attribute are defined by the ST_TextNonNegativePoint simple type (§20.1.10.72).</p>
kumimoji (Kumimoji)	<p>Specifies whether the numbers contained within vertical text continue vertically with the text or whether they are to be displayed horizontally while the surrounding characters continue in a vertical fashion. If this attribute is omitted, than a value of 0, or false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
lang (Language ID)	<p>Specifies the language to be used when the generating application is displaying the user interface controls. If this attribute is omitted, than the generating application can select a language of its choice.</p> <p>The possible values for this attribute are defined by the ST_Lang simple type (§22.9.2.6).</p>

Attributes	Description
noProof (No Proofing)	<p>Specifies that a run of text has been selected by the user to not be checked for mistakes. Therefore if there are spelling, grammar, etc mistakes within this text the generating application should ignore them.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
normalizeH (Normalize Heights)	<p>Specifies the normalization of height that is to be applied to the text run. This is a render-only modification and does not affect the actual characters stored in the text run. This attribute is also distinct from the toggle function where the actual characters stored in the text run are changed. If this attribute is omitted, than a value of 0, or false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
smtClean (SmartTag Clean)	<p>Specifies whether or not a text run has been checked for smart tags. This attribute acts much like the dirty attribute dose for the checking of spelling, grammar, etc. A value of true here indicates to the generating application that this text run should be checked for smart tags. If this attribute is omitted, than a value of 0, or false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
smtId (SmartTag ID)	<p>Specifies a smart tag identifier for a run of text. This ID is unique throughout the presentation and is used to reference corresponding auxiliary information about the smart tag. [Note: For a complete definition of smart tags, which are semantically identical throughout Office Open XML, see §17.5.1. <i>end note</i>]</p> <p>[Example: Consider the following DrawingML:</p> <pre> <p:txBody> <a:bodyPr/> <a:lstStyle/> <a:p> <a:r> <a:rPr lang="en-US" dirty="0" smtId="1"/> <a:t>CNTS</a:t> </a:r> <a:endParaRPr lang="en-US" dirty="0"/> </a:p> </p:txBody> </pre> <p>The text run has a smtId attribute value of 1, which denotes that the text should be inspected for smart tag information, which in this case maps to a stock ticker symbol. <i>end example</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt</p>

Attributes	Description
	datatype.
spc (Spacing)	<p>Specifies the spacing between characters within a text run. This spacing is specified numerically and should be consistently applied across the entire run of text by the generating application. Whole points are specified in increments of 100 starting with 100 being a point size of 1. For instance a font point size of 12 would be 1200 and a font point size of 12.5 would be 1250. If this attribute is omitted than a value of 0 or no adjustment is assumed.</p> <p>The possible values for this attribute are defined by the ST_TextPoint simple type (§20.1.10.73).</p>
strike (Strikethrough)	<p>Specifies whether a run of text is formatted as strikethrough text. If this attribute is omitted, than no strikethrough is assumed.</p> <p>[Example: Consider the DrawingML shown below.</p> <pre data-bbox="451 808 922 1039"><a:p> ... <a:rPr strike="sngStrike"/> ... <a:t>Some Text</a:t> ... </a:p></pre> <p>The above run of text is formatted as single strikethrough text. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TextStrikeType simple type (§20.1.10.78).</p>
sz (Font Size)	<p>Specifies the size of text within a text run. Whole points are specified in increments of 100 starting with 100 being a point size of 1. For instance a font point size of 12 would be 1200 and a font point size of 12.5 would be 1250. If this attribute is omitted, than the value in defRPr should be used.</p> <p>[Example: Consider the DrawingML shown below.</p> <pre data-bbox="451 1480 808 1711"><a:p> ... <a:rPr sz="1200"/> ... <a:t>Some Text</a:t> ... </a:p></pre> <p>The above run of text is formatted with a 12 point text size. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TextFontSize simple type (§20.1.10.67).</p>

Attributes	Description
u (Underline)	<p>Specifies whether a run of text is formatted as underlined text. If this attribute is omitted, than no underline is assumed.</p> <p>[<i>Example:</i> Consider the DrawingML shown below.</p> <pre><a:p> ... <a:rPr u="sng"/> ... <a:t>Some Text</a:t> ... </a:p></pre> <p>The above run of text is formatted as single underline text. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TextUnderlineType simple type (§20.1.10.81).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_TextCharacterProperties](#)) is located in §A.4.1. *end note*]

21.1.2.2.4 fld (Text Field)

This element specifies a text field which contains generated text that the application should update periodically. Each piece of text when it is generated is given a unique identification number that is used to refer to a specific field. At the time of creation the text field indicates the kind of text that should be used to update this field. This update type is used so that all applications that did not create this text field can still know what kind of text it should be updated with. Thus the new application can then attach an update type to the text field id for continual updating.

[*Example:* Consider a slide within a presentation that needs to have the slide number placed on the slide. The following DrawingML can be used to describe such a situation.

```
<p:txBody>
  <a:bodyPr/>
  <a:lstStyle/>
  <a:p>
    <a:fld id="{424CEEAC-8F67-4238-9622-1B74DC6E8318}" type="slidenum">
      <a:rPr lang="en-US" smtClean="0"/>
      <a:pPr/>
      <a:t>3</a:t>
    </a:fld>
```

```

    <a:endParaRPr lang="en-US"/>
  </a:p>
</p:txBody>

```

end example]

Attributes	Description																										
id (Field ID)	<p>Specifies the unique to this document, host specified token that is used to identify the field. This token is generated when the text field is created and persists in the file as the same token until the text field is removed. Any application should check the document for conflicting tokens before assigning a new token to a text field.</p> <p>The possible values for this attribute are defined by the ST_Guid simple type (§22.9.2.4).</p>																										
type (Field Type)	<p>Specifies the type of text that should be used to update this text field. This is used to inform the rendering application what text it should use to update this text field. There are no specific syntax restrictions placed on this attribute. The generating application can use it to represent any text that should be updated before rendering the presentation.</p> <p>Reserved Values:</p> <table> <tr> <th>Value</th><th>Description</th></tr> <tr> <td>slidenum</td><td>presentation slide number</td></tr> <tr> <td>datetime</td><td>default date time format for the rendering application</td></tr> <tr> <td>datetime1</td><td>MM/DD/YYYY date time format [<i>Example: 10/12/2007 end example</i>]</td></tr> <tr> <td>datetime2</td><td>Day, Month DD, YYYY date time format [<i>Example: Friday, October 12, 2007 end example</i>]</td></tr> <tr> <td>datetime3</td><td>DD Month YYYY date time format [<i>Example: 12 October 2007 end example</i>]</td></tr> <tr> <td>datetime4</td><td>Month DD, YYYY date time format [<i>Example: October 12, 2007 end example</i>]</td></tr> <tr> <td>datetime5</td><td>DD-Mon-YY date time format [<i>Example: 12-Oct-07 end example</i>]</td></tr> <tr> <td>datetime6</td><td>Month YY date time format [<i>Example: October 07 end example</i>]</td></tr> <tr> <td>datetime7</td><td>Mon-YY date time format [<i>Example: Oct-07 end example</i>]</td></tr> <tr> <td>datetime8</td><td>MM/DD/YYYY hh:mm AM/PM date time format [<i>Example: 10/12/2007 4:28 PM end example</i>]</td></tr> <tr> <td>datetime9</td><td>MM/DD/YYYY hh:mm:ss AM/PM date time format [<i>Example: 10/12/2007 4:28:34 PM end example</i>]</td></tr> <tr> <td>datetime10</td><td>hh:mm date time format [<i>Example: 16:28 end example</i>]</td></tr> </table>	Value	Description	slidenum	presentation slide number	datetime	default date time format for the rendering application	datetime1	MM/DD/YYYY date time format [<i>Example: 10/12/2007 end example</i>]	datetime2	Day, Month DD, YYYY date time format [<i>Example: Friday, October 12, 2007 end example</i>]	datetime3	DD Month YYYY date time format [<i>Example: 12 October 2007 end example</i>]	datetime4	Month DD, YYYY date time format [<i>Example: October 12, 2007 end example</i>]	datetime5	DD-Mon-YY date time format [<i>Example: 12-Oct-07 end example</i>]	datetime6	Month YY date time format [<i>Example: October 07 end example</i>]	datetime7	Mon-YY date time format [<i>Example: Oct-07 end example</i>]	datetime8	MM/DD/YYYY hh:mm AM/PM date time format [<i>Example: 10/12/2007 4:28 PM end example</i>]	datetime9	MM/DD/YYYY hh:mm:ss AM/PM date time format [<i>Example: 10/12/2007 4:28:34 PM end example</i>]	datetime10	hh:mm date time format [<i>Example: 16:28 end example</i>]
Value	Description																										
slidenum	presentation slide number																										
datetime	default date time format for the rendering application																										
datetime1	MM/DD/YYYY date time format [<i>Example: 10/12/2007 end example</i>]																										
datetime2	Day, Month DD, YYYY date time format [<i>Example: Friday, October 12, 2007 end example</i>]																										
datetime3	DD Month YYYY date time format [<i>Example: 12 October 2007 end example</i>]																										
datetime4	Month DD, YYYY date time format [<i>Example: October 12, 2007 end example</i>]																										
datetime5	DD-Mon-YY date time format [<i>Example: 12-Oct-07 end example</i>]																										
datetime6	Month YY date time format [<i>Example: October 07 end example</i>]																										
datetime7	Mon-YY date time format [<i>Example: Oct-07 end example</i>]																										
datetime8	MM/DD/YYYY hh:mm AM/PM date time format [<i>Example: 10/12/2007 4:28 PM end example</i>]																										
datetime9	MM/DD/YYYY hh:mm:ss AM/PM date time format [<i>Example: 10/12/2007 4:28:34 PM end example</i>]																										
datetime10	hh:mm date time format [<i>Example: 16:28 end example</i>]																										

Attributes	Description	
	datetime11	hh:mm:ss date time format [<i>Example: 16:28:34 end example</i>]
	datetime12	hh:mm AM/PM date time format [<i>Example: 4:28 PM end example</i>]
	datetime13	hh:mm:ss: AM/PM date time format [<i>Example: 4:28:34 PM end example</i>]
	The possible values for this attribute are defined by the W3C XML Schema string datatype.	

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_TextField](#)) is located in §A.4.1. *end note*]

21.1.2.2.5 **lnSpc (Line Spacing)**

This element specifies the vertical line spacing that is to be used within a paragraph. This can be specified in two different ways, percentage spacing and font point spacing. If this element is omitted then the spacing between two lines of text should be determined by the point size of the largest piece of text within a line.

[*Example:* Consider the DrawingML shown below.

```
<p:txBody>
  <a:p>
    <a:pPr>
      <a:lnSpc>
        <a:spcPct val="200%"/>
      </a:lnSpc>
    </a:pPr>
    <a:r>
      <a:rPr lang="en-US" dirty="0" smtClean="0"/>
      <a:t>Some</a:t>
    </a:r>
    <a:br>
      <a:rPr lang="en-US" smtClean="0"/>
    </a:br>
    <a:r>
      <a:rPr lang="en-US" dirty="0" smtClean="0"/>
      <a:t>Text</a:t>
    </a:r>
  </a:p>
</p:txBody>
```


This paragraph has two lines of text that have percentage based vertical spacing. This kind of spacing should change based on the size of the text involved as its size is calculated as a percentage of this. *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TextSpacing](#)) is located in §A.4.1. *end note*]

21.1.2.2.6 p (Text Paragraphs)

This element specifies the presence of a paragraph of text within the containing text body. The paragraph is the highest level text separation mechanism within a text body. A paragraph can contain text paragraph properties associated with the paragraph. If no properties are listed then properties specified in the defPPr element are used.

[*Example:* Consider the case where the user would like to describe a text body that contains two paragraphs. The requirement for these paragraphs is that one be right aligned and the other left aligned. The following DrawingML would specify a text body such as this.

```
<p:txBody>
  ...
  <a:p>
    <a:pPr align="r">
    </a:pPr>
    ...
    <a:t>Some text</a:t>
    ...
  </a:p>
  <a:p>
    <a:pPr align="l">
    </a:pPr>
    ...
    <a:t>Some text</a:t>
    ...
  </a:p>
</p:txBody>
```

end example

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TextParagraph](#)) is located in §A.4.1. *end note*]

21.1.2.2.7 pPr (Text Paragraph Properties)

This element contains all paragraph level text properties for the containing paragraph. These paragraph properties should override any and all conflicting properties that are associated with the paragraph in question.

[*Example:* Consider the DrawingML shown below.

```
<a:p>
  <a:pPr marL="0" align="ctr">
    <a:buNone/>
  </a:pPr>
  ...
  <a:t>Some Text</a:t>
  ...
</a:p>
```

The paragraph described above is formatting with a left margin of 0 and has all of text runs contained within it centered about the horizontal median of the bounding box for the text body. *end example*]

[*Note:* To resolve conflicting paragraph properties the linear hierarchy of paragraph properties should be examined starting first with the pPr element. The rule here is that properties that are defined at a level closer to the actual text should take precedence. That is if there is a conflicting property between the pPr and lvl1pPr elements then the pPr property should take precedence because in the property hierarchy it is closer to the actual text being represented. *end note*]

Attributes	Description
align (Alignment)	<p>Specifies the alignment that is to be applied to the paragraph. Possible values for this include left, right, centered, justified and distributed. If this attribute is omitted, then a value of left is implied.</p> <div><div>Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text</div><div>Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text</div></div> <hr/> <p>[<i>Example:</i> Consider the case where the user wishes to have two columns of text that have a justified alignment, much like text within a book. The following DrawingML could describe this.</p> <pre><p:txBody> <a:bodyPr numCol="2" spcCol="914400".../> <a:normAutofit/> </a:bodyPr> ... <a:p></pre>

Attributes	Description
	<pre> <a:pPr marL="0" algn="just"> <a:buNone/> </a:pPr> ... <a:t>Sample Text ...</a:t> ... </a:p> </p:txBody> end example] The possible values for this attribute are defined by the ST_TextAlignType simple type (§20.1.10.58).</pre>
defTabSz (Default Tab Size)	<p>Specifies the default size for a tab character within this paragraph. This attribute should be used to describe the spacing of tabs within the paragraph instead of a leading indentation tab. For indentation tabs there are the marL and indent attributes to assist with this.</p> <p>[<i>Example:</i> Consider the case where a paragraph contains numerous tabs that need to be of a specific size. The following DrawingML would describe this.</p> <pre> <p:txBody> ... <a:p> <a:pPr defTabSz="376300" .../> ... <a:t>Sample Text ...</a:t> ... </a:p> </p:txBody> end example] The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</pre>
eaLnBrk (East Asian Line Break)	<p>Specifies whether an East Asian word can be broken in half and wrapped onto the next line without a hyphen being added. To determine whether an East Asian word can be broken the presentation application would use the kinsoku settings here. This attribute is to be used specifically when there is a word that cannot be broken into multiple pieces without a hyphen. That is it is not present within the existence of normal breakable East Asian words but is when a special case word arises that should not be broken for a line break. If this attribute is omitted, then a value of 1 or true is implied.</p> <p>[<i>Example:</i> Consider the case where the presentation contains a long word that must not be divided with a line break. Instead it should be placed, in whole on a new line so that it can fit. The picture below shows a normal paragraph where a long word has been broken</p>

Attributes	Description
	<p>for a line break. The second picture shown below shows that same paragraph with the long word specified to not allow a line break. The resulting DrawingML is as follows.</p> <pre> <p:txBody> ... <a:p> <a:pPr eaLnBrk="0" .../> ... <a:t>Sample text (Long word)</a:t> ... </a:p> </p:txBody> </pre> <p>Sample text Sample text Sample text supercalifr agilisticxpialidocious</p> <p>Sample text Sample text Sample text supercalifragilisticxpialidocious</p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fontAlgn (Font Alignment)	<p>Determines where vertically on a line of text the actual words are positioned. This deals with vertical placement of the characters with respect to the baselines. For instance having text anchored to the top baseline, anchored to the bottom baseline, centered in between, etc. To understand this attribute and it's use it is helpful to understand what baselines are. A diagram describing these different cases is shown below. If this attribute is omitted, then a value of base is implied.</p> <p><i>[Example: Consider the case where the user wishes to represent the chemical compound of a water molecule. For this they need to make sure the H, the 2, and the O are all in the correct position and are of the correct size. The results below can be achieved through the DrawingML shown below.</i></p>

Attributes	Description
	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> H^2O <p>fontAlign="t"</p> </div> <div style="text-align: center;"> H^2O <p>fontAlign="ctr"</p> </div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-start; margin-top: 20px;"> <div style="text-align: center;"> H_2O <p>fontAlign="base"</p> </div> <div style="text-align: center;"> H_2O <p>fontAlign="b"</p> </div> </div> <pre> <a:txtBody> ... <a:pPr fontAlign="b" .../> ... <a:r> <a:rPr .../> <a:t>H </a:t> </a:r> <a:r> <a:rPr sz="1200" .../> <a:t>2</a:t> </a:r> <a:r> <a:rPr .../> <a:t>O</a:t> </a:r> ... </p:txBody> </pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_TextFontAlignType simple type (§20.1.10.65).</p>
hangingPunct (Hanging Punctuation)	<p>Specifies whether punctuation is to be forcefully laid out on a line of text or put on a different line of text. That is, if there is punctuation at the end of a run of text that should be carried over to a separate line does it actually get carried over. A true value allows for hanging punctuation forcing the punctuation to not be carried over and a value of false allows the punctuation to be carried onto the next text line. If this attribute is omitted, then a value of 0, or false is implied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
indent (Indent)	<p>Specifies the indent size that is applied to the first line of text in the paragraph. An indentation of 0 is considered to be at the same location as marL attribute. If this</p>

Attributes	Description
	<p>attribute is omitted, then a value of -342900 is implied.</p> <p>Here is some text Sample text Sample text Sample text Sample text text Sample text text Sample text Sample text Sample text Sample text text Sample text text Sample text Sample text Sample text Sample text text Sample text text Sample text Sample text Sample text Sample text text Sample text text Sample text Sample text Sample text Sample text text Sample text text Sample text Sample text Sample text Sample text</p> <p>[<i>Example:</i> Consider the scenario where the user now wanted to add a paragraph indentation to the first line of text in their two column format book.</p> <pre> <p:txBody> <a:bodyPr numCol="2" spcCol="914400".../> <a:normAutofit/> </a:bodyPr> ... <a:p> <a:pPr marL="0" indent="571500" algn="just"> <a:buNone/> </a:pPr> ... <a:t>Here is some...</a:t> ... </a:p> </p:txBody> </pre> <p>By adding the indent attribute the user has effectively added a first line indent to this paragraph of text. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TextIndent simple type (§20.1.10.69).</p>
latinLnBrk (Latin Line Break)	<p>Specifies whether a Latin word can be broken in half and wrapped onto the next line without a hyphen being added. This attribute is to be used specifically when there is a word that cannot be broken into multiple pieces without a hyphen. It is not present within the existence of normal breakable Latin words but is when a special case word arises that should not be broken for a line break. If this attribute is omitted, then a value of 1 or true is implied.</p> <p>[<i>Example:</i> Consider the case where the presentation contains a long word that must not</p>

Attributes	Description
	<p>be divided with a line break. Instead it should be placed, in whole on a new line so that it can fit. The picture below shows a normal paragraph where a long word has been broken for a line break. The second picture shown below shows that same paragraph with the long word specified to not allow a line break. The resulting DrawingML is as follows.</p> <pre><p:txBody> ... <a:p> <a:pPr latinLnBrk="0" .../> ... <a:t>Sample text (Long word)</a:t> ... </a:p> </p:txBody></pre> <p>Sample text Sample text Sample text supercalifr agilisticxpialidocious</p> <p>Sample text Sample text Sample text supercalifragilisticxpialidocious</p> <p style="text-align: right;"><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
lvl (Level)	<p>Specifies the particular level text properties that this paragraph follows. The value for this attribute is numerical and formats the text according to the corresponding level paragraph properties that are listed within the lstStyle element. Since there are nine separate level properties defined, this tag has an effective range of 0-8 = 9 available values.</p> <p>[Example: Consider the following DrawingML. This would specify that this paragraph should follow the lvl2pPr formatting style because once again lvl="1" is considered to be level 2.</p> <pre><p:txBody> ... <a:p> <a:pPr lvl="1" .../> ... <a:t>Sample text</a:t> ... </a:p> </p:txBody></pre> <p><i>end example]</i></p>

Attributes	Description
	<p>[<i>Note:</i> To resolve conflicting paragraph properties the linear hierarchy of paragraph properties should be examined starting first with the pPr element. The rule here is that properties that are defined at a level closer to the actual text should take precedence. That is if there is a conflicting property between the pPr and lvl1pPr elements then the pPr property should take precedence because in the property hierarchy it is closer to the actual text being represented. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_TextIndentLevelType simple type (§20.1.10.70).</p>
marL (Left Margin)	<p>Specifies the left margin of the paragraph. This is specified in addition to the text body inset and applies only to this text paragraph. That is the text body inset and the marL attributes are additive with respect to the text position. If this attribute is omitted, then a value of 347663 is implied.</p> <p>The possible values for this attribute are defined by the ST_TextMargin simple type (§20.1.10.71).</p>
marR (Right Margin)	<p>Specifies the right margin of the paragraph. This is specified in addition to the text body inset and applies only to this text paragraph. That is the text body inset and the marR attributes are additive with respect to the text position. If this attribute is omitted, then a value of 0 is implied.</p> <p>The possible values for this attribute are defined by the ST_TextMargin simple type (§20.1.10.71).</p>
rtl (Right To Left)	<p>Specifies whether the text is right-to-left or left-to-right in its flow direction. If this attribute is omitted, then a value of 0, or left-to-right is implied.</p> <p>[<i>Example:</i> Consider the following example of a text body with two lines of text. In this example, both lines contain English and Arabic text, however, the second line has the rtl attribute set to true whereas the first line does not set the rtl attribute.</p> <div style="text-align: right; margin-top: 10px;"> <p>Test تجربة ← rtl = 0</p> <p>تجربةTest ← rtl = 1</p> </div> <pre style="margin-top: 20px;"> <p:txBody> ... <a:p> <a:r> <a:t>Test </a:t> </a:r> <a:r> <a:rPr> <a:rtl w:val="1"/> </a:rPr> </a:r> </a:p> </pre>

Attributes	Description
	<pre> <a:t>تجربة_</a:t> </a:r> </a:p> <a:p> <a:pPr rtl="1"/> <a:r> <a:rPr> <a:rtl w:val="0"/> </a:rPr> <a:t>Test </a:t> </a:r> </a:p> <a:p> <a:t>تجربة</a:t> </a:p> </p:txBody> </pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TextParagraphProperties](#)) is located in §A.4.1. *end note*]

21.1.2.2.8 rtl (Right to Left Run)

This element specifies whether the contents of this run shall have right-to-left characteristics. Specifically, the following behaviors are applied when this element's val attribute is true (or an equivalent):

- **Formatting** – When the contents of this run are displayed, all characters shall be treated as complex script characters. This means that the values of the cs element (§21.1.2.3.1) shall be used to determine the font face.
- **Character Directionality Override** – When the contents of this run are displayed, this property acts as a right-to-left override for characters which are classified as follows (using the Unicode Character Database):
 - Weak types except European Number, European Number Terminator, Common Number Separator, Arabic Number and (for Hebrew text) European Number Separator when constituting part of a number
 - Neutral types
- *[Rationale:* This override allows applications to store and utilize higher-level information beyond that implicitly derived from the Unicode Bidirectional algorithm. For example, if the string “first second” appears in a right-to-left paragraph inside a document, the Unicode algorithm would always result in

“first second” at display time (since the neutral character is surrounded by strongly classified characters). However, if the whitespace was entered using a right-to-left input method (e.g. a Hebrew keyboard), then that character could be classified as RTL using this property, allowing the display of “second first” in a right-to-left paragraph, since the user explicitly asked for the space in a right-to-left context. *end rationale*]

This element provides information used to resolve the (Unicode) classifications of individual characters as either L, R, AN or EN. Once this is determined, the line should be displayed subject to the recommendation of the Unicode Bidirectional Algorithm in reordering resolved levels.

This property shall not be used with strong left-to-right text. Any behavior under that condition is unspecified. This property, when off, should not be used with strong right-to-left text. Any behavior under that condition is unspecified.

If this element is not present, the default value is to leave the formatting applied at previous level in the *style hierarchy*. If this element is never applied in the style hierarchy, then right to left characteristics shall not be applied to the contents of this run.

[*Example:* Consider the following DrawingML visual content: “first second, أولى ثاني”. This content might appear as follows within its parent paragraph:

```
<a:p>
  <a:r>
    <a:t>first second, </w:t>
  </a:r>
  <a:r>
    <a:rPr>
      <a:rtl/>
    </a:rPr>
    <a:t>أولى</a:t>
  </a:r>
  <a:r>
    <a:rPr>
      <a:rtl/>
    </a:rPr>
    <a:t> </a:t>
  </a:r>
  <a:r>
    <a:rPr>
      <a:rtl/>
    </a:rPr>
    <a:t>ثاني</a:t>
  </a:r>
</a:p>
```

The presence of the rtl element on the second, third, and fourth runs specifies that:

- The formatting on those runs is specified using the complex-script property variants.
- The whitespace character is treated as right-to-left.

Note that the second, third and fourth runs could be joined as one run with the rtl element specified.

end example]

Attributes	Description
val (On/Off Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted. A value of 0 or false specifies that the property shall be explicitly turned off.</p> <p>[<i>Example:</i> For example, consider the following on/off property:</p> <pre><... val="false"/></pre> <p>The val attribute explicitly declares that the property is false. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.4.1. *end note]*

21.1.2.2.9 spcAft (Space After)

This element specifies the amount of vertical white space that is present after a paragraph. This space is specified in either percentage or points via the child elements spcPct and spcPts.

[*Example:* Consider the DrawingML shown below.

```
<p:txBody>
...
<a:p>
  <a:pPr ...>
    <a:spcBef>
      <a:spcPts val="1800"/>
    </a:spcBef>
    <a:spcAft>
      <a:spcPts val="600"/>
    </a:spcAft>
  </a:pPr>
```

```

...
<a:t>Sample Text</a:t>
...
</a:p>
...
</p:txBody>

```

The above paragraph of text is formatted to have a spacing both before and after the paragraph text. The spacing before is a size of 18 points, or value=1800 and the spacing after is a size of 6 points, or value=600. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_TextSpacing](#)) is located in §A.4.1. *end note*]

21.1.2.2.10 spcBef (Space Before)

This element specifies the amount of vertical white space that is present before a paragraph. This space is specified in either percentage or points via the child elements spcPct and spcPts.

[Example: Consider the DrawingML shown below.

```

<p:txBody>
...
<a:p>
  <a:pPr ...>
    <a:spcBef>
      <a:spcPts val="1800"/>
    </a:spcBef>
    <a:spcAft>
      <a:spcPts val="600"/>
    </a:spcAft>
  </a:pPr>
  ...
  <a:t>Sample Text</a:t>
  ...
</a:p>
...
</p:txBody>

```

The above paragraph of text is formatted to have a spacing both before and after the paragraph text. The spacing before is a size of 18 points, or value=1800 and the spacing after is a size of 6 points, or value=600. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_TextSpacing](#)) is located in §A.4.1. *end note*]

21.1.2.2.11 spcPct (Spacing Percent)

This element specifies the amount of white space that is to be used between lines and paragraphs in the form of a percentage of the text size. The text size that is used to calculate the spacing here is the text for each run, with the largest text size having precedence. That is if there is a run of text with 10 point font and within the same paragraph on the same line there is a run of text with a 12 point font size then the 12 point should be used to calculate the spacing to be used.

[*Example:* Consider the DrawingML shown below.

```
<p:txBody>
...
<a:p>
  <a:pPr ...>
    <a:spcBef>
      <a:spcPct val="200%"/>
    </a:spcBef>
  </a:pPr>
  ...
  <a:t>Sample Text</a:t>
  ...
</a:p>
...
</p:txBody>
```

The above paragraph of text is formatted to have a spacing before the paragraph text. This spacing is 200% of the size of the largest text on each line. *end example*]

Attributes	Description
val (Value)	Specifies the percentage of the size that the white space should be. The possible values for this attribute are defined by the ST_TextSpacingPercentOrPercentString simple type (§20.1.10.76).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TextSpacingPercent](#)) is located in §A.4.1. *end note*]

21.1.2.2.12 spcPts (Spacing Points)

This element specifies the amount of white space that is to be used between lines and paragraphs in the form of a text point size. The size is specified using points where 100 is equal to 1 point font and 1200 is equal to 12 point.

[*Example:* Consider the DrawingML shown below.

```
<p:txBody>
...
<a:p>
  <a:pPr ...>
    <a:spcBef>
      <a:spcPts val="1400"/>
    </a:spcBef>
  </a:pPr>
  ...
  <a:t>Sample Text</a:t>
  ...
</a:p>
...
</p:txBody>
```

The above paragraph of text is formatted to have a spacing before the paragraph text. This spacing is a size of 14 points due to val="1400". *end example*]

Attributes	Description
val (Value)	<p>Specifies the size of the white space in point size. Whole points are specified in increments of 100 starting with 100 being a point size of 1. For instance a font point size of 12 would be 1200 and a font point size of 12.5 would be 1250.</p> <p>The possible values for this attribute are defined by the ST_TextSpacingPoint simple type (§20.1.10.77).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_TextSpacingPoint](#)) is located in §A.4.1. *end note*]

21.1.2.2.13 **tab (Tab Stop)**

This element specifies a single tab stop to be used on a line of text when there are one or more tab characters present within the text. When there is more than one present than they should be utilized in increasing position order which is specified via the pos attribute.

[*Example*: Consider the DrawingML shown below.

```

<p:txBody>
...
<a:p>
  <a:pPr ...>
    <a:tabLst>
      <a:tab pos="2292350" algn="1"/>
      <a:tab pos="2627313" algn="1"/>
      <a:tab pos="2743200" algn="1"/>
      <a:tab pos="2974975" algn="1"/>
    </a:tabLst>
  </a:pPr>
  ...
  <a:t>Sample Text</a:t>
  ...
</a:p>
...
</p:txBody>

```

The paragraph within which this <a:tab> information resides has a total of 4 unique tab stops that should be listed in order of increasing position. Along with specifying the tab position each tab allows for the specifying of an alignment. *end example*]

Attributes	Description
algn (Tab Alignment)	<p>Specifies the alignment that is to be applied to text using this tab stop. If this attribute is omitted then the application default for the generating application.</p> <p>The possible values for this attribute are defined by the ST_TextTabAlignType simple type (§20.1.10.79).</p>
pos (Tab Position)	<p>Specifies the position of the tab stop relative to the left margin. If this attribute is omitted then the application default for tab stops is used.</p> <p>The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_TextTabStop](#)) is located in §A.4.1. *end note*]

21.1.2.2.14 tabLst (Tab List)

This element specifies the list of all tab stops that are to be used within a paragraph. These tabs should be used when describing any custom tab stops within the document. If these are not specified then the default tab stops of the generating application should be used.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TextTabStopList](#)) is located in §A.4.1. *end note*]

21.1.2.3 Run Formatting

Run level formatting is the most granular property level and allows for the specifying of all low level text properties. The text run is what all paragraphs are derived from and thus specifying various properties per run allows for a diversely formatted text paragraph.

[*Example:* Consider the case where have multiple runs within a paragraph and you wish to apply bold to only one of them without having to split up the text into higher level XML groups. To do this we would simply apply the bold run property to the text run that we wish to format as shown below.

```
<a:r>
...
</a:r>
<a:r>
  <a:rPr lang="en-US" b="1" dirty="0" smtClean="0"/>
  <a:t>This text will be bold</a:t>
</a:r>
<a:r>
...
</a:r>
```

end example]

21.1.2.3.1 cs (Complex Script Font)

This element specifies that a complex script font be used for a specific run of text. This font is specified with a typeface attribute much like the others but is specifically classified as a complex script font.

[*Example:* Consider the DrawingML shown below.

```
<a:r>
  <a:rPr ...>
    <a:cs typeface="Sample Font"/>
  </a:rPr>
  <a:t>Sample Text</a:t>
</a:r>
```

The above run of text is rendered using the complex script font "Sample Font". *end example*]

If the specified font is not available on a system being used for rendering, then the attributes of this element can be utilized to select an alternative font.

Attributes	Description
charset (Similar	Specifies the character set which is supported by the parent font. This information can be

Attributes	Description																																										
Character Set)	<p>used in font substitution logic to locate an appropriate substitute font when this font is not available. This information is determined by querying the font when present and shall not be modified when the font is not available.</p> <p>The value of this attribute shall be interpreted as follows:</p> <table data-bbox="415 459 1484 1688"> <tr> <th>Value</th><th>Description</th></tr> <tr> <td>0x00</td><td>Specifies the ANSI character set. (IANA name iso-8859-1)</td></tr> <tr> <td>0x01</td><td>Specifies the default character set.</td></tr> <tr> <td>0x02</td><td>Specifies the Symbol character set. This value specifies that the characters in the Unicode private use area (U+FF00 to U+FFFF) of the font should be used to display characters in the range U+0000 to U+00FF.</td></tr> <tr> <td>0x4D</td><td>Specifies a Macintosh (Standard Roman) character set. (IANA name macintosh)</td></tr> <tr> <td>0x80</td><td>Specifies the JIS character set. (IANA name shift_jis)</td></tr> <tr> <td>0x81</td><td>Specifies the Hangul character set. (IANA name ks_c_5601-1987)</td></tr> <tr> <td>0x82</td><td>Specifies a Johab character set. (IANA name KS C-5601-1992)</td></tr> <tr> <td>0x86</td><td>Specifies the GB-2312 character set. (IANA name GBK)</td></tr> <tr> <td>0x88</td><td>Specifies the Chinese Big Five character set. (IANA name Big5)</td></tr> <tr> <td>0xA1</td><td>Specifies a Greek character set. (IANA name windows-1253)</td></tr> <tr> <td>0xA2</td><td>Specifies a Turkish character set. (IANA name iso-8859-9)</td></tr> <tr> <td>0xA3</td><td>Specifies a Vietnamese character set. (IANA name windows-1258)</td></tr> <tr> <td>0xB1</td><td>Specifies a Hebrew character set. (IANA name windows-1255)</td></tr> <tr> <td>0xB2</td><td>Specifies an Arabic character set. (IANA name windows-1256)</td></tr> <tr> <td>0xBA</td><td>Specifies a Baltic character set. (IANA name windows-1257)</td></tr> <tr> <td>0xCC</td><td>Specifies a Russian character set. (IANA name windows-1251)</td></tr> <tr> <td>0xDE</td><td>Specifies a Thai character set. (IANA name windows-874)</td></tr> <tr> <td>0xEE</td><td>Specifies an Eastern European character set. (IANA name windows-1250)</td></tr> <tr> <td>0xFF</td><td>Specifies an OEM character set not defined by ECMA-376.</td></tr> <tr> <td>Any other value</td><td>Application-defined, can be ignored.</td></tr> </table> <p>The possible values for this attribute are defined by the W3C XML Schema byte datatype.</p>	Value	Description	0x00	Specifies the ANSI character set. (IANA name iso-8859-1)	0x01	Specifies the default character set.	0x02	Specifies the Symbol character set. This value specifies that the characters in the Unicode private use area (U+FF00 to U+FFFF) of the font should be used to display characters in the range U+0000 to U+00FF.	0x4D	Specifies a Macintosh (Standard Roman) character set. (IANA name macintosh)	0x80	Specifies the JIS character set. (IANA name shift_jis)	0x81	Specifies the Hangul character set. (IANA name ks_c_5601-1987)	0x82	Specifies a Johab character set. (IANA name KS C-5601-1992)	0x86	Specifies the GB-2312 character set. (IANA name GBK)	0x88	Specifies the Chinese Big Five character set. (IANA name Big5)	0xA1	Specifies a Greek character set. (IANA name windows-1253)	0xA2	Specifies a Turkish character set. (IANA name iso-8859-9)	0xA3	Specifies a Vietnamese character set. (IANA name windows-1258)	0xB1	Specifies a Hebrew character set. (IANA name windows-1255)	0xB2	Specifies an Arabic character set. (IANA name windows-1256)	0xBA	Specifies a Baltic character set. (IANA name windows-1257)	0xCC	Specifies a Russian character set. (IANA name windows-1251)	0xDE	Specifies a Thai character set. (IANA name windows-874)	0xEE	Specifies an Eastern European character set. (IANA name windows-1250)	0xFF	Specifies an OEM character set not defined by ECMA-376.	Any other value	Application-defined, can be ignored.
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0x88	Specifies the Chinese Big Five character set. (IANA name Big5)																																										
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0xEE	Specifies an Eastern European character set. (IANA name windows-1250)																																										
0xFF	Specifies an OEM character set not defined by ECMA-376.																																										
Any other value	Application-defined, can be ignored.																																										
panose (Panose Setting)	Specifies the Panose-1 classification number for the current font using the mechanism defined in §5.2.7.17 of ISO/IEC 14496-22.																																										

Attributes	Description																																						
	<p>The possible values for this attribute are defined by the ST_Panose simple type (§22.9.2.8).</p>																																						
<p>pitchFamily (Similar Font Family)</p>	<p>Specifies the font pitch as well as the font family for the corresponding font. Because the value of this attribute is determined by an octet value this value shall be interpreted as follows:</p> <table data-bbox="415 506 1482 1425"> <tr> <th>Value</th><th>Description</th></tr> <tr><td>0x00</td><td>DEFAULT PITCH + UNKNOWN FONT FAMILY</td></tr> <tr><td>0x01</td><td>FIXED PITCH + UNKNOWN FONT FAMILY</td></tr> <tr><td>0x02</td><td>VARIABLE PITCH + UNKNOWN FONT FAMILY</td></tr> <tr><td>0x10</td><td>DEFAULT PITCH + ROMAN FONT FAMILY</td></tr> <tr><td>0x11</td><td>FIXED PITCH + ROMAN FONT FAMILY</td></tr> <tr><td>0x12</td><td>VARIABLE PITCH + ROMAN FONT FAMILY</td></tr> <tr><td>0x20</td><td>DEFAULT PITCH + SWISS FONT FAMILY</td></tr> <tr><td>0x21</td><td>FIXED PITCH + SWISS FONT FAMILY</td></tr> <tr><td>0x22</td><td>VARIABLE PITCH + SWISS FONT FAMILY</td></tr> <tr><td>0x30</td><td>DEFAULT PITCH + MODERN FONT FAMILY</td></tr> <tr><td>0x31</td><td>FIXED PITCH + MODERN FONT FAMILY</td></tr> <tr><td>0x32</td><td>VARIABLE PITCH + MODERN FONT FAMILY</td></tr> <tr><td>0x40</td><td>DEFAULT PITCH + SCRIPT FONT FAMILY</td></tr> <tr><td>0x41</td><td>FIXED PITCH + SCRIPT FONT FAMILY</td></tr> <tr><td>0x42</td><td>VARIABLE PITCH + SCRIPT FONT FAMILY</td></tr> <tr><td>0x50</td><td>DEFAULT PITCH + DECORATIVE FONT FAMILY</td></tr> <tr><td>0x51</td><td>FIXED PITCH + DECORATIVE FONT FAMILY</td></tr> <tr><td>0x52</td><td>VARIABLE PITCH + DECORATIVE FONT FAMILY</td></tr> </table> <p>This information is determined by querying the font when present and shall not be modified when the font is not available. This information can be used in font substitution logic to locate an appropriate substitute font when this font is not available.</p> <p>[<i>Note:</i> Although the attribute name is pitchFamily, the integer value of this attribute specifies the font family with higher 4 bits and the font pitch with lower 4 bits. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema byte datatype.</p>	Value	Description	0x00	DEFAULT PITCH + UNKNOWN FONT FAMILY	0x01	FIXED PITCH + UNKNOWN FONT FAMILY	0x02	VARIABLE PITCH + UNKNOWN FONT FAMILY	0x10	DEFAULT PITCH + ROMAN FONT FAMILY	0x11	FIXED PITCH + ROMAN FONT FAMILY	0x12	VARIABLE PITCH + ROMAN FONT FAMILY	0x20	DEFAULT PITCH + SWISS FONT FAMILY	0x21	FIXED PITCH + SWISS FONT FAMILY	0x22	VARIABLE PITCH + SWISS FONT FAMILY	0x30	DEFAULT PITCH + MODERN FONT FAMILY	0x31	FIXED PITCH + MODERN FONT FAMILY	0x32	VARIABLE PITCH + MODERN FONT FAMILY	0x40	DEFAULT PITCH + SCRIPT FONT FAMILY	0x41	FIXED PITCH + SCRIPT FONT FAMILY	0x42	VARIABLE PITCH + SCRIPT FONT FAMILY	0x50	DEFAULT PITCH + DECORATIVE FONT FAMILY	0x51	FIXED PITCH + DECORATIVE FONT FAMILY	0x52	VARIABLE PITCH + DECORATIVE FONT FAMILY
Value	Description																																						
0x00	DEFAULT PITCH + UNKNOWN FONT FAMILY																																						
0x01	FIXED PITCH + UNKNOWN FONT FAMILY																																						
0x02	VARIABLE PITCH + UNKNOWN FONT FAMILY																																						
0x10	DEFAULT PITCH + ROMAN FONT FAMILY																																						
0x11	FIXED PITCH + ROMAN FONT FAMILY																																						
0x12	VARIABLE PITCH + ROMAN FONT FAMILY																																						
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0x42	VARIABLE PITCH + SCRIPT FONT FAMILY																																						
0x50	DEFAULT PITCH + DECORATIVE FONT FAMILY																																						
0x51	FIXED PITCH + DECORATIVE FONT FAMILY																																						
0x52	VARIABLE PITCH + DECORATIVE FONT FAMILY																																						
<p>typeface (Text Typeface)</p>	<p>Specifies the typeface, or name of the font that is to be used. The typeface is a string name of the specific font that should be used in rendering the presentation. If this font is not available within the font list of the generating application than font substitution logic</p>																																						

Attributes	Description
	<p>should be utilized in order to select an alternate font.</p> <p>The possible values for this attribute are defined by the ST_TextTypeface simple type (§20.1.10.80).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TextFont](#)) is located in §A.4.1. *end note*]

21.1.2.3.2 defRPr (Default Text Run Properties)

This element contains all default run level text properties for the text runs within a containing paragraph. These properties are to be used when overriding properties have not been defined within the rPr element.

[Example: Consider the DrawingML shown below.

```
<a:p>
...
<a:rPr u="sng"/>
...
<a:t>Some Text</a:t>
...
</a:p>
```

The run of text described above is formatting with a single underline of text matching color. *end example*]

Attributes	Description
altLang (Alternative Language)	<p>Specifies the alternate language to use when the generating application is displaying the user interface controls. If this attribute is omitted, than the lang attribute is used here.</p> <p>The possible values for this attribute are defined by the ST_Lang simple type (§22.9.2.6).</p>
b (Bold)	<p>Specifies whether a run of text is formatted as bold text. If this attribute is omitted, than a value of 0, or false is assumed.</p> <p>[Example: Consider the DrawingML shown below.</p> <pre><a:p> ... <a:rPr b="1"/> ... <a:t>Some Text</a:t> ... </a:p></pre> <p>The above run of text is formatted as bold text. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

Attributes	Description
baseline (Baseline)	<p>Specifies the baseline for both the superscript and subscript fonts. The size is specified using a percentage where 1% is equal to 1 percent of the font size and 100% is equal to 100 percent font of the font size.</p> <p>The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).</p>
bmk (Bookmark Link Target)	<p>Specifies the link target name that is used to reference to the proper link properties in a custom XML part within the document.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
cap (Capitalization)	<p>Specifies the capitalization that is to be applied to the text run. This is a render-only modification and does not affect the actual characters stored in the text run. This attribute is also distinct from the toggle function where the actual characters stored in the text run are changed.</p> <p>The possible values for this attribute are defined by the ST_TextCapsType simple type (§20.1.10.63).</p>
dirty (Dirty)	<p>Specifies that the content of a text run has changed since the proofing tools have last been run. Effectively this flags text that is to be checked again by the generating application for mistakes such as spelling, grammar, etc.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
err (Spelling Error)	<p>Specifies that when this run of text was checked for spelling, grammar, etc. that a mistake was indeed found. This allows the generating application to effectively save the state of the mistakes within the document instead of having to perform a full pass check upon opening the document.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
i (Italics)	<p>Specifies whether a run of text is formatted as italic text. If this attribute is omitted, than a value of 0, or false is assumed.</p> <p>[Example: Consider the DrawingML shown below.</p> <pre data-bbox="451 1591 808 1833"> <a:p> ... <a:rPr i="1"/> ... <a:t>Some Text</a:t> ... </a:p> </pre> <p>The above run of text is formatted as italic text. <i>end example</i>]</p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
kern (Kerning)	<p>Specifies the minimum font size at which character kerning occurs for this text run. Whole points are specified in increments of 100 starting with 100 being a point size of 1. For instance a font point size of 12 would be 1200 and a font point size of 12.5 would be 1250. If this attribute is omitted, than kerning occurs for all font sizes down to a 0 point font.</p> <p>The possible values for this attribute are defined by the ST_TextNonNegativePoint simple type (§20.1.10.72).</p>
kumimoji (Kumimoji)	<p>Specifies whether the numbers contained within vertical text continue vertically with the text or whether they are to be displayed horizontally while the surrounding characters continue in a vertical fashion. If this attribute is omitted, than a value of 0, or false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
lang (Language ID)	<p>Specifies the language to be used when the generating application is displaying the user interface controls. If this attribute is omitted, than the generating application can select a language of its choice.</p> <p>The possible values for this attribute are defined by the ST_Lang simple type (§22.9.2.6).</p>
noProof (No Proofing)	<p>Specifies that a run of text has been selected by the user to not be checked for mistakes. Therefore if there are spelling, grammar, etc mistakes within this text the generating application should ignore them.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
normalizeH (Normalize Heights)	<p>Specifies the normalization of height that is to be applied to the text run. This is a render-only modification and does not affect the actual characters stored in the text run. This attribute is also distinct from the toggle function where the actual characters stored in the text run are changed. If this attribute is omitted, than a value of 0, or false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
smtClean (SmartTag Clean)	<p>Specifies whether or not a text run has been checked for smart tags. This attribute acts much like the dirty attribute dose for the checking of spelling, grammar, etc. A value of true here indicates to the generating application that this text run should be checked for smart tags. If this attribute is omitted, than a value of 0, or false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

Attributes	Description
smtId (SmartTag ID)	<p>Specifies a smart tag identifier for a run of text. This ID is unique throughout the presentation and is used to reference corresponding auxiliary information about the smart tag. [Note: For a complete definition of smart tags, which are semantically identical throughout Office Open XML, see §17.5.1. <i>end note</i>]</p> <p>[Example: Consider the following DrawingML:</p> <pre> <p:txBody> <a:bodyPr/> <a:lstStyle/> <a:p> <a:r> <a:rPr lang="en-US" dirty="0" smtId="1"/> <a:t>CNTS</a:t> </a:r> <a:endParaRPr lang="en-US" dirty="0"/> </a:p> </p:txBody> </pre> <p>The text run has a smtId attribute value of 1, which denotes that the text should be inspected for smart tag information, which in this case maps to a stock ticker symbol. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
spc (Spacing)	<p>Specifies the spacing between characters within a text run. This spacing is specified numerically and should be consistently applied across the entire run of text by the generating application. Whole points are specified in increments of 100 starting with 100 being a point size of 1. For instance a font point size of 12 would be 1200 and a font point size of 12.5 would be 1250. If this attribute is omitted than a value of 0 or no adjustment is assumed.</p> <p>The possible values for this attribute are defined by the ST_TextPoint simple type (§20.1.10.73).</p>
strike (Strikethrough)	<p>Specifies whether a run of text is formatted as strikethrough text. If this attribute is omitted, than no strikethrough is assumed.</p> <p>[Example: Consider the DrawingML shown below.</p> <pre> <a:p> ... <a:rPr strike="sngStrike"/> ... <a:t>Some Text</a:t> ... </a:p> </pre>

Attributes	Description
	<p>The above run of text is formatted as single strikethrough text. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_TextStrikeType simple type (§20.1.10.78).</p>
sz (Font Size)	<p>Specifies the size of text within a text run. Whole points are specified in increments of 100 starting with 100 being a point size of 1. For instance a font point size of 12 would be 1200 and a font point size of 12.5 would be 1250. If this attribute is omitted, than the value in defRPr should be used.</p> <p>[Example: Consider the DrawingML shown below.</p> <pre data-bbox="451 688 808 924"> <a:p> ... <a:rPr sz="1200"/> ... <a:t>Some Text</a:t> ... </a:p> </pre> <p>The above run of text is formatted with a 12 point text size. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_TextFontSize simple type (§20.1.10.67).</p>
u (Underline)	<p>Specifies whether a run of text is formatted as underlined text. If this attribute is omitted, than no underline is assumed.</p> <p>[Example: Consider the DrawingML shown below.</p> <pre data-bbox="451 1297 808 1533"> <a:p> ... <a:rPr u="sng"/> ... <a:t>Some Text</a:t> ... </a:p> </pre> <p>The above run of text is formatted as single underline text. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_TextUnderlineType simple type (§20.1.10.81).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TextCharacterProperties](#)) is located in §A.4.1. *end note*]

21.1.2.3.3 ea (East Asian Font)

This element specifies that an East Asian font be used for a specific run of text. This font is specified with a typeface attribute much like the others but is specifically classified as an East Asian font.

[*Example:* Consider the DrawingML shown below.

```
<a:r>
  <a:rPr ...>
    <a:ea typeface="Sample Font"/>
  </a:rPr>
  <a:t>Sample Text</a:t>
</a:r>
```

The above run of text is rendered using the East Asian font "Sample Font". *end example*

If the specified font is not available on a system being used for rendering, then the attributes of this element can be utilized to select an alternative font.

Attributes	Description																								
charset (Similar Character Set)	<p>Specifies the character set which is supported by the parent font. This information can be used in font substitution logic to locate an appropriate substitute font when this font is not available. This information is determined by querying the font when present and shall not be modified when the font is not available.</p> <p>The value of this attribute shall be interpreted as follows:</p> <table> <tr> <th>Value</th><th>Description</th></tr> <tr> <td>0x00</td><td>Specifies the ANSI character set. (IANA name <code>iso-8859-1</code>)</td></tr> <tr> <td>0x01</td><td>Specifies the default character set.</td></tr> <tr> <td>0x02</td><td>Specifies the Symbol character set. This value specifies that the characters in the Unicode private use area (U+FF00 to U+FFFF) of the font should be used to display characters in the range U+0000 to U+00FF.</td></tr> <tr> <td>0x4D</td><td>Specifies a Macintosh (Standard Roman) character set. (IANA name <code>macintosh</code>)</td></tr> <tr> <td>0x80</td><td>Specifies the JIS character set. (IANA name <code>shift_jis</code>)</td></tr> <tr> <td>0x81</td><td>Specifies the Hangul character set. (IANA name <code>ks_c_5601-1987</code>)</td></tr> <tr> <td>0x82</td><td>Specifies a Johab character set. (IANA name <code>KS C-5601-1992</code>)</td></tr> <tr> <td>0x86</td><td>Specifies the GB-2312 character set. (IANA name <code>GBK</code>)</td></tr> <tr> <td>0x88</td><td>Specifies the Chinese Big Five character set. (IANA name <code>Big5</code>)</td></tr> <tr> <td>0xA1</td><td>Specifies a Greek character set. (IANA name <code>windows-1253</code>)</td></tr> <tr> <td>0xA2</td><td>Specifies a Turkish character set. (IANA name <code>iso-8859-9</code>)</td></tr> </table>	Value	Description	0x00	Specifies the ANSI character set. (IANA name <code>iso-8859-1</code>)	0x01	Specifies the default character set.	0x02	Specifies the Symbol character set. This value specifies that the characters in the Unicode private use area (U+FF00 to U+FFFF) of the font should be used to display characters in the range U+0000 to U+00FF.	0x4D	Specifies a Macintosh (Standard Roman) character set. (IANA name <code>macintosh</code>)	0x80	Specifies the JIS character set. (IANA name <code>shift_jis</code>)	0x81	Specifies the Hangul character set. (IANA name <code>ks_c_5601-1987</code>)	0x82	Specifies a Johab character set. (IANA name <code>KS C-5601-1992</code>)	0x86	Specifies the GB-2312 character set. (IANA name <code>GBK</code>)	0x88	Specifies the Chinese Big Five character set. (IANA name <code>Big5</code>)	0xA1	Specifies a Greek character set. (IANA name <code>windows-1253</code>)	0xA2	Specifies a Turkish character set. (IANA name <code>iso-8859-9</code>)
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Attributes	Description																												
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Any other value	Application-defined, can be ignored.																												
panose (Panose Setting)	<p>Specifies the Panose-1 classification number for the current font using the mechanism defined in §5.2.7.17 of ISO/IEC 14496-22.</p> <p>The possible values for this attribute are defined by the ST_Panose simple type (§22.9.2.8).</p>																												
pitchFamily (Similar Font Family)	<p>Specifies the font pitch as well as the font family for the corresponding font. Because the value of this attribute is determined by a byte variable this value shall be interpreted as follows:</p> <table border="1"> <thead> <tr> <th>Value</th><th>Description</th></tr> </thead> <tbody> <tr> <td>0x00</td><td>DEFAULT PITCH + UNKNOWN FONT FAMILY</td></tr> <tr> <td>0x01</td><td>FIXED PITCH + UNKNOWN FONT FAMILY</td></tr> <tr> <td>0x02</td><td>VARIABLE PITCH + UNKNOWN FONT FAMILY</td></tr> <tr> <td>0x10</td><td>DEFAULT PITCH + ROMAN FONT FAMILY</td></tr> <tr> <td>0x11</td><td>FIXED PITCH + ROMAN FONT FAMILY</td></tr> <tr> <td>0x12</td><td>VARIABLE PITCH + ROMAN FONT FAMILY</td></tr> <tr> <td>0x20</td><td>DEFAULT PITCH + SWISS FONT FAMILY</td></tr> <tr> <td>0x21</td><td>FIXED PITCH + SWISS FONT FAMILY</td></tr> <tr> <td>0x22</td><td>VARIABLE PITCH + SWISS FONT FAMILY</td></tr> <tr> <td>0x30</td><td>DEFAULT PITCH + MODERN FONT FAMILY</td></tr> <tr> <td>0x31</td><td>FIXED PITCH + MODERN FONT FAMILY</td></tr> <tr> <td>0x32</td><td>VARIABLE PITCH + MODERN FONT FAMILY</td></tr> <tr> <td>0x40</td><td>DEFAULT PITCH + SCRIPT FONT FAMILY</td></tr> </tbody> </table>	Value	Description	0x00	DEFAULT PITCH + UNKNOWN FONT FAMILY	0x01	FIXED PITCH + UNKNOWN FONT FAMILY	0x02	VARIABLE PITCH + UNKNOWN FONT FAMILY	0x10	DEFAULT PITCH + ROMAN FONT FAMILY	0x11	FIXED PITCH + ROMAN FONT FAMILY	0x12	VARIABLE PITCH + ROMAN FONT FAMILY	0x20	DEFAULT PITCH + SWISS FONT FAMILY	0x21	FIXED PITCH + SWISS FONT FAMILY	0x22	VARIABLE PITCH + SWISS FONT FAMILY	0x30	DEFAULT PITCH + MODERN FONT FAMILY	0x31	FIXED PITCH + MODERN FONT FAMILY	0x32	VARIABLE PITCH + MODERN FONT FAMILY	0x40	DEFAULT PITCH + SCRIPT FONT FAMILY
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0x40	DEFAULT PITCH + SCRIPT FONT FAMILY																												

Attributes	Description	
	0x41	FIXED PITCH + SCRIPT FONT FAMILY
	0x42	VARIABLE PITCH + SCRIPT FONT FAMILY
	0x50	DEFAULT PITCH + DECORATIVE FONT FAMILY
	0x51	FIXED PITCH + DECORATIVE FONT FAMILY
	0x52	VARIABLE PITCH + DECORATIVE FONT FAMILY
	This information is determined by querying the font when present and shall not be modified when the font is not available. This information can be used in font substitution logic to locate an appropriate substitute font when this font is not available.	
	The possible values for this attribute are defined by the W3C XML Schema byte datatype.	
typeface (Text Typeface)	Specifies the typeface, or name of the font that is to be used. The typeface is a string name of the specific font that should be used in rendering the presentation. If this font is not available within the font list of the generating application than font substitution logic should be utilized in order to select an alternate font.	
	The possible values for this attribute are defined by the ST_TextTypeface simple type (§20.1.10.80).	

[Note: The W3C XML Schema definition of this element’s content model ([CT_TextFont](#)) is located in §A.4.1. *end note*]

21.1.2.3.4 highlight (Highlight Color)

This element specifies the highlight color that is present for a run of text.

[Example: Consider the DrawingML shown below.

```
<p:txBody>
...
<a:p>
  <a:r>
    <a:rPr ...>
      <a:highlight>
        <a:srgbClr val="FFFF00"/>
      </a:highlight>
    </a:rPr>
```

```

...
<a:t>Sample Text</a:t>
...
</a:r>
</a:p>
...
</p:txBody>

```

The above run of text has a yellow highlight color as specified by the `srgbClr` child element. *end example*

[Note: The W3C XML Schema definition of this element's content model ([CT_Color](#)) is located in §A.4.1. *end note*]

21.1.2.3.5 `hlinkClick` (Click Hyperlink)

Specifies the on-click hyperlink information to be applied to a run of text. When the hyperlink text is clicked the link is fetched.

[Example: Consider the DrawingML shown below.

```

<p:txBody>
...
<a:p>
  <a:r>
    <a:rPr ...>
      <a:hlinkClick r:id="rId2" tooltip="Some Sample Text"/>
    </a:rPr>
    ...
    <a:t>Sample Text</a:t>
    ...
  </a:r>
</a:p>
...
</p:txBody>

```

The above run of text is a hyperlink that points to the resource pointed at by `rId2` within this slides relationship file. Additionally this text should display a tooltip when the mouse is hovered over the run of text. *end example*

Attributes	Description
action (Action Setting)	Specifies an action that is to be taken when this hyperlink is activated. This can be used to specify a slide to be navigated to or a script of code to be run. The possible values for this attribute are defined by the W3C XML Schema string datatype.
endSnd (End Sounds)	Specifies if the URL in question should stop all sounds that are playing when it is clicked.

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
highlightClick (Highlight Click)	<p>Specifies if this attribute has already been used within this document. That is when a hyperlink has already been visited that this attribute would be utilized so the generating application can determine the color of this text. If this attribute is omitted, then a value of 0 or false is implied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
history (Add Hyperlink to Page History)	<p>Specifies whether to add this URI to the history when navigating to it. This allows for the viewing of this presentation without the storing of history information on the viewing machine. If this attribute is omitted, then a value of 1 or true is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
id (Drawing Object Hyperlink Target) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	<p>Specifies the relationship id that when looked up in this slides relationship file contains the target of this hyperlink. This attribute cannot be omitted.</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
invalidUrl (Invalid URL)	<p>Specifies the URL when it has been determined by the generating application that the URL is invalid. That is the generating application can still store the URL but it is known that this URL is not correct.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
tgtFrame (Target Frame)	<p>Specifies the target frame that is to be used when opening this hyperlink. When the hyperlink is activated this attribute is used to determine if a new window is launched for viewing or if an existing one can be used. If this attribute is omitted, then a new window is opened.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
tooltip (Hyperlink Tooltip)	<p>Specifies the tooltip that should be displayed when the hyperlink text is hovered over with the mouse. If this attribute is omitted, then the hyperlink text itself can be displayed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Hyperlink](#)) is located in §A.4.1. *end note*]

21.1.2.3.6 hlinkMouseOver (Mouse-Over Hyperlink)

Specifies the mouse-over hyperlink information to be applied to a run of text. When the mouse is hovered over this hyperlink text the link is fetched.

[*Example:* Consider the DrawingML shown below.

```
<p:txBody>
...
<a:p>
  <a:r>
    <a:rPr ...>
      <a:hlinkMouseOver r:id="rId2" tooltip="Some Sample Text"/>
    </a:rPr>
    ...
    <a:t>Sample Text</a:t>
    ...
  </a:r>
</a:p>
...
</p:txBody>
```

The above run of text is a hyperlink that points to the resource pointed at by rId2 within this slides relationship file. Additionally this text should display a tooltip when the mouse is hovered over the run of text. *end example*]

Attributes	Description
action (Action Setting)	<p>Specifies an action that is to be taken when this hyperlink is activated. This can be used to specify a slide to be navigated to or a script of code to be run.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
endSnd (End Sounds)	<p>Specifies if the URL in question should stop all sounds that are playing when it is clicked.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
highlightClick (Highlight Click)	<p>Specifies if this attribute has already been used within this document. That is when a hyperlink has already been visited that this attribute would be utilized so the generating application can determine the color of this text. If this attribute is omitted, then a value of 0 or false is implied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

Attributes	Description
history (Add Hyperlink to Page History)	<p>Specifies whether to add this URI to the history when navigating to it. This allows for the viewing of this presentation without the storing of history information on the viewing machine. If this attribute is omitted, then a value of 1 or true is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
id (Drawing Object Hyperlink Target) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	<p>Specifies the relationship id that when looked up in this slides relationship file contains the target of this hyperlink. This attribute cannot be omitted.</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
invalidUrl (Invalid URL)	<p>Specifies the URL when it has been determined by the generating application that the URL is invalid. That is the generating application can still store the URL but it is known that this URL is not correct.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
tgtFrame (Target Frame)	<p>Specifies the target frame that is to be used when opening this hyperlink. When the hyperlink is activated this attribute is used to determine if a new window is launched for viewing or if an existing one can be used. If this attribute is omitted, then a new window is opened.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
tooltip (Hyperlink Tooltip)	<p>Specifies the tooltip that should be displayed when the hyperlink text is hovered over with the mouse. If this attribute is omitted, then the hyperlink text itself can be displayed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Hyperlink](#)) is located in §A.4.1. *end note*]

21.1.2.3.7 latin (Latin Font)

This element specifies that a Latin font be used for a specific run of text. This font is specified with a typeface attribute much like the others but is specifically classified as a Latin font.

[Example: Consider the DrawingML shown below.

```

<a:r>
  <a:rPr ...>
    <a:latin typeface="Sample Font"/>
  </a:rPr>
  <a:t>Sample Text</a:t>
</a:r>

```

The above run of text is rendered using the Latin font "Sample Font". *end example*

Attributes	Description																																						
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	Any other value	Application-defined, can be ignored.																																						
	The possible values for this attribute are defined by the W3C XML Schema byte datatype.																																							
panose (Panose Setting)	Specifies the Panose-1 classification number for the current font using the mechanism defined in §5.2.7.17 of ISO/IEC 14496-22. The possible values for this attribute are defined by the ST_Panose simple type (§22.9.2.8).																																							
pitchFamily (Similar Font Family)	Specifies the font pitch as well as the font family for the corresponding font. Because the value of this attribute is determined by an octet value this value shall be interpreted as follows: <table><tr><th>Value</th><th>Description</th></tr><tr><td>0x00</td><td>DEFAULT PITCH + UNKNOWN FONT FAMILY</td></tr><tr><td>0x01</td><td>FIXED PITCH + UNKNOWN FONT FAMILY</td></tr><tr><td>0x02</td><td>VARIABLE PITCH + UNKNOWN FONT FAMILY</td></tr><tr><td>0x10</td><td>DEFAULT PITCH + ROMAN FONT FAMILY</td></tr><tr><td>0x11</td><td>FIXED PITCH + ROMAN FONT FAMILY</td></tr><tr><td>0x12</td><td>VARIABLE PITCH + ROMAN FONT FAMILY</td></tr><tr><td>0x20</td><td>DEFAULT PITCH + SWISS FONT FAMILY</td></tr><tr><td>0x21</td><td>FIXED PITCH + SWISS FONT FAMILY</td></tr><tr><td>0x22</td><td>VARIABLE PITCH + SWISS FONT FAMILY</td></tr><tr><td>0x30</td><td>DEFAULT PITCH + MODERN FONT FAMILY</td></tr><tr><td>0x31</td><td>FIXED PITCH + MODERN FONT FAMILY</td></tr><tr><td>0x32</td><td>VARIABLE PITCH + MODERN FONT FAMILY</td></tr><tr><td>0x40</td><td>DEFAULT PITCH + SCRIPT FONT FAMILY</td></tr><tr><td>0x41</td><td>FIXED PITCH + SCRIPT FONT FAMILY</td></tr><tr><td>0x42</td><td>VARIABLE PITCH + SCRIPT FONT FAMILY</td></tr><tr><td>0x50</td><td>DEFAULT PITCH + DECORATIVE FONT FAMILY</td></tr><tr><td>0x51</td><td>FIXED PITCH + DECORATIVE FONT FAMILY</td></tr><tr><td>0x52</td><td>VARIABLE PITCH + DECORATIVE FONT FAMILY</td></tr></table> This information is determined by querying the font when present and shall not be		Value	Description	0x00	DEFAULT PITCH + UNKNOWN FONT FAMILY	0x01	FIXED PITCH + UNKNOWN FONT FAMILY	0x02	VARIABLE PITCH + UNKNOWN FONT FAMILY	0x10	DEFAULT PITCH + ROMAN FONT FAMILY	0x11	FIXED PITCH + ROMAN FONT FAMILY	0x12	VARIABLE PITCH + ROMAN FONT FAMILY	0x20	DEFAULT PITCH + SWISS FONT FAMILY	0x21	FIXED PITCH + SWISS FONT FAMILY	0x22	VARIABLE PITCH + SWISS FONT FAMILY	0x30	DEFAULT PITCH + MODERN FONT FAMILY	0x31	FIXED PITCH + MODERN FONT FAMILY	0x32	VARIABLE PITCH + MODERN FONT FAMILY	0x40	DEFAULT PITCH + SCRIPT FONT FAMILY	0x41	FIXED PITCH + SCRIPT FONT FAMILY	0x42	VARIABLE PITCH + SCRIPT FONT FAMILY	0x50	DEFAULT PITCH + DECORATIVE FONT FAMILY	0x51	FIXED PITCH + DECORATIVE FONT FAMILY	0x52	VARIABLE PITCH + DECORATIVE FONT FAMILY
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Attributes	Description
	<p>modified when the font is not available. This information can be used in font substitution logic to locate an appropriate substitute font when this font is not available.</p> <p><u>[Note: Although the attribute name is pitchFamily, the integer value of this attribute specifies the font family with higher 4 bits and the font pitch with lower 4 bits. end note]</u></p> <p>The possible values for this attribute are defined by the W3C XML Schema byte datatype.</p>
typeface (Text Typeface)	<p>Specifies the typeface, or name of the font that is to be used. The typeface is a string name of the specific font that should be used in rendering the presentation. If this font is not available within the font list of the generating application than font substitution logic should be utilized in order to select an alternate font.</p> <p>The possible values for this attribute are defined by the ST_TextTypeface simple type (§20.1.10.80).</p>

[Note: The W3C XML Schema definition of this element's content model (CT_TextFont) is located in §A.4.1. end note]

21.1.2.3.8 r (Text Run)

This element specifies the presence of a run of text within the containing text body. The run element is the lowest level text separation mechanism within a text body. A text run can contain text run properties associated with the run. If no properties are listed then properties specified in the defRPr element are used.

[Example: Consider the case where the user would like to describe a text body that contains two runs of text and would like one to be bold and the other not. The following DrawingML would specify such a text body.

```
<p:txBody>
...
<a:r>
  <a:rPr b="1">
  </a:rPr>
  <a:t>Some text</a:t>
</a:r>
...
<a:r>
  <a:rPr/>
  <a:t>Some text</a:t>
</a:r>
</p:txBody>
```

The above text body has the first run be formatted bold and the second normally. end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_RegularTextRun](#)) is located in §A.4.1. *end note*]

21.1.2.3.9 rPr (Text Run Properties)

This element contains all run level text properties for the text runs within a containing paragraph.

[*Example:* Consider the DrawingML shown below.

```
<a:p>
...
<a:rPr u="sng"/>
...
<a:t>Some Text</a:t>
...
</a:p>
```

The run of text described above is formatting with a single underline of text matching color. *end example*]

Attributes	Description
altLang (Alternative Language)	Specifies the alternate language to use when the generating application is displaying the user interface controls. If this attribute is omitted, than the lang attribute is used here. The possible values for this attribute are defined by the ST_Lang simple type (§22.9.2.6).
b (Bold)	Specifies whether a run of text is formatted as bold text. If this attribute is omitted, than a value of 0, or false is assumed. [<i>Example:</i> Consider the DrawingML shown below. <pre><a:p> ... <a:rPr b="1"/> ... <a:t>Some Text</a:t> ... </a:p></pre> The above run of text is formatted as bold text. <i>end example</i>] The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
baseline (Baseline)	Specifies the baseline for both the superscript and subscript fonts. The size is specified using a percentage where 1% is equal to 1 percent of the font size and 100% is equal to 100 percent font of the font size. The possible values for this attribute are defined by the ST_Percentage simple type (§20.1.10.40).
bmk (Bookmark Link Target)	Specifies the link target name that is used to reference to the proper link properties in a custom XML part within the document.

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema string datatype.
cap (Capitalization)	<p>Specifies the capitalization that is to be applied to the text run. This is a render-only modification and does not affect the actual characters stored in the text run. This attribute is also distinct from the toggle function where the actual characters stored in the text run are changed.</p> <p>The possible values for this attribute are defined by the ST_TextCapsType simple type (§20.1.10.63).</p>
dirty (Dirty)	<p>Specifies that the content of a text run has changed since the proofing tools have last been run. Effectively this flags text that is to be checked again by the generating application for mistakes such as spelling, grammar, etc.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
err (Spelling Error)	<p>Specifies that when this run of text was checked for spelling, grammar, etc. that a mistake was indeed found. This allows the generating application to effectively save the state of the mistakes within the document instead of having to perform a full pass check upon opening the document.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
i (Italics)	<p>Specifies whether a run of text is formatted as italic text. If this attribute is omitted, than a value of 0, or false is assumed.</p> <p>[Example: Consider the DrawingML shown below.</p> <pre data-bbox="451 1262 808 1493"> <a:p> ... <a:rPr i="1"/> ... <a:t>Some Text</a:t> ... </a:p> </pre> <p>The above run of text is formatted as italic text. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
kern (Kerning)	<p>Specifies the minimum font size at which character kerning occurs for this text run. Whole points are specified in increments of 100 starting with 100 being a point size of 1. For instance a font point size of 12 would be 1200 and a font point size of 12.5 would be 1250. If this attribute is omitted, than kerning occurs for all font sizes down to a 0 point font.</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_TextNonNegativePoint simple type (§20.1.10.72).
kumimoji (Kumimoji)	<p>Specifies whether the numbers contained within vertical text continue vertically with the text or whether they are to be displayed horizontally while the surrounding characters continue in a vertical fashion. If this attribute is omitted, than a value of 0, or false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
lang (Language ID)	<p>Specifies the language to be used when the generating application is displaying the user interface controls. If this attribute is omitted, than the generating application can select a language of its choice.</p> <p>The possible values for this attribute are defined by the ST_Lang simple type (§22.9.2.6).</p>
noProof (No Proofing)	<p>Specifies that a run of text has been selected by the user to not be checked for mistakes. Therefore if there are spelling, grammar, etc mistakes within this text the generating application should ignore them.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
normalizeH (Normalize Heights)	<p>Specifies the normalization of height that is to be applied to the text run. This is a render-only modification and does not affect the actual characters stored in the text run. This attribute is also distinct from the toggle function where the actual characters stored in the text run are changed. If this attribute is omitted, than a value of 0, or false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
smtClean (SmartTag Clean)	<p>Specifies whether or not a text run has been checked for smart tags. This attribute acts much like the dirty attribute dose for the checking of spelling, grammar, etc. A value of true here indicates to the generating application that this text run should be checked for smart tags. If this attribute is omitted, than a value of 0, or false is assumed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
smtId (SmartTag ID)	<p>Specifies a smart tag identifier for a run of text. This ID is unique throughout the presentation and is used to reference corresponding auxiliary information about the smart tag. [Note: For a complete definition of smart tags, which are semantically identical throughout Office Open XML, see §17.5.1. <i>end note</i>]</p> <p>[Example: Consider the following DrawingML:</p> <pre><p:txBody> <a:bodyPr/></pre>

Attributes	Description
	<pre> <a:lstStyle/> <a:p> <a:r> <a:rPr lang="en-US" dirty="0" smtId="1"/> <a:t>CNTS</a:t> </a:r> <a:endParaRPr lang="en-US" dirty="0"/> </a:p> </p:txBody> </pre> <p>The text run has a smtId attribute value of 1, which denotes that the text should be inspected for smart tag information, which in this case maps to a stock ticker symbol. <i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
spc (Spacing)	<p>Specifies the spacing between characters within a text run. This spacing is specified numerically and should be consistently applied across the entire run of text by the generating application. Whole points are specified in increments of 100 starting with 100 being a point size of 1. For instance a font point size of 12 would be 1200 and a font point size of 12.5 would be 1250. If this attribute is omitted than a value of 0 or no adjustment is assumed.</p> <p>The possible values for this attribute are defined by the ST_TextPoint simple type (§20.1.10.73).</p>
strike (Strikethrough)	<p>Specifies whether a run of text is formatted as strikethrough text. If this attribute is omitted, than no strikethrough is assumed.</p> <p>[<i>Example:</i> Consider the DrawingML shown below.</p> <pre> <a:p> ... <a:rPr strike="sngStrike"/> ... <a:t>Some Text</a:t> ... </a:p> </pre> <p>The above run of text is formatted as single strikethrough text. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_TextStrikeType simple type (§20.1.10.78).</p>
sz (Font Size)	<p>Specifies the size of text within a text run. Whole points are specified in increments of 100 starting with 100 being a point size of 1. For instance a font point size of 12 would be 1200 and a font point size of 12.5 would be 1250. If this attribute is omitted, than the value in defRPr should be used.</p>

Attributes	Description
	<p>[<i>Example:</i> Consider the DrawingML shown below.</p> <pre> <a:p> ... <a:rPr sz="1200"/> ... <a:t>Some Text</a:t> ... </a:p> </pre> <p>The above run of text is formatted with a 12 point text size. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TextFontSize simple type (§20.1.10.67).</p>
u (Underline)	<p>Specifies whether a run of text is formatted as underlined text. If this attribute is omitted, than no underline is assumed.</p> <p>[<i>Example:</i> Consider the DrawingML shown below.</p> <pre> <a:p> ... <a:rPr u="sng"/> ... <a:t>Some Text</a:t> ... </a:p> </pre> <p>The above run of text is formatted as single underline text. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TextUnderlineType simple type (§20.1.10.81).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TextCharacterProperties](#)) is located in §A.4.1. *end note*]

21.1.2.3.10 sym (Symbol Font)

This element specifies that a symbol font be used for a specific run of text. This font is specified with a typeface attribute much like the others but is specifically classified as a symbol font.

[*Example:* Consider the DrawingML shown below.

```

<a:r>
  <a:rPr ...>
    <a:sym typeface="Sample Font"/>
  </a:rPr>
  <a:t>Sample Text</a:t>
</a:r>

```

The above run of text is rendered using the symbol font "Sample Font". *end example*]

Attributes	Description																																						
charset (Similar Character Set)	<p>Specifies the character set which is supported by the parent font. This information can be used in font substitution logic to locate an appropriate substitute font when this font is not available. This information is determined by querying the font when present and shall not be modified when the font is not available.</p> <p>The value of this attribute shall be interpreted as follows:</p> <table> <tr> <th>Value</th><th>Description</th></tr> <tr> <td>0x00</td><td>Specifies the ANSI character set. (IANA name iso-8859-1)</td></tr> <tr> <td>0x01</td><td>Specifies the default character set.</td></tr> <tr> <td>0x02</td><td>Specifies the Symbol character set. This value specifies that the characters in the Unicode private use area (U+FF00 to U+FFFF) of the font should be used to display characters in the range U+0000 to U+00FF.</td></tr> <tr> <td>0x4D</td><td>Specifies a Macintosh (Standard Roman) character set. (IANA name macintosh)</td></tr> <tr> <td>0x80</td><td>Specifies the JIS character set. (IANA name shift_jis)</td></tr> <tr> <td>0x81</td><td>Specifies the Hangul character set. (IANA name ks_c_5601-1987)</td></tr> <tr> <td>0x82</td><td>Specifies a Johab character set. (IANA name KS C-5601-1992)</td></tr> <tr> <td>0x86</td><td>Specifies the GB-2312 character set. (IANA name GBK)</td></tr> <tr> <td>0x88</td><td>Specifies the Chinese Big Five character set. (IANA name Big5)</td></tr> <tr> <td>0xA1</td><td>Specifies a Greek character set. (IANA name windows-1253)</td></tr> <tr> <td>0xA2</td><td>Specifies a Turkish character set. (IANA name iso-8859-9)</td></tr> <tr> <td>0xA3</td><td>Specifies a Vietnamese character set. (IANA name windows-1258)</td></tr> <tr> <td>0xB1</td><td>Specifies a Hebrew character set. (IANA name windows-1255)</td></tr> <tr> <td>0xB2</td><td>Specifies an Arabic character set. (IANA name windows-1256)</td></tr> <tr> <td>0xBA</td><td>Specifies a Baltic character set. (IANA name windows-1257)</td></tr> <tr> <td>0xCC</td><td>Specifies a Russian character set. (IANA name windows-1251)</td></tr> <tr> <td>0xDE</td><td>Specifies a Thai character set. (IANA name windows-874)</td></tr> <tr> <td>0xEE</td><td>Specifies an Eastern European character set. (IANA name windows-</td></tr> </table>	Value	Description	0x00	Specifies the ANSI character set. (IANA name iso-8859-1)	0x01	Specifies the default character set.	0x02	Specifies the Symbol character set. This value specifies that the characters in the Unicode private use area (U+FF00 to U+FFFF) of the font should be used to display characters in the range U+0000 to U+00FF.	0x4D	Specifies a Macintosh (Standard Roman) character set. (IANA name macintosh)	0x80	Specifies the JIS character set. (IANA name shift_jis)	0x81	Specifies the Hangul character set. (IANA name ks_c_5601-1987)	0x82	Specifies a Johab character set. (IANA name KS C-5601-1992)	0x86	Specifies the GB-2312 character set. (IANA name GBK)	0x88	Specifies the Chinese Big Five character set. (IANA name Big5)	0xA1	Specifies a Greek character set. (IANA name windows-1253)	0xA2	Specifies a Turkish character set. (IANA name iso-8859-9)	0xA3	Specifies a Vietnamese character set. (IANA name windows-1258)	0xB1	Specifies a Hebrew character set. (IANA name windows-1255)	0xB2	Specifies an Arabic character set. (IANA name windows-1256)	0xBA	Specifies a Baltic character set. (IANA name windows-1257)	0xCC	Specifies a Russian character set. (IANA name windows-1251)	0xDE	Specifies a Thai character set. (IANA name windows-874)	0xEE	Specifies an Eastern European character set. (IANA name windows-
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0xCC	Specifies a Russian character set. (IANA name windows-1251)																																						
0xDE	Specifies a Thai character set. (IANA name windows-874)																																						
0xEE	Specifies an Eastern European character set. (IANA name windows-																																						

Attributes	Description																																						
		1250)																																					
	0xFF	Specifies an OEM character set not defined by ECMA-376.																																					
	Any other value	Application-defined, can be ignored.																																					
	The possible values for this attribute are defined by the W3C XML Schema byte datatype.																																						
panose (Panose Setting)	Specifies the Panose-1 classification number for the current font using the mechanism defined in §5.2.7.17 of ISO/IEC 14496-22. The possible values for this attribute are defined by the ST_Panose simple type (§22.9.2.8).																																						
pitchFamily (Similar Font Family)	Specifies the font pitch as well as the font family for the corresponding font. Because the value of this attribute is determined by an octet value this value shall be interpreted as follows:																																						
	<table><tr><th>Value</th><th>Description</th></tr><tr><td>0x00</td><td>DEFAULT PITCH + UNKNOWN FONT FAMILY</td></tr><tr><td>0x01</td><td>FIXED PITCH + UNKNOWN FONT FAMILY</td></tr><tr><td>0x02</td><td>VARIABLE PITCH + UNKNOWN FONT FAMILY</td></tr><tr><td>0x10</td><td>DEFAULT PITCH + ROMAN FONT FAMILY</td></tr><tr><td>0x11</td><td>FIXED PITCH + ROMAN FONT FAMILY</td></tr><tr><td>0x12</td><td>VARIABLE PITCH + ROMAN FONT FAMILY</td></tr><tr><td>0x20</td><td>DEFAULT PITCH + SWISS FONT FAMILY</td></tr><tr><td>0x21</td><td>FIXED PITCH + SWISS FONT FAMILY</td></tr><tr><td>0x22</td><td>VARIABLE PITCH + SWISS FONT FAMILY</td></tr><tr><td>0x30</td><td>DEFAULT PITCH + MODERN FONT FAMILY</td></tr><tr><td>0x31</td><td>FIXED PITCH + MODERN FONT FAMILY</td></tr><tr><td>0x32</td><td>VARIABLE PITCH + MODERN FONT FAMILY</td></tr><tr><td>0x40</td><td>DEFAULT PITCH + SCRIPT FONT FAMILY</td></tr><tr><td>0x41</td><td>FIXED PITCH + SCRIPT FONT FAMILY</td></tr><tr><td>0x42</td><td>VARIABLE PITCH + SCRIPT FONT FAMILY</td></tr><tr><td>0x50</td><td>DEFAULT PITCH + DECORATIVE FONT FAMILY</td></tr><tr><td>0x51</td><td>FIXED PITCH + DECORATIVE FONT FAMILY</td></tr><tr><td>0x52</td><td>VARIABLE PITCH + DECORATIVE FONT FAMILY</td></tr></table> This information is determined by querying the font when present and shall not be		Value	Description	0x00	DEFAULT PITCH + UNKNOWN FONT FAMILY	0x01	FIXED PITCH + UNKNOWN FONT FAMILY	0x02	VARIABLE PITCH + UNKNOWN FONT FAMILY	0x10	DEFAULT PITCH + ROMAN FONT FAMILY	0x11	FIXED PITCH + ROMAN FONT FAMILY	0x12	VARIABLE PITCH + ROMAN FONT FAMILY	0x20	DEFAULT PITCH + SWISS FONT FAMILY	0x21	FIXED PITCH + SWISS FONT FAMILY	0x22	VARIABLE PITCH + SWISS FONT FAMILY	0x30	DEFAULT PITCH + MODERN FONT FAMILY	0x31	FIXED PITCH + MODERN FONT FAMILY	0x32	VARIABLE PITCH + MODERN FONT FAMILY	0x40	DEFAULT PITCH + SCRIPT FONT FAMILY	0x41	FIXED PITCH + SCRIPT FONT FAMILY	0x42	VARIABLE PITCH + SCRIPT FONT FAMILY	0x50	DEFAULT PITCH + DECORATIVE FONT FAMILY	0x51	FIXED PITCH + DECORATIVE FONT FAMILY	0x52
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0x52	VARIABLE PITCH + DECORATIVE FONT FAMILY																																						

Attributes	Description
	<p>modified when the font is not available. This information can be used in font substitution logic to locate an appropriate substitute font when this font is not available.</p> <p><u>[Note: Although the attribute name is pitchFamily, the integer value of this attribute specifies the font family with higher 4 bits and the font pitch with lower 4 bits. end note]</u></p> <p>The possible values for this attribute are defined by the W3C XML Schema byte datatype.</p>
typeface (Text Typeface)	<p>Specifies the typeface, or name of the font that is to be used. The typeface is a string name of the specific font that should be used in rendering the presentation. If this font is not available within the font list of the generating application than font substitution logic should be utilized in order to select an alternate font.</p> <p>The possible values for this attribute are defined by the ST_TextTypeface simple type (§20.1.10.80).</p>

[Note: The W3C XML Schema definition of this element's content model (CT_TextFont) is located in §A.4.1. end note]

21.1.2.3.11 t (Text String)

This element specifies the actual text for this text run. This is the text that is formatted using all specified body, paragraph and run properties. This element shall be present within a run of text.

[Example: Consider the DrawingML shown below.

```
<p:txBody>
...
<a:p>
...
<a:r>
...
<a:t>Sample Text</a:t>
...
</a:r>
...
</a:p>
...
</p:txBody>
```

The above DrawingML specifies a text body containing a single paragraph, containing a single run which contains the actual text specified with the <a:t> element.

The possible values for this element are defined by the W3C XML Schema string datatype.

21.1.2.3.12 uFill (Underline Fill)

This element specifies the fill color of an underline for a run of text.

[*Example:* Consider the DrawingML shown below.]

```
<p:txBody>
...
<a:p>
  <a:r>
    <a:rPr ...>
      <a:uFill>
        <a:solidFill>
          <a:srgbClr val="FFFF00"/>
        </a:solidFill>
      </a:uFill>
    </a:rPr>
    ...
    <a:t>Sample Text</a:t>
  </a:r>
</a:p>
...
</p:txBody>
```

The underline color of the above text is yellow specified by the srgbClr child element. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TextUnderlineFillGroupWrapper](#)) is located in §A.4.1. *end note*]

21.1.2.3.13 uFillTx (Underline Fill Properties Follow Text)

This element specifies that the fill color of an underline for a run of text should be of the same color as the text run within which it is contained.

[*Example:* Consider the DrawingML shown below.]

```
<p:txBody>
...
<a:p>
  <a:r>
    <a:rPr ...>
      <a:uFillTx>
    </a:rPr>
  </a:r>
...
</a:p>
```

```

    <a:t>Sample Text</a:t>
    ...
  </a:r>
</a:p>
...
</p:txBody>

```

The underline color of the above text follows the color of the text run within which it resides. *end example*]

[*Note*: The W3C XML Schema definition of this element's content model ([CT_TextUnderlineFillFollowText](#)) is located in §A.4.1. *end note*]

21.1.2.3.14 uLn (Underline Stroke)

This element specifies the properties for the stroke of the underline that is present within a run of text.

[*Example*: Consider the DrawingML shown below.

```

<p:txBody>
...
<a:p>
  <a:r>
    <a:rPr ...>
      <a:uLn align="r">
    </a:rPr>
    ...
    <a:t>Sample Text</a:t>
    ...
  </a:r>
</a:p>
...
</p:txBody>

```

The underline alignment of the above text is right aligned. *end example*]

Attributes	Description
align (Stroke Alignment)	<p>Specifies the alignment to be used for the underline stroke.</p> <p>The possible values for this attribute are defined by the ST_PenAlignment simple type (§20.1.10.39).</p>
cap (Line Ending Cap Type)	<p>Specifies the ending caps that should be used for this line. [<i>Note</i>: Examples of cap types are rounded, flat, etc. <i>end note</i>] If this attribute is omitted, than a value of square is assumed.</p> <p>The possible values for this attribute are defined by the ST_LineCap simple type (§20.1.10.31).</p>

Attributes	Description
cmpd (Compound Line Type)	<p>Specifies the compound line type to be used for the underline stroke. If this attribute is omitted, then a value of sng is assumed.</p> <p>The possible values for this attribute are defined by the ST_CompoundLine simple type (§20.1.10.15).</p>
w (Line Width)	<p>Specifies the width to be used for the underline stroke. If this attribute is omitted, then a value of 0 is assumed.</p> <p>The possible values for this attribute are defined by the ST_LineWidth simple type (§20.1.10.35).</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_LineProperties](#)) is located in §A.4.1. *end note*]

21.1.2.3.15 uLnTx (Underline Follows Text)

This element specifies that the stroke style of an underline for a run of text should be of the same as the text run within which it is contained.

[*Example*: Consider the DrawingML shown below.

```

<p:txBody>
...
<a:p>
  <a:r>
    <a:rPr ...>
      <a:uLnTx>
    </a:rPr>
    ...
    <a:t>Sample Text</a:t>
    ...
  </a:r>
</a:p>
...
</p:txBody>

```

The underline stroke of the above text follows the stroke of the run text within which it resides. *end example*]

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_TextUnderlineLineFollowText](#)) is located in §A.4.1. *end note*]

21.1.2.4 Bullets and Numbering

In addition to the above body, paragraph and text run properties there can also be a structure of bullets and numbering that can be defined by utilizing a few of these layers. Since Bullet and Numbering does span multiple formatting levels it is described on it's own in the following section.

21.1.2.4.1 buAutoNum (Auto-Numbered Bullet)

This element specifies that automatic numbered bullet points should be applied to a paragraph. These are not just numbers used as bullet points but instead automatically assigned numbers that are based on both buAutoNum attributes and paragraph level.

[Example: Consider the DrawingML content shown below.

1. Bullet 1
 1. Bullet 2
2. Bullet 3

```
<p:txBody>
...
<a:p>
  <a:pPr ...>
    <a:buAutoNum type="arabicPeriod"/>
  </a:pPr>
  ...
  <a:t>Bullet 1</a:t>
  ...
</a:p>
<a:p>
  <a:pPr lvl="1"...>
    <a:buAutoNum type="arabicPeriod"/>
  </a:pPr>
  ...
  <a:t>Bullet 2</a:t>
  ...
</a:p>
```

```
<a:p>
  <a:pPr ...>
    <a:buAutoNum type="arabicPeriod"/>
  </a:pPr>
  ...
  <a:t>Bullet 3</a:t>
  ...
</a:p>
...
</p:txBody>
```

For the above text there are a total of three bullet points. Two of which are at lvl="0" and one at lvl="1". Due to this breakdown of levels, the numbering sequence that should be automatically applied is 1, 1, 2 as is shown in the picture above. *end example*]

Attributes	Description
startAt (Start Numbering At)	<p>Specifies the number that starts a given sequence of automatically numbered bullets. When the numbering is alphabetical, the number should map to the appropriate letter. For instance 1 maps to 'a', 2 to 'b' and so on. If the numbers are larger than 26, then multiple letters should be used. For instance 27 should be represented as 'aa' and similarly 53 should be 'aaa'.</p> <p>The possible values for this attribute are defined by the ST_TextBulletStartAtNum simple type (§20.1.10.62).</p>
type (Bullet Autonumbering Type)	<p>Specifies the numbering scheme that is to be used. This allows for the describing of formats other than strictly numbers. For instance, a set of bullets can be represented by a series of Roman numerals instead of the standard 1,2,3,etc. number set.</p> <p>The possible values for this attribute are defined by the ST_TextAutonumberScheme simple type (§20.1.10.60).</p>


[*Note:* The W3C XML Schema definition of this element’s content model ([CT_TextAutonumberBullet](#)) is located in §A.4.1. *end note*]

21.1.2.4.2 buBlip (Picture Bullet)

This element specifies that a picture be applied to a set of bullets. This element allows for any standard picture format graphic to be used instead of the typical bullet characters. This opens up the possibility for bullets to be anything the generating application would seek to apply.

[*Example:* Consider the DrawingML shown below.

 Bullet 1

 Bullet 2

 Bullet 3

```
<p:txBody>
...
<a:p>
  <a:pPr ...>
    <a:buBlip>
      <a:blip r:embed="rId2"/>
    </a:buBlip>
  </a:pPr>
  ...
  <a:t>Bullet 1</a:t>
  ...
</a:p>
<a:p>
  <a:pPr lvl="1" ...>
    <a:buBlip>
      <a:blip r:embed="rId2"/>
    </a:buBlip>
  </a:pPr>
  ...
  <a:t>Bullet 2</a:t>
  ...
</a:p>
<a:p>
  <a:pPr ...>
    <a:buBlip>
      <a:blip r:embed="rId2"/>
    </a:buBlip>
  </a:pPr>
  ...
  <a:t>Bullet 3</a:t>
  ...
</a:p>
...
</p:txBody>
```

For the above text there are a total of three bullet points. Two of which are at `lvl="0"` and one at `lvl="1"`. Because the same picture is specified for each bullet the levels do not stand out here. The only difference is the indentation as shown in the picture above. *end example*

[*Note*: The W3C XML Schema definition of this element's content model ([CT_TextBlipBullet](#)) is located in §A.4.1. *end note*]

21.1.2.4.3 buChar (Character Bullet)

This element specifies that a character be applied to a set of bullets. These bullets are allowed to be any character in any font that the system is able to support. If no bullet font is specified along with this element then the paragraph font is used.

[*Example*: Consider the DrawingML shown below.

```
g  Bullet 1
  g  Bullet 2
g  Bullet 3
```

```
<p:txBody>
...
<a:p>
  <a:pPr ...>
    <a:buFont typeface="Calibri"/>
    <a:buChar char="g"/>
  </a:pPr>
  ...
  <a:t>Bullet 1</a:t>
  ...
</a:p>
<a:p>
  <a:pPr lvl="1" ...>
    <a:buFont typeface="Calibri"/>
    <a:buChar char="g"/>
  </a:pPr>
  ...
  <a:t>Bullet 2</a:t>
  ...
</a:p>
```



```

<a:p>
  <a:pPr ...>
    <a:buFont typeface="Calibri"/>
    <a:buChar char="g"/>
  </a:pPr>
  ...
  <a:t>Bullet 3</a:t>
  ...
</a:p>
...
</p:txBody>

```

For the above text there are a total of three bullet points. Two of which are at lvl="0" and one at lvl="1". Because the same character is specified for each bullet the levels do not stand out here. The only difference is the indentation as shown in the picture above. *end example]*

Attributes	Description
char (Bullet Character)	<p>Specifies the character to be used in place of the standard bullet point. This character can be any character for the specified font that is supported by the system upon which this document is being viewed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TextCharBullet](#)) is located in §A.4.1. *end note]*

21.1.2.4.4 buClr (Color Specified)

This element specifies the color to be used on bullet characters within a given paragraph. The color is specified using the numerical RGB color format.

[*Example:* Consider the DrawingML shown below.

```

<p:txBody>
...
<a:p>
  <a:pPr ...>
    <a:buClr>
      <a:srgbClr val="FFFF00"/>
    </a:buClr>
  </a:pPr>
...
  <a:t>Bullet 1</a:t>
...
</a:p>
...
</p:txBody>

```

The color of the above bullet does not follow the text color but instead has a yellow color specified by `val="FFFF00"`. This color should only apply to the actual bullet character and not to the text within the bullet. *end example*

[*Note*: The W3C XML Schema definition of this element's content model ([CT_Color](#)) is located in §A.4.1. *end note*]

21.1.2.4.5 buClrTx (Follow Text)

This element specifies that the color of the bullets for a paragraph should be of the same color as the text run within which each bullet is contained.

[*Example*: Consider the DrawingML shown below.

```

<p:txBody>
...
<a:p>
  <a:pPr ...>
    <a:buClrTx>
  </a:pPr>
...
  <a:t>Bullet 1</a:t>
...
</a:p>
...
</p:txBody>

```

The color of the above bullet follows the default text color of the text for the run of text shown above since no specific text color was specified. *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TextBulletColorFollowText](#)) is located in §A.4.1. *end note*]

21.1.2.4.6 buFont (Specified)

This element specifies the font to be used on bullet characters within a given paragraph. The font is specified using the typeface that it is registered as within the generating application.

[*Example:* Consider the DrawingML shown below.

```
<p:txBody>
...
<a:p>
  <a:pPr ...>
    <a:buFont typeface="Arial"/>
    <a:buChar char="g"/>
  </a:pPr>
  ...
  <a:t>Bullet 1</a:t>
  ...
</a:p>
...
</p:txBody>
```

The font of the above bullet does not follow the text font but instead has Arial font specified by typeface="Arial". This font should only apply to the actual bullet character and not to the text within the bullet. *end example*]

Attributes	Description										
charset (Similar Character Set)	<p>Specifies the character set which is supported by the parent font. This information can be used in font substitution logic to locate an appropriate substitute font when this font is not available. This information is determined by querying the font when present and shall not be modified when the font is not available.</p> <p>The value of this attribute shall be interpreted as follows:</p> <table> <tr> <th>Value</th><th>Description</th></tr> <tr> <td>0x00</td><td>Specifies the ANSI character set. (IANA name <code>iso-8859-1</code>)</td></tr> <tr> <td>0x01</td><td>Specifies the default character set.</td></tr> <tr> <td>0x02</td><td>Specifies the Symbol character set. This value specifies that the characters in the Unicode private use area (U+FF00 to U+FFFF) of the font should be used to display characters in the range U+0000 to U+00FF.</td></tr> <tr> <td>0x4D</td><td>Specifies a Macintosh (Standard Roman) character set. (IANA name</td></tr> </table>	Value	Description	0x00	Specifies the ANSI character set. (IANA name <code>iso-8859-1</code>)	0x01	Specifies the default character set.	0x02	Specifies the Symbol character set. This value specifies that the characters in the Unicode private use area (U+FF00 to U+FFFF) of the font should be used to display characters in the range U+0000 to U+00FF.	0x4D	Specifies a Macintosh (Standard Roman) character set. (IANA name
Value	Description										
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Attributes	Description																																		
	<table border="1"> <tr> <td></td><td>macintosh)</td></tr> <tr> <td>0x80</td><td>Specifies the JIS character set. (IANA name shift_jis)</td></tr> <tr> <td>0x81</td><td>Specifies the Hangul character set. (IANA name ks_c_5601-1987)</td></tr> <tr> <td>0x82</td><td>Specifies a Johab character set. (IANA name KS C-5601-1992)</td></tr> <tr> <td>0x86</td><td>Specifies the GB-2312 character set. (IANA name GBK)</td></tr> <tr> <td>0x88</td><td>Specifies the Chinese Big Five character set. (IANA name Big5)</td></tr> <tr> <td>0xA1</td><td>Specifies a Greek character set. (IANA name windows-1253)</td></tr> <tr> <td>0xA2</td><td>Specifies a Turkish character set. (IANA name iso-8859-9)</td></tr> <tr> <td>0xA3</td><td>Specifies a Vietnamese character set. (IANA name windows-1258)</td></tr> <tr> <td>0xB1</td><td>Specifies a Hebrew character set. (IANA name windows-1255)</td></tr> <tr> <td>0xB2</td><td>Specifies an Arabic character set. (IANA name windows-1256)</td></tr> <tr> <td>0xBA</td><td>Specifies a Baltic character set. (IANA name windows-1257)</td></tr> <tr> <td>0xCC</td><td>Specifies a Russian character set. (IANA name windows-1251)</td></tr> <tr> <td>0xDE</td><td>Specifies a Thai character set. (IANA name windows-874)</td></tr> <tr> <td>0xEE</td><td>Specifies an Eastern European character set. (IANA name windows-1250)</td></tr> <tr> <td>0xFF</td><td>Specifies an OEM character set not defined by ECMA-376.</td></tr> <tr> <td>Any other value</td><td>Application-defined, can be ignored.</td></tr> </table> <p>The possible values for this attribute are defined by the W3C XML Schema byte datatype.</p>		macintosh)	0x80	Specifies the JIS character set. (IANA name shift_jis)	0x81	Specifies the Hangul character set. (IANA name ks_c_5601-1987)	0x82	Specifies a Johab character set. (IANA name KS C-5601-1992)	0x86	Specifies the GB-2312 character set. (IANA name GBK)	0x88	Specifies the Chinese Big Five character set. (IANA name Big5)	0xA1	Specifies a Greek character set. (IANA name windows-1253)	0xA2	Specifies a Turkish character set. (IANA name iso-8859-9)	0xA3	Specifies a Vietnamese character set. (IANA name windows-1258)	0xB1	Specifies a Hebrew character set. (IANA name windows-1255)	0xB2	Specifies an Arabic character set. (IANA name windows-1256)	0xBA	Specifies a Baltic character set. (IANA name windows-1257)	0xCC	Specifies a Russian character set. (IANA name windows-1251)	0xDE	Specifies a Thai character set. (IANA name windows-874)	0xEE	Specifies an Eastern European character set. (IANA name windows-1250)	0xFF	Specifies an OEM character set not defined by ECMA-376.	Any other value	Application-defined, can be ignored.
	macintosh)																																		
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0xCC	Specifies a Russian character set. (IANA name windows-1251)																																		
0xDE	Specifies a Thai character set. (IANA name windows-874)																																		
0xEE	Specifies an Eastern European character set. (IANA name windows-1250)																																		
0xFF	Specifies an OEM character set not defined by ECMA-376.																																		
Any other value	Application-defined, can be ignored.																																		
panose (Panose Setting)	<p>Specifies the Panose-1 classification number for the current font using the mechanism defined in §5.2.7.17 of ISO/IEC 14496-22.</p> <p>The possible values for this attribute are defined by the ST_Panose simple type (§22.9.2.8).</p>																																		
pitchFamily (Similar Font Family)	<p>Specifies the font pitch as well as the font family for the corresponding font. Because the value of this attribute is determined by an octet value this value shall be interpreted as follows:</p> <table border="1"> <tr> <th>Value</th><th>Description</th></tr> <tr> <td>0x00</td><td>DEFAULT PITCH + UNKNOWN FONT FAMILY</td></tr> <tr> <td>0x01</td><td>FIXED PITCH + UNKNOWN FONT FAMILY</td></tr> <tr> <td>0x02</td><td>VARIABLE PITCH + UNKNOWN FONT FAMILY</td></tr> <tr> <td>0x10</td><td>DEFAULT PITCH + ROMAN FONT FAMILY</td></tr> <tr> <td>0x11</td><td>FIXED PITCH + ROMAN FONT FAMILY</td></tr> </table>	Value	Description	0x00	DEFAULT PITCH + UNKNOWN FONT FAMILY	0x01	FIXED PITCH + UNKNOWN FONT FAMILY	0x02	VARIABLE PITCH + UNKNOWN FONT FAMILY	0x10	DEFAULT PITCH + ROMAN FONT FAMILY	0x11	FIXED PITCH + ROMAN FONT FAMILY																						
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0x10	DEFAULT PITCH + ROMAN FONT FAMILY																																		
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Attributes	Description																										
	<table border="1"> <tr><td>0x12</td><td>VARIABLE PITCH + ROMAN FONT FAMILY</td></tr> <tr><td>0x20</td><td>DEFAULT PITCH + SWISS FONT FAMILY</td></tr> <tr><td>0x21</td><td>FIXED PITCH + SWISS FONT FAMILY</td></tr> <tr><td>0x22</td><td>VARIABLE PITCH + SWISS FONT FAMILY</td></tr> <tr><td>0x30</td><td>DEFAULT PITCH + MODERN FONT FAMILY</td></tr> <tr><td>0x31</td><td>FIXED PITCH + MODERN FONT FAMILY</td></tr> <tr><td>0x32</td><td>VARIABLE PITCH + MODERN FONT FAMILY</td></tr> <tr><td>0x40</td><td>DEFAULT PITCH + SCRIPT FONT FAMILY</td></tr> <tr><td>0x41</td><td>FIXED PITCH + SCRIPT FONT FAMILY</td></tr> <tr><td>0x42</td><td>VARIABLE PITCH + SCRIPT FONT FAMILY</td></tr> <tr><td>0x50</td><td>DEFAULT PITCH + DECORATIVE FONT FAMILY</td></tr> <tr><td>0x51</td><td>FIXED PITCH + DECORATIVE FONT FAMILY</td></tr> <tr><td>0x52</td><td>VARIABLE PITCH + DECORATIVE FONT FAMILY</td></tr> </table> <p>This information is determined by querying the font when present and shall not be modified when the font is not available. This information can be used in font substitution logic to locate an appropriate substitute font when this font is not available.</p> <p>[<i>Note</i>: Although the attribute name is pitchFamily, the integer value of this attribute specifies the font family with higher 4 bits and the font pitch with lower 4 bits. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema byte datatype.</p>	0x12	VARIABLE PITCH + ROMAN FONT FAMILY	0x20	DEFAULT PITCH + SWISS FONT FAMILY	0x21	FIXED PITCH + SWISS FONT FAMILY	0x22	VARIABLE PITCH + SWISS FONT FAMILY	0x30	DEFAULT PITCH + MODERN FONT FAMILY	0x31	FIXED PITCH + MODERN FONT FAMILY	0x32	VARIABLE PITCH + MODERN FONT FAMILY	0x40	DEFAULT PITCH + SCRIPT FONT FAMILY	0x41	FIXED PITCH + SCRIPT FONT FAMILY	0x42	VARIABLE PITCH + SCRIPT FONT FAMILY	0x50	DEFAULT PITCH + DECORATIVE FONT FAMILY	0x51	FIXED PITCH + DECORATIVE FONT FAMILY	0x52	VARIABLE PITCH + DECORATIVE FONT FAMILY
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0x32	VARIABLE PITCH + MODERN FONT FAMILY																										
0x40	DEFAULT PITCH + SCRIPT FONT FAMILY																										
0x41	FIXED PITCH + SCRIPT FONT FAMILY																										
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0x50	DEFAULT PITCH + DECORATIVE FONT FAMILY																										
0x51	FIXED PITCH + DECORATIVE FONT FAMILY																										
0x52	VARIABLE PITCH + DECORATIVE FONT FAMILY																										
typeface (Text Typeface)	<p>Specifies the typeface, or name of the font that is to be used. The typeface is a string name of the specific font that should be used in rendering the presentation. If this font is not available within the font list of the generating application than font substitution logic should be utilized in order to select an alternate font.</p> <p>The possible values for this attribute are defined by the ST_TextTypeface simple type (§20.1.10.80).</p>																										

[*Note*: The W3C XML Schema definition of this element's content model (CT_TextFont) is located in §A.4.1. *end note*]

21.1.2.4.7 buFontTx (Follow text)

This element specifies that the font of the bullets for a paragraph should be of the same font as the text run within which each bullet is contained.

[*Example*: Consider the DrawingML shown below.

```

<p:txBody>
...
<a:p>
  <a:pPr ...>
    <a:buFontTx>
  </a:pPr>
  ...
  <a:t>Bullet 1</a:t>
  ...
</a:p>
...
</p:txBody>

```

The font of the above bullet follows the default text font of the text for the run of text shown above since no specific text font was specified. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TextBulletTypefaceFollowText](#)) is located in §A.4.1. *end note*]

21.1.2.4.8 buNone (No Bullet)

This element specifies that the paragraph within which it is applied is to have no bullet formatting applied to it. That is to say that there should be no bulleting found within the paragraph where this element is specified.

[*Example:* Consider the DrawingML shown below.

```

<p:txBody>
...
<a:p>
  <a:pPr ...>
    <a:buNone/>
  </a:pPr>
  ...
  <a:t>Bullet 1</a:t>
  ...
</a:p>
...
</p:txBody>

```

The above paragraph is formatted with no bullets. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TextNoBullet](#)) is located in §A.4.1. *end note*]

21.1.2.4.9 buSzPct (Bullet Size Percentage)

This element specifies the size in percentage of the surrounding text to be used on bullet characters within a given paragraph.

[*Example:* Consider the DrawingML shown below.

```
<p:txBody>
...
<a:p>
  <a:pPr ...>
    <a:buSzPct val="111%"/>
  </a:pPr>
  ...
  <a:t>Bullet 1</a:t>
  ...
</a:p>
...
</p:txBody>
```

The size of the above bullet follows the text size in that it is always rendered at 111% the size of the text within the given text run. This is specified by `val="111%"`, with a restriction on the values not being less than 25% or more than 400%. This percentage size should only apply to the actual bullet character and not to the text within the bullet. *end example*]

Attributes	Description
val (Value)	<p>Specifies the percentage of the text size that this bullet should be. This attribute should not be lower than 25% and not be higher than 400%.</p> <p>The possible values for this attribute are defined by the <code>ST_TextBulletSizePercent</code> simple type (§20.1.10.61).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TextBulletSizePercent](#)) is located in §A.4.1. *end note*]

21.1.2.4.10 buSzPts (Bullet Size Points)

This element specifies the size in points to be used on bullet characters within a given paragraph. The size is specified using the points where 100 is equal to 1 point font and 1200 is equal to 12 point font.

[*Example:* Consider the DrawingML shown below.

```
<p:txBody>
...
<a:p>
  <a:pPr ...>
    <a:buSzPts val="1400"/>
  </a:pPr>
  ...
  <a:t>Bullet 1</a:t>
  ...
</a:p>
...
</p:txBody>
```

The size of the above bullet does not follow the text size of the text within the given text run. The bullets size is specified by val="1400", which corresponds to a point size of 14. This bullet size should only apply to the actual bullet character and not to the text within the bullet. *end example*]

Attributes	Description
val (Value)	<p>Specifies the size of the bullets in point size. Whole points are specified in increments of 100 starting with 100 being a point size of 1. For instance a font point size of 12 would be 1200 and a font point size of 12.5 would be 1250.</p> <p>The possible values for this attribute are defined by the ST_TextFontSize simple type (§20.1.10.67).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_TextBulletSizePoint](#)) is located in §A.4.1. *end note*]

21.1.2.4.11 buSzTx (Bullet Size Follows Text)

This element specifies that the size of the bullets for a paragraph should be of the same point size as the text run within which each bullet is contained.

[Example: Consider the DrawingML shown below.


```

<p:txBody>
...
<a:p>
  <a:pPr ...>
    <a:buSzTx>
  </a:pPr>
...
  <a:t>Bullet 1</a:t>
...
</a:p>
...
</p:txBody>

```

The size of the above bullet follows the default text size of the text for the run of text shown above since no specific text size was specified. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TextBulletSizeFollowText](#)) is located in §A.4.1. *end note*]

21.1.2.4.12 [lstStyle](#) (Text List Styles)

This element specifies the list of styles associated with this body of text.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TextListStyle](#)) is located in §A.4.1. *end note*]

21.1.2.4.13 [lvl1pPr](#) (List Level 1 Text Style)

This element specifies all paragraph level text properties for all elements that have the attribute `lvl="0"`. There are a total of 9 level text property elements allowed, levels 0-8. It is recommended that the order in which this and other level property elements are specified be in order of increasing level. That is `lvl2pPr` should come before `lvl3pPr`. This allows the lower level properties to take precedence over the higher level ones because they are parsed first.

[*Example:* Consider the following DrawingML code that would specify a paragraph to follow the level style defined in `lvl1pPr` and thus create a paragraph of text that has no bullets and is right aligned.

```
<p:txBody>
...
<a:lstStyle>
  <a:lv1pPr align="r">
    <a:buNone/>
  </a:lv1pPr>
</a:lstStyle>
<a:p>
  <a:pPr lvl="0">
    </a:pPr>
    ...
    <a:t>Some text</a:t>
    ...
  </a:p>
</p:txBody>
```

end example]

[*Note:* To resolve conflicting paragraph properties the linear hierarchy of paragraph properties should be examined starting first with the pPr element. The rule here is that properties that are defined at a level closer to the actual text should take precedence. That is if there is a conflicting property between the pPr and lv1pPr elements then the pPr property should take precedence because in the property hierarchy it is closer to the actual text being represented. *end note]*

Attributes	Description
align (Alignment)	<p>Specifies the alignment that is to be applied to the paragraph. Possible values for this include left, right, centered, justified and distributed. If this attribute is omitted, then a value of left is implied.</p> <div><div>Sample text text Sample Sample text text Sample Sample text text Sample Sample text text Sample Sample text text Sample Sample text text Sample Sample text text Sample Sample text text Sample</div><div>Sample text text Sample Sample text text Sample Sample text text Sample Sample text text Sample Sample text text Sample Sample text text Sample Sample text text Sample Sample text text Sample</div></div> <hr/> <p>[<i>Example:</i> Consider the case where the user wishes to have two columns of text that have a justified alignment, much like text within a book. The following DrawingML could describe this.</p>


Attributes	Description
	<pre> <p:txBody> <a:bodyPr numCol="2" spcCol="914400" .../> <a:normAutofit/> </a:bodyPr> ... <a:p> <a:pPr marL="0" algn="just"> <a:buNone/> </a:pPr> ... <a:t>Sample Text ...</a:t> ... </a:p> </p:txBody> end example] </pre> <p>The possible values for this attribute are defined by the ST_TextAlignType simple type (§20.1.10.58).</p>
defTabSz (Default Tab Size)	<p>Specifies the default size for a tab character within this paragraph. This attribute should be used to describe the spacing of tabs within the paragraph instead of a leading indentation tab. For indentation tabs there are the marL and indent attributes to assist with this.</p> <p>[<i>Example:</i> Consider the case where a paragraph contains numerous tabs that need to be of a specific size. The following DrawingML would describe this.</p> <pre> <p:txBody> ... <a:p> <a:pPr defTabSz="376300" .../> ... <a:t>Sample Text ...</a:t> ... </a:p> </p:txBody> end example] </pre> <p>The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</p>
eaLnBrk (East Asian Line Break)	<p>Specifies whether an East Asian word can be broken in half and wrapped onto the next line without a hyphen being added. To determine whether an East Asian word can be broken the presentation application would use the kinsoku settings here. This attribute is to be used specifically when there is a word that cannot be broken into multiple pieces</p>

Attributes	Description
	<p>without a hyphen. That is it is not present within the existence of normal breakable East Asian words but is when a special case word arises that should not be broken for a line break. If this attribute is omitted, then a value of 1 or true is implied.</p> <p>[<i>Example:</i> Consider the case where the presentation contains a long word that must not be divided with a line break. Instead it should be placed, in whole on a new line so that it can fit. The picture below shows a normal paragraph where a long word has been broken for a line break. The second picture shown below shows that same paragraph with the long word specified to not allow a line break. The resulting DrawingML is as follows.</p> <pre><p:txBody> ... <a:p> <a:pPr eaLnBrk="0" .../> ... <a:t>Sample text (Long word)</a:t> ... </a:p> </p:txBody></pre> <p>Sample text Sample text Sample text supercalifr agilisticxpialidocious</p> <p>Sample text Sample text Sample text supercalifragilisticxpialidocious</p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fontAlgn (Font Alignment)	<p>Determines where vertically on a line of text the actual words are positioned. This deals with vertical placement of the characters with respect to the baselines. For instance having text anchored to the top baseline, anchored to the bottom baseline, centered in between, etc. To understand this attribute and it's use it is helpful to understand what baselines are. A diagram describing these different cases is shown below. If this attribute is omitted, then a value of base is implied.</p> <p>[<i>Example:</i> Consider the case where the user wishes to represent the chemical compound of a water molecule. For this they need to make sure the H, the 2, and the O are all in the correct position and are of the correct size. The results below can be achieved through the DrawingML shown below.</p>

Attributes	Description
	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> H^2O <p>fontAlign="t"</p> </div> <div style="text-align: center;"> H^2O <p>fontAlign="ctr"</p> </div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-start; margin-top: 20px;"> <div style="text-align: center;"> H_2O <p>fontAlign="base"</p> </div> <div style="text-align: center;"> H_2O <p>fontAlign="b"</p> </div> </div> <pre> <a:txtBody> ... <a:pPr fontAlign="b" .../> ... <a:r> <a:rPr .../> <a:t>H </a:t> </a:r> <a:r> <a:rPr sz="1200" .../> <a:t>2</a:t> </a:r> <a:r> <a:rPr .../> <a:t>O</a:t> </a:r> ... </p:txBody> </pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_TextFontAlignType simple type (§20.1.10.65).</p>
hangingPunct (Hanging Punctuation)	<p>Specifies whether punctuation is to be forcefully laid out on a line of text or put on a different line of text. That is, if there is punctuation at the end of a run of text that should be carried over to a separate line does it actually get carried over. A true value allows for hanging punctuation forcing the punctuation to not be carried over and a value of false allows the punctuation to be carried onto the next text line. If this attribute is omitted, then a value of 0, or false is implied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
indent (Indent)	<p>Specifies the indent size that is applied to the first line of text in the paragraph. An indentation of 0 is considered to be at the same location as marL attribute. If this</p>

Attributes	Description
	<p>attribute is omitted, then a value of -342900 is implied.</p> <p>Here is some text Sample text Sample text Sample text Sample text text Sample text text Sample text Sample text Sample text Sample text text Sample text text Sample text Sample text Sample text Sample text text Sample text text Sample text Sample text Sample text Sample text text Sample text text Sample text Sample text Sample text Sample text text Sample text text Sample text Sample text Sample text Sample text</p> <p>[<i>Example:</i> Consider the scenario where the user now wanted to add a paragraph indentation to the first line of text in their two column format book.</p> <pre><p:txBody> <a:bodyPr numCol="2" spcCol="914400".../> <a:normAutofit/> </a:bodyPr> ... <a:p> <a:pPr marL="0" indent="571500" algn="just"> <a:buNone/> </a:pPr> ... <a:t>Here is some...</a:t> ... </a:p> </p:txBody></pre> <p>By adding the indent attribute the user has effectively added a first line indent to this paragraph of text. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TextIndent simple type (§20.1.10.69).</p>
latinLnBrk (Latin Line Break)	<p>Specifies whether a Latin word can be broken in half and wrapped onto the next line without a hyphen being added. This attribute is to be used specifically when there is a word that cannot be broken into multiple pieces without a hyphen. It is not present within the existence of normal breakable Latin words but is when a special case word arises that should not be broken for a line break. If this attribute is omitted, then a value of 1 or true is implied.</p> <p>[<i>Example:</i> Consider the case where the presentation contains a long word that must not</p>

Attributes	Description
	<p>be divided with a line break. Instead it should be placed, in whole on a new line so that it can fit. The picture below shows a normal paragraph where a long word has been broken for a line break. The second picture shown below shows that same paragraph with the long word specified to not allow a line break. The resulting DrawingML is as follows.</p> <pre><p:txBody> ... <a:p> <a:pPr latinLnBrk="0" .../> ... <a:t>Sample text (Long word)</a:t> ... </a:p> </p:txBody></pre> <p>Sample text Sample text Sample text supercalifr agilisticxpialidocious</p> <p>Sample text Sample text Sample text supercalifragilisticxpialidocious</p> <p style="text-align: right;"><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
lvl (Level)	<p>Specifies the particular level text properties that this paragraph follows. The value for this attribute is numerical and formats the text according to the corresponding level paragraph properties that are listed within the lstStyle element. Since there are nine separate level properties defined, this tag has an effective range of 0-8 = 9 available values.</p> <p>[Example: Consider the following DrawingML. This would specify that this paragraph should follow the lvl2pPr formatting style because once again lvl="1" is considered to be level 2.</p> <pre><p:txBody> ... <a:p> <a:pPr lvl="1" .../> ... <a:t>Sample text</a:t> ... </a:p> </p:txBody></pre> <p><i>end example]</i></p>

Attributes	Description
	<p>[<i>Note:</i> To resolve conflicting paragraph properties the linear hierarchy of paragraph properties should be examined starting first with the pPr element. The rule here is that properties that are defined at a level closer to the actual text should take precedence. That is if there is a conflicting property between the pPr and lvl1pPr elements then the pPr property should take precedence because in the property hierarchy it is closer to the actual text being represented. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_TextIndentLevelType simple type (§20.1.10.70).</p>
marL (Left Margin)	<p>Specifies the left margin of the paragraph. This is specified in addition to the text body inset and applies only to this text paragraph. That is the text body inset and the marL attributes are additive with respect to the text position. If this attribute is omitted, then a value of 347663 is implied.</p> <p>The possible values for this attribute are defined by the ST_TextMargin simple type (§20.1.10.71).</p>
marR (Right Margin)	<p>Specifies the right margin of the paragraph. This is specified in addition to the text body inset and applies only to this text paragraph. That is the text body inset and the marR attributes are additive with respect to the text position. If this attribute is omitted, then a value of 0 is implied.</p> <p>The possible values for this attribute are defined by the ST_TextMargin simple type (§20.1.10.71).</p>
rtl (Right To Left)	<p>Specifies whether the text is right-to-left or left-to-right in its flow direction. If this attribute is omitted, then a value of 0, or left-to-right is implied.</p> <p>[<i>Example:</i> Consider the following example of a text body with two lines of text. In this example, both lines contain English and Arabic text, however, the second line has the rtl attribute set to true whereas the first line does not set the rtl attribute.</p> <div style="text-align: center; margin: 10px 0;">  </div> <pre> <p:txBody> ... <a:p> <a:r> <a:t>Test </a:t> </a:r> <a:r> <a:rPr> <a:rtl w:val="1"/> </a:rPr> </pre>

Attributes	Description
	<pre> <a:t>تجربة</a:t> </a:r> </a:p> <a:p> <a:pPr rtl="1"/> <a:r> <a:rPr> <a:rtl w:val="0"/> </a:rPr> <a:t>Test </a:t> </a:r> <a:r> <a:t>تجربة</a:t> </a:r> </a:p> </p:txBody> end example] The possible values for this attribute are defined by the W3C XML Schema boolean datatype. </pre>

[Note: The W3C XML Schema definition of this element's content model ([CT_TextParagraphProperties](#)) is located in §A.4.1. *end note*]

21.1.2.4.14 lvl2pPr (List Level 2 Text Style)

This element specifies all paragraph level text properties for all elements that have the attribute `lvl="1"`. There are a total of 9 level text property elements allowed, levels 0-8. It is recommended that the order in which this and other level property elements are specified be in order of increasing level. That is `lvl2pPr` should come before `lvl3pPr`. This allows the lower level properties to take precedence over the higher level ones because they are parsed first.

[Example: Consider the following DrawingML code that would specify a paragraph to follow the level style defined in `lvl2pPr` and thus create a paragraph of text that has no bullets and is right aligned.

```

<p:txBody>
...
<a:lstStyle>
  <a:lvl2pPr algn="r">
    <a:buNone/>
  </a:lvl2pPr>
</a:lstStyle>

```

```
<a:p>
  <a:pPr lvl="1">
    </a:pPr>
    ...
    <a:t>Some text</a:t>
    ...
  </a:p>
</p:txBody>
```

end example]

[*Note:* To resolve conflicting paragraph properties the linear hierarchy of paragraph properties should be examined starting first with the pPr element. The rule here is that properties that are defined at a level closer to the actual text should take precedence. That is if there is a conflicting property between the pPr and lvl1pPr elements then the pPr property should take precedence because in the property hierarchy it is closer to the actual text being represented. *end note*]

Attributes	Description
align (Alignment)	<p>Specifies the alignment that is to be applied to the paragraph. Possible values for this include left, right, centered, justified and distributed. If this attribute is omitted, then a value of left is implied.</p> <div><div>Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text</div><div>Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text</div></div> <hr/> <p>[<i>Example:</i> Consider the case where the user wishes to have two columns of text that have a justified alignment, much like text within a book. The following DrawingML could describe this.</p> <pre><p:txBody> <a:bodyPr numCol="2" spcCol="914400".../> <a:normAutofit/> </a:bodyPr> ... <a:p> <a:pPr marL="0" align="just"></pre>

Attributes	Description
	<pre> <a:buNone/> </a:pPr> ... <a:t>Sample Text ...</a:t> ... </a:p> </p:txBody> end example] The possible values for this attribute are defined by the ST_TextAlignType simple type (§20.1.10.58).</pre>
defTabSz (Default Tab Size)	<p>Specifies the default size for a tab character within this paragraph. This attribute should be used to describe the spacing of tabs within the paragraph instead of a leading indentation tab. For indentation tabs there are the marL and indent attributes to assist with this.</p> <p>[Example: Consider the case where a paragraph contains numerous tabs that need to be of a specific size. The following DrawingML would describe this.</p> <pre> <p:txBody> ... <a:p> <a:pPr defTabSz="376300" .../> ... <a:t>Sample Text ...</a:t> ... </a:p> </p:txBody> end example] The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</pre>
eaLnBrk (East Asian Line Break)	<p>Specifies whether an East Asian word can be broken in half and wrapped onto the next line without a hyphen being added. To determine whether an East Asian word can be broken the presentation application would use the kinsoku settings here. This attribute is to be used specifically when there is a word that cannot be broken into multiple pieces without a hyphen. That is it is not present within the existence of normal breakable East Asian words but is when a special case word arises that should not be broken for a line break. If this attribute is omitted, then a value of 1 or true is implied.</p> <p>[Example: Consider the case where the presentation contains a long word that must not be divided with a line break. Instead it should be placed, in whole on a new line so that it can fit. The picture below shows a normal paragraph where a long word has been broken for a line break. The second picture shown below shows that same paragraph with the</p>

Attributes	Description
	<p>long word specified to not allow a line break. The resulting DrawingML is as follows.</p> <pre><p:txBody> ... <a:p> <a:pPr eaLnBrk="0" .../> ... <a:t>Sample text (Long word)</a:t> ... </a:p> </p:txBody></pre> <p>Sample text Sample text Sample text supercalifr agilisticxpialidocious</p> <p>Sample text Sample text Sample text supercalifragilisticxpialidocious</p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fontAlgn (Font Alignment)	<p>Determines where vertically on a line of text the actual words are positioned. This deals with vertical placement of the characters with respect to the baselines. For instance having text anchored to the top baseline, anchored to the bottom baseline, centered in between, etc. To understand this attribute and it's use it is helpful to understand what baselines are. A diagram describing these different cases is shown below. If this attribute is omitted, then a value of base is implied.</p> <p>[Example: Consider the case where the user wishes to represent the chemical compound of a water molecule. For this they need to make sure the H, the 2, and the O are all in the correct position and are of the correct size. The results below can be achieved through the DrawingML shown below.</p> <div><div>H^2O<p>fontAlgn="t"</p></div><div>H^2O<p>fontAlgn="ctr"</p></div><div>H_2O<p>fontAlgn="base"</p></div><div>H_2O<p>fontAlgn="b"</p></div></div>

Attributes	Description
	<pre> <a:txtBody> ... <a:pPr fontAlign="b" .../> ... <a:r> <a:rPr .../> <a:t>H </a:t> </a:r> <a:r> <a:rPr sz="1200" .../> <a:t>2</a:t> </a:r> <a:r> <a:rPr .../> <a:t>0</a:t> </a:r> ... </p:txBody> end example] </pre> <p>The possible values for this attribute are defined by the ST_TextFontAlignType simple type (§20.1.10.65).</p>
hangingPunct (Hanging Punctuation)	<p>Specifies whether punctuation is to be forcefully laid out on a line of text or put on a different line of text. That is, if there is punctuation at the end of a run of text that should be carried over to a separate line does it actually get carried over. A true value allows for hanging punctuation forcing the punctuation to not be carried over and a value of false allows the punctuation to be carried onto the next text line. If this attribute is omitted, then a value of 0, or false is implied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
indent (Indent)	<p>Specifies the indent size that is applied to the first line of text in the paragraph. An indentation of 0 is considered to be at the same location as marL attribute. If this attribute is omitted, then a value of -342900 is implied.</p>

Attributes	Description
	<div>Here is some text Sample text Sample text Sample text Sample text Sample text text Sample text Sample text Sample text Sample text Sample text text Sample text Sample text Sample text Sample text Sample text text Sample text Sample text Sample text Sample text Sample text text Sample text Sample text Sample text Sample text Sample text text Sample text Sample text Sample text Sample</div> <p>[<i>Example:</i> Consider the scenario where the user now wanted to add a paragraph indentation to the first line of text in their two column format book.</p> <pre><p:txBody> <a:bodyPr numCol="2" spcCol="914400".../> <a:normAutofit/> </a:bodyPr> ... <a:p> <a:pPr marL="0" indent="571500" algn="just"> <a:buNone/> </a:pPr> ... <a:t>Here is some...</a:t> ... </a:p> </p:txBody></pre> <p>By adding the indent attribute the user has effectively added a first line indent to this paragraph of text. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_TextIndent simple type (§20.1.10.69).</p>
latinLnBrk (Latin Line Break)	<p>Specifies whether a Latin word can be broken in half and wrapped onto the next line without a hyphen being added. This attribute is to be used specifically when there is a word that cannot be broken into multiple pieces without a hyphen. It is not present within the existence of normal breakable Latin words but is when a special case word arises that should not be broken for a line break. If this attribute is omitted, then a value of 1 or true is implied.</p> <p>[<i>Example:</i> Consider the case where the presentation contains a long word that must not be divided with a line break. Instead it should be placed, in whole on a new line so that it can fit. The picture below shows a normal paragraph where a long word has been broken</p>

Attributes	Description
	<p>for a line break. The second picture shown below shows that same paragraph with the long word specified to not allow a line break. The resulting DrawingML is as follows.</p> <pre> <p:txBody> ... <a:p> <a:pPr latinLnBrk="0" .../> ... <a:t>Sample text (Long word)</a:t> ... </a:p> </p:txBody> </pre> <p>Sample text Sample text Sample text supercalifr agilisticxpialidocious</p> <p>Sample text Sample text Sample text supercalifragilisticxpialidocious</p> <p style="text-align: right;"><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
lvl (Level)	<p>Specifies the particular level text properties that this paragraph follows. The value for this attribute is numerical and formats the text according to the corresponding level paragraph properties that are listed within the lStStyle element. Since there are nine separate level properties defined, this tag has an effective range of 0-8 = 9 available values.</p> <p>[Example: Consider the following DrawingML. This would specify that this paragraph should follow the lvl2pPr formatting style because once again lvl="1" is considered to be level 2.</p> <pre> <p:txBody> ... <a:p> <a:pPr lvl="1" .../> ... <a:t>Sample text</a:t> ... </a:p> </p:txBody> </pre> <p><i>end example]</i></p> <p>[Note: To resolve conflicting paragraph properties the linear hierarchy of paragraph properties should be examined starting first with the pPr element. The rule here is that</p>

Attributes	Description
	<p>properties that are defined at a level closer to the actual text should take precedence. That is if there is a conflicting property between the pPr and lvl1pPr elements then the pPr property should take precedence because in the property hierarchy it is closer to the actual text being represented. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_TextIndentLevelType simple type (§20.1.10.70).</p>
marL (Left Margin)	<p>Specifies the left margin of the paragraph. This is specified in addition to the text body inset and applies only to this text paragraph. That is the text body inset and the marL attributes are additive with respect to the text position. If this attribute is omitted, then a value of 347663 is implied.</p> <p>The possible values for this attribute are defined by the ST_TextMargin simple type (§20.1.10.71).</p>
marR (Right Margin)	<p>Specifies the right margin of the paragraph. This is specified in addition to the text body inset and applies only to this text paragraph. That is the text body inset and the marR attributes are additive with respect to the text position. If this attribute is omitted, then a value of 0 is implied.</p> <p>The possible values for this attribute are defined by the ST_TextMargin simple type (§20.1.10.71).</p>
rtl (Right To Left)	<p>Specifies whether the text is right-to-left or left-to-right in its flow direction. If this attribute is omitted, then a value of 0, or left-to-right is implied.</p> <p>[Example: Consider the following example of a text body with two lines of text. In this example, both lines contain English and Arabic text, however, the second line has the rtl attribute set to true whereas the first line does not set the rtl attribute.</p> <div style="text-align: center;"> <p>Test تجربة ← rtl = 0</p> <p>تجربةTest ← rtl = 1</p> </div> <pre> <p:txBody> ... <a:p> <a:r> <a:t>Test </a:t> </a:r> <a:r> <a:rPr> <a:rtl w:val="1"/> </a:rPr> <a:t>تجربة</a:t> </a:r> </a:p> </pre>

Attributes	Description
	<pre> </a:p> <a:p> <a:pPr rtl="1"/> <a:r> <a:rPr> <a:rtl w:val="0"/> </a:rPr> <a:t>Test </a:t> </a:r> <a:r> <a:t>تجربة</a:t> </a:r> </a:p> </p:txBody> end example] The possible values for this attribute are defined by the W3C XML Schema boolean datatype. </pre>

[Note: The W3C XML Schema definition of this element's content model ([CT_TextParagraphProperties](#)) is located in §A.4.1. *end note*]

21.1.2.4.15 lvl3pPr (List Level 3 Text Style)

This element specifies all paragraph level text properties for all elements that have the attribute `lvl="2"`. There are a total of 9 level text property elements allowed, levels 0-8. It is recommended that the order in which this and other level property elements are specified be in order of increasing level. That is `lvl2pPr` should come before `lvl3pPr`. This allows the lower level properties to take precedence over the higher level ones because they are parsed first.

[Example: Consider the following DrawingML code that would specify a paragraph to follow the level style defined in `lvl3pPr` and thus create a paragraph of text that has no bullets and is right aligned.

```

<p:txBody>
...
<a:lstStyle>
  <a:lvl3pPr algn="r">
    <a:buNone/>
  </a:lvl3pPr>
</a:lstStyle>

```

```
<a:p>
  <a:pPr lvl="2">
    </a:pPr>
    ...
    <a:t>Some text</a:t>
    ...
  </a:p>
</p:txBody>
```

end example]

[*Note:* To resolve conflicting paragraph properties the linear hierarchy of paragraph properties should be examined starting first with the pPr element. The rule here is that properties that are defined at a level closer to the actual text should take precedence. That is if there is a conflicting property between the pPr and lvl1pPr elements then the pPr property should take precedence because in the property hierarchy it is closer to the actual text being represented. *end note*]

Attributes	Description
align (Alignment)	<p>Specifies the alignment that is to be applied to the paragraph. Possible values for this include left, right, centered, justified and distributed. If this attribute is omitted, then a value of left is implied.</p> <div><div>Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text</div><div>Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text</div></div> <hr/> <p>[<i>Example:</i> Consider the case where the user wishes to have two columns of text that have a justified alignment, much like text within a book. The following DrawingML could describe this.</p> <pre><p:txBody> <a:bodyPr numCol="2" spcCol="914400".../> <a:normAutofit/> </a:bodyPr> ... <a:p> <a:pPr marL="0" align="just"></pre>


Attributes	Description
	<pre> <a:buNone/> </a:pPr> ... <a:t>Sample Text ...</a:t> ... </a:p> </p:txBody> end example] The possible values for this attribute are defined by the ST_TextAlignType simple type (§20.1.10.58).</pre>
defTabSz (Default Tab Size)	<p>Specifies the default size for a tab character within this paragraph. This attribute should be used to describe the spacing of tabs within the paragraph instead of a leading indentation tab. For indentation tabs there are the marL and indent attributes to assist with this.</p> <p>[Example: Consider the case where a paragraph contains numerous tabs that need to be of a specific size. The following DrawingML would describe this.</p> <pre> <p:txBody> ... <a:p> <a:pPr defTabSz="376300" .../> ... <a:t>Sample Text ...</a:t> ... </a:p> </p:txBody> end example] The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</pre>
eaLnBrk (East Asian Line Break)	<p>Specifies whether an East Asian word can be broken in half and wrapped onto the next line without a hyphen being added. To determine whether an East Asian word can be broken the presentation application would use the kinsoku settings here. This attribute is to be used specifically when there is a word that cannot be broken into multiple pieces without a hyphen. That is it is not present within the existence of normal breakable East Asian words but is when a special case word arises that should not be broken for a line break. If this attribute is omitted, then a value of 1 or true is implied.</p> <p>[Example: Consider the case where the presentation contains a long word that must not be divided with a line break. Instead it should be placed, in whole on a new line so that it can fit. The picture below shows a normal paragraph where a long word has been broken for a line break. The second picture shown below shows that same paragraph with the</p>

Attributes	Description
	<p>long word specified to not allow a line break. The resulting DrawingML is as follows.</p> <pre><p:txBody> ... <a:p> <a:pPr eaLnBrk="0" .../> ... <a:t>Sample text (Long word)</a:t> ... </a:p> </p:txBody></pre> <p>Sample text Sample text Sample text supercalifr agilisticxpialidocious</p> <p>Sample text Sample text Sample text supercalifragilisticxpialidocious</p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fontAlgn (Font Alignment)	<p>Determines where vertically on a line of text the actual words are positioned. This deals with vertical placement of the characters with respect to the baselines. For instance having text anchored to the top baseline, anchored to the bottom baseline, centered in between, etc. To understand this attribute and it's use it is helpful to understand what baselines are. A diagram describing these different cases is shown below. If this attribute is omitted, then a value of base is implied.</p> <p>[Example: Consider the case where the user wishes to represent the chemical compound of a water molecule. For this they need to make sure the H, the 2, and the O are all in the correct position and are of the correct size. The results below can be achieved through the DrawingML shown below.</p> <div><div>H^2O<p>fontAlgn="t"</p></div><div>H^2O<p>fontAlgn="ctr"</p></div><div>H_2O<p>fontAlgn="base"</p></div><div>H_2O<p>fontAlgn="b"</p></div></div>

Attributes	Description
	<pre> <a:txtBody> ... <a:pPr fontAlign="b" .../> ... <a:r> <a:rPr .../> <a:t>H </a:t> </a:r> <a:r> <a:rPr sz="1200" .../> <a:t>2</a:t> </a:r> <a:r> <a:rPr .../> <a:t>0</a:t> </a:r> ... </p:txBody> end example] </pre> <p>The possible values for this attribute are defined by the ST_TextFontAlignType simple type (§20.1.10.65).</p>
hangingPunct (Hanging Punctuation)	<p>Specifies whether punctuation is to be forcefully laid out on a line of text or put on a different line of text. That is, if there is punctuation at the end of a run of text that should be carried over to a separate line does it actually get carried over. A true value allows for hanging punctuation forcing the punctuation to not be carried over and a value of false allows the punctuation to be carried onto the next text line. If this attribute is omitted, then a value of 0, or false is implied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
indent (Indent)	<p>Specifies the indent size that is applied to the first line of text in the paragraph. An indentation of 0 is considered to be at the same location as marL attribute. If this attribute is omitted, then a value of -342900 is implied.</p>

Attributes	Description
	<div data-bbox="448 289 974 667"> <pre> Here is some text Sample text Sample text Sample text Sample text Sample text text Sample text Sample text Sample text Sample text Sample text text Sample text Sample text Sample text Sample text Sample text text Sample text Sample text Sample text Sample text Sample text text Sample text Sample text Sample text Sample </pre> </div> <p data-bbox="415 726 1370 793">[<i>Example:</i> Consider the scenario where the user now wanted to add a paragraph indentation to the first line of text in their two column format book.</p> <pre data-bbox="453 835 1224 1310"> <p:txBody> <a:bodyPr numCol="2" spcCol="914400".../> <a:normAutofit/> </a:bodyPr> ... <a:p> <a:pPr marL="0" indent="571500" algn="just"> <a:buNone/> </a:pPr> ... <a:t>Here is some...</a:t> ... </a:p> </p:txBody> </pre> <p data-bbox="415 1348 1425 1415">By adding the indent attribute the user has effectively added a first line indent to this paragraph of text. <i>end example]</i></p> <p data-bbox="415 1453 1403 1520">The possible values for this attribute are defined by the ST_TextIndent simple type (§20.1.10.69).</p>
latinLnBrk (Latin Line Break)	<p data-bbox="415 1537 1468 1751">Specifies whether a Latin word can be broken in half and wrapped onto the next line without a hyphen being added. This attribute is to be used specifically when there is a word that cannot be broken into multiple pieces without a hyphen. It is not present within the existence of normal breakable Latin words but is when a special case word arises that should not be broken for a line break. If this attribute is omitted, then a value of 1 or true is implied.</p> <p data-bbox="415 1789 1468 1890">[<i>Example:</i> Consider the case where the presentation contains a long word that must not be divided with a line break. Instead it should be placed, in whole on a new line so that it can fit. The picture below shows a normal paragraph where a long word has been broken</p>

Attributes	Description
	<p>for a line break. The second picture shown below shows that same paragraph with the long word specified to not allow a line break. The resulting DrawingML is as follows.</p> <pre> <p:txBody> ... <a:p> <a:pPr latinLnBrk="0" .../> ... <a:t>Sample text (Long word)</a:t> ... </a:p> </p:txBody> </pre> <p>Sample text Sample text Sample text supercalifr agilisticxpialidocious</p> <p>Sample text Sample text Sample text supercalifragilisticxpialidocious</p> <p style="text-align: right;"><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
lvl (Level)	<p>Specifies the particular level text properties that this paragraph follows. The value for this attribute is numerical and formats the text according to the corresponding level paragraph properties that are listed within the lStStyle element. Since there are nine separate level properties defined, this tag has an effective range of 0-8 = 9 available values.</p> <p>[Example: Consider the following DrawingML. This would specify that this paragraph should follow the lvl2pPr formatting style because once again lvl="1" is considered to be level 2.</p> <pre> <p:txBody> ... <a:p> <a:pPr lvl="1" .../> ... <a:t>Sample text</a:t> ... </a:p> </p:txBody> </pre> <p><i>end example]</i></p> <p>[Note: To resolve conflicting paragraph properties the linear hierarchy of paragraph properties should be examined starting first with the pPr element. The rule here is that</p>

Attributes	Description
	<p>properties that are defined at a level closer to the actual text should take precedence. That is if there is a conflicting property between the pPr and lvl1pPr elements then the pPr property should take precedence because in the property hierarchy it is closer to the actual text being represented. <i>end note</i></p> <p>The possible values for this attribute are defined by the ST_TextIndentLevelType simple type (§20.1.10.70).</p>
marL (Left Margin)	<p>Specifies the left margin of the paragraph. This is specified in addition to the text body inset and applies only to this text paragraph. That is the text body inset and the marL attributes are additive with respect to the text position. If this attribute is omitted, then a value of 347663 is implied.</p> <p>The possible values for this attribute are defined by the ST_TextMargin simple type (§20.1.10.71).</p>
marR (Right Margin)	<p>Specifies the right margin of the paragraph. This is specified in addition to the text body inset and applies only to this text paragraph. That is the text body inset and the marR attributes are additive with respect to the text position. If this attribute is omitted, then a value of 0 is implied.</p> <p>The possible values for this attribute are defined by the ST_TextMargin simple type (§20.1.10.71).</p>
rtl (Right To Left)	<p>Specifies whether the text is right-to-left or left-to-right in its flow direction. If this attribute is omitted, then a value of 0, or left-to-right is implied.</p> <p>[Example: Consider the following example of a text body with two lines of text. In this example, both lines contain English and Arabic text, however, the second line has the rtl attribute set to true whereas the first line does not set the rtl attribute.</p> <div style="text-align: center; margin: 10px 0;">  </div> <pre> <p:txBody> ... <a:p> <a:r> <a:t>Test </a:t> </a:r> <a:r> <a:rPr> <a:rtl w:val="1"/> </a:rPr> <a:t>تجربة</a:t> </a:r> </a:p> </pre>

Attributes	Description
	<pre> </a:p> <a:p> <a:pPr rtl="1"/> <a:r> <a:rPr> <a:rtl w:val="0"/> </a:rPr> <a:t>Test </a:t> </a:r> <a:r> <a:t>تجربة</a:t> </a:r> </a:p> </p:txBody> </pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TextParagraphProperties](#)) is located in §A.4.1. *end note*]

21.1.2.4.16 lvl4pPr (List Level 4 Text Style)

This element specifies all paragraph level text properties for all elements that have the attribute `lvl="3"`. There are a total of 9 level text property elements allowed, levels 0-8. It is recommended that the order in which this and other level property elements are specified be in order of increasing level. That is `lvl2pPr` should come before `lvl3pPr`. This allows the lower level properties to take precedence over the higher level ones because they are parsed first.

[Example: Consider the following DrawingML code that would specify a paragraph to follow the level style defined in `lvl4pPr` and thus create a paragraph of text that has no bullets and is right aligned.

```

<p:txBody>
...
<a:lstStyle>
  <a:lvl4pPr algn="r">
    <a:buNone/>
  </a:lvl4pPr>
</a:lstStyle>

```

```
<a:p>
  <a:pPr lvl="3">
    </a:pPr>
    ...
    <a:t>Some text</a:t>
    ...
  </a:p>
</p:txBody>
```

end example]

[*Note:* To resolve conflicting paragraph properties the linear hierarchy of paragraph properties should be examined starting first with the pPr element. The rule here is that properties that are defined at a level closer to the actual text should take precedence. That is if there is a conflicting property between the pPr and lvl1pPr elements then the pPr property should take precedence because in the property hierarchy it is closer to the actual text being represented. *end note*]

Attributes	Description
align (Alignment)	<p>Specifies the alignment that is to be applied to the paragraph. Possible values for this include left, right, centered, justified and distributed. If this attribute is omitted, then a value of left is implied.</p> <div><div>Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text</div><div>Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text</div></div> <hr/> <p>[<i>Example:</i> Consider the case where the user wishes to have two columns of text that have a justified alignment, much like text within a book. The following DrawingML could describe this.</p> <pre><p:txBody> <a:bodyPr numCol="2" spcCol="914400".../> <a:normAutofit/> </a:bodyPr> ... <a:p> <a:pPr marL="0" align="just"></pre>


Attributes	Description
	<pre> <a:buNone/> </a:pPr> ... <a:t>Sample Text ...</a:t> ... </a:p> </p:txBody> end example] The possible values for this attribute are defined by the ST_TextAlignType simple type (§20.1.10.58).</pre>
defTabSz (Default Tab Size)	<p>Specifies the default size for a tab character within this paragraph. This attribute should be used to describe the spacing of tabs within the paragraph instead of a leading indentation tab. For indentation tabs there are the marL and indent attributes to assist with this.</p> <p>[Example: Consider the case where a paragraph contains numerous tabs that need to be of a specific size. The following DrawingML would describe this.</p> <pre> <p:txBody> ... <a:p> <a:pPr defTabSz="376300" .../> ... <a:t>Sample Text ...</a:t> ... </a:p> </p:txBody> end example] The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</pre>
eaLnBrk (East Asian Line Break)	<p>Specifies whether an East Asian word can be broken in half and wrapped onto the next line without a hyphen being added. To determine whether an East Asian word can be broken the presentation application would use the kinsoku settings here. This attribute is to be used specifically when there is a word that cannot be broken into multiple pieces without a hyphen. That is it is not present within the existence of normal breakable East Asian words but is when a special case word arises that should not be broken for a line break. If this attribute is omitted, then a value of 1 or true is implied.</p> <p>[Example: Consider the case where the presentation contains a long word that must not be divided with a line break. Instead it should be placed, in whole on a new line so that it can fit. The picture below shows a normal paragraph where a long word has been broken for a line break. The second picture shown below shows that same paragraph with the</p>

Attributes	Description
	<p>long word specified to not allow a line break. The resulting DrawingML is as follows.</p> <pre><p:txBody> ... <a:p> <a:pPr eaLnBrk="0" .../> ... <a:t>Sample text (Long word)</a:t> ... </a:p> </p:txBody></pre> <p>Sample text Sample text Sample text supercalifr agilisticxpialidocious</p> <p>Sample text Sample text Sample text supercalifragilisticxpialidocious</p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fontAlgn (Font Alignment)	<p>Determines where vertically on a line of text the actual words are positioned. This deals with vertical placement of the characters with respect to the baselines. For instance having text anchored to the top baseline, anchored to the bottom baseline, centered in between, etc. To understand this attribute and it's use it is helpful to understand what baselines are. A diagram describing these different cases is shown below. If this attribute is omitted, then a value of base is implied.</p> <p>[Example: Consider the case where the user wishes to represent the chemical compound of a water molecule. For this they need to make sure the H, the 2, and the O are all in the correct position and are of the correct size. The results below can be achieved through the DrawingML shown below.</p> <div><div>H^2O<p>fontAlgn="t"</p></div><div>H^2O<p>fontAlgn="ctr"</p></div><div>H_2O<p>fontAlgn="base"</p></div><div>H_2O<p>fontAlgn="b"</p></div></div>

Attributes	Description
	<pre> <a:txtBody> ... <a:pPr fontAlign="b" .../> ... <a:r> <a:rPr .../> <a:t>H </a:t> </a:r> <a:r> <a:rPr sz="1200" .../> <a:t>2</a:t> </a:r> <a:r> <a:rPr .../> <a:t>0</a:t> </a:r> ... </p:txBody> end example] </pre> <p>The possible values for this attribute are defined by the ST_TextFontAlignType simple type (§20.1.10.65).</p>
hangingPunct (Hanging Punctuation)	<p>Specifies whether punctuation is to be forcefully laid out on a line of text or put on a different line of text. That is, if there is punctuation at the end of a run of text that should be carried over to a separate line does it actually get carried over. A true value allows for hanging punctuation forcing the punctuation to not be carried over and a value of false allows the punctuation to be carried onto the next text line. If this attribute is omitted, then a value of 0, or false is implied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
indent (Indent)	<p>Specifies the indent size that is applied to the first line of text in the paragraph. An indentation of 0 is considered to be at the same location as marL attribute. If this attribute is omitted, then a value of -342900 is implied.</p>

Attributes	Description
	<div>Here is some text Sample text Sample text Sample text Sample text Sample text text Sample text Sample text Sample text Sample text Sample text text Sample text Sample text Sample text Sample text Sample text text Sample text Sample text Sample text Sample text Sample text text Sample text Sample text Sample text Sample text Sample text text Sample text Sample text Sample text Sample</div> <p>[<i>Example:</i> Consider the scenario where the user now wanted to add a paragraph indentation to the first line of text in their two column format book.</p> <pre><p:txBody> <a:bodyPr numCol="2" spcCol="914400".../> <a:normAutofit/> </a:bodyPr> ... <a:p> <a:pPr marL="0" indent="571500" algn="just"> <a:buNone/> </a:pPr> ... <a:t>Here is some...</a:t> ... </a:p> </p:txBody></pre> <p>By adding the indent attribute the user has effectively added a first line indent to this paragraph of text. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_TextIndent simple type (§20.1.10.69).</p>
latinLnBrk (Latin Line Break)	<p>Specifies whether a Latin word can be broken in half and wrapped onto the next line without a hyphen being added. This attribute is to be used specifically when there is a word that cannot be broken into multiple pieces without a hyphen. It is not present within the existence of normal breakable Latin words but is when a special case word arises that should not be broken for a line break. If this attribute is omitted, then a value of 1 or true is implied.</p> <p>[<i>Example:</i> Consider the case where the presentation contains a long word that must not be divided with a line break. Instead it should be placed, in whole on a new line so that it can fit. The picture below shows a normal paragraph where a long word has been broken</p>

Attributes	Description
	<p>for a line break. The second picture shown below shows that same paragraph with the long word specified to not allow a line break. The resulting DrawingML is as follows.</p> <pre> <p:txBody> ... <a:p> <a:pPr latinLnBrk="0" .../> ... <a:t>Sample text (Long word)</a:t> ... </a:p> </p:txBody> </pre> <p>Sample text Sample text Sample text supercalifr agilisticxpialidocious</p> <p>Sample text Sample text Sample text supercalifragilisticxpialidocious</p> <p style="text-align: right;"><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
lvl (Level)	<p>Specifies the particular level text properties that this paragraph follows. The value for this attribute is numerical and formats the text according to the corresponding level paragraph properties that are listed within the lStStyle element. Since there are nine separate level properties defined, this tag has an effective range of 0-8 = 9 available values.</p> <p>[Example: Consider the following DrawingML. This would specify that this paragraph should follow the lvl2pPr formatting style because once again lvl="1" is considered to be level 2.</p> <pre> <p:txBody> ... <a:p> <a:pPr lvl="1" .../> ... <a:t>Sample text</a:t> ... </a:p> </p:txBody> </pre> <p><i>end example]</i></p> <p>[Note: To resolve conflicting paragraph properties the linear hierarchy of paragraph properties should be examined starting first with the pPr element. The rule here is that</p>

Attributes	Description
	<p>properties that are defined at a level closer to the actual text should take precedence. That is if there is a conflicting property between the pPr and lvl1pPr elements then the pPr property should take precedence because in the property hierarchy it is closer to the actual text being represented. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_TextIndentLevelType simple type (§20.1.10.70).</p>
marL (Left Margin)	<p>Specifies the left margin of the paragraph. This is specified in addition to the text body inset and applies only to this text paragraph. That is the text body inset and the marL attributes are additive with respect to the text position. If this attribute is omitted, then a value of 347663 is implied.</p> <p>The possible values for this attribute are defined by the ST_TextMargin simple type (§20.1.10.71).</p>
marR (Right Margin)	<p>Specifies the right margin of the paragraph. This is specified in addition to the text body inset and applies only to this text paragraph. That is the text body inset and the marR attributes are additive with respect to the text position. If this attribute is omitted, then a value of 0 is implied.</p> <p>The possible values for this attribute are defined by the ST_TextMargin simple type (§20.1.10.71).</p>
rtl (Right To Left)	<p>Specifies whether the text is right-to-left or left-to-right in its flow direction. If this attribute is omitted, then a value of 0, or left-to-right is implied.</p> <p>[Example: Consider the following example of a text body with two lines of text. In this example, both lines contain English and Arabic text, however, the second line has the rtl attribute set to true whereas the first line does not set the rtl attribute.</p> <div style="text-align: center; margin: 10px 0;">  </div> <pre> <p:txBody> ... <a:p> <a:r> <a:t>Test </a:t> </a:r> <a:r> <a:rPr> <a:rtl w:val="1"/> </a:rPr> <a:t>تجربة</a:t> </a:r> </a:p> </pre>

Attributes	Description
	<pre> </a:p> <a:p> <a:pPr rtl="1"/> <a:r> <a:rPr> <a:rtl w:val="0"/> </a:rPr> <a:t>Test </a:t> </a:r> <a:r> <a:t>تجربة</a:t> </a:r> </a:p> </p:txBody> end example] The possible values for this attribute are defined by the W3C XML Schema boolean datatype. </pre>

[Note: The W3C XML Schema definition of this element's content model ([CT_TextParagraphProperties](#)) is located in §A.4.1. *end note*]

21.1.2.4.17 lvl5pPr (List Level 5 Text Style)

This element specifies all paragraph level text properties for all elements that have the attribute `lvl="4"`. There are a total of 9 level text property elements allowed, levels 0-8. It is recommended that the order in which this and other level property elements are specified be in order of increasing level. That is `lvl2pPr` should come before `lvl3pPr`. This allows the lower level properties to take precedence over the higher level ones because they are parsed first.

[Example: Consider the following DrawingML code that would specify a paragraph to follow the level style defined in `lvl5pPr` and thus create a paragraph of text that has no bullets and is right aligned.

```

<p:txBody>
...
<a:lstStyle>
  <a:lvl5pPr algn="r">
    <a:buNone/>
  </a:lvl5pPr>
</a:lstStyle>

```

```
<a:p>
  <a:pPr lvl="4">
    </a:pPr>
    ...
    <a:t>Some text</a:t>
    ...
  </a:p>
</p:txBody>
```

end example]

[*Note:* To resolve conflicting paragraph properties the linear hierarchy of paragraph properties should be examined starting first with the pPr element. The rule here is that properties that are defined at a level closer to the actual text should take precedence. That is if there is a conflicting property between the pPr and lvl1pPr elements then the pPr property should take precedence because in the property hierarchy it is closer to the actual text being represented. *end note]*

Attributes	Description
align (Alignment)	<p>Specifies the alignment that is to be applied to the paragraph. Possible values for this include left, right, centered, justified and distributed. If this attribute is omitted, then a value of left is implied.</p> <div><div>Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text</div><div>Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text</div></div> <hr/> <p>[<i>Example:</i> Consider the case where the user wishes to have two columns of text that have a justified alignment, much like text within a book. The following DrawingML could describe this.</p> <pre><p:txBody> <a:bodyPr numCol="2" spcCol="914400".../> <a:normAutofit/> </a:bodyPr> ... <a:p> <a:pPr marL="0" align="just"></pre>


Attributes	Description
	<pre> <a:buNone/> </a:pPr> ... <a:t>Sample Text ...</a:t> ... </a:p> </p:txBody> end example] The possible values for this attribute are defined by the ST_TextAlignType simple type (§20.1.10.58).</pre>
defTabSz (Default Tab Size)	<p>Specifies the default size for a tab character within this paragraph. This attribute should be used to describe the spacing of tabs within the paragraph instead of a leading indentation tab. For indentation tabs there are the marL and indent attributes to assist with this.</p> <p>[Example: Consider the case where a paragraph contains numerous tabs that need to be of a specific size. The following DrawingML would describe this.</p> <pre> <p:txBody> ... <a:p> <a:pPr defTabSz="376300" .../> ... <a:t>Sample Text ...</a:t> ... </a:p> </p:txBody> end example] The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</pre>
eaLnBrk (East Asian Line Break)	<p>Specifies whether an East Asian word can be broken in half and wrapped onto the next line without a hyphen being added. To determine whether an East Asian word can be broken the presentation application would use the kinsoku settings here. This attribute is to be used specifically when there is a word that cannot be broken into multiple pieces without a hyphen. That is it is not present within the existence of normal breakable East Asian words but is when a special case word arises that should not be broken for a line break. If this attribute is omitted, then a value of 1 or true is implied.</p> <p>[Example: Consider the case where the presentation contains a long word that must not be divided with a line break. Instead it should be placed, in whole on a new line so that it can fit. The picture below shows a normal paragraph where a long word has been broken for a line break. The second picture shown below shows that same paragraph with the</p>

Attributes	Description
	<p>long word specified to not allow a line break. The resulting DrawingML is as follows.</p> <pre> <p:txBody> ... <a:p> <a:pPr eaLnBrk="0" .../> ... <a:t>Sample text (Long word)</a:t> ... </a:p> </p:txBody> </pre> <p>Sample text Sample text Sample text supercalifr agilisticxpialidocious</p> <p>Sample text Sample text Sample text supercalifragilisticxpialidocious</p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fontAlgn (Font Alignment)	<p>Determines where vertically on a line of text the actual words are positioned. This deals with vertical placement of the characters with respect to the baselines. For instance having text anchored to the top baseline, anchored to the bottom baseline, centered in between, etc. To understand this attribute and it's use it is helpful to understand what baselines are. A diagram describing these different cases is shown below. If this attribute is omitted, then a value of base is implied.</p> <p>[Example: Consider the case where the user wishes to represent the chemical compound of a water molecule. For this they need to make sure the H, the 2, and the O are all in the correct position and are of the correct size. The results below can be achieved through the DrawingML shown below.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> H^2O <p>fontAlgn="t"</p> </div> <div style="text-align: center;"> H^2O <p>fontAlgn="ctr"</p> </div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-start; margin-top: 20px;"> <div style="text-align: center;"> H_2O <p>fontAlgn="base"</p> </div> <div style="text-align: center;"> H_2O <p>fontAlgn="b"</p> </div> </div>

Attributes	Description
	<pre> <a:txtBody> ... <a:pPr fontAlign="b" .../> ... <a:r> <a:rPr .../> <a:t>H </a:t> </a:r> <a:r> <a:rPr sz="1200" .../> <a:t>2</a:t> </a:r> <a:r> <a:rPr .../> <a:t>0</a:t> </a:r> ... </p:txBody> end example] </pre> <p>The possible values for this attribute are defined by the ST_TextFontAlignType simple type (§20.1.10.65).</p>
hangingPunct (Hanging Punctuation)	<p>Specifies whether punctuation is to be forcefully laid out on a line of text or put on a different line of text. That is, if there is punctuation at the end of a run of text that should be carried over to a separate line does it actually get carried over. A true value allows for hanging punctuation forcing the punctuation to not be carried over and a value of false allows the punctuation to be carried onto the next text line. If this attribute is omitted, then a value of 0, or false is implied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
indent (Indent)	<p>Specifies the indent size that is applied to the first line of text in the paragraph. An indentation of 0 is considered to be at the same location as marL attribute. If this attribute is omitted, then a value of -342900 is implied.</p>

Attributes	Description
	<div data-bbox="451 289 974 667"> <pre> Here is some text Sample text Sample text Sample Sample text Sample text Sample text text Sample text Sample text Sample Sample text Sample text Sample text text Sample text Sample text Sample Sample text text Sample text Sample text Sample text Sample text Sample text Sample Sample text Sample text Sample text Sample </pre> </div> <p data-bbox="418 726 1370 793">[<i>Example:</i> Consider the scenario where the user now wanted to add a paragraph indentation to the first line of text in their two column format book.</p> <pre data-bbox="451 835 1224 1310"> <p:txBody> <a:bodyPr numCol="2" spcCol="914400".../> <a:normAutofit/> </a:bodyPr> ... <a:p> <a:pPr marL="0" indent="571500" algn="just"> <a:buNone/> </a:pPr> ... <a:t>Here is some...</a:t> ... </a:p> </p:txBody> </pre> <p data-bbox="418 1348 1425 1415">By adding the indent attribute the user has effectively added a first line indent to this paragraph of text. <i>end example]</i></p> <p data-bbox="418 1453 1403 1520">The possible values for this attribute are defined by the ST_TextIndent simple type (§20.1.10.69).</p>
latinLnBrk (Latin Line Break)	<p data-bbox="418 1537 1468 1747">Specifies whether a Latin word can be broken in half and wrapped onto the next line without a hyphen being added. This attribute is to be used specifically when there is a word that cannot be broken into multiple pieces without a hyphen. It is not present within the existence of normal breakable Latin words but is when a special case word arises that should not be broken for a line break. If this attribute is omitted, then a value of 1 or true is implied.</p> <p data-bbox="418 1785 1468 1890">[<i>Example:</i> Consider the case where the presentation contains a long word that must not be divided with a line break. Instead it should be placed, in whole on a new line so that it can fit. The picture below shows a normal paragraph where a long word has been broken</p>

Attributes	Description
	<p>for a line break. The second picture shown below shows that same paragraph with the long word specified to not allow a line break. The resulting DrawingML is as follows.</p> <pre> <p:txBody> ... <a:p> <a:pPr latinLnBrk="0" .../> ... <a:t>Sample text (Long word)</a:t> ... </a:p> </p:txBody> </pre> <p>Sample text Sample text Sample text supercalifr agilisticxpialidocious</p> <p>Sample text Sample text Sample text supercalifragilisticxpialidocious</p> <p style="text-align: right;"><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
lvl (Level)	<p>Specifies the particular level text properties that this paragraph follows. The value for this attribute is numerical and formats the text according to the corresponding level paragraph properties that are listed within the lStStyle element. Since there are nine separate level properties defined, this tag has an effective range of 0-8 = 9 available values.</p> <p>[Example: Consider the following DrawingML. This would specify that this paragraph should follow the lvl2pPr formatting style because once again lvl="1" is considered to be level 2.</p> <pre> <p:txBody> ... <a:p> <a:pPr lvl="1" .../> ... <a:t>Sample text</a:t> ... </a:p> </p:txBody> </pre> <p><i>end example]</i></p> <p>[Note: To resolve conflicting paragraph properties the linear hierarchy of paragraph properties should be examined starting first with the pPr element. The rule here is that</p>

Attributes	Description
	<p>properties that are defined at a level closer to the actual text should take precedence. That is if there is a conflicting property between the pPr and lvl1pPr elements then the pPr property should take precedence because in the property hierarchy it is closer to the actual text being represented. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_TextIndentLevelType simple type (§20.1.10.70).</p>
marL (Left Margin)	<p>Specifies the left margin of the paragraph. This is specified in addition to the text body inset and applies only to this text paragraph. That is the text body inset and the marL attributes are additive with respect to the text position. If this attribute is omitted, then a value of 347663 is implied.</p> <p>The possible values for this attribute are defined by the ST_TextMargin simple type (§20.1.10.71).</p>
marR (Right Margin)	<p>Specifies the right margin of the paragraph. This is specified in addition to the text body inset and applies only to this text paragraph. That is the text body inset and the marR attributes are additive with respect to the text position. If this attribute is omitted, then a value of 0 is implied.</p> <p>The possible values for this attribute are defined by the ST_TextMargin simple type (§20.1.10.71).</p>
rtl (Right To Left)	<p>Specifies whether the text is right-to-left or left-to-right in its flow direction. If this attribute is omitted, then a value of 0, or left-to-right is implied.</p> <p>[Example: Consider the following example of a text body with two lines of text. In this example, both lines contain English and Arabic text, however, the second line has the rtl attribute set to true whereas the first line does not set the rtl attribute.</p> <div style="text-align: center; margin: 10px 0;">  </div> <pre> <p:txBody> ... <a:p> <a:r> <a:t>Test </a:t> </a:r> <a:r> <a:rPr> <a:rtl w:val="1"/> </a:rPr> <a:t>تجربة</a:t> </a:r> </pre>

Attributes	Description
	<pre> </a:p> <a:p> <a:pPr rtl="1"/> <a:r> <a:rPr> <a:rtl w:val="0"/> </a:rPr> <a:t>Test </a:t> </a:r> <a:r> <a:t>تجربة</a:t> </a:r> </a:p> </p:txBody> end example] The possible values for this attribute are defined by the W3C XML Schema boolean datatype. </pre>

[Note: The W3C XML Schema definition of this element's content model ([CT_TextParagraphProperties](#)) is located in §A.4.1. *end note*]

21.1.2.4.18 lvl6pPr (List Level 6 Text Style)

This element specifies all paragraph level text properties for all elements that have the attribute `lvl="5"`. There are a total of 9 level text property elements allowed, levels 0-8. It is recommended that the order in which this and other level property elements are specified be in order of increasing level. That is `lvl2pPr` should come before `lvl3pPr`. This allows the lower level properties to take precedence over the higher level ones because they are parsed first.

[Example: Consider the following DrawingML code that would specify a paragraph to follow the level style defined in `lvl6pPr` and thus create a paragraph of text that has no bullets and is right aligned.

```

<p:txBody>
...
<a:lstStyle>
  <a:lvl6pPr algn="r">
    <a:buNone/>
  </a:lvl6pPr>
</a:lstStyle>

```

```
<a:p>
  <a:pPr lvl="5">
    </a:pPr>
    ...
    <a:t>Some text</a:t>
    ...
  </a:p>
</p:txBody>
```

end example]

[*Note:* To resolve conflicting paragraph properties the linear hierarchy of paragraph properties should be examined starting first with the pPr element. The rule here is that properties that are defined at a level closer to the actual text should take precedence. That is if there is a conflicting property between the pPr and lvl1pPr elements then the pPr property should take precedence because in the property hierarchy it is closer to the actual text being represented. *end note*]

Attributes	Description
align (Alignment)	<p>Specifies the alignment that is to be applied to the paragraph. Possible values for this include left, right, centered, justified and distributed. If this attribute is omitted, then a value of left is implied.</p> <div><div>Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text</div><div>Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text</div></div> <hr/> <p>[<i>Example:</i> Consider the case where the user wishes to have two columns of text that have a justified alignment, much like text within a book. The following DrawingML could describe this.</p> <pre><p:txBody> <a:bodyPr numCol="2" spcCol="914400".../> <a:normAutofit/> </a:bodyPr> ... <a:p> <a:pPr marL="0" align="just"></pre>

Attributes	Description
	<pre> <a:buNone/> </a:pPr> ... <a:t>Sample Text ...</a:t> ... </a:p> </p:txBody> end example] The possible values for this attribute are defined by the ST_TextAlignType simple type (§20.1.10.58).</pre>
defTabSz (Default Tab Size)	<p>Specifies the default size for a tab character within this paragraph. This attribute should be used to describe the spacing of tabs within the paragraph instead of a leading indentation tab. For indentation tabs there are the marL and indent attributes to assist with this.</p> <p>[Example: Consider the case where a paragraph contains numerous tabs that need to be of a specific size. The following DrawingML would describe this.</p> <pre> <p:txBody> ... <a:p> <a:pPr defTabSz="376300" .../> ... <a:t>Sample Text ...</a:t> ... </a:p> </p:txBody> end example] The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</pre>
eaLnBrk (East Asian Line Break)	<p>Specifies whether an East Asian word can be broken in half and wrapped onto the next line without a hyphen being added. To determine whether an East Asian word can be broken the presentation application would use the kinsoku settings here. This attribute is to be used specifically when there is a word that cannot be broken into multiple pieces without a hyphen. That is it is not present within the existence of normal breakable East Asian words but is when a special case word arises that should not be broken for a line break. If this attribute is omitted, then a value of 1 or true is implied.</p> <p>[Example: Consider the case where the presentation contains a long word that must not be divided with a line break. Instead it should be placed, in whole on a new line so that it can fit. The picture below shows a normal paragraph where a long word has been broken for a line break. The second picture shown below shows that same paragraph with the</p>

Attributes	Description
	<p>long word specified to not allow a line break. The resulting DrawingML is as follows.</p> <pre> <p:txBody> ... <a:p> <a:pPr eaLnBrk="0" .../> ... <a:t>Sample text (Long word)</a:t> ... </a:p> </p:txBody> </pre> <p>Sample text Sample text Sample text supercalifr agilisticxpialidocious</p> <p>Sample text Sample text Sample text supercalifragilisticxpialidocious</p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fontAlgn (Font Alignment)	<p>Determines where vertically on a line of text the actual words are positioned. This deals with vertical placement of the characters with respect to the baselines. For instance having text anchored to the top baseline, anchored to the bottom baseline, centered in between, etc. To understand this attribute and it's use it is helpful to understand what baselines are. A diagram describing these different cases is shown below. If this attribute is omitted, then a value of base is implied.</p> <p>[Example: Consider the case where the user wishes to represent the chemical compound of a water molecule. For this they need to make sure the H, the 2, and the O are all in the correct position and are of the correct size. The results below can be achieved through the DrawingML shown below.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> H^2O <p>fontAlgn="t"</p> </div> <div style="text-align: center;"> H^2O <p>fontAlgn="ctr"</p> </div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-start; margin-top: 20px;"> <div style="text-align: center;"> H_2O <p>fontAlgn="base"</p> </div> <div style="text-align: center;"> H_2O <p>fontAlgn="b"</p> </div> </div>

Attributes	Description
	<pre> <a:txtBody> ... <a:pPr fontAlign="b" .../> ... <a:r> <a:rPr .../> <a:t>H </a:t> </a:r> <a:r> <a:rPr sz="1200" .../> <a:t>2</a:t> </a:r> <a:r> <a:rPr .../> <a:t>0</a:t> </a:r> ... </p:txBody> end example] </pre> <p>The possible values for this attribute are defined by the ST_TextFontAlignType simple type (§20.1.10.65).</p>
hangingPunct (Hanging Punctuation)	<p>Specifies whether punctuation is to be forcefully laid out on a line of text or put on a different line of text. That is, if there is punctuation at the end of a run of text that should be carried over to a separate line does it actually get carried over. A true value allows for hanging punctuation forcing the punctuation to not be carried over and a value of false allows the punctuation to be carried onto the next text line. If this attribute is omitted, then a value of 0, or false is implied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
indent (Indent)	<p>Specifies the indent size that is applied to the first line of text in the paragraph. An indentation of 0 is considered to be at the same location as marL attribute. If this attribute is omitted, then a value of -342900 is implied.</p>

Attributes	Description
	<p>Here is some text Sample text Sample text Sample text Sample text text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text</p> <p>[<i>Example:</i> Consider the scenario where the user now wanted to add a paragraph indentation to the first line of text in their two column format book.</p> <pre><p:txBody> <a:bodyPr numCol="2" spcCol="914400".../> <a:normAutofit/> </a:bodyPr> ... <a:p> <a:pPr marL="0" indent="571500" algn="just"> <a:buNone/> </a:pPr> ... <a:t>Here is some...</a:t> ... </a:p> </p:txBody></pre> <p>By adding the indent attribute the user has effectively added a first line indent to this paragraph of text. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TextIndent simple type (§20.1.10.69).</p>
latinLnBrk (Latin Line Break)	<p>Specifies whether a Latin word can be broken in half and wrapped onto the next line without a hyphen being added. This attribute is to be used specifically when there is a word that cannot be broken into multiple pieces without a hyphen. It is not present within the existence of normal breakable Latin words but is when a special case word arises that should not be broken for a line break. If this attribute is omitted, then a value of 1 or true is implied.</p> <p>[<i>Example:</i> Consider the case where the presentation contains a long word that must not be divided with a line break. Instead it should be placed, in whole on a new line so that it can fit. The picture below shows a normal paragraph where a long word has been broken</p>

Attributes	Description
	<p>for a line break. The second picture shown below shows that same paragraph with the long word specified to not allow a line break. The resulting DrawingML is as follows.</p> <pre> <p:txBody> ... <a:p> <a:pPr latinLnBrk="0" .../> ... <a:t>Sample text (Long word)</a:t> ... </a:p> </p:txBody> </pre> <p>Sample text Sample text Sample text supercalifr agilisticxpialidocious</p> <p>Sample text Sample text Sample text supercalifragilisticxpialidocious</p> <p style="text-align: right;"><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
lvl (Level)	<p>Specifies the particular level text properties that this paragraph follows. The value for this attribute is numerical and formats the text according to the corresponding level paragraph properties that are listed within the lStStyle element. Since there are nine separate level properties defined, this tag has an effective range of 0-8 = 9 available values.</p> <p>[Example: Consider the following DrawingML. This would specify that this paragraph should follow the lvl2pPr formatting style because once again lvl="1" is considered to be level 2.</p> <pre> <p:txBody> ... <a:p> <a:pPr lvl="1" .../> ... <a:t>Sample text</a:t> ... </a:p> </p:txBody> </pre> <p><i>end example]</i></p> <p>[Note: To resolve conflicting paragraph properties the linear hierarchy of paragraph properties should be examined starting first with the pPr element. The rule here is that</p>

Attributes	Description
	<p>properties that are defined at a level closer to the actual text should take precedence. That is if there is a conflicting property between the pPr and lvl1pPr elements then the pPr property should take precedence because in the property hierarchy it is closer to the actual text being represented. <i>end note</i></p> <p>The possible values for this attribute are defined by the ST_TextIndentLevelType simple type (§20.1.10.70).</p>
marL (Left Margin)	<p>Specifies the left margin of the paragraph. This is specified in addition to the text body inset and applies only to this text paragraph. That is the text body inset and the marL attributes are additive with respect to the text position. If this attribute is omitted, then a value of 347663 is implied.</p> <p>The possible values for this attribute are defined by the ST_TextMargin simple type (§20.1.10.71).</p>
marR (Right Margin)	<p>Specifies the right margin of the paragraph. This is specified in addition to the text body inset and applies only to this text paragraph. That is the text body inset and the marR attributes are additive with respect to the text position. If this attribute is omitted, then a value of 0 is implied.</p> <p>The possible values for this attribute are defined by the ST_TextMargin simple type (§20.1.10.71).</p>
rtl (Right To Left)	<p>Specifies whether the text is right-to-left or left-to-right in its flow direction. If this attribute is omitted, then a value of 0, or left-to-right is implied.</p> <p>[Example: Consider the following example of a text body with two lines of text. In this example, both lines contain English and Arabic text, however, the second line has the rtl attribute set to true whereas the first line does not set the rtl attribute.</p> <div style="text-align: center;"> <p>Test تجربة ← rtl = 0</p> <p>تجربةTest ← rtl = 1</p> </div> <pre> <p:txBody> ... <a:p> <a:r> <a:t>Test </a:t> </a:r> <a:r> <a:rPr> <a:rtl w:val="1"/> </a:rPr> <a:t>تجربة</a:t> </a:r> </pre>

Attributes	Description
	<pre> </a:p> <a:p> <a:pPr rtl="1"/> <a:r> <a:rPr> <a:rtl w:val="0"/> </a:rPr> <a:t>Test </a:t> </a:r> <a:r> <a:t>تجربة</a:t> </a:r> </a:p> </p:txBody> </pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TextParagraphProperties](#)) is located in §A.4.1. *end note*]

21.1.2.4.19 lvl7pPr (List Level 7 Text Style)

This element specifies all paragraph level text properties for all elements that have the attribute `lvl="6"`. There are a total of 9 level text property elements allowed, levels 0-8. It is recommended that the order in which this and other level property elements are specified be in order of increasing level. That is `lvl2pPr` should come before `lvl3pPr`. This allows the lower level properties to take precedence over the higher level ones because they are parsed first.

[Example: Consider the following DrawingML code that would specify a paragraph to follow the level style defined in `lvl7pPr` and thus create a paragraph of text that has no bullets and is right aligned.

```

<p:txBody>
...
<a:lstStyle>
  <a:lvl7pPr algn="r">
    <a:buNone/>
  </a:lvl7pPr>
</a:lstStyle>

```

```
<a:p>
  <a:pPr lvl="6">
    </a:pPr>
    ...
    <a:t>Some text</a:t>
    ...
  </a:p>
</p:txBody>
```

end example]

[*Note:* To resolve conflicting paragraph properties the linear hierarchy of paragraph properties should be examined starting first with the pPr element. The rule here is that properties that are defined at a level closer to the actual text should take precedence. That is if there is a conflicting property between the pPr and lvl1pPr elements then the pPr property should take precedence because in the property hierarchy it is closer to the actual text being represented. *end note*]

Attributes	Description
align (Alignment)	<p>Specifies the alignment that is to be applied to the paragraph. Possible values for this include left, right, centered, justified and distributed. If this attribute is omitted, then a value of left is implied.</p> <div><div>Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text</div><div>Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text</div></div> <hr/> <p>[<i>Example:</i> Consider the case where the user wishes to have two columns of text that have a justified alignment, much like text within a book. The following DrawingML could describe this.</p> <pre><p:txBody> <a:bodyPr numCol="2" spcCol="914400".../> <a:normAutofit/> </a:bodyPr> ... <a:p> <a:pPr marL="0" align="just"></pre>

Attributes	Description
	<pre> <a:buNone/> </a:pPr> ... <a:t>Sample Text ...</a:t> ... </a:p> </p:txBody> end example] The possible values for this attribute are defined by the ST_TextAlignType simple type (§20.1.10.58).</pre>
defTabSz (Default Tab Size)	<p>Specifies the default size for a tab character within this paragraph. This attribute should be used to describe the spacing of tabs within the paragraph instead of a leading indentation tab. For indentation tabs there are the marL and indent attributes to assist with this.</p> <p>[Example: Consider the case where a paragraph contains numerous tabs that need to be of a specific size. The following DrawingML would describe this.</p> <pre> <p:txBody> ... <a:p> <a:pPr defTabSz="376300" .../> ... <a:t>Sample Text ...</a:t> ... </a:p> </p:txBody> end example] The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</pre>
eaLnBrk (East Asian Line Break)	<p>Specifies whether an East Asian word can be broken in half and wrapped onto the next line without a hyphen being added. To determine whether an East Asian word can be broken the presentation application would use the kinsoku settings here. This attribute is to be used specifically when there is a word that cannot be broken into multiple pieces without a hyphen. That is it is not present within the existence of normal breakable East Asian words but is when a special case word arises that should not be broken for a line break. If this attribute is omitted, then a value of 1 or true is implied.</p> <p>[Example: Consider the case where the presentation contains a long word that must not be divided with a line break. Instead it should be placed, in whole on a new line so that it can fit. The picture below shows a normal paragraph where a long word has been broken for a line break. The second picture shown below shows that same paragraph with the</p>

Attributes	Description
	<p>long word specified to not allow a line break. The resulting DrawingML is as follows.</p> <pre><p:txBody> ... <a:p> <a:pPr eaLnBrk="0" .../> ... <a:t>Sample text (Long word)</a:t> ... </a:p> </p:txBody></pre> <p>Sample text Sample text Sample text supercalifr agilisticxpialidocious</p> <p>Sample text Sample text Sample text supercalifragilisticxpialidocious</p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fontAlgn (Font Alignment)	<p>Determines where vertically on a line of text the actual words are positioned. This deals with vertical placement of the characters with respect to the baselines. For instance having text anchored to the top baseline, anchored to the bottom baseline, centered in between, etc. To understand this attribute and it's use it is helpful to understand what baselines are. A diagram describing these different cases is shown below. If this attribute is omitted, then a value of base is implied.</p> <p>[Example: Consider the case where the user wishes to represent the chemical compound of a water molecule. For this they need to make sure the H, the 2, and the O are all in the correct position and are of the correct size. The results below can be achieved through the DrawingML shown below.</p> <div><div>H^2O<p>fontAlgn="t"</p></div><div>H^2O<p>fontAlgn="ctr"</p></div><div>H_2O<p>fontAlgn="base"</p></div><div>H_2O<p>fontAlgn="b"</p></div></div>

Attributes	Description
	<pre> <a:txtBody> ... <a:pPr fontAlign="b" .../> ... <a:r> <a:rPr .../> <a:t>H </a:t> </a:r> <a:r> <a:rPr sz="1200" .../> <a:t>2</a:t> </a:r> <a:r> <a:rPr .../> <a:t>0</a:t> </a:r> ... </p:txBody> end example] </pre> <p>The possible values for this attribute are defined by the ST_TextFontAlignType simple type (§20.1.10.65).</p>
hangingPunct (Hanging Punctuation)	<p>Specifies whether punctuation is to be forcefully laid out on a line of text or put on a different line of text. That is, if there is punctuation at the end of a run of text that should be carried over to a separate line does it actually get carried over. A true value allows for hanging punctuation forcing the punctuation to not be carried over and a value of false allows the punctuation to be carried onto the next text line. If this attribute is omitted, then a value of 0, or false is implied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
indent (Indent)	<p>Specifies the indent size that is applied to the first line of text in the paragraph. An indentation of 0 is considered to be at the same location as marL attribute. If this attribute is omitted, then a value of -342900 is implied.</p>

Attributes	Description
	<div data-bbox="451 289 974 667"> <pre> Here is some text Sample text Sample text Sample Sample text Sample text Sample text text Sample text Sample text Sample Sample text Sample text Sample text text Sample text Sample text Sample Sample text text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text </pre> </div> <p data-bbox="418 726 1370 793">[<i>Example:</i> Consider the scenario where the user now wanted to add a paragraph indentation to the first line of text in their two column format book.</p> <pre data-bbox="451 835 1224 1310"> <p:txBody> <a:bodyPr numCol="2" spcCol="914400".../> <a:normAutofit/> </a:bodyPr> ... <a:p> <a:pPr marL="0" indent="571500" algn="just"> <a:buNone/> </a:pPr> ... <a:t>Here is some...</a:t> ... </a:p> </p:txBody> </pre> <p data-bbox="418 1348 1429 1415">By adding the indent attribute the user has effectively added a first line indent to this paragraph of text. <i>end example]</i></p> <p data-bbox="418 1453 1403 1520">The possible values for this attribute are defined by the ST_TextIndent simple type (§20.1.10.69).</p>
latinLnBrk (Latin Line Break)	<p data-bbox="418 1537 1468 1747">Specifies whether a Latin word can be broken in half and wrapped onto the next line without a hyphen being added. This attribute is to be used specifically when there is a word that cannot be broken into multiple pieces without a hyphen. It is not present within the existence of normal breakable Latin words but is when a special case word arises that should not be broken for a line break. If this attribute is omitted, then a value of 1 or true is implied.</p> <p data-bbox="418 1785 1468 1890">[<i>Example:</i> Consider the case where the presentation contains a long word that must not be divided with a line break. Instead it should be placed, in whole on a new line so that it can fit. The picture below shows a normal paragraph where a long word has been broken</p>

Attributes	Description
	<p>for a line break. The second picture shown below shows that same paragraph with the long word specified to not allow a line break. The resulting DrawingML is as follows.</p> <pre> <p:txBody> ... <a:p> <a:pPr latinLnBrk="0" .../> ... <a:t>Sample text (Long word)</a:t> ... </a:p> </p:txBody> </pre> <p>Sample text Sample text Sample text supercalifr agilisticxpialidocious</p> <p>Sample text Sample text Sample text supercalifragilisticxpialidocious</p> <p style="text-align: right;"><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
lvl (Level)	<p>Specifies the particular level text properties that this paragraph follows. The value for this attribute is numerical and formats the text according to the corresponding level paragraph properties that are listed within the lStStyle element. Since there are nine separate level properties defined, this tag has an effective range of 0-8 = 9 available values.</p> <p>[Example: Consider the following DrawingML. This would specify that this paragraph should follow the lvl2pPr formatting style because once again lvl="1" is considered to be level 2.</p> <pre> <p:txBody> ... <a:p> <a:pPr lvl="1" .../> ... <a:t>Sample text</a:t> ... </a:p> </p:txBody> </pre> <p><i>end example]</i></p> <p>[Note: To resolve conflicting paragraph properties the linear hierarchy of paragraph properties should be examined starting first with the pPr element. The rule here is that</p>

Attributes	Description
	<p>properties that are defined at a level closer to the actual text should take precedence. That is if there is a conflicting property between the pPr and lvl1pPr elements then the pPr property should take precedence because in the property hierarchy it is closer to the actual text being represented. <i>end note</i></p> <p>The possible values for this attribute are defined by the ST_TextIndentLevelType simple type (§20.1.10.70).</p>
marL (Left Margin)	<p>Specifies the left margin of the paragraph. This is specified in addition to the text body inset and applies only to this text paragraph. That is the text body inset and the marL attributes are additive with respect to the text position. If this attribute is omitted, then a value of 347663 is implied.</p> <p>The possible values for this attribute are defined by the ST_TextMargin simple type (§20.1.10.71).</p>
marR (Right Margin)	<p>Specifies the right margin of the paragraph. This is specified in addition to the text body inset and applies only to this text paragraph. That is the text body inset and the marR attributes are additive with respect to the text position. If this attribute is omitted, then a value of 0 is implied.</p> <p>The possible values for this attribute are defined by the ST_TextMargin simple type (§20.1.10.71).</p>
rtl (Right To Left)	<p>Specifies whether the text is right-to-left or left-to-right in its flow direction. If this attribute is omitted, then a value of 0, or left-to-right is implied.</p> <p>[Example: Consider the following example of a text body with two lines of text. In this example, both lines contain English and Arabic text, however, the second line has the rtl attribute set to true whereas the first line does not set the rtl attribute.</p> <div style="text-align: center;"> <p>Test تجربة ← rtl = 0</p> <p>تجربةTest ← rtl = 1</p> </div> <pre> <p:txBody> ... <a:p> <a:r> <a:t>Test </a:t> </a:r> <a:r> <a:rPr> <a:rtl w:val="1"/> </a:rPr> <a:t>تجربة</a:t> </a:r> </pre>

Attributes	Description
	<pre> </a:p> <a:p> <a:pPr rtl="1"/> <a:r> <a:rPr> <a:rtl w:val="0"/> </a:rPr> <a:t>Test </a:t> </a:r> <a:r> <a:t>تجربة</a:t> </a:r> </a:p> </p:txBody> end example] The possible values for this attribute are defined by the W3C XML Schema boolean datatype. </pre>

[Note: The W3C XML Schema definition of this element's content model ([CT_TextParagraphProperties](#)) is located in §A.4.1. *end note*]

21.1.2.4.20 `lvl8pPr` (List Level 8 Text Style)

This element specifies all paragraph level text properties for all elements that have the attribute `lvl="7"`. There are a total of 9 level text property elements allowed, levels 0-8. It is recommended that the order in which this and other level property elements are specified be in order of increasing level. That is `lvl2pPr` should come before `lvl3pPr`. This allows the lower level properties to take precedence over the higher level ones because they are parsed first.

[Example: Consider the following DrawingML code that would specify a paragraph to follow the level style defined in `lvl8pPr` and thus create a paragraph of text that has no bullets and is right aligned.

```

<p:txBody>
...
<a:lstStyle>
  <a:lvl8pPr algn="r">
    <a:buNone/>
  </a:lvl8pPr>
</a:lstStyle>
<a:p>
  <a:pPr lvl="7">
    </a:pPr>
  ...

```

```
<a:t>Some text</a:t>
...
</a:p>
</p:txBody>
```

end example]

[*Note:* To resolve conflicting paragraph properties the linear hierarchy of paragraph properties should be examined starting first with the pPr element. The rule here is that properties that are defined at a level closer to the actual text should take precedence. That is if there is a conflicting property between the pPr and lvl1pPr elements then the pPr property should take precedence because in the property hierarchy it is closer to the actual text being represented. *end note]*

Attributes	Description
align (Alignment)	<p>Specifies the alignment that is to be applied to the paragraph. Possible values for this include left, right, centered, justified and distributed. If this attribute is omitted, then a value of left is implied.</p> <div><div>Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text</div><div>Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text</div></div> <hr/> <p>[<i>Example:</i> Consider the case where the user wishes to have two columns of text that have a justified alignment, much like text within a book. The following DrawingML could describe this.</p> <pre><p:txBody> <a:bodyPr numCol="2" spcCol="914400"../> <a:normAutofit/> </a:bodyPr> ... <a:p> <a:pPr marL="0" align="just"> <a:buNone/> </a:pPr> ... <a:t>Sample Text ...</a:t></pre>

Attributes	Description
	<pre> ... </a:p> </p:txBody> end example] The possible values for this attribute are defined by the ST_TextAlignType simple type (§20.1.10.58).</pre>
defTabSz (Default Tab Size)	<p>Specifies the default size for a tab character within this paragraph. This attribute should be used to describe the spacing of tabs within the paragraph instead of a leading indentation tab. For indentation tabs there are the marL and indent attributes to assist with this.</p> <p>[<i>Example:</i> Consider the case where a paragraph contains numerous tabs that need to be of a specific size. The following DrawingML would describe this.</p> <pre> <p:txBody> ... <a:p> <a:pPr defTabSz="376300" .../> ... <a:t>Sample Text ...</a:t> ... </a:p> </p:txBody> end example] The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</pre>
eaLnBrk (East Asian Line Break)	<p>Specifies whether an East Asian word can be broken in half and wrapped onto the next line without a hyphen being added. To determine whether an East Asian word can be broken the presentation application would use the kinsoku settings here. This attribute is to be used specifically when there is a word that cannot be broken into multiple pieces without a hyphen. That is it is not present within the existence of normal breakable East Asian words but is when a special case word arises that should not be broken for a line break. If this attribute is omitted, then a value of 1 or true is implied.</p> <p>[<i>Example:</i> Consider the case where the presentation contains a long word that must not be divided with a line break. Instead it should be placed, in whole on a new line so that it can fit. The picture below shows a normal paragraph where a long word has been broken for a line break. The second picture shown below shows that same paragraph with the long word specified to not allow a line break. The resulting DrawingML is as follows.</p> <pre> <p:txBody> ...</pre>

Attributes	Description
	<pre> <a:p> <a:pPr eaLnBrk="0" .../> ... <a:t>Sample text (Long word)</a:t> ... </a:p> </p:txBody> </pre> <p>Sample text Sample text Sample text supercalifr agilisticxpialidocious</p> <p>Sample text Sample text Sample text supercalifragilisticxpialidocious</p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fontAlgn (Font Alignment)	<p>Determines where vertically on a line of text the actual words are positioned. This deals with vertical placement of the characters with respect to the baselines. For instance having text anchored to the top baseline, anchored to the bottom baseline, centered in between, etc. To understand this attribute and it's use it is helpful to understand what baselines are. A diagram describing these different cases is shown below. If this attribute is omitted, then a value of base is implied.</p> <p>[Example: Consider the case where the user wishes to represent the chemical compound of a water molecule. For this they need to make sure the H, the 2, and the O are all in the correct position and are of the correct size. The results below can be achieved through the DrawingML shown below.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"> H^2O <p>fontAlgn="t"</p> </div> <div style="text-align: center;"> H^2O <p>fontAlgn="ctr"</p> </div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-end; margin-top: 20px;"> <div style="text-align: center;"> H_2O <p>fontAlgn="base"</p> </div> <div style="text-align: center;"> H_2O <p>fontAlgn="b"</p> </div> </div> <pre> <a:txtBody> ... <a:pPr fontAlgn="b" .../> </pre>

Attributes	Description
	<pre> ... <a:r> <a:rPr .../> <a:t>H </a:t> </a:r> <a:r> <a:rPr sz="1200" .../> <a:t>2</a:t> </a:r> <a:r> <a:rPr .../> <a:t>0</a:t> </a:r> ... </p:txBody> end example] </pre> <p>The possible values for this attribute are defined by the ST_TextFontAlignType simple type (§20.1.10.65).</p>
hangingPunct (Hanging Punctuation)	<p>Specifies whether punctuation is to be forcefully laid out on a line of text or put on a different line of text. That is, if there is punctuation at the end of a run of text that should be carried over to a separate line does it actually get carried over. A true value allows for hanging punctuation forcing the punctuation to not be carried over and a value of false allows the punctuation to be carried onto the next text line. If this attribute is omitted, then a value of 0, or false is implied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
indent (Indent)	<p>Specifies the indent size that is applied to the first line of text in the paragraph. An indentation of 0 is considered to be at the same location as marL attribute. If this attribute is omitted, then a value of -342900 is implied.</p> <div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div style="width: 45%;"> <p>Here is some</p> <p>Sample text Sample</p> <p>text Sample text</p> <p>Sample text Sample</p> <p>text Sample text</p> <p>Sample text Sample</p> <p>text Sample text</p> <p>Sample text Sample</p> <p>text Sample text</p> <p>Sample text Sample</p> <p>text Sample text</p> <p>Sample text Sample</p> </div> <div style="width: 45%;"> <p>text Sample text</p> <p>Sample text Sample</p> <p>text Sample text</p> <p>Sample text Sample</p> <p>text Sample text</p> <p>Sample text</p> </div> </div>

Attributes	Description
	<p>[<i>Example:</i> Consider the scenario where the user now wanted to add a paragraph indentation to the first line of text in their two column format book.</p> <pre> <p:txBody> <a:bodyPr numCol="2" spcCol="914400" .../> <a:normAutofit/> </a:bodyPr> ... <a:p> <a:pPr marL="0" indent="571500" algn="just"> <a:buNone/> </a:pPr> ... <a:t>Here is some...</a:t> ... </a:p> </p:txBody> </pre> <p>By adding the indent attribute the user has effectively added a first line indent to this paragraph of text. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_TextIndent simple type (§20.1.10.69).</p>
latinLnBrk (Latin Line Break)	<p>Specifies whether a Latin word can be broken in half and wrapped onto the next line without a hyphen being added. This attribute is to be used specifically when there is a word that cannot be broken into multiple pieces without a hyphen. It is not present within the existence of normal breakable Latin words but is when a special case word arises that should not be broken for a line break. If this attribute is omitted, then a value of 1 or true is implied.</p> <p>[<i>Example:</i> Consider the case where the presentation contains a long word that must not be divided with a line break. Instead it should be placed, in whole on a new line so that it can fit. The picture below shows a normal paragraph where a long word has been broken for a line break. The second picture shown below shows that same paragraph with the long word specified to not allow a line break. The resulting DrawingML is as follows.</p> <pre> <p:txBody> ... <a:p> <a:pPr latinLnBrk="0" .../> ... <a:t>Sample text (Long word)</a:t> ... </a:p> </p:txBody> </pre>

Attributes	Description
	<p>Sample text Sample text Sample text supercalifr agilisticxpialidocious</p> <p>Sample text Sample text Sample text supercalifragilisticxpialidocious</p> <p style="text-align: right;"><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
lvl (Level)	<p>Specifies the particular level text properties that this paragraph follows. The value for this attribute is numerical and formats the text according to the corresponding level paragraph properties that are listed within the <code>lstStyle</code> element. Since there are nine separate level properties defined, this tag has an effective range of 0-8 = 9 available values.</p> <p>[<i>Example:</i> Consider the following DrawingML. This would specify that this paragraph should follow the <code>lvl2pPr</code> formatting style because once again <code>lvl="1"</code> is considered to be level 2.</p> <pre> <p:txBody> ... <a:p> <a:pPr lvl="1" .../> ... <a:t>Sample text</a:t> ... </a:p> </p:txBody> </pre> <p><i>end example]</i></p> <p>[<i>Note:</i> To resolve conflicting paragraph properties the linear hierarchy of paragraph properties should be examined starting first with the <code>pPr</code> element. The rule here is that properties that are defined at a level closer to the actual text should take precedence. That is if there is a conflicting property between the <code>pPr</code> and <code>lvl1pPr</code> elements then the <code>pPr</code> property should take precedence because in the property hierarchy it is closer to the actual text being represented. <i>end note]</i></p> <p>The possible values for this attribute are defined by the <code>ST_TextIndentLevelType</code> simple type (§20.1.10.70).</p>
marL (Left Margin)	<p>Specifies the left margin of the paragraph. This is specified in addition to the text body inset and applies only to this text paragraph. That is the text body inset and the <code>marL</code> attributes are additive with respect to the text position. If this attribute is omitted, then a value of 347663 is implied.</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_TextMargin simple type (§20.1.10.71).
marR (Right Margin)	<p>Specifies the right margin of the paragraph. This is specified in addition to the text body inset and applies only to this text paragraph. That is the text body inset and the marR attributes are additive with respect to the text position. If this attribute is omitted, then a value of 0 is implied.</p> <p>The possible values for this attribute are defined by the ST_TextMargin simple type (§20.1.10.71).</p>
rtl (Right To Left)	<p>Specifies whether the text is right-to-left or left-to-right in its flow direction. If this attribute is omitted, then a value of 0, or left-to-right is implied.</p> <p>[Example: Consider the following example of a text body with two lines of text. In this example, both lines contain English and Arabic text, however, the second line has the rtl attribute set to true whereas the first line does not set the rtl attribute.</p> <div style="text-align: right; margin-top: 10px;"> <p>Test تجربة ← rtl = 0</p> <p>تجربةTest ← rtl = 1</p> </div> <pre> <p:txBody> ... <a:p> <a:r> <a:t>Test </a:t> </a:r> <a:r> <a:rPr> <a:rtl w:val="1"/> </a:rPr> <a:t>تجربة</a:t> </a:r> </a:p> <a:p> <a:pPr rtl="1"/> <a:r> <a:rPr> <a:rtl w:val="0"/> </a:rPr> <a:t>Test </a:t> </a:r> <a:r> <a:t>تجربة</a:t> </a:r> </a:p> </pre>

Attributes	Description
	<p data-bbox="456 247 630 281"></p:txBody></p> <p data-bbox="415 317 574 350"><i>end example]</i></p> <p data-bbox="415 388 1398 457">The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TextParagraphProperties](#)) is located in §A.4.1. *end note*]

21.1.2.4.21 `lvl9pPr` (List Level 9 Text Style)

This element specifies all paragraph level text properties for all elements that have the attribute `lvl="8"`. There are a total of 9 level text property elements allowed, levels 0-8. It is recommended that the order in which this and other level property elements are specified be in order of increasing level. That is `lvl2pPr` should come before `lvl3pPr`. This allows the lower level properties to take precedence over the higher level ones because they are parsed first.

[Example: Consider the following DrawingML code that would specify a paragraph to follow the level style defined in `lvl9pPr` and thus create a paragraph of text that has no bullets and is right aligned.

```
<p:txBody>
...
<a:lstStyle>
  <a:lvl9pPr align="r">
    <a:buNone/>
  </a:lvl9pPr>
</a:lstStyle>
<a:p>
  <a:pPr lvl="8">
    </a:pPr>
  ...
  <a:t>Some text</a:t>
  ...
</a:p>
</p:txBody>
```

end example]

[Note: To resolve conflicting paragraph properties the linear hierarchy of paragraph properties should be examined starting first with the `pPr` element. The rule here is that properties that are defined at a level closer to the actual text should take precedence. That is if there is a conflicting property between the `pPr` and `lvl1pPr`

elements then the pPr property should take precedence because in the property hierarchy it is closer to the actual text being represented. *end note*]

Attributes	Description
algn (Alignment)	<p>Specifies the alignment that is to be applied to the paragraph. Possible values for this include left, right, centered, justified and distributed. If this attribute is omitted, then a value of left is implied.</p> <div><div>Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text</div><div>Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text</div></div> <p>[<i>Example:</i> Consider the case where the user wishes to have two columns of text that have a justified alignment, much like text within a book. The following DrawingML could describe this.</p> <pre><p:txBody> <a:bodyPr numCol="2" spcCol="914400".../> <a:normAutofit/> </a:bodyPr> ... <a:p> <a:pPr marL="0" algn="just"> <a:buNone/> </a:pPr> ... <a:t>Sample Text ...</a:t> ... </a:p> </p:txBody></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TextAlignType simple type (§20.1.10.58).</p>
defTabSz (Default Tab Size)	<p>Specifies the default size for a tab character within this paragraph. This attribute should be used to describe the spacing of tabs within the paragraph instead of a leading indentation tab. For indentation tabs there are the marL and indent attributes to assist</p>


Attributes	Description
	<p>with this.</p> <p>[<i>Example:</i> Consider the case where a paragraph contains numerous tabs that need to be of a specific size. The following DrawingML would describe this.</p> <pre><p:txBody> ... <a:p> <a:pPr defTabSz="376300" .../> ... <a:t>Sample Text ...</a:t> ... </a:p> </p:txBody></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</p>
eaLnBrk (East Asian Line Break)	<p>Specifies whether an East Asian word can be broken in half and wrapped onto the next line without a hyphen being added. To determine whether an East Asian word can be broken the presentation application would use the kinsoku settings here. This attribute is to be used specifically when there is a word that cannot be broken into multiple pieces without a hyphen. That is it is not present within the existence of normal breakable East Asian words but is when a special case word arises that should not be broken for a line break. If this attribute is omitted, then a value of 1 or true is implied.</p> <p>[<i>Example:</i> Consider the case where the presentation contains a long word that must not be divided with a line break. Instead it should be placed, in whole on a new line so that it can fit. The picture below shows a normal paragraph where a long word has been broken for a line break. The second picture shown below shows that same paragraph with the long word specified to not allow a line break. The resulting DrawingML is as follows.</p> <pre><p:txBody> ... <a:p> <a:pPr eaLnBrk="0" .../> ... <a:t>Sample text (Long word)</a:t> ... </a:p> </p:txBody></pre> <p>Sample text Sample text Sample text supercalifr agilisticxpialidocious</p>

Attributes	Description
	<p>Sample text Sample text Sample text supercalifragilisticexpialidocious</p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fontAlgn (Font Alignment)	<p>Determines where vertically on a line of text the actual words are positioned. This deals with vertical placement of the characters with respect to the baselines. For instance having text anchored to the top baseline, anchored to the bottom baseline, centered in between, etc. To understand this attribute and it's use it is helpful to understand what baselines are. A diagram describing these different cases is shown below. If this attribute is omitted, then a value of base is implied.</p> <p>[Example: Consider the case where the user wishes to represent the chemical compound of a water molecule. For this they need to make sure the H, the 2, and the O are all in the correct position and are of the correct size. The results below can be achieved through the DrawingML shown below.</p> <div><div>H^2O<p>fontAlgn="t"</p></div><div>H^2O<p>fontAlgn="ctr"</p></div><div>H_2O<p>fontAlgn="base"</p></div><div>H_2O<p>fontAlgn="b"</p></div></div> <pre><a:txtBody> ... <a:pPr fontAlgn="b" .../> ... <a:r> <a:rPr .../> <a:t>H </a:t> </a:r> <a:r> <a:rPr sz="1200" .../> <a:t>2</a:t> </a:r> <a:r> <a:rPr .../> <a:t>O</a:t></pre>

Attributes	Description
	<pre> </a:r> ... </p:txBody> end example] The possible values for this attribute are defined by the ST_TextFontAlignType simple type (§20.1.10.65). </pre>
hangingPunct (Hanging Punctuation)	<p>Specifies whether punctuation is to be forcefully laid out on a line of text or put on a different line of text. That is, if there is punctuation at the end of a run of text that should be carried over to a separate line does it actually get carried over. A true value allows for hanging punctuation forcing the punctuation to not be carried over and a value of false allows the punctuation to be carried onto the next text line. If this attribute is omitted, then a value of 0, or false is implied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
indent (Indent)	<p>Specifies the indent size that is applied to the first line of text in the paragraph. An indentation of 0 is considered to be at the same location as marL attribute. If this attribute is omitted, then a value of -342900 is implied.</p> <div data-bbox="446 1058 974 1432"> <pre> Here is some text Sample text Sample text Sample Sample text Sample text Sample text text Sample text Sample text Sample Sample text Sample text Sample text text Sample text Sample text Sample Sample text text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample text Sample </pre> </div> <p>[Example: Consider the scenario where the user now wanted to add a paragraph indentation to the first line of text in their two column format book.</p> <pre> <p:txBody> <a:bodyPr numCol="2" spcCol="914400".../> <a:normAutofit/> </a:bodyPr> ... <a:p> <a:pPr marL="0" indent="571500" algn="just"> <a:buNone/> </pre>

Attributes	Description
	<pre> </a:pPr> ... <a:t>Here is some...</a:t> ... </a:p> </p:txBody> </pre> <p>By adding the indent attribute the user has effectively added a first line indent to this paragraph of text. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_TextIndent simple type (§20.1.10.69).</p>
latinLnBrk (Latin Line Break)	<p>Specifies whether a Latin word can be broken in half and wrapped onto the next line without a hyphen being added. This attribute is to be used specifically when there is a word that cannot be broken into multiple pieces without a hyphen. It is not present within the existence of normal breakable Latin words but is when a special case word arises that should not be broken for a line break. If this attribute is omitted, then a value of 1 or true is implied.</p> <p>[<i>Example:</i> Consider the case where the presentation contains a long word that must not be divided with a line break. Instead it should be placed, in whole on a new line so that it can fit. The picture below shows a normal paragraph where a long word has been broken for a line break. The second picture shown below shows that same paragraph with the long word specified to not allow a line break. The resulting DrawingML is as follows.</p> <pre> <p:txBody> ... <a:p> <a:pPr latinLnBrk="0" .../> ... <a:t>Sample text (Long word)</a:t> ... </a:p> </p:txBody> </pre> <p>Sample text Sample text Sample text supercalifr agilisticxpialidocious</p> <p>Sample text Sample text Sample text supercalifragilisticxpialidocious</p> <p style="text-align: right;"><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
lvl (Level)	Specifies the particular level text properties that this paragraph follows. The value for this

Attributes	Description
	<p>attribute is numerical and formats the text according to the corresponding level paragraph properties that are listed within the <code>lstStyle</code> element. Since there are nine separate level properties defined, this tag has an effective range of 0-8 = 9 available values.</p> <p>[<i>Example:</i> Consider the following DrawingML. This would specify that this paragraph should follow the <code>lvl2pPr</code> formatting style because once again <code>lvl="1"</code> is considered to be level 2.</p> <pre> <p:txBody> ... <a:p> <a:pPr lvl="1" .../> ... <a:t>Sample text</a:t> ... </a:p> </p:txBody> </pre> <p><i>end example]</i></p> <p>[<i>Note:</i> To resolve conflicting paragraph properties the linear hierarchy of paragraph properties should be examined starting first with the <code>pPr</code> element. The rule here is that properties that are defined at a level closer to the actual text should take precedence. That is if there is a conflicting property between the <code>pPr</code> and <code>lvl1pPr</code> elements then the <code>pPr</code> property should take precedence because in the property hierarchy it is closer to the actual text being represented. <i>end note]</i></p> <p>The possible values for this attribute are defined by the <code>ST_TextIndentLevelType</code> simple type (§20.1.10.70).</p>
marL (Left Margin)	<p>Specifies the left margin of the paragraph. This is specified in addition to the text body inset and applies only to this text paragraph. That is the text body inset and the <code>marL</code> attributes are additive with respect to the text position. If this attribute is omitted, then a value of 347663 is implied.</p> <p>The possible values for this attribute are defined by the <code>ST_TextMargin</code> simple type (§20.1.10.71).</p>
marR (Right Margin)	<p>Specifies the right margin of the paragraph. This is specified in addition to the text body inset and applies only to this text paragraph. That is the text body inset and the <code>marR</code> attributes are additive with respect to the text position. If this attribute is omitted, then a value of 0 is implied.</p> <p>The possible values for this attribute are defined by the <code>ST_TextMargin</code> simple type (§20.1.10.71).</p>
rtl (Right To Left)	<p>Specifies whether the text is right-to-left or left-to-right in its flow direction. If this</p>

Attributes	Description
	<p>attribute is omitted, then a value of 0, or left-to-right is implied.</p> <p>[Example: Consider the following example of a text body with two lines of text. In this example, both lines contain English and Arabic text, however, the second line has the <code>rtl</code> attribute set to true whereas the first line does not set the <code>rtl</code> attribute.</p> <p>  </p> <pre> <p:txBody> ... <a:p> <a:r> <a:t>Test </a:t> </a:r> <a:r> <a:rPr> <a:rtl w:val="1"/> </a:rPr> <a:t>تجربة</a:t> </a:r> </a:p> <a:p> <a:pPr rtl="1"/> <a:r> <a:rPr> <a:rtl w:val="0"/> </a:rPr> <a:t>Test </a:t> </a:r> <a:r> <a:t>تجربة</a:t> </a:r> </a:p> </p:txBody> </pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TextParagraphProperties](#)) is located in §A.4.1. *end note*]

21.1.2.5 Font Substitution

If any DrawingML element references a font and an appropriate format of the font is not stored within the document, the process of finding a suitable alternative font is known as *font substitution*.

The following elements specify font information: buFont@panose (§21.1.2.4.6); cs@panose (§21.1.2.3.1); ea@panose (§21.1.2.3.3); font@panose (§19.2.1.13); latin@panose (§21.1.2.3.7); sym@panose (§21.1.2.3.10).

The exact algorithm which is used for font substitution is highly dependent on the characteristics which are most desirable when performing the substitution: similar appearance of each glyph (to maximize visual familiarity), similar physical characteristics (to minimize changes in line height and breaking), etc. ECMA-376 recommends that applications look for the closest match to the following attribute values (in descending priority) in order to determine a suitable alternative font: panose, charset, pitchFamily, and typeface; however, applications are free to apply higher-order logic in its place.

21.1.3 Tables

This section contains information regarding the definition of a table within DrawingML. The following image is an example table within DrawingML.

text	text	text	text	text
text	text	text	text	text
text	text	text	text	text
text	text	text	text	text
text	text	text	text	text

21.1.3.1 cell3D (Cell 3-D)

This element specifies a set of properties which dictate the 3-D appearance of a given cell in a table.

Collectively, these properties are referred to as a cell 3-D. The application of these properties occurs on a per-cell basis in the table.

Attributes	Description
prstMaterial (Preset Material)	Specifies a material type which is used to define the material characteristics of the cell. The material properties, combined with the lighting characteristics of the scene in define the final look and feel of the 3-D appearance of the cell. The possible values for this attribute are defined by the ST_PresetMaterialType simple

Attributes	Description
	type (§20.1.10.49).

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_Cell3D](#)) is located in §A.4.1. *end note*]

21.1.3.2 [gridCol \(Table Grid Column\)](#)

This element specifies the width of a given column within a table. For each column in a table, there is an associated table grid column defining the width of the column.

[*Example*: Consider the following example of a table grid containing widths defined for three table grid columns:

```
<a:tblGrid>
  <a:gridCol w="1117600"/>
  <a:gridCol w="1117600"/>
  <a:gridCol w="1117600"/>
</a:tblGrid>
```

end example]

Attributes	Description
w (Width)	The width of the column in EMUs. The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_TableCol](#)) is located in §A.4.1. *end note*]

21.1.3.3 [header \(Header Cell Reference\)](#)

This element specifies a reference, using a unique identifier, to a table header cell that is associated with the current table cell. The identifier representing the reference shall be stored on this element’s val attribute and is used to reference the unique identifier value of a table header cell. The contents of the table header cell designated by a specific unique identifier shall be used as the table header information associated with the table cell that references that specific unique identifier.

If this element is omitted or the value of the header cell identifier cannot be resolved, no header cell shall be associated with the current table cell.

[*Example*: Consider the following 3 x 3 table with four header cells with values A, B, C, and D and four data cells with values x1, x2, y1, and y2:

	A	B
C	x1	x2
D	y1	y2

Each of the data cells is associated with two header cells and can be represented in DrawingML as follows:

```

<a:tbl>
...
<a:tr>
...
<a:tc >
...
</a:tc>
<a:tc id="HeaderA">
...
<a:p>
  <a:r>
    <a:t>A</a:t>
  </a:r>
</a:p>
</a:tc>
...
</a:tr>
<a:tr>
...
<a:tc id="HeaderC">
...
<a:p>
  <a:r>
    <a:t>C</a:t>
  </a:r>
</a:p>
</a:tc>
<a:tc>

  <a:p>
    <a:r>
      <a:t>x1</a:t>
    </a:r>
  </a:p>
  <a:tcPr>

...
  <a:headers>
    <a:header val="HeaderA" />

```

```
        <a:header val="HeaderC" />
      </a:headers>
      ...
    </a:tcPr>
  </a:tc>
  ...
</a:tr>
</a:tbl>
```

The headers element specifies the list of header cells associated with the table cell that has a value of x1. In this example the table cell with the content value of x1 is associated with headers that have an id of HeaderA and HeaderC. *end example*]

The possible values for this element are defined by the W3C XML Schema string datatype.

21.1.3.4 headers (Header Cells Associated With Table Cell)

This element specifies the list of header cells, as specified by children header elements, that provide header information associated with the current table cell. Each header cell shall specify a unique identifier, as specified by the use of the attribute id on the header cell tc element. This element is typically used to gather header information about data and sub header cells.

If this element is omitted or there exists no children header element, no header cell shall be associated with the given table cell.

[*Example:* Consider the following 3 x 3 table with four header cells with values A, B, C, and D and four data cells with values x1, x2, y1, and y2:

	A	B
C	x1	x2
D	y1	y2

Each of the data cells is associated with two header cells and can be represented in DrawingML as follows:

```
<a:tbl>
...
<a:tr>
...
  <a:tc >
    ...
  </a:tc>
  <a:tc id="HeaderA">
    ...
    <a:p>
      <a:r>
        <a:t>A</a:t>
```

```

        </a:r>
      </a:p>
    </a:tc>
    ...
  </a:tr>
  <a:tr>
    ...
    <a:tc id="HeaderC">
      ...
      <a:p>
        <a:r>
          <a:t>C</a:t>
        </a:r>
      </a:p>
    </a:tc>
    <a:tc>
      <a:p>
        <a:r>
          <a:t>x1</a:t>
        </a:r>
      </a:p>
    <a:tcPr>
      ...
      <a:headers>
        <a:header val="HeaderA" />
        <a:header val="HeaderC" />
      </a:headers>
      ...
    </a:tcPr>
  </a:tc>
  ...
</a:tr>
</a:tbl>

```

The headers element specifies the list of header cells associated with the table cell that has a value of x1. In this example x1 is associated with headers that have an id of HeaderA and HeaderC. *end example*]

[Note: The W3C XML Schema definition of this element's content model ([CT_Headers](#)) is located in §A.4.1. *end note*]

21.1.3.5 lnB (Bottom Border Line Properties)

This element defines the line properties associated with the bottom border of a given cell.

[Example: Consider the following example of a bottom border line properties element within DrawingML:

```
<a:lnB w="38100" cap="flat" compd="sng" algn="ctr">
  <a:solidFill>
    <a:schemeClr val="accent2"/>
  </a:solidFill>
  <a:prstDash val="solid"/>
  <a:round/>
  <a:headEnd type="none" w="med" len="med"/>
  <a:tailEnd type="none" w="med" len="med"/>
</a:lnB>
```

In this example, one can see that the bottom border line style defined with certain properties, such as a flat end line cap, a given width, head and tail end, color, etc. *end example*]

Attributes	Description
algn (Stroke Alignment)	Specifies the alignment to be used for the underline stroke. The possible values for this attribute are defined by the ST_PenAlignment simple type (§20.1.10.39).
cap (Line Ending Cap Type)	Specifies the ending caps that should be used for this line. [<i>Note</i> : Examples of cap types are rounded, flat, etc. <i>end note</i>] If this attribute is omitted, than a value of square is assumed. The possible values for this attribute are defined by the ST_LineCap simple type (§20.1.10.31).
compd (Compound Line Type)	Specifies the compound line type to be used for the underline stroke. If this attribute is omitted, then a value of sng is assumed. The possible values for this attribute are defined by the ST_CompoundLine simple type (§20.1.10.15).
w (Line Width)	Specifies the width to be used for the underline stroke. If this attribute is omitted, then a value of 0 is assumed. The possible values for this attribute are defined by the ST_LineWidth simple type (§20.1.10.35).

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_LineProperties](#)) is located in §A.4.1. *end note*]

21.1.3.6 lnBlToTr (Bottom-Left to Top-Right Border Line Properties)

This element defines the line properties associated with the diagonal line from the bottom left corner of the cell to the top right corner.

[*Example*: Consider the following example of a lnBlToTr within DrawingML:

```

<a:lnBlToTr w="38100" cap="flat" cmpd="sng" algn="ctr">
  <a:solidFill>
    <a:schemeClr val="accent2"/>
  </a:solidFill>
  <a:prstDash val="solid"/>
  <a:round/>
  <a:headEnd type="none" w="med" len="med"/>
  <a:tailEnd type="none" w="med" len="med"/>
</a:lnBlToTr >

```

In this example, one can see that the border line style defined with certain properties, such as a flat end line cap, a given width, head and tail end, color, etc. *end example*

Attributes	Description
algn (Stroke Alignment)	Specifies the alignment to be used for the underline stroke. The possible values for this attribute are defined by the ST_PenAlignment simple type (§20.1.10.39).
cap (Line Ending Cap Type)	Specifies the ending caps that should be used for this line. [<i>Note</i> : Examples of cap types are rounded, flat, etc. <i>end note</i>] If this attribute is omitted, then a value of square is assumed. The possible values for this attribute are defined by the ST_LineCap simple type (§20.1.10.31).
cmpd (Compound Line Type)	Specifies the compound line type to be used for the underline stroke. If this attribute is omitted, then a value of sng is assumed. The possible values for this attribute are defined by the ST_CompoundLine simple type (§20.1.10.15).
w (Line Width)	Specifies the width to be used for the underline stroke. If this attribute is omitted, then a value of 0 is assumed. The possible values for this attribute are defined by the ST_LineWidth simple type (§20.1.10.35).

[*Note*: The W3C XML Schema definition of this element's content model ([CT_LineProperties](#)) is located in §A.4.1. *end note*]

21.1.3.7 InL (Left Border Line Properties)

This element defines the line properties associated with the left border of a cell

[*Example*: Consider the following example of a InL within DrawingML:

```
<a:lnL w="38100" cap="flat" compd="sng" algn="ctr">
  <a:solidFill>
    <a:schemeClr val="accent2"/>
  </a:solidFill>
  <a:prstDash val="solid"/>
  <a:round/>
  <a:headEnd type="none" w="med" len="med"/>
  <a:tailEnd type="none" w="med" len="med"/>
</a:lnL >
```

In this example, one can see that the border line style defined with certain properties, such as a flat end line cap, a given width, head and tail end, color, etc. *end example*

Attributes	Description
algn (Stroke Alignment)	Specifies the alignment to be used for the underline stroke. The possible values for this attribute are defined by the ST_PenAlignment simple type (§20.1.10.39).
cap (Line Ending Cap Type)	Specifies the ending caps that should be used for this line. [<i>Note</i> : Examples of cap types are rounded, flat, etc. <i>end note</i>] If this attribute is omitted, than a value of square is assumed. The possible values for this attribute are defined by the ST_LineCap simple type (§20.1.10.31).
compd (Compound Line Type)	Specifies the compound line type to be used for the underline stroke. If this attribute is omitted, then a value of sng is assumed. The possible values for this attribute are defined by the ST_CompoundLine simple type (§20.1.10.15).
w (Line Width)	Specifies the width to be used for the underline stroke. If this attribute is omitted, then a value of 0 is assumed. The possible values for this attribute are defined by the ST_LineWidth simple type (§20.1.10.35).

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_LineProperties](#)) is located in §A.4.1. *end note*]

21.1.3.8 lnR (Right Border Line Properties)

This element defines the line properties associated with right border of a cell.

[*Example*: Consider the following example of a lnR within DrawingML:


```

<a:lnR w="38100" cap="flat" compd="sng" algn="ctr">
  <a:solidFill>
    <a:schemeClr val="accent2"/>
  </a:solidFill>
  <a:prstDash val="solid"/>
  <a:round/>
  <a:headEnd type="none" w="med" len="med"/>
  <a:tailEnd type="none" w="med" len="med"/>
</a:lnR >

```

In this example, one can see that the border line style defined with certain properties, such as a flat end line cap, a given width, head and tail end, color, etc. *end example*

Attributes	Description
algn (Stroke Alignment)	Specifies the alignment to be used for the underline stroke. The possible values for this attribute are defined by the ST_PenAlignment simple type (§20.1.10.39).
cap (Line Ending Cap Type)	Specifies the ending caps that should be used for this line. [<i>Note</i> : Examples of cap types are rounded, flat, etc. <i>end note</i>] If this attribute is omitted, then a value of square is assumed. The possible values for this attribute are defined by the ST_LineCap simple type (§20.1.10.31).
compd (Compound Line Type)	Specifies the compound line type to be used for the underline stroke. If this attribute is omitted, then a value of sng is assumed. The possible values for this attribute are defined by the ST_CompoundLine simple type (§20.1.10.15).
w (Line Width)	Specifies the width to be used for the underline stroke. If this attribute is omitted, then a value of 0 is assumed. The possible values for this attribute are defined by the ST_LineWidth simple type (§20.1.10.35).

[*Note*: The W3C XML Schema definition of this element's content model ([CT_LineProperties](#)) is located in §A.4.1. *end note*]

21.1.3.9 InT (Top Border Line Properties)

This element defines the line properties associated with the top border of a cell.

[*Example*: Consider the following example of a InT within DrawingML:

```
<a:lnT w="38100" cap="flat" compd="sng" algn="ctr">
  <a:solidFill>
    <a:schemeClr val="accent2"/>
  </a:solidFill>
  <a:prstDash val="solid"/>
  <a:round/>
  <a:headEnd type="none" w="med" len="med"/>
  <a:tailEnd type="none" w="med" len="med"/>
</a:lnT >
```

In this example, one can see that the border line style defined with certain properties, such as a flat end line cap, a given width, head and tail end, color, etc. *end example*

Attributes	Description
algn (Stroke Alignment)	Specifies the alignment to be used for the underline stroke. The possible values for this attribute are defined by the ST_PenAlignment simple type (§20.1.10.39).
cap (Line Ending Cap Type)	Specifies the ending caps that should be used for this line. [<i>Note</i> : Examples of cap types are rounded, flat, etc. <i>end note</i>] If this attribute is omitted, than a value of square is assumed. The possible values for this attribute are defined by the ST_LineCap simple type (§20.1.10.31).
compd (Compound Line Type)	Specifies the compound line type to be used for the underline stroke. If this attribute is omitted, then a value of sng is assumed. The possible values for this attribute are defined by the ST_CompoundLine simple type (§20.1.10.15).
w (Line Width)	Specifies the width to be used for the underline stroke. If this attribute is omitted, then a value of 0 is assumed. The possible values for this attribute are defined by the ST_LineWidth simple type (§20.1.10.35).

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_LineProperties](#)) is located in §A.4.1. *end note*]

21.1.3.10 lnTlToBr (Top-Left to Bottom-Right Border Line Properties)

This element defines the line properties associated with the diagonal line from the top left corner of the cell to the bottom right corner.

[*Example*: Consider the following example of a lnTlToBr within DrawingML:

```

<a:lnTlToBr w="38100" cap="flat" cmpd="sng" algn="ctr">
  <a:solidFill>
    <a:schemeClr val="accent2"/>
  </a:solidFill>
  <a:prstDash val="solid"/>
  <a:round/>
  <a:headEnd type="none" w="med" len="med"/>
  <a:tailEnd type="none" w="med" len="med"/>
</a:lnTlToBr>

```

In this example, one can see that the border line style defined with certain properties, such as a flat end line cap, a given width, head and tail end, color, etc. *end example*

Attributes	Description
algn (Stroke Alignment)	Specifies the alignment to be used for the underline stroke. The possible values for this attribute are defined by the ST_PenAlignment simple type (§20.1.10.39).
cap (Line Ending Cap Type)	Specifies the ending caps that should be used for this line. [<i>Note</i> : Examples of cap types are rounded, flat, etc. <i>end note</i>] If this attribute is omitted, then a value of square is assumed. The possible values for this attribute are defined by the ST_LineCap simple type (§20.1.10.31).
cmpd (Compound Line Type)	Specifies the compound line type to be used for the underline stroke. If this attribute is omitted, then a value of sng is assumed. The possible values for this attribute are defined by the ST_CompoundLine simple type (§20.1.10.15).
w (Line Width)	Specifies the width to be used for the underline stroke. If this attribute is omitted, then a value of 0 is assumed. The possible values for this attribute are defined by the ST_LineWidth simple type (§20.1.10.35).

[*Note*: The W3C XML Schema definition of this element's content model ([CT_LineProperties](#)) is located in §A.4.1. *end note*]

21.1.3.11 tableStyle (Table Style)

This element specifies a particular table style. Fourteen elements make up the styling information of a given table style. These fourteen elements work together to provide visual formatting options for on/off states of the following toggles:

- First row on/off - Associated element: firstRow

- Last row on/off - Associated element: lastRow
- First column on/off - Associated element: firstCol
- Last column on/off - Associated element: lastCol
- Row banding on/off - Associated elements: band1H, band2H
- Column banding on/off - Associated elements: band1V, band2V

The formatting associated with the wholeTbl element defines the table formatting when all options are off. When an option is turned on, the formatting for that particular option is applied to the table. The four cell specific formatting options are enabled when overlapping options are toggled on. For example, when the first row, and first column formatting options are enabled, any formatting within the northwest cell is also be applied since that is the overlapping table cell when both first column and first row formatting options are on.

[Example: Consider the following partial example of a tblStyle within DrawingML:

```
<a:tblStyle styleId="{5940675A-B579-460E-94D1-54222C63F5DA}"
  styleName="No Style, Table Grid">
  <a:wholeTbl>
    <a:tcTxStyle>
      <a:fontRef idx="minor">
        <a:scrgbClr r="0" g="0" b="0"/>
      </a:fontRef>
      <a:schemeClr val="tx1"/>
    </a:tcTxStyle>
    <a:tcStyle>
      <a:tcBdr>
        <a:left>
          <a:ln w="12700" cmpd="sng">
            <a:solidFill>
              <a:schemeClr val="tx1"/>
            </a:solidFill>
          </a:ln>
        </a:left>
```

...right, top, bottom, insideH, insideV border information is defined just as the 'left' tag...

```
      </a:tcBdr>
      <a:fill>
        <a:noFill/>
      </a:fill>
    </a:tcStyle>
  </a:wholeTbl>
```

```

<a:band1H>
  <a:tcStyle>
    <a:tcBdr/>
  </a:tcStyle>
</a:band1H>

```

...band2H, band1V, band2V, firstCol, firstRow, lastCol, lastRow, neCell, nwCell, seCell, swCell tags are all defined just as the 'band1H' tag

```

</a:tblStyle>

```

In this example, one can get an idea for the definition of a table style in its entirety. The above defined table style creates a style with only 1pt line formatting applied to all of the cells in a table. Notice that the on/off toggle formatting (band1H, band2H, firstCol, etc) do not define any formatting and therefore have no effect to the table when toggled. *end example]*

Attributes	Description
styleId (Style ID)	Specifies a GUID identifying the table style in a unique manner. The possible values for this attribute are defined by the ST_Guid simple type (§22.9.2.4).
styleName (Name)	Specifies the name of the table style which can show up in the user interface identifying the style to a user. The possible values for this attribute are defined by the W3C XML Schema string datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_TableStyle](#)) is located in §A.4.1. *end note]*

21.1.3.12 tableStyleId (Table Style ID)

This element defines the table style which is currently applied to the table by referencing the styleId attribute of the tableStyle element.

[Example: Consider the following example of a tableStyleId within DrawingML:

```

<a:tblPr firstRow="1" bandRow="1">
  <a:tableStyleId>{5940675A-B579-460E-94D1-54222C63F5DA}</a:tableStyleId>
</a:tblPr>

```

In this example, we see a reference to a table style being specified in the tableStyleId element. *end example]*

The possible values for this element are defined by the ST_Guid simple type (§22.9.2.4).

[Note: The W3C XML Schema definition of this element's content model ([ST_Guid](#)) is located in §A.6.9. *end note]*

21.1.3.13 `tbl` (Table)

This element is the root element for a table. Within this element is contained everything that one would need to define a table within DrawingML.

[*Example:* Consider the following example of a `tbl` within DrawingML:

```
<a:tbl>
  <a:tblPr firstRow="1" bandRow="1">
    ...
  <a:tblPr>
    <a:tblGrid>
      ...
    </a:tblGrid>
    <a:tr h="419100">
      ...
    </a:tr>
  </a:tbl>
```

In this example, we see can see the definition of a table within DrawingML. *end example]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Table](#)) is located in §A.4.1. *end note]*

21.1.3.14 `tblGrid` (Table Grid)

This element defines a list of table column (§21.1.3.2) elements. There should be a table column (§21.1.3.2) element for every column held within the table.

[*Example:* Consider the following example of a `tblGrid` within DrawingML:

```
<a:tblGrid>
  <a:gridCol w="1117600"/>
  <a:gridCol w="1117600"/>
  <a:gridCol w="1117600"/>
</a:tblGrid>
```

In this example, we have a `tblGrid` defined that holds three columns, therefore the table has three columns. *end example]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TableGrid](#)) is located in §A.4.1. *end note]*

21.1.3.15 `tblPr` (Table Properties)

This element defines the properties of a table on the whole. Within this element are many visual modifications that can be applied to the table.

[*Example:* Consider the following example of a `tblPr` within DrawingML:

```
<a:tblPr firstRow="1" bandRow="1">
  <a:tableStyleId>{5940675A-B579-460E-94D1-54222C63F5DA}</a:tableStyleId>
</a:tblPr>
```

In this example, we see that there is a link to a table style id (§21.1.3.12) which is defined elsewhere and that the first column formatting and banded row formatting has been enabled. The table style defines the formatting applied with the two formatting options enabled. *end example*]

Attributes	Description
bandCol (Banded Columns)	<p>Enables or disables the banded column formatting for a table style. A value of 1 or true enables the banded column formatting defined in the table style. The attribute defaults to off if it is not specified.</p> <p>[<i>Example:</i> Consider the following run:</p> <pre><a:tblPr bandCol="1"> <a:tableStyleId>{5940675A-B579-460E-94D1-54222C63F5DA}</a:tableStyleId> </a:tblPr></pre> <p>In this example, we can see the banded column formatting is enabled for the table. When applied, the linked table style defines the formatting for banded columns. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
bandRow (Banded Rows)	<p>Enables or disables the banded row formatting for a table style. A value of 1 or true enables the banded row formatting defined in the table style. The attribute defaults to false if it is not specified.</p> <p>[<i>Example:</i> Consider the following run:</p> <pre><a:tblPr bandRow="1"> <a:tableStyleId>{5940675A-B579-460E-94D1-54222C63F5DA}</a:tableStyleId> </a:tblPr></pre> <p>In this example, we can see the banded row formatting is enabled for the table. When applied, the linked table style defines the formatting for banded rows. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
firstCol (First	Enables or disables the first column formatting for a table style. A value of 1 or true

Attributes	Description
Column)	<p>enables the first column formatting defined in the table style. The attribute defaults to false if it is not specified.</p> <p>[<i>Example:</i> Consider the following run:</p> <pre><a:tblPr firstCol="1"> <a:tableStyleId>{5940675A-B579-460E-94D1-54222C63F5DA}</a:tableStyleId> </a:tblPr></pre> <p>In this example, we can see the first column formatting is enabled for the table. When applied, the linked table style defines the formatting for the first column. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
firstRow (First Row)	<p>Enables or disables the first row formatting for a table style. A value of 1 or true enables the first row formatting defined in the table style. The attribute defaults to false if it is not specified.</p> <p>[<i>Example:</i> Consider the following run:</p> <pre><a:tblPr firstRow="1"> <a:tableStyleId>{5940675A-B579-460E-94D1-54222C63F5DA}</a:tableStyleId> </a:tblPr></pre> <p>In this example, we can see the first row formatting is enabled for the table. When applied, the linked table style defines the formatting for the first row. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
lastCol (Last Column)	<p>Enables or disables the last column formatting for a table style. A value of 1 or true enables the last column formatting defined in the table style. The attribute defaults to false if it is not specified.</p> <p>[<i>Example:</i> Consider the following run:</p> <pre><a:tblPr lastCol="1"> <a:tableStyleId>{5940675A-B579-460E-94D1-54222C63F5DA}</a:tableStyleId> </a:tblPr></pre> <p>In this example, we can see the last column formatting is enabled for the table. When applied, the linked table style defines the formatting for the last column. <i>end example</i>]</p>

Attributes	Description
	<p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>lastRow (Last Row)</p>	<p>Enables or disables the last row formatting for a table style. A value of 1 or true enables the last row formatting defined in the table style. The attribute defaults to false if it is not specified.</p> <p>[Example: Consider the following run:</p> <pre><a:tblPr lastRow="1"> <a:tableStyleId>{5940675A-B579-460E-94D1-54222C63F5DA}</a:tableStyleId> </a:tblPr></pre> <p>In this example, we can see the last row formatting is enabled for the table. When applied, the linked table style defines the formatting for the last row. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>rtl (Right-to-Left)</p>	<p>Defines enables the right-to-left settings of a table. If the value of rtl is 1 or true , then the table is laid out from the right-to-left rather than the default left-to-right.</p> <p>[Example: Consider the following run:</p> <pre><a:tblPr rtl="1"> <a:tableStyleId>{5940675A-B579-460E-94D1-54222C63F5DA}</a:tableStyleId> </a:tblPr></pre> <p>In this example, we can see that the table is to be created in a right-to-left direction. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT TableProperties](#)) is located in §A.4.1. *end note*]

21.1.3.16 tc (Table Cell)

This element defines a cell within the table. The table cell holds a text body that actually contains the data held within the cell along with the properties of the table cell which hold formatting options associated with the cell.

[Example: Consider the following example of a tc within DrawingML:

```
<a:tc>
  <a:txBody>
    <a:bodyPr/>
    <a:lstStyle/>
    <a:p>
      <a:pPr marL="0" algn="ctr" rtl="0"/>
      <a:r>
        <a:rPr lang="en-US" dirty="0" smtClean="0"/>
        <a:t>data</a:t>
      </a:r>
    <a:endParaRPr lang="en-US" dirty="0"/>
  </a:p>
</a:txBody>
<a:tcPr/>
</a:tc>
```

In this example, we see a single cell in a table being defined with the default cell properties and a text body which contains the word "data". The text "data" is the only text in the cell. *end example*]

Attributes	Description
gridSpan (Grid Span)	<p>Specifies the number of columns that a merged cell spans. This is used in combination with the hMerge attribute on other cells in order to specify the beginning cell of a horizontal merge.</p> <p>[Example: Consider the following example:</p> <pre><a:tc gridSpan="3"> ... /a:tc> <a:tc hMerge="1"> ... /a:tc> <a:tc hMerge="1"> ... /a:tc></pre> <p>In this example, we can define what looks like a single cell in the table as a group of three cells merged together. The merged cell spans three columns of the table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
hMerge (Horizontal Merge)	<p>When this attribute is set to 1 or true , then this table cell is to be merged with the previous horizontal table cell when the table is created.</p> <p>[Example: Consider the following example:</p>

Attributes	Description
	<pre><a:tc hMerge="1"> ... </a:tc></pre> <p>In this example, we see the hMerge attribute set to on which signifies that this cell is to be merged with the previous horizontal cell in the table. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
id (Table Cell Identifier)	<p>Specifies a unique identifier for the current table cell. This identifier shall be unique within the table, and is used to identify this table cell as a header cell for other cells within the table, using the headers child element.</p> <p>If this element is omitted, this table cell has no unique identifier.</p> <p>[<i>Example:</i> Consider a table cell defined as follows:</p> <pre><a:tc id="januarytwentynine"> ... </a:tc></pre> <p>The value in the id specifies a unique identifier of januarytwentynine. Other cells in the table are then able to reference this cell as a row or column header by referencing this ID. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
rowSpan (Row Span)	<p>Specifies the number of rows that a merged cell spans. This is used in combination with the vMerge attribute on other cells in order to specify the beginning cell of a horizontal merge.</p> <p>[<i>Example:</i> Consider the following example:</p> <pre><a:tc rowspan="3"> ... </a:tc> <a:tc vMerge="1"> ... </a:tc> <a:tc vMerge="1"> ... </a:tc></pre> <p>In this example, we can define what looks like a single cell in the table as a group of three</p>

Attributes	Description
	<p>cells merged together. The merged cell spans three rows of the table. <i>end example</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
vMerge (Vertical Merge)	<p>When this attribute is set to 1 or true , then this table cell is to be merged with the previous vertical table cell when the table is created.</p> <p>[Example: Consider the following example:</p> <pre data-bbox="451 548 727 646"><a:tc vMerge="1"> ... /a:tc></pre> <p>In this example, we see the vMerge attribute set to on which signifies that this cell is to be merged with the previous vertical cell in the table. <i>end example</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TableCell](#)) is located in §A.4.1. *end note*]

21.1.3.17 tcPr (Table Cell Properties)

This element defines the formatting properties associated with a cell. The formatting options which are available to be adjusted range from the line types used for the borders to the cell fill to the margins associated with the layout of the text in the cell.

[Example: Consider the following example of a tcPr within DrawingML:

```
<a:tcPr marL="45720" marR="45720">
  <a:lnL w="38100" cap="flat" cmpd="sng" algn="ctr">
    <a:solidFill>
      <a:schemeClr val="accent2"/>
    </a:solidFill>
    <a:prstDash val="solid"/>
    <a:round/>
    <a:headEnd type="none" w="med" len="med"/>
    <a:tailEnd type="none" w="med" len="med"/>
  </a:lnL>
</a:tcPr>
```

In this example, we have a solid line defined as the left border of the cell along with left and right margin adjustments being made from the default margins. *end example*]

Attributes	Description
anchor (Anchor)	<p>Defines the alignment of the text vertically within the cell.</p> <p>[<i>Example</i>: Consider the following example:</p> <pre><a:tcPr marL="45720" anchor="ctr"/></pre> <p>In this example, the text in the cell is anchored to the center of the cell vertically. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TextAnchoringType simple type (§20.1.10.59).</p>
anchorCtr (Anchor Center)	<p>When this attribute is 1 or true , it modifies the anchor attribute. This attribute center-aligns the text box itself which allows for text to be left aligned along the center of the cell for example.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
horzOverflow (Horizontal Overflow)	<p>Specifies the clipping behavior of the cell. The two options here allow for the text to be clipped and out of view when outside of the bounds of the cell, or for the text to remain visible and overflow outside of the cell.</p> <p>[<i>Example</i>: Consider the following example:</p> <pre><a:tcPr horzOverflow="overflow"> ... </a:tcPr></pre> <p>In this example, the text in the cell freely overflows outside of the cell boundaries and always remains visible. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TextHorzOverflowType simple type (§20.1.10.68).</p>
marB (Bottom Margin)	<p>Specifies the bottom margin of the cell. The value specified in this attribute is the distance to offset from the bottom of the cell.</p> <p>[<i>Example</i>: Consider the following example:</p> <pre><a:tcPr marB="45720" anchor="ctr"> ... </a:tcPr></pre> <p>In this example, we have specified a value for the margin on the bottom of the cell. <i>end</i></p>

Attributes	Description
	<p><i>example]</i></p> <p>The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</p>
marL (Left Margin)	<p>This attribute specifies the left margin of the cell. The value specified in this attribute is the distance to offset from the left of the cell in EMU's.</p> <p>[<i>Example:</i> Consider the following example:</p> <pre><a:tcPr marL="45720" anchor="ctr"> ... </a:tcPr></pre> <p>In this example, we have specified a value for the margin on the left of the cell. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</p>
marR (Right Margin)	<p>This attribute specifies the right margin of the cell. The value specified in this attribute is the distance to offset from the right of the cell in EMU's.</p> <p>[<i>Example:</i> Consider the following example:</p> <pre><a:tcPr marR="45720" anchor="ctr"> ... </a:tcPr></pre> <p>In this example, we have specified a value for the margin on the right of the cell. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</p>
marT (Top Margin)	<p>This attribute specifies the top margin of the cell. The value specified in this attribute is the distance to offset from the top of the cell in EMU's.</p> <p>[<i>Example:</i> Consider the following example:</p> <pre><a:tcPr marT="45720" anchor="ctr"> ... </a:tcPr></pre> <p>In this example, we have specified a value for the margin on the top of the cell. <i>end example]</i></p>

Attributes	Description
	<p>The possible values for this attribute are defined by the ST_Coordinate32 simple type (§20.1.10.17).</p>
vert (Text Direction)	<p>Defines the text direction within the cell.</p> <p>[<i>Example:</i> Consider the following example: <code><a:tcPr vert="vert270"></code> ... <code></a:tcPr></code></p> <p>In this example, we have rotated the layout of the text 270 degrees so that it starts at the bottom of the cell and goes upward toward the top of the cell. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_TextVerticalType simple type (§20.1.10.82).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TableCellProperties](#)) is located in §A.4.1. *end note*]

21.1.3.18 tr (Table Row)

This element defines a row in a table. A row as defined in a table is simply a listing of table cells (§21.1.3.16). There is a table row element defined for every row in the table.

[*Example:* Consider the following example of a tr within DrawingML:

```
<a:tr h="774700">
  <a:tc>
    <a:txBody>
      <a:bodyPr/>
      <a:lstStyle/>
      <a:p>
        <a:endParaRPr lang="en-US" dirty="0"/>
      </a:p>
    </a:txBody>
  </a:tcPr/>
</a:tc>
...
</a:tr>
```

In this example, we see a table row defined with an example table cell (§21.1.3.16) defined within it. The height of the row has been specified and in real use, there is a table cell defined in this row for each grid column (§21.1.3.2) defined in the table. *end example*]

Attributes	Description
h (Height)	Defines the height of the row in the table. The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).

[Note: The W3C XML Schema definition of this element’s content model ([CT_TableRow](#)) is located in §A.4.1. *end note*]

21.2 DrawingML - Charts

The chart namespace in DrawingML is for representing visualizations of numeric data with column charts, pie charts, scatter charts, or other types of charts.

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End of informative text.

21.2.2 Elements

In DrawingML, charts define a visualization of numeric data. The definition includes where the data shall come from, a cache of the data, and how the data shall be represented graphically. Other DrawingML elements are reused to define aspects of the formatting of the visualization.

See the informative material in Annex L for a description and overview of the basic chart types and chart components.

21.2.2.1 `applyToEnd` (Apply to End)

This element specifies the picture shall be applied to the end of the point or series.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.2 `applyToFront` (Apply To Front)

This element specifies the picture shall be applied to the front of the point or series.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or <code>true</code> specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or <code>false</code> specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.3 `applyToSides` (Apply To Sides)

This element specifies the picture shall be applied to the sides of the point or series.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or <code>true</code> specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or <code>false</code> specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.4 [area3DChart \(3D Area Charts\)](#)

This element specifies the 3-D area series on this chart.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_Area3DChart](#)) is located in §A.5.1. *end note*]

21.2.2.5 [areaChart \(Area Charts\)](#)

This element specifies the 2-D area series on this chart.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_AreaChart](#)) is located in §A.5.1. *end note*]

21.2.2.6 [auto \(Automatic Category Axis\)](#)

This element specifies that this axis is a date or text axis based on the data that is used for the axis labels, not a specific choice.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.7 [autoTitleDeleted \(Auto Title Is Deleted\)](#)

This element specifies the title shall not be shown for this chart.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.8 [autoUpdate \(Update Automatically\)](#)

This element specifies the external data is updated automatically when the document containing the chart is opened.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.9 [axId \(Axis ID\)](#)

When specified as a child element of valAx, dateAx, catAx, or serAx, this element specifies the identifier for the axis. When specified as a child element of a chart, this element specifies the identifier of an axis that defines the coordinate space of the chart.

Attributes	Description
val (Integer Value)	<p>Specifies that the contents of this attribute contain an integer number.</p> <p>The contents of this number are interpreted based on the context of the parent XML element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[*Note: The W3C XML Schema definition of this element's content model ([CT_UnsignedInt](#)) is located in §A.5.1. end note*]

21.2.2.10 [axPos \(Axis Position\)](#)

This element specifies the position of the axis on the chart.

Attributes	Description
val (Axis Position Value)	<p>Specifies the position of the axis on the chart.</p> <p>The possible values for this attribute are defined by the ST_AxPos simple type (§21.2.3.2).</p>

[*Note: The W3C XML Schema definition of this element's content model ([CT_AxPos](#)) is located in §A.5.1. end note*]

21.2.2.11 [backWall \(Back Wall\)](#)

This element specifies the back wall of the chart.

[*Note: The W3C XML Schema definition of this element's content model ([CT_Surface](#)) is located in §A.5.1. end note*]

21.2.2.12 [backward \(Backward\)](#)

This element specifies the number of categories (or units on a scatter chart) that the trend line extends before the data for the series that is being trended. On scatter and non-scatter charts, the value shall be any non-negative value.

Attributes	Description
val (Floating Point Value)	<p>Specifies that the contents of this attribute contain a floating point number.</p> <p>The contents of this number are interpreted based on the context of the parent XML element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>

[*Note: The W3C XML Schema definition of this element's content model ([CT_Double](#)) is located in §A.5.1. end note*]

21.2.2.13 [bandFmt \(Band Format\)](#)

This element specifies the formatting band of a surface chart.

[*Note: The W3C XML Schema definition of this element's content model ([CT_BandFmt](#)) is located in §A.5.1. end note*]

21.2.2.14 [bandFmts \(Band Formats\)](#)

This element contains a collection of formatting bands for a surface chart indexed from low to high.

[*Note: The W3C XML Schema definition of this element's content model ([CT_BandFmts](#)) is located in §A.5.1. end note*]

21.2.2.15 [bar3DChart \(3D Bar Charts\)](#)

This element contains the 3-D bar or column series on this chart.

[*Note: The W3C XML Schema definition of this element's content model ([CT_Bar3DChart](#)) is located in §A.5.1. end note*]

21.2.2.16 [barChart \(Bar Charts\)](#)

This element contains the 2-D bar or column series on this chart.

[*Note: The W3C XML Schema definition of this element's content model ([CT_BarChart](#)) is located in §A.5.1. end note*]

21.2.2.17 [barDir \(Bar Direction\)](#)

This element specifies whether the series form a bar (horizontal) chart or a column (vertical) chart

Attributes	Description
val (Bar Direction Value)	Specifies the direction of the series. The possible values for this attribute are defined by the ST_BarDir simple type (§21.2.3.3).

[*Note: The W3C XML Schema definition of this element's content model ([CT_BarDir](#)) is located in §A.5.1. end note*]

21.2.2.18 [baseTimeUnit \(Base Time Unit\)](#)

This element specifies the smallest time unit that is represented on the date axis.

Attributes	Description
val (Time Unit Value)	Specifies the time unit for the tick marks. The possible values for this attribute are defined by the ST_TimeUnit simple type (§21.2.3.49).

[*Note: The W3C XML Schema definition of this element's content model ([CT_TimeUnit](#)) is located in §A.5.1. end note*]

21.2.2.19 [bubble3D \(3D Bubble\)](#)

This element specifies that the bubbles have a 3-D effect applied to them.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note: The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. end note*]

21.2.2.20 [bubbleChart \(Bubble Charts\)](#)

This element contains the bubble series on this chart.

[*Note: The W3C XML Schema definition of this element's content model ([CT_BubbleChart](#)) is located in §A.5.1. end note*]

21.2.2.21 [bubbleScale \(Bubble Scale\)](#)

This element specifies the scale factor for the bubble chart. This element can be a percentage value from 0 to 300, corresponding to a percentage of the default size.

Attributes	Description
val (Bubble Scale Value)	<p>Specifies how to scale bubbles on a bubble chart.</p> <p>The possible values for this attribute are defined by the ST_BubbleScale simple type (§21.2.3.5).</p>

[*Note: The W3C XML Schema definition of this element's content model ([CT_BubbleScale](#)) is located in §A.5.1. end note*]

21.2.2.22 [bubbleSize \(Bubble Size\)](#)

This element specifies the data for the sizes of the bubbles on the bubble chart.

[Note: The W3C XML Schema definition of this element's content model ([CT_NumDataSource](#)) is located in §A.5.1. *end note*]

21.2.2.23 [builtInUnit \(Built in Display Unit Value\)](#)

This element specifies the display unit is one of the built in values.

Attributes	Description
val (Built In Unit Value)	Specifies the display unit scaling applied to the axis. The possible values for this attribute are defined by the ST_BuiltInUnit simple type (§21.2.3.6).

[Note: The W3C XML Schema definition of this element's content model ([CT_BuiltInUnit](#)) is located in §A.5.1. *end note*]

21.2.2.24 [cat \(Category Axis Data\)](#)

This element specifies the data used for the category axis.

[Note: The W3C XML Schema definition of this element's content model ([CT_AxDataSource](#)) is located in §A.5.1. *end note*]

21.2.2.25 [catAx \(Category Axis Data\)](#)

This element specifies the category axis of the chart.

[Note: The W3C XML Schema definition of this element's content model ([CT_CatAx](#)) is located in §A.5.1. *end note*]

21.2.2.26 [chart \(Reference to Chart Part\)](#)

This element specifies the chart.

Attributes	Description
id (Relationship Reference) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the relationship ID for the relationship for this Chart or Chart Drawing part. The type of relationship needed is specified by the parent element. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

[Note: The W3C XML Schema definition of this element's content model ([CT_RelId](#)) is located in §A.5.1. *end note*]

21.2.2.27 [chart \(Chart\)](#)

This element specifies the chart.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_Chart](#)) is located in §A.5.1. *end note*]

21.2.2.28 [chartObject \(Chart Object\)](#)

This element specifies that the chart cannot be edited by the user

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.29 [chartSpace \(Chart Space\)](#)

This element specifies overall settings for a single chart, and is the root node for the chart part.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_ChartSpace](#)) is located in §A.5.1. *end note*]

21.2.2.30 [clrMapOvr \(Color Map Override\)](#)

This element represents color mapping information. It is used to override the applications color mapping if the user has selected keep source formatting after a copy-paste.

Attributes	Description
accent1 (Accent 1) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies a color defined which is associated as the accent 1 color.</p> <p>The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).</p>
accent2 (Accent 2)	<p>Specifies a color defined which is associated as the accent 2 color.</p>

Attributes	Description
Namespace: http://purl.oclc.org/ooxml/drawingml/main	The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
accent3 (Accent 3) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies a color defined which is associated as the accent 3 color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
accent4 (Accent 4) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies a color defined which is associated as the accent 4 color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
accent5 (Accent 5) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies a color defined which is associated as the accent 5 color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
accent6 (Accent 6) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies a color defined which is associated as the accent 6 color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
bg1 (Background 1) Namespace: http://purl.oclc.org/ooxml/drawingml/main	A color defined which is associated as the first background color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
bg2 (Background 2) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies a color defined which is associated as the second background color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
folHlink (Followed Hyperlink) Namespace:	Specifies a color defined which is associated as the color for a followed hyperlink. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).

Attributes	Description
http://purl.oclc.org/ooxml/drawing/ml/main	
hlink (Hyperlink) Namespace: http://purl.oclc.org/ooxml/drawing/ml/main	Specifies a color defined which is associated as the color for a hyperlink. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
tx1 (Text 1) Namespace: http://purl.oclc.org/ooxml/drawing/ml/main	Specifies a color defined which is associated as the first text color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).
tx2 (Text 2) Namespace: http://purl.oclc.org/ooxml/drawing/ml/main	Specifies a color defined which is associated as the second text color. The possible values for this attribute are defined by the ST_ColorSchemeIndex simple type (§20.1.10.14).

[Note: The W3C XML Schema definition of this element's content model ([CT_ColorMapping](#)) is located in §A.4.1. end note]

21.2.2.31 crossAx (Crossing Axis ID)

This element specifies the ID of axis that this axis crosses. For instance, a category axis might cross a value axis, and the category axis's crossAx would contain the ID of the value axis.

Attributes	Description
val (Integer Value)	Specifies that the contents of this attribute contain an integer number. The contents of this number are interpreted based on the context of the parent XML element. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_UnsignedInt](#)) is located in §A.5.1. end note]

21.2.2.32 `crossBetween` (Cross Between)

This element specifies whether the value axis crosses the category axis between categories.

If not specified, then the application should choose an appropriate behavior.

Attributes	Description
val (Cross Between Value)	Specifies whether the value axis crosses the category axis between categories or on categories. The possible values for this attribute are defined by the ST_CrossBetween simple type (§21.2.3.7).

[Note: The W3C XML Schema definition of this element's content model (`CT_CrossBetween`) is located in §A.5.1. *end note*]

21.2.2.33 `crosses` (Crosses)

This element specifies how this axis crosses the perpendicular axis.

Attributes	Description
val (Crosses Value)	Specifies where the axis crosses its perpendicular axis. The possible values for this attribute are defined by the ST_Crosses simple type (§21.2.3.8).

[Note: The W3C XML Schema definition of this element's content model (`CT_Crosses`) is located in §A.5.1. *end note*]

21.2.2.34 `crossesAt` (Crossing Value)

This element specifies where on the axis the perpendicular axis crosses. The units are dependent on the type of axis.

When specified as a child element of `valAx`, the value is a decimal number on the value axis. When specified as a child element of `dateAx`, the date is defined as a integer number of days relative to the base date of the current date system. When specified as a child element of `catAx`, the value is an integer category number, starting with 1 as the first category.

Attributes	Description
val (Floating Point Value)	Specifies that the contents of this attribute contain a floating point number. The contents of this number are interpreted based on the context of the parent XML element.

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema double datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Double](#)) is located in §A.5.1. *end note*]

21.2.2.35 [custSplit \(Custom Split\)](#)

This element contains the custom split information for a pie-of-pie or bar-of-pie chart with a custom split.

[Note: The W3C XML Schema definition of this element's content model ([CT_CustSplit](#)) is located in §A.5.1. *end note*]

21.2.2.36 [custUnit \(Custom Display Unit\)](#)

This element specifies a custom value for the display unit.

Attributes	Description
val (Floating Point Value)	<p>Specifies that the contents of this attribute contain a floating point number.</p> <p>The contents of this number are interpreted based on the context of the parent XML element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Double](#)) is located in §A.5.1. *end note*]

21.2.2.37 [data \(Data Cannot Be Changed\)](#)

This element specifies that the user cannot change the choice of data used for the chart

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.38 [date1904 \(1904 Date System\)](#)

This element specifies that the chart uses the 1904 date system. If the 1904 date system is used, then all dates and times shall be specified as a decimal number of days since Dec. 31, 1903. If the 1904 date system is not used, then all dates and times shall be specified as a decimal number of days since Dec. 31, 1899.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.39 [dateAx \(Date Axis\)](#)

This element specifies a date axis for the chart.

[Note: The W3C XML Schema definition of this element's content model ([CT DateAx](#)) is located in §A.5.1. *end note*]

21.2.2.40 [delete \(Delete\)](#)

This element specifies that the chart element specified by its containing element shall be deleted from the chart.

This should be set to true if the application adds these elements by default even after the user has specified that they should be removed from the chart.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p>

Attributes	Description
	<p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.41 depthPercent (Depth Percent)

This element specifies the depth of a 3-D chart as a percentage of the chart width (between 20 and 2000 percent).

Attributes	Description
val (Depth Percent Value)	<p>Specifies a percentage value for the property defined by the parent XML element.</p> <p>The possible values for this attribute are defined by the ST_DepthPercent simple type (§21.2.3.9).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_DepthPercent](#)) is located in §A.5.1. *end note*]

21.2.2.42 dispBlanksAs (Display Blanks As)

This element specifies how blank cells shall be plotted on a chart .

Attributes	Description
val (Display Blanks As Value)	<p>Specifies how blank cells are plotted on the chart.</p> <p>The possible values for this attribute are defined by the ST_DispBlanksAs simple type (§21.2.3.10).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_DispBlanksAs](#)) is located in §A.5.1. *end note*]

21.2.2.43 dispEq (Display Equation)

This element specifies that the equation for the trendline is displayed on the chart (in the same label as the R-squared value).

Attributes	Description
val (Boolean Value)	Specifies a boolean value for the property defined by the parent XML element.

Attributes	Description
	<p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.44 [dispRSqr \(Display R Squared Value\)](#)

This element specifies that the R-squared value of the trendline is displayed on the chart (in the same label as the equation).

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.45 [dispUnits \(Display Units\)](#)

This element specifies the scaling value of the display units for the value axis.

[Note: The W3C XML Schema definition of this element's content model ([CT DispUnits](#)) is located in §A.5.1. *end note*]

21.2.2.46 [dispUnitsLbl \(Display Units Label\)](#)

This element specifies the display unit label for the value axis in the specified chart.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_DispUnitsLbl](#)) is located in §A.5.1. *end note*]

21.2.2.47 [dLbl \(Data Label\)](#)

This element specifies a data label.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_DLbl](#)) is located in §A.5.1. *end note*]

21.2.2.48 [dLblPos \(Data Label Position\)](#)

This element specifies the position of the data label.

Attributes	Description
val (Data Label Position Value)	Specifies how the data label is positioned on the chart. The possible values for this attribute are defined by the ST_DLblPos simple type (§21.2.3.11).

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_DLblPos](#)) is located in §A.5.1. *end note*]

21.2.2.49 [dLbls \(Data Labels\)](#)

This element serves as a root element that specifies the settings for the data labels for an entire series or the entire chart. It contains child elements that specify the specific formatting and positioning settings.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_DLbls](#)) is located in §A.5.1. *end note*]

21.2.2.50 [doughnutChart \(Doughnut Charts\)](#)

This element contains the doughnut chart series.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_DoughnutChart](#)) is located in §A.5.1. *end note*]

21.2.2.51 [downBars \(Down Bars\)](#)

This element specifies the down bars.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_UpDownBar](#)) is located in §A.5.1. *end note*]

21.2.2.52 [dPt \(Data Point\)](#)

This element specifies a single data point.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_DPt](#)) is located in §A.5.1. *end note*]

21.2.2.53 `dropLines` (Drop Lines)

This element specifies drop lines.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ChartLines](#)) is located in §A.5.1. *end note*]

21.2.2.54 `dTable` (Data Table)

This element specifies a data table.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DTable](#)) is located in §A.5.1. *end note*]

21.2.2.55 `errBars` (Error Bars)

This element specifies error bars. The `errValType` element controls whether the `minus`, `plus`, or `val` elements are used.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ErrBars](#)) is located in §A.5.1. *end note*]

21.2.2.56 `errBarType` (Error Bar Type)

This element specifies the style of the error bars - positive, negative, or both.

Attributes	Description
<code>val</code> (Error Bar Type Value)	Specifies the style of error bars. The possible values for this attribute are defined by the <code>ST_ErrBarType</code> simple type (§21.2.3.12).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ErrBarType](#)) is located in §A.5.1. *end note*]

21.2.2.57 `errDir` (Error Bar Direction)

This element specifies the direction of the error bars.

Attributes	Description
<code>val</code> (Error Bar Direction Value)	Specifies the direction of the error bars. The possible values for this attribute are defined by the <code>ST_ErrDir</code> simple type (§21.2.3.13).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ErrDir](#)) is located in §A.5.1. *end note*]

21.2.2.58 `errValType` (Error Bar Value Type)

This element specifies the type of values used to determine the length of the error bars.

Attributes	Description
val (Error Bar Type Value)	<p>Specifies the type of values of the error bars.</p> <p>The possible values for this attribute are defined by the ST_ErrValType simple type (§21.2.3.14).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_ErrValType](#)) is located in §A.5.1. *end note*]

21.2.2.59 `evenFooter` (Even Footer)

This element specifies the footer to use on even numbered pages.

The possible values for this element are defined by the ST_Xstring simple type (§22.9.2.19).

Attributes	Description
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	<p>Specifies how white space should be handled for the contents of this element using the W3C space preservation rules.</p> <p>The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.</p>

[*Note*: The W3C XML Schema definition of this element's content model ([ST_Xstring](#)) is located in §A.6.9. *end note*]

21.2.2.60 `evenHeader` (Even Header)

This element specifies the header to use on even numbered pages.

The possible values for this element are defined by the ST_Xstring simple type (§22.9.2.19).

Attributes	Description
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	Specifies how white space should be handled for the contents of this element using the W3C space preservation rules. The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.

[Note: The W3C XML Schema definition of this element's content model ([ST_Xstring](#)) is located in §A.6.9. *end note*]

21.2.2.61 explosion (Explosion)

This element specifies the amount the data point shall be moved from the center of the pie.

Attributes	Description
val (Integer Value)	Specifies that the contents of this attribute contain an integer number. The contents of this number are interpreted based on the context of the parent XML element. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_UnsignedInt](#)) is located in §A.5.1. *end note*]

21.2.2.62 ext (Extension)

This element specifies an extension that is used for future extensions to the current version of DrawingML. This allows for the specifying of currently unknown elements in the future that are used for later versions of generating applications.

Attributes	Description
uri (Uniform Resource Identifier)	Specifies the URI, or uniform resource identifier that represents the data stored under this tag. The URI is used to identify the correct 'server' that can process the contents of this tag. The possible values for this attribute are defined by the W3C XML Schema token datatype.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_Extension](#)) is located in §A.5.1. *end note*]

21.2.2.63 externalData (External Data Relationship)

This element specifies the relationship to the data for this chart.

The data can be linked, pointing to a spreadsheet in another file. Or, the data can be embedded, contained in a separate part within the same xml package containing the chart. In this case, it shall be stored as an embedded Spreadsheet object in Office Open XML format.

This is not used by a spreadsheet application as the spreadsheet application can maintain its own reference to the data in the spreadsheet via the formula <f> element.

Attributes	Description
id (Relationship Reference) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	Specifies the relationship ID for the relationship for this chart. The relationship explicitly targeted by this attribute shall either be of type http://schemas.openxmlformats.org/officeDocument/2006/relationships/package, or http://schemas.openxmlformats.org/officeDocument/2006/relationships/oleObject. The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_ExternalData](#)) is located in §A.5.1. *end note*]

21.2.2.64 extLst (Chart Extensibility)

This element contains tags used for future extensibility of the file format.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_ExtensionList](#)) is located in §A.5.1. *end note*]

21.2.2.65 f (Formula)

This element specifies a reference to source of the data contained in this chart. This shall be used by the spreadsheet application only. A presentation, or word processing application should use the externalData element.

This reference is in the form of a book, sheet, and cell reference or a book, optional sheet, and defined name reference. This reference does not include the equals sign. [*Example*:

```

<c:cat>
  <c:strRef>
    <c:f>Sheet1!$A$1:$C$1</c:f>
    <c:strCache>
      ...
    </c:strCache>
  </c:strRef>
</c:cat>

```

The above example shows a formula reference used for the string cache. In this case the series names, which are referenced by the formula element, are in cells A1, B1, and C1.

end example]

The possible values for this element are defined by the W3C XML Schema string datatype.

21.2.2.66 firstFooter (First Footer)

This element specifies the footer to use on the first page.

The possible values for this element are defined by the ST_Xstring simple type (§22.9.2.19).

Attributes	Description
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	Specifies how white space should be handled for the contents of this element using the W3C space preservation rules. The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.

[Note: The W3C XML Schema definition of this element's content model ([ST_Xstring](#)) is located in §A.6.9. *end note*]

21.2.2.67 firstHeader (First Header)

This element specifies the header to use on the first page.

The possible values for this element are defined by the ST_Xstring simple type (§22.9.2.19).

Attributes	Description
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	Specifies how white space should be handled for the contents of this element using the W3C space preservation rules. The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.

[Note: The W3C XML Schema definition of this element's content model ([ST_Xstring](#)) is located in §A.6.9. *end note*]

21.2.2.68 firstSliceAng (First Slice Angle)

This element specifies the angle of the first pie or doughnut chart slice, in degrees (clockwise from up).

Attributes	Description
val (First Slice Angle Value)	Specifies the angle of the first slice. The possible values for this attribute are defined by the ST_FirstSliceAng simple type (§21.2.3.15).

[Note: The W3C XML Schema definition of this element's content model ([CT_FirstSliceAng](#)) is located in §A.5.1. *end note*]

21.2.2.69 floor (Floor)

This element specifies the floor of a 3D chart.

[Note: The W3C XML Schema definition of this element's content model ([CT_Surface](#)) is located in §A.5.1. *end note*]

21.2.2.70 fmtId (Format ID)

This element represents a pivot format ID. It serves as a link back to the correct pivotTable which in turn specifies a link that then defines which set of chart format rules apply to this chart.

This ID shall match the chartFormat element, chart attribute, described in §18.10.1.12 of the SpreadsheetML reference material. The chartFormat element also contains a format attribute which is used to index into the pivotFmts collection (§21.2.2.143).

Attributes	Description
val (Integer Value)	Specifies that the contents of this attribute contain an integer number.

Attributes	Description
	<p>The contents of this number are interpreted based on the context of the parent XML element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_UnsignedInt](#)) is located in §A.5.1. *end note*]

21.2.2.71 [formatCode \(Format Code\)](#)

This element specifies a string representing the format code to apply. For more information see the SpreadsheetML numFmt element's (§18.8.30) formatCode attribute.

The possible values for this element are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element's content model ([ST_Xstring](#)) is located in §A.6.9. *end note*]

21.2.2.72 [formatting \(Formatting\)](#)

This element specifies that a user cannot change formatting on chart elements.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.73 [forward \(Forward\)](#)

This element specifies the number of categories (or units on a scatter chart) that the trendline extends after the data for the series that is being trended. On scatter and non-scatter charts, the value shall be any non-negative value.

Attributes	Description
val (Floating Point Value)	<p>Specifies that the contents of this attribute contain a floating point number.</p> <p>The contents of this number are interpreted based on the context of the parent XML element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Double](#)) is located in §A.5.1. *end note*]

21.2.2.74 [gapDepth \(Gap Depth\)](#)

This element specifies the space between bar or column clusters, as a percentage of the bar or column width.

Attributes	Description
val (Gap Size Value)	<p>Specifies that the contents of this attribute contain a gap amount between 0% and 500%.</p> <p>The possible values for this attribute are defined by the ST_GapAmount simple type (§21.2.3.16).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_GapAmount](#)) is located in §A.5.1. *end note*]

21.2.2.75 [gapWidth \(Gap Width\)](#)

This element specifies the space between bar or column clusters, as a percentage of the bar or column width.

Attributes	Description
val (Gap Size Value)	<p>Specifies that the contents of this attribute contain a gap amount between 0% and 500%.</p> <p>The possible values for this attribute are defined by the ST_GapAmount simple type (§21.2.3.16).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_GapAmount](#)) is located in §A.5.1. *end note*]

21.2.2.76 [grouping \(Grouping\)](#)

This element specifies the kind of grouping for a column, line, or area chart.

Attributes	Description
val (Grouping	Specifies the grouping value.

Attributes	Description
Value)	The possible values for this attribute are defined by the ST_Grouping simple type (§21.2.3.17).

[Note: The W3C XML Schema definition of this element's content model ([CT_Grouping](#)) is located in §A.5.1. *end note*]

21.2.2.77 grouping (Bar Grouping)

This element specifies the kind of grouping for a bar chart.

Attributes	Description
val (Bar Grouping Value)	Specifies the bar grouping value. The possible values for this attribute are defined by the ST_BarGrouping simple type (§21.2.3.4).

[Note: The W3C XML Schema definition of this element's content model ([CT_BarGrouping](#)) is located in §A.5.1. *end note*]

21.2.2.78 h (Height)

This element specifies the height (if Height Mode is Factor) or bottom (if Height Mode is edge) of the chart element as a fraction of the height of the chart.

Attributes	Description
val (Floating Point Value)	Specifies that the contents of this attribute contain a floating point number. The contents of this number are interpreted based on the context of the parent XML element. The possible values for this attribute are defined by the W3C XML Schema double datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Double](#)) is located in §A.5.1. *end note*]

21.2.2.79 headerFooter (Header and Footer)

This element specifies the headers and footers that shall be used when the chart is printed.

Attributes	Description
alignWithMargins	Specifies the header and footer should align with the left and right margins of the chart.

Attributes	Description
(Align With Margins)	<p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
differentFirst (Different First)	<p>Specifies the header and footer are different for the first page.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
differentOddEven (Different Odd Even)	<p>Specifies the header and footer are different on odd-numbered pages and even-numbered pages.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_HeaderFooter](#)) is located in §A.5.1. *end note*]

21.2.2.80 [hiLowLines \(High Low Lines\)](#)

This element specifies the high-low lines for the series.

[Note: The W3C XML Schema definition of this element's content model ([CT_ChartLines](#)) is located in §A.5.1. *end note*]

21.2.2.81 [hMode \(Height Mode\)](#)

This element specifies how to interpret the Height element for this manual layout.

Attributes	Description
val (Layout Mode Value)	Specifies the layout mode for the width. The possible values for this attribute are defined by the ST_LayoutMode simple type (§21.2.3.20).

[Note: The W3C XML Schema definition of this element's content model ([CT_LayoutMode](#)) is located in §A.5.1. *end note*]

21.2.2.82 holeSize (Hole Size)

This element specifies the size of the hole in a doughnut chart group.

Attributes	Description
val (Hole Size Value)	Specifies that the contents of this attribute contain a hole size between 10% and 90% of the size of the plot area. The possible values for this attribute are defined by the ST_HoleSize simple type (§21.2.3.18).

[Note: The W3C XML Schema definition of this element's content model ([CT_HoleSize](#)) is located in §A.5.1. *end note*]

21.2.2.83 hPercent (Height Percent)

This element specifies the height of a 3-D chart as a percentage of the chart width.

Attributes	Description
val (Height Percent Value)	Specifies that the contents of this attribute contain a height percent between 5% and 500%. The possible values for this attribute are defined by the ST_HPercent simple type (§21.2.3.19).

[Note: The W3C XML Schema definition of this element's content model ([CT_HPercent](#)) is located in §A.5.1. *end note*]

21.2.2.84 idx (Index)

This element specifies the index of the containing element. This index shall determine which of the parent's children collection this element applies to.

Attributes	Description
val (Integer Value)	Specifies that the contents of this attribute contain an integer number.

Attributes	Description
	<p>The contents of this number are interpreted based on the context of the parent XML element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_UnsignedInt](#)) is located in §A.5.1. *end note*]

21.2.2.85 [intercept \(Intercept\)](#)

This element specifies the value where the trendline shall cross the y axis. This property shall be supported only when the trendline type is exp, linear, or poly.

Attributes	Description
val (Floating Point Value)	<p>Specifies that the contents of this attribute contain a floating point number.</p> <p>The contents of this number are interpreted based on the context of the parent XML element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Double](#)) is located in §A.5.1. *end note*]

21.2.2.86 [invertIfNegative \(Invert if Negative\)](#)

This element specifies the parent element shall invert its colors if the value is negative.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note: The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. end note*]

21.2.2.87 [lang \(Editing Language\)](#)

This element specifies the primary editing language which was use when this chart was last modified.

Attributes	Description
val (Language Code)	Specifies a language tag as defined by RFC 3066. See simple type for additional information. The possible values for this attribute are defined by the ST_Lang simple type (§22.9.2.6).

[*Note: The W3C XML Schema definition of this element's content model ([CT_TextLanguageID](#)) is located in §A.5.1. end note*]

21.2.2.88 [layout \(Layout\)](#)

This element specifies how the chart element is placed on the chart.

[*Note: The W3C XML Schema definition of this element's content model ([CT_Layout](#)) is located in §A.5.1. end note*]

21.2.2.89 [layoutTarget \(Layout Target\)](#)

This element specifies whether to layout the plot area by its inside (not including axis and axis labels) or outside (including axis and axis labels).

Attributes	Description
val (Layout Target Value)	Specifies the layout target value. The possible values for this attribute are defined by the ST_LayoutTarget simple type (§21.2.3.21).

[*Note: The W3C XML Schema definition of this element's content model ([CT_LayoutTarget](#)) is located in §A.5.1. end note*]

21.2.2.90 [lblAlign \(Label Alignment\)](#)

This element specifies the text alignment for the tick labels on the axis.

Attributes	Description
val (Label Alignment Value)	Specifies the label alignment. The possible values for this attribute are defined by the ST_LblAlign simple type (§21.2.3.22).

[*Note: The W3C XML Schema definition of this element's content model ([CT_LblAlign](#)) is located in §A.5.1. end note*]

21.2.2.91 [lblOffset \(Label Offset\)](#)

This element specifies the distance of labels from the axis.

Attributes	Description
val (Label Offset Value)	Specifies the distance of labels from the axis. Shall contain a percentage between 0% and 1000%. The possible values for this attribute are defined by the ST_LblOffset simple type (§21.2.3.23).

[*Note: The W3C XML Schema definition of this element's content model ([CT_LblOffset](#)) is located in §A.5.1. end note*]

21.2.2.92 [leaderLines \(Leader Lines\)](#)

This element specifies the leader lines for data labels.

[*Note: The W3C XML Schema definition of this element's content model ([CT_ChartLines](#)) is located in §A.5.1. end note*]

21.2.2.93 [legend \(Legend\)](#)

This element specifies the legend.

[*Note: The W3C XML Schema definition of this element's content model ([CT_Legend](#)) is located in §A.5.1. end note*]

21.2.2.94 [legendEntry \(Legend Entry\)](#)

This element specifies a legend entry.

[*Note: The W3C XML Schema definition of this element's content model ([CT_LegendEntry](#)) is located in §A.5.1. end note*]

21.2.2.95 [legendPos \(Legend Position\)](#)

This element specifies the position of the legend.

Attributes	Description
val (Legend Position Value)	Specifies the position of the legend. The possible values for this attribute are defined by the ST_LegendPos simple type

Attributes	Description
	(§21.2.3.24).

[Note: The W3C XML Schema definition of this element's content model ([CT_LegendPos](#)) is located in §A.5.1. *end note*]

21.2.2.96 [line3DChart \(3D Line Charts\)](#)

This element contains the 3-D line chart series.

[Note: The W3C XML Schema definition of this element's content model ([CT_Line3DChart](#)) is located in §A.5.1. *end note*]

21.2.2.97 [lineChart \(Line Charts\)](#)

This element contains the 2-D line chart series.

[Note: The W3C XML Schema definition of this element's content model ([CT_LineChart](#)) is located in §A.5.1. *end note*]

21.2.2.98 [logBase \(Logarithmic Base\)](#)

This element specifies the logarithmic base for a logarithmic axis.

Attributes	Description
val (Logarithmic Base Value)	Specifies the logarithmic base for a logarithmic axis. Shall contain a floating point value greater than or equal to 2. The possible values for this attribute are defined by the ST_LogBase simple type (§21.2.3.25).

[Note: The W3C XML Schema definition of this element's content model ([CT_LogBase](#)) is located in §A.5.1. *end note*]

21.2.2.99 [lvl \(Level\)](#)

This element specifies data for a single level of labels for a category axis.

[Note: The W3C XML Schema definition of this element's content model ([CT_Lvl](#)) is located in §A.5.1. *end note*]

21.2.2.100 [majorGridlines \(Major Gridlines\)](#)

This element specifies major gridlines.

[Note: The W3C XML Schema definition of this element's content model ([CT_ChartLines](#)) is located in §A.5.1. *end note*]

21.2.2.101 `majorTickMark` (Major Tick Mark)

This element specifies the major tick marks.

Attributes	Description
val (Tick Mark Value)	Specifies the minor tick mark position. The possible values for this attribute are defined by the ST_TickMark simple type (§21.2.3.48).

[Note: The W3C XML Schema definition of this element's content model ([CT_TickMark](#)) is located in §A.5.1. *end note*]

21.2.2.102 `majorTimeUnit` (Major Time Unit)

This element specifies the time unit for major tick marks.

Attributes	Description
val (Time Unit Value)	Specifies the time unit for the tick marks. The possible values for this attribute are defined by the ST_TimeUnit simple type (§21.2.3.49).

[Note: The W3C XML Schema definition of this element's content model ([CT_TimeUnit](#)) is located in §A.5.1. *end note*]

21.2.2.103 `majorUnit` (Major Unit)

This element specifies the distance between major ticks.

Attributes	Description
val (Major Unit Value)	Specifies the distance between major ticks. Shall contain a positive floating-point number. The possible values for this attribute are defined by the ST_AxisUnit simple type (§21.2.3.1).

[Note: The W3C XML Schema definition of this element's content model ([CT_AxisUnit](#)) is located in §A.5.1. *end note*]

21.2.2.104 `manualLayout` (Manual Layout)

This element specifies the exact position of a chart element.

[Note: The W3C XML Schema definition of this element's content model ([CT_ManualLayout](#)) is located in §A.5.1. *end note*]

21.2.2.105 [marker \(Show Marker\)](#)

This element is a Boolean that, when `true`, specifies that the marker shall be shown.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of <code>1</code> or <code>true</code> specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of <code>0</code> or <code>false</code> specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.106 [marker \(Marker\)](#)

This element specifies a data marker.

[Note: The W3C XML Schema definition of this element's content model ([CT_Marker](#)) is located in §A.5.1. *end note*]

21.2.2.107 [max \(Maximum\)](#)

This element specifies the maximum value of the axis.

Attributes	Description
val (Floating Point Value)	<p>Specifies that the contents of this attribute contain a floating point number.</p> <p>The contents of this number are interpreted based on the context of the parent XML element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Double](#)) is located in §A.5.1. *end note*]

21.2.2.108 min (Minimum)

This element specifies the minimum value of the axis.

Attributes	Description
val (Floating Point Value)	<p>Specifies that the contents of this attribute contain a floating point number.</p> <p>The contents of this number are interpreted based on the context of the parent XML element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Double](#)) is located in §A.5.1. *end note*]

21.2.2.109 minorGridlines (Minor Gridlines)

This element specifies the minor gridlines.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ChartLines](#)) is located in §A.5.1. *end note*]

21.2.2.110 minorTickMark (Minor Tick Mark)

This element specifies the minor tick marks for the axis.

Attributes	Description
val (Tick Mark Value)	<p>Specifies the minor tick mark position.</p> <p>The possible values for this attribute are defined by the ST_TickMark simple type (§21.2.3.48).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TickMark](#)) is located in §A.5.1. *end note*]

21.2.2.111 minorTimeUnit (Minor Time Unit)

This element specifies the time unit for the minor tick marks.

Attributes	Description
val (Time Unit Value)	<p>Specifies the time unit for the tick marks.</p> <p>The possible values for this attribute are defined by the ST_TimeUnit simple type (§21.2.3.49).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TimeUnit](#)) is located in §A.5.1. *end note*]

21.2.2.112 [minorUnit \(Minor Unit\)](#)

This element specifies the distance between minor tick marks.

Attributes	Description
val (Minor Unit Value)	Specifies the distance between minor tick marks. Shall contain a positive floating-point number. The possible values for this attribute are defined by the ST_AxisUnit simple type (§21.2.3.1).

[Note: The W3C XML Schema definition of this element's content model ([CT_AxisUnit](#)) is located in §A.5.1. *end note*]

21.2.2.113 [minus \(Minus\)](#)

This element specifies the error bar value in the negative direction. It shall be used only when the errValType is cust.

[Note: The W3C XML Schema definition of this element's content model ([CT_NumDataSource](#)) is located in §A.5.1. *end note*]

21.2.2.114 [multiLvlStrCache \(Multi Level String Cache\)](#)

This element specifies the last data shown on the chart for a category axis.

[Note: The W3C XML Schema definition of this element's content model ([CT_MultiLvlStrData](#)) is located in §A.5.1. *end note*]

21.2.2.115 [multiLvlStrRef \(Multi Level String Reference\)](#)

This element specifies a reference to data for the category axis with a cache of the last values used.

[Note: The W3C XML Schema definition of this element's content model ([CT_MultiLvlStrRef](#)) is located in §A.5.1. *end note*]

21.2.2.116 [name \(Trendline Name\)](#)

This element specifies the name of the trendline.

The possible values for this element are defined by the W3C XML Schema string datatype.

21.2.2.117 [name \(Pivot Name\)](#)

This element specifies the name of the pivot table to get the data for the chart from.

The possible values for this element are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element’s content model ([ST_Xstring](#)) is located in §A.6.9. *end note*]

21.2.2.118 noEndCap (No End Cap)

This element specifies an end cap is not drawn on the error bars.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.119 noMultiLvlLbl (No Multi-level Labels)

This element specifies the labels shall be shown as flat text. If this element is not included or is set to false, then the labels shall be drawn as a hierarchy.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.120 numCache (Number Cache)

This element specifies the last data shown on the chart for a series.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_NumData](#)) is located in §A.5.1. *end note*]

21.2.2.121 numFmt (Number Format)

This element specifies number formatting for the parent element.

Attributes	Description
formatCode (Number Format Code)	<p>This element specifies a string representing the format code to apply. For more information see the SpreadsheetML numFmt element's (§18.8.30) formatCode attribute.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
sourceLinked (Linked to Source)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_NumFmt](#)) is located in §A.5.1. *end note*]

21.2.2.122 numLit (Number Literal)

This element specifies a set of numbers used for the parent element.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_NumData](#)) is located in §A.5.1. *end note*]

21.2.2.123 numRef (Number Reference)

This element specifies a reference to numeric data with a cache of the last values used.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_NumRef](#)) is located in §A.5.1. *end note*]

21.2.2.124 oddFooter (Odd Footer)

This element specifies the footer to use on odd numbered pages.

The possible values for this element are defined by the ST_Xstring simple type (§22.9.2.19).

Attributes	Description
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	Specifies how white space should be handled for the contents of this element using the W3C space preservation rules. The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.

[Note: The W3C XML Schema definition of this element's content model ([ST_Xstring](#)) is located in §A.6.9. *end note*]

21.2.2.125 oddHeader (Odd Header)

This element specifies the header to use on odd numbered pages.

The possible values for this element are defined by the ST_Xstring simple type (§22.9.2.19).

Attributes	Description
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	Specifies how white space should be handled for the contents of this element using the W3C space preservation rules. The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.

[Note: The W3C XML Schema definition of this element's content model ([ST_Xstring](#)) is located in §A.6.9. *end note*]

21.2.2.126 ofPieChart (Pie of Pie or Bar of Pie Charts)

This element contains the pie of pie or bar of pie series on this chart. Only the first series shall be displayed. The splitType element shall determine whether the splitPos and custSplit elements apply.

[Note: The W3C XML Schema definition of this element's content model ([CT_OfPieChart](#)) is located in §A.5.1. *end note*]

21.2.2.127 ofPieType (Pie of Pie or Bar of Pie Type)

This element specifies whether this chart is pie of pie or bar of pie.

Attributes	Description
val (Pie of Pie or Bar of Pie Type Value)	<p>Specifies the type of pie of pie or bar of pie chart.</p> <p>The possible values for this attribute are defined by the ST_OfPieType simple type (§21.2.3.28).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_OfPieType](#)) is located in §A.5.1. *end note*]

21.2.2.128 order (Order)

This element specifies the order of the series in the collection. It is 0 based.

Attributes	Description
val (Integer Value)	<p>Specifies that the contents of this attribute contain an integer number.</p> <p>The contents of this number are interpreted based on the context of the parent XML element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_UnsignedInt](#)) is located in §A.5.1. *end note*]

21.2.2.129 order (Polynomial Trendline Order)

This element specifies the order of the polynomial trend line. It is ignored for other trend line types.

Attributes	Description
val (Order Value)	<p>Specifies that the contents of this attribute contain an integer between 2 and 6.</p> <p>The possible values for this attribute are defined by the ST_Order simple type (§21.2.3.29).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Order](#)) is located in §A.5.1. *end note*]

21.2.2.130 orientation (Axis Orientation)

This element specifies the stretching and stacking of the picture on the data point, series, wall, or floor.

Attributes	Description
val (Orientation Value)	<p>Specifies the orientation of the axis.</p> <p>The possible values for this attribute are defined by the ST_Orientation simple type (§21.2.3.30).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Orientation](#)) is located in §A.5.1. *end note*]

21.2.2.131 [overlap \(Overlap\)](#)

This element specifies how much bars and columns shall overlap on 2-D charts.

Attributes	Description
val (Overlap Value)	<p>Specifies how much bars and columns shall overlap on 2-D charts. Shall contain a percentage between -100% and 100%.</p> <p>The possible values for this attribute are defined by the ST_Overlap simple type (§21.2.3.31).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Overlap](#)) is located in §A.5.1. *end note*]

21.2.2.132 [overlay \(Overlay\)](#)

This element specifies that other chart elements shall be allowed to overlap this chart element.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.133 `pageMargins` (Page Margins)

This element specifies the page margins for a chart.

Attributes	Description
b (Bottom)	Specifies the bottom page margin in inches. The possible values for this attribute are defined by the W3C XML Schema double datatype.
footer (Footer)	Specifies the footer margin in inches. The possible values for this attribute are defined by the W3C XML Schema double datatype.
header (Header)	Specifies the header margin in inches. The possible values for this attribute are defined by the W3C XML Schema double datatype.
l (Left)	Specifies the left page margin in inches. The possible values for this attribute are defined by the W3C XML Schema double datatype.
r (Right)	Specifies the right page margin in inches. The possible values for this attribute are defined by the W3C XML Schema double datatype.
t (Top)	Specifies the top page margin in inches. The possible values for this attribute are defined by the W3C XML Schema double datatype.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_PageMargins](#)) is located in §A.5.1.
end note]

21.2.2.134 `pageSetup` (Page Setup)

This element defines the page setup for the chart.

[*Example*: The following example shows the `pageSetup` element for ISO A0 paper, printed in black and white, with graphics:

```
<pageSetup blackAndWhite="true" draft="false" paperHeight="1189mm"
  paperWidth="841mm"/>
```

end example]

Attributes	Description																																
blackAndWhite (Black and White)	<p>Specifies the page shall print in black and white.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>																																
copies (Copies)	<p>Specifies the number of copies that shall be printed.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>																																
draft (Draft)	<p>Specifies the page shall be printed in draft mode.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>																																
firstPageNumber (First Page Number)	<p>Specifies the page number.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>																																
horizontalDpi (Horizontal DPI)	<p>Specifies the horizontal resolution to print in dots per inch.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>																																
orientation (Orientation)	<p>Specifies the orientation of the paper.</p> <p>The possible values for this attribute are defined by the ST_PageSetupOrientation simple type (§21.2.3.32).</p>																																
paperHeight (Paper Height)	<p>Height of custom paper as a number followed by a unit identifier. <i>[Example: 297mm, 11in end example]</i></p> <p>When paperHeight and paperWidth are specified, paperSize shall be ignored.</p> <p>The possible values for this attribute are defined by the ST_PositiveUniversalMeasure simple type (§22.9.2.12).</p>																																
paperSize (Paper Size)	<p>Specifies the paper size according to the following table.</p> <table><tr><th>Paper Size</th><th>Width</th><th>Height</th><th>Value</th></tr><tr><td>Letter paper</td><td>8.5 in.</td><td>11 in.</td><td>1</td></tr><tr><td>Legal paper</td><td>8.5 in.</td><td>14 in.</td><td>5</td></tr><tr><td>Standard paper</td><td>10 in.</td><td>11 in.</td><td>45</td></tr><tr><td>Standard paper</td><td>10 in.</td><td>14 in.</td><td>16</td></tr><tr><td>Standard paper</td><td>11 in.</td><td>17 in.</td><td>17</td></tr><tr><td>Standard paper</td><td>15 in.</td><td>11 in.</td><td>46</td></tr><tr><td>Standard paper</td><td>9 in.</td><td>11 in.</td><td>44</td></tr></table>	Paper Size	Width	Height	Value	Letter paper	8.5 in.	11 in.	1	Legal paper	8.5 in.	14 in.	5	Standard paper	10 in.	11 in.	45	Standard paper	10 in.	14 in.	16	Standard paper	11 in.	17 in.	17	Standard paper	15 in.	11 in.	46	Standard paper	9 in.	11 in.	44
Paper Size	Width	Height	Value																														
Letter paper	8.5 in.	11 in.	1																														
Legal paper	8.5 in.	14 in.	5																														
Standard paper	10 in.	11 in.	45																														
Standard paper	10 in.	14 in.	16																														
Standard paper	11 in.	17 in.	17																														
Standard paper	15 in.	11 in.	46																														
Standard paper	9 in.	11 in.	44																														

Attributes	Description			
	SuperA/SuperA/A4 paper	227 mm	356 mm	57
	A2 paper	420 mm	594 mm	66
	A3 paper	297 mm	420 mm	8
	A3 extra paper	322 mm	445 mm	63
	A3 extra transverse paper	322 mm	445 mm	68
	A3 transverse paper	297 mm	420 mm	67
	A4 paper	210 mm	297 mm	9
	A4 extra paper	236 mm	322 mm	53
	A4 plus paper	210 mm	330 mm	60
	A4 transverse paper	210 mm	297 mm	55
	A4 small paper	210 mm	297 mm	10
	A5 paper	148 mm	210 mm	11
	A5 extra paper	174 mm	235 mm	64
	A5 transverse paper	148 mm	210 mm	61
	SuperB/SuperB/A3 paper	305 mm	487 mm	58
	B4 paper	250 mm	353 mm	12
	B5 paper	176 mm	250 mm	13
	ISO B5 extra paper	201 mm	276 mm	65
	JIS B5 transverse paper	182 mm	257 mm	62
	C paper	17 in.	22 in.	24
	D paper	22 in.	34 in.	25
	#10 envelope	4.125 in.	9.5 in.	20
	#11 envelope	4.5 in.	10.375 in.	21
	#12 envelope	4.75 in.	11 in.	22
	#14 envelope	5 in.	11.5 in.	23
	#9 envelope	3.875 in.	8.875 in.	19
	B4 envelope	250 mm	353 mm	33
	B5 envelope	176 mm	250 mm	34
	B6 envelope	176 mm	125 mm	35
	C3 envelope	324 mm	458 mm	29
	C4 envelope	229 mm	324 mm	30

Attributes	Description			
	C5 envelope	162 mm	229 mm	28
	C6 envelope	114 mm	162 mm	31
	C65 envelope	114 mm	229 mm	32
	DL envelope	110 mm	220 mm	27
	Invite envelope	220 mm	220 mm	47
	Italy envelope	110 mm	230 mm	36
	Monarch envelope	3.875 in.	7.5 in.)	37
	6 3/4 envelope	3.625 in.	6.5 in.	38
	E paper	34 in.	44 in.	26
	Executive paper	7.25 in.	10.5 in.	7
	German legal fanfold	8.5 in.	13 in.	41
	German standard fanfold	8.5 in.	12 in.	40
	US standard fanfold	14.875 in.	11 in.	39
	Folio paper	8.5 in.	13 in.	14
	ISO B4	250 mm	353 mm	42
	Japanese double postcard	200 mm	148 mm	43
	Ledger paper	17 in.	11 in.	4
	Legal extra paper	9.275 in.	15 in.	51
	Letter extra paper	9.275 in.	12 in.	50
	Letter extra transverse paper	9.275 in.	12 in.	56
	Letter plus paper	8.5 in.	12.69 in.	59
	Letter transverse paper	8.275 in.	11 in.	54
	Letter small paper	8.5 in.	11 in.	2
	Note paper	8.5 in.	11 in.	18
	Quarto paper	215 mm	275 mm	15
	Statement paper	5.5 in.	8.5 in.	6
	Tabloid paper	11 in.	17 in.	3
	Tabloid extra paper	11.69 in.	18 in.	52
<p>When paperHeight and paperWidth are specified, paperSize should be ignored.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt</p>				

Attributes	Description
	datatype.
paperWidth (Paper Width)	<p>Width of custom paper as a number followed by a unit identifier. [Example: 21cm, 8.5in end example]</p> <p>When paperHeight and paperWidth are specified, paperSize shall be ignored.</p> <p>The possible values for this attribute are defined by the ST_PositiveUniversalMeasure simple type (§22.9.2.12).</p>
useFirstPageNumber (Use First Page Number)	<p>Specifies to use the first page number instead of automatically generating a page number.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
verticalDpi (Vertical DPI)	<p>Specifies the vertical resolution to print in dots per inch.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_PageSetup](#)) is located in §A.5.1. end note]

21.2.2.135 period (Period)

This element specifies the period of the trend line for a moving average trend line. It is ignored for other trend line variants.

Attributes	Description
val (Period Value)	<p>Specifies the period of the trend line for a moving average trend line. Shall contain an integer between 2 and 255.</p> <p>The possible values for this attribute are defined by the ST_Period simple type (§21.2.3.33).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Period](#)) is located in §A.5.1. end note]

21.2.2.136 perspective (Perspective)

This element specifies the field of view angle for the 3-D chart. This element is ignored if Right Angle Axes is true.

Attributes	Description
val (Perspective)	Specifies the field of view angle for the 3-D chart. Shall contain an integer between 0

Attributes	Description
Value)	and 240, whose unit is one-half degrees. The possible values for this attribute are defined by the ST_Perspective simple type (§21.2.3.34).

[Note: The W3C XML Schema definition of this element's content model ([CT_Perspective](#)) is located in §A.5.1. *end note*]

21.2.2.137 [pictureFormat](#) (Picture Format)

This element specifies the stretching and stacking of the picture on the data point, series, wall, or floor.

Attributes	Description
val (Picture Format Value)	Specifies the stretching and stacking of the picture. The possible values for this attribute are defined by the ST_PictureFormat simple type (§21.2.3.35).

[Note: The W3C XML Schema definition of this element's content model ([CT_PictureFormat](#)) is located in §A.5.1. *end note*]

21.2.2.138 [pictureOptions](#) (Picture Options)

This element specifies the picture to be used on the data point, series, wall, or floor.

[Note: The W3C XML Schema definition of this element's content model ([CT_PictureOptions](#)) is located in §A.5.1. *end note*]

21.2.2.139 [pictureStackUnit](#) (Picture Stack Unit)

This element specifies the unit for each picture on the chart. This element applies only if the Picture Format is Stack and Scale.

Attributes	Description
val (Picture Stack Unit)	Specifies the unit for each picture on the chart. Shall contain a floating point number. The possible values for this attribute are defined by the ST_PictureStackUnit simple type (§21.2.3.36).

[Note: The W3C XML Schema definition of this element's content model ([CT_PictureStackUnit](#)) is located in §A.5.1. *end note*]

21.2.2.140 pie3DChart (3D Pie Charts)

This element contains the 3-D pie series for this chart.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_Pie3DChart](#)) is located in §A.5.1. *end note*]

21.2.2.141 pieChart (Pie Charts)

This element contains the 2-D pie series for this chart.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_PieChart](#)) is located in §A.5.1. *end note*]

21.2.2.142 pivotFmt (Pivot Format)

This element contains a set of formatting to be applied to the chart that is based on a pivotTable.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_PivotFmt](#)) is located in §A.5.1. *end note*]

21.2.2.143 pivotFmts (Pivot Formats)

This element contains a collection of formatting bands for a surface chart indexed from low to high.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_PivotFmts](#)) is located in §A.5.1. *end note*]

21.2.2.144 pivotSource (Pivot Source)

This element specifies the source pivot table for a pivot chart.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_PivotSource](#)) is located in §A.5.1. *end note*]

21.2.2.145 plotArea (Plot Area)

This element specifies the plot area of the chart.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_PlotArea](#)) is located in §A.5.1. *end note*]

21.2.2.146 plotVisOnly (Plot Visible Only)

This element specifies that only visible cells should be plotted on the chart.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is</p>

Attributes	Description
	<p>omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.147 plus (Plus)

This element specifies the error bar value in the positive direction. It shall be used only when the errValType is cust.

[Note: The W3C XML Schema definition of this element's content model ([CT_NumDataSource](#)) is located in §A.5.1. *end note*]

21.2.2.148 printSettings (Print Settings)

This element specifies the print settings for the chart.

[Note: The W3C XML Schema definition of this element's content model ([CT_PrintSettings](#)) is located in §A.5.1. *end note*]

21.2.2.149 protection (Protection)

This element specifies protection for the chart. If the chart is on a protected worksheet or chart sheet, then these settings shall control how a user is able to interact with the chart.

[Note: The W3C XML Schema definition of this element's content model ([CT_Protection](#)) is located in §A.5.1. *end note*]

21.2.2.150 pt (Numeric Point)

This element specifies data for a particular data point.

Attributes	Description
formatCode (Number Format)	<p>A string representing the format code to apply. For more information see the SpreadsheetML numFmt element's (§18.8.30) formatCode attribute.</p> <p>The possible values for this attribute are defined by the ST_Xstring simple type (§22.9.2.19).</p>
idx (Index)	<p>The index of the series in the collection</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt</p>

Attributes	Description
	datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_NumVal](#)) is located in §A.5.1. *end note*]

21.2.2.151 `pt` (String Point)

This element specifies string data for a specific data point.

Attributes	Description
idx (Index)	<p>A 0 based index into a set of points. Represents the data point number this data is for.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_StrVal](#)) is located in §A.5.1. *end note*]

21.2.2.152 `ptCount` (Point Count)

This element contains the number of values in the cache.

Attributes	Description
val (Integer Value)	<p>Specifies that the contents of this attribute contain an integer number.</p> <p>The contents of this number are interpreted based on the context of the parent XML element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_UnsignedInt](#)) is located in §A.5.1. *end note*]

21.2.2.153 `radarChart` (Radar Charts)

This element contains the radar chart series on this chart.

[Note: The W3C XML Schema definition of this element's content model ([CT_RadarChart](#)) is located in §A.5.1. *end note*]

21.2.2.154 `radarStyle` (Radar Style)

This element specifies what type of radar chart shall be drawn.

Attributes	Description
val (Radar Style Value)	<p>Specifies the style of the radar chart.</p> <p>The possible values for this attribute are defined by the ST_RadarStyle simple type (§21.2.3.37).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_RadarStyle](#)) is located in §A.5.1. *end note*]

21.2.2.155 [rAngAx \(Right Angle Axes\)](#)

This element specifies that the chart axes are at right angles, rather than drawn in perspective. Applies only to 3-D charts.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.156 [rich \(Rich Text\)](#)

This element contains a string with rich text formatting.

[Note: The W3C XML Schema definition of this element's content model ([CT_TextBody](#)) is located in §A.4.1. *end note*]

21.2.2.157 [rotX \(X Rotation\)](#)

This element specifies the amount a 3-D chart shall be rotated in the X direction.

Attributes	Description
val (X Rotation Value)	<p>Specifies the amount a 3-D chart shall be rotated in the X direction. Shall contain an integer between -90 and 90.</p> <p>The possible values for this attribute are defined by the ST_RotX simple type</p>

Attributes	Description
	(§21.2.3.38).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_RotX](#)) is located in §A.5.1. *end note*]

21.2.2.158 [rotY \(Y Rotation\)](#)

This element specifies the amount a 3-D chart shall be rotated in the Y direction.

Attributes	Description
val (Y Rotation Value)	Specifies the amount a 3-D chart shall be rotated in the Y direction. Shall contain an integer between 0 and 360. The possible values for this attribute are defined by the ST_RotY simple type (§21.2.3.39).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_RotY](#)) is located in §A.5.1. *end note*]

21.2.2.159 [roundedCorners \(Rounded Corners\)](#)

This element specifies the chart area shall have rounded corners.

Attributes	Description
val (Boolean Value)	Specifies a boolean value for the property defined by the parent XML element. A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted. A value of 0 or false specifies that the property is not applied. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.160 [scaling \(Scaling\)](#)

This element contains additional axis settings.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Scaling](#)) is located in §A.5.1. *end note*]

21.2.2.161 `scatterChart` (Scatter Charts)

This element contains the scatter chart series for this chart.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ScatterChart](#)) is located in §A.5.1. *end note*]

21.2.2.162 `scatterStyle` (Scatter Style)

This element specifies the kind of lines for the scatter chart.

Attributes	Description
val (Scatter Style Value)	<p>Specifies the style of the scatter chart.</p> <p>The possible values for this attribute are defined by the ST_ScatterStyle simple type (§21.2.3.40).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ScatterStyle](#)) is located in §A.5.1. *end note*]

21.2.2.163 `secondPiePt` (Second Pie Point)

This element specifies a data point that shall be drawn in the second pie or bar in a pie of pie or bar of pie chart.

Attributes	Description
val (Integer Value)	<p>Specifies that the contents of this attribute contain an integer number.</p> <p>The contents of this number are interpreted based on the context of the parent XML element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_UnsignedInt](#)) is located in §A.5.1. *end note*]

21.2.2.164 `secondPieSize` (Second Pie Size)

This element specifies the size of the second pie or bar of a pie of pie chart or a bar of pie chart.

Attributes	Description
val (Second Pie Size Value)	<p>Specifies the second pie or bar of a pie of pie chart or a bar of pie chart, as a percentage of the size of the first pie. Shall contain a percentage between 5% and 200%.</p> <p>The possible values for this attribute are defined by the ST_SecondPieSize simple type (§21.2.3.41).</p>

[*Note: The W3C XML Schema definition of this element's content model ([CT_SecondPieSize](#)) is located in §A.5.1. end note*]

21.2.2.165 [selection \(Selection\)](#)

This element specifies the chart elements are protected from selection.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note: The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. end note*]

21.2.2.166 [separator \(Separator\)](#)

This element specifies text that shall be used to separate the parts of a data label. The default is a comma, except for pie charts showing only category name and percentage, when a line break shall be used instead.

The possible values for this element are defined by the W3C XML Schema string datatype.

21.2.2.167 [ser \(Scatter Chart Series\)](#)

This element specifies a series on a scatter chart.

[*Note: The W3C XML Schema definition of this element's content model ([CT_ScatterSer](#)) is located in §A.5.1. end note*]

21.2.2.168 [ser \(Area Chart Series\)](#)

This element specifies a series on an area chart.

[*Note: The W3C XML Schema definition of this element's content model ([CT_AreaSer](#)) is located in §A.5.1. end note*]

21.2.2.169 [ser \(Radar Chart Series\)](#)

This element specifies a series on a radar chart.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_RadarSer](#)) is located in §A.5.1. *end note*]

21.2.2.170 [ser](#) (Bar Chart Series)

This element specifies a series on a bar chart.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_BarSer](#)) is located in §A.5.1. *end note*]

21.2.2.171 [ser](#) (Line Chart Series)

This element specifies a series on a line chart.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_LineSer](#)) is located in §A.5.1. *end note*]

21.2.2.172 [ser](#) (Pie Chart Series)

This element specifies a series on a doughnut or pie chart.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_PieSer](#)) is located in §A.5.1. *end note*]

21.2.2.173 [ser](#) (Surface Chart Series)

This element specifies a series on a surface chart.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_SurfaceSer](#)) is located in §A.5.1. *end note*]

21.2.2.174 [ser](#) (Bubble Chart Series)

This element specifies a series on a bubble chart.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_BubbleSer](#)) is located in §A.5.1. *end note*]

21.2.2.175 [serAx](#) (Series Axis)

This element specifies a series axis for the chart.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_SerAx](#)) is located in §A.5.1. *end note*]

21.2.2.176 [serLines](#) (Series Lines)

This element specifies series lines for the chart.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_ChartLines](#)) is located in §A.5.1. *end note*]

21.2.2.177 `shape` (Shape)

This element specifies the shape of a series or a 3-D bar chart.

Attributes	Description
val (Shape Value)	<p>Specifies the shape of the series.</p> <p>The possible values for this attribute are defined by the ST_Shape simple type (§21.2.3.42).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Shape](#)) is located in §A.5.1. *end note*]

21.2.2.178 `showBubbleSize` (Show Bubble Size)

This element specifies the bubble size shall be shown in a data label.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.179 `showCatName` (Show Category Name)

This element specifies that the category name shall be shown in the data label.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.180 [showDLblsOverMax \(Show Data Labels over Maximum\)](#)

This element specifies data labels over the maximum of the chart shall be shown.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.181 [showHorzBorder \(Show Horizontal Border\)](#)

This element specifies the horizontal borders shall be shown in a data table.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.182 showKeys (Show Legend Keys)

This element specifies the legend keys shall be shown in a data table.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.183 showLeaderLines (Show Leader Lines)

This element specifies leader lines shall be shown for data labels.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.184 showLegendKey (Show Legend Key)

This element specifies legend keys shall be shown in data labels.

Attributes	Description
val (Boolean Value)	Specifies a boolean value for the property defined by the parent XML element.

Attributes	Description
	<p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.185 [showNegBubbles \(Show Negative Bubbles\)](#)

This element specifies negative sized bubbles shall be shown on a bubble chart.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.186 [showOutline \(Show Outline Border\)](#)

This element specifies the outline shall be shown on a data table.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.187 [showPercent \(Show Percent\)](#)

This element specifies that the percentage shall be shown in a data label.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.188 [showSerName \(Show Series Name\)](#)

This element specifies that the series name shall be shown in a data label.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.189 **showVal (Show Value)**

This element specifies that the value shall be shown in a data label.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.190 **showVertBorder (Show Vertical Border)**

This element specifies the vertical border shall be shown in a data table.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.191 **sideWall (Side Wall)**

This element specifies the side wall.

[Note: The W3C XML Schema definition of this element's content model ([CT_Surface](#)) is located in §A.5.1. *end note*]

21.2.2.192 `size` (Size)

This element specifies the size of the marker in points.

Attributes	Description
val (Marker Size Value)	Specifies the size of the marker in points. Shall contain an integer between 2 and 72. The possible values for this attribute are defined by the ST_MarkerSize simple type (§21.2.3.26).

[Note: The W3C XML Schema definition of this element's content model ([CT_MarkerSize](#)) is located in §A.5.1. *end note*]

21.2.2.193 `sizeRepresents` (Size Represents)

This element specifies how the bubble size values are represented on the chart.

Attributes	Description
val (Size Represents Value)	Specifies how the bubble sizes represent the values. The possible values for this attribute are defined by the ST_SizeRepresents simple type (§21.2.3.43).

[Note: The W3C XML Schema definition of this element's content model ([CT_SizeRepresents](#)) is located in §A.5.1. *end note*]

21.2.2.194 `smooth` (Smoothing)

This element specifies the line connecting the points on the chart shall be smoothed using Catmull-Rom splines.

Attributes	Description
val (Boolean Value)	Specifies a boolean value for the property defined by the parent XML element. A value of 1 or <code>true</code> specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted. A value of 0 or <code>false</code> specifies that the property is not applied. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.195 splitPos (Split Position)

This element specifies a value that shall be used to determine which data points are in the second pie or bar on a pie of pie or bar of pie chart.

Attributes	Description
val (Floating Point Value)	<p>Specifies that the contents of this attribute contain a floating point number.</p> <p>The contents of this number are interpreted based on the context of the parent XML element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Double](#)) is located in §A.5.1. *end note*]

21.2.2.196 splitType (Split Type)

This element specifies how to determine which data points are in the second pie or bar on a pie of pie or bar of pie chart.

Attributes	Description
val (Split Type Value)	<p>Specifies how to split the data points between the first pie and second pie or bar.</p> <p>The possible values for this attribute are defined by the ST_SplitType simple type (§21.2.3.45).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_SplitType](#)) is located in §A.5.1. *end note*]

21.2.2.197 spPr (Shape Properties)

This element specifies the formatting for the parent chart element. The custGeom, prstGeom, scene3d, and xfrm elements are not supported. The bwMode attribute is not supported.

Attributes	Description
bwMode (Black and White Mode) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies that the picture should be rendered using only black and white coloring. That is the coloring information for the picture should be converted to either black or white when rendering the picture.</p> <p>No gray is to be used in rendering this image, only stark black and stark white.</p> <p>[Note: This does not mean that the picture itself that is stored within the file is necessarily a black and white picture. This attribute instead sets the rendering mode that</p>

Attributes	Description
	<p>the picture has applied to when rendering. <i>end note</i></p> <p>The possible values for this attribute are defined by the ST_BlackWhiteMode simple type (§20.1.10.10).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_ShapeProperties](#)) is located in §A.4.1. *end note*]

21.2.2.198 stockChart (Stock Charts)

This element contains the collection of stock chart series.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_StockChart](#)) is located in §A.5.1. *end note*]

21.2.2.199 strCache (String Cache)

This element specifies the last string data used for a chart.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_StrData](#)) is located in §A.5.1. *end note*]

21.2.2.200 strLit (String Literal)

This element specifies a set of strings used for a chart

[*Note*: The W3C XML Schema definition of this element's content model ([CT_StrData](#)) is located in §A.5.1. *end note*]

21.2.2.201 strRef (String Reference)

This element specifies a reference to data for a single data label or title with a cache of the last values used.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_StrRef](#)) is located in §A.5.1. *end note*]

21.2.2.202 style (Style)

This element specifies the style that shall be applied to the chart.

Attributes	Description
val (Style Type)	<p>Specifies the chart style.</p> <p>The possible values for this attribute are defined by the ST_Style simple type (§21.2.3.46).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Style](#)) is located in §A.5.1. *end note*]

21.2.2.203 [surface3DChart](#) (3D Surface Charts)

This element contains the set of 3-D surface series.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Surface3DChart](#)) is located in §A.5.1. *end note*]

21.2.2.204 [surfaceChart](#) (Surface Charts)

This element contains the set of 2-D contour charts.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SurfaceChart](#)) is located in §A.5.1. *end note*]

21.2.2.205 [symbol](#) (Symbol)

This element specifies the marker that is used for the data points.

Attributes	Description
val (Marker Style Value)	Specifies the marker style. The possible values for this attribute are defined by the ST_MarkerStyle simple type (§21.2.3.27).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_MarkerStyle](#)) is located in §A.5.1. *end note*]

21.2.2.206 [thickness](#) (Thickness)

This element specifies the thickness of the walls or floor as a percentage of the largest dimension of the plot volume.

Attributes	Description
val (Integer Value)	Specifies that the contents of this attribute contain a percentage. The contents of this number are interpreted based on the context of the parent XML element. The possible values for this attribute are defined by the ST_Thickness simple type (§21.2.3.59).

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Thickness](#)) is located in §A.5.1. *end note*]

21.2.2.207 `tickLblPos` (Tick Label Position)

This element specifies the position of the tick labels on the axis.

Attributes	Description
val (Tick Label Position Value)	<p>Specifies the tick label position.</p> <p>The possible values for this attribute are defined by the <code>ST_TickLblPos</code> simple type (§21.2.3.47).</p>

[Note: The W3C XML Schema definition of this element's content model (`CT_TickLblPos`) is located in §A.5.1. *end note*]

21.2.2.208 `tickLblSkip` (Tick Label Skip)

This element specifies how many tick labels to skip between label that is drawn.

Attributes	Description
val (Tick Skip Value)	<p>Specifies the how many tick labels to skip between label that is drawn. Shall contain an integer greater than or equal to one.</p> <p>The possible values for this attribute are defined by the <code>ST_Skip</code> simple type (§21.2.3.44).</p>

[Note: The W3C XML Schema definition of this element's content model (`CT_Skip`) is located in §A.5.1. *end note*]

21.2.2.209 `tickMarkSkip` (Tick Mark Skip)

This element specifies how many tick marks shall be skipped before the next one shall be drawn.

Attributes	Description
val (Tick Skip Value)	<p>Specifies the how many tick marks shall be skipped before the next one shall be drawn. Shall contain an integer greater than or equal to one.</p> <p>The possible values for this attribute are defined by the <code>ST_Skip</code> simple type (§21.2.3.44).</p>

[Note: The W3C XML Schema definition of this element's content model (`CT_Skip`) is located in §A.5.1. *end note*]

21.2.2.210 `title` (Title)

This element specifies a title.

[Note: The W3C XML Schema definition of this element's content model (`CT_Title`) is located in §A.5.1. *end note*]

21.2.2.211 `trendline` (Trendlines)

This element specifies a trendline.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_Trendline](#)) is located in §A.5.1. *end note*]

21.2.2.212 trendlineLbl (Trendline Label)

This element specifies the label for the trendline.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_TrendlineLbl](#)) is located in §A.5.1. *end note*]

21.2.2.213 trendlineType (Trendline Type)

This element specifies the style of the trendline.

Attributes	Description
val (Trendline Type Value)	Specifies the trendline style. The possible values for this attribute are defined by the ST_TrendlineType simple type (§21.2.3.50).

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_TrendlineType](#)) is located in §A.5.1. *end note*]

21.2.2.214 tx (Chart Text)

This element specifies text to use on a chart, including rich text formatting.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_Tx](#)) is located in §A.5.1. *end note*]

21.2.2.215 tx (Series Text)

This element specifies text for a series name, without rich text formatting.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_SerTx](#)) is located in §A.5.1. *end note*]

21.2.2.216 txPr (Text Properties)

This element specifies text formatting. The `lstStyle` element is not supported.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_TextBody](#)) is located in §A.4.1. *end note*]

21.2.2.217 upBars (Up Bars)

This element specifies the up bars on the chart.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_UpDownBar](#)) is located in §A.5.1. *end note*]

21.2.2.218 upDownBars (Up/Down Bars)

This element specifies the up and down bars.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_UpDownBars](#)) is located in §A.5.1. *end note*]

21.2.2.219 userInterface (User Interface)

This element specifies that the protection applies to the user interface only, and not to changes made through the object model.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.220 userShapes (User Shapes)

This element shall specify the shapes drawn on top of the chart.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Drawing](#)) is located in §A.5.2. *end note*]

21.2.2.221 userShapes (Reference to Chart Drawing Part)

This element specifies a relationship to a separate part which contains a drawing to be drawn on top of the chart.

Attributes	Description
id (Relationship Reference)	Specifies the relationship ID for the relationship for this Chart or Chart Drawing part. The type of relationship needed is specified by the parent element.
Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).

[Note: The W3C XML Schema definition of this element’s content model ([CT_RelId](#)) is located in §A.5.1. *end note*]

21.2.2.222 **v (Numeric Value)**

This element specifies a numeric value.

The possible values for this element are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element’s content model ([ST_Xstring](#)) is located in §A.6.9. *end note*]

21.2.2.223 **v (Text Value)**

This element specifies a text value for a category axis label or a series name.

The possible values for this element are defined by the ST_Xstring simple type (§22.9.2.19).

[Note: The W3C XML Schema definition of this element’s content model ([ST_Xstring](#)) is located in §A.6.9. *end note*]

21.2.2.224 **val (Values)**

This element specifies the data values which shall be used to define the location of data markers on a chart.

[Note: The W3C XML Schema definition of this element’s content model ([CT_NumDataSource](#)) is located in §A.5.1. *end note*]

21.2.2.225 **val (Error Bar Value)**

This element specifies a value which is used with the errBar element to determine the length of the error bars.

Attributes	Description
val (Floating Point Value)	<p>Specifies that the contents of this attribute contain a floating point number.</p> <p>The contents of this number are interpreted based on the context of the parent XML element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_Double](#)) is located in §A.5.1. *end note*]

21.2.2.226 **valAx (Value Axis)**

This element specifies a value axis.

[Note: The W3C XML Schema definition of this element's content model ([CT_ValAx](#)) is located in §A.5.1. *end note*]

21.2.2.227 varyColors (Vary Colors by Point)

This element specifies that each data marker in the series has a different color.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.228 view3D (View In 3D)

This element specifies the 3-D view of the chart.

[Note: The W3C XML Schema definition of this element's content model ([CT_View3D](#)) is located in §A.5.1. *end note*]

21.2.2.229 w (Width)

This element specifies the width (if Width Mode is Factor) or right (if Width Mode is Edge) of the chart element as a fraction of the width of the chart.

Attributes	Description
val (Floating Point Value)	<p>Specifies that the contents of this attribute contain a floating point number.</p> <p>The contents of this number are interpreted based on the context of the parent XML element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Double](#)) is located in §A.5.1. *end note*]

21.2.2.230 `wireframe` (Wireframe)

This element specifies the surface chart is drawn as a wireframe.

Attributes	Description
val (Boolean Value)	<p>Specifies a boolean value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property is applied. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.</p> <p>A value of 0 or false specifies that the property is not applied.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Boolean](#)) is located in §A.5.1. *end note*]

21.2.2.231 `wMode` (Width Mode)

This element specifies how to interpret the Width element for this manual layout.

Attributes	Description
val (Layout Mode Value)	<p>Specifies the layout mode for the width.</p> <p>The possible values for this attribute are defined by the ST_LayoutMode simple type (§21.2.3.20).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_LayoutMode](#)) is located in §A.5.1. *end note*]

21.2.2.232 `x` (Left)

This element specifies the x location (left) of the chart element as a fraction of the width of the chart. If Left Mode is Factor, then the position is relative to the default position for the chart element.

Attributes	Description
val (Floating Point Value)	<p>Specifies that the contents of this attribute contain a floating point number.</p> <p>The contents of this number are interpreted based on the context of the parent XML element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Double](#)) is located in §A.5.1. *end note*]

21.2.2.233 xMode (Left Mode)

This element specifies how to interpret the Left element for this manual layout.

Attributes	Description
val (Layout Mode Value)	Specifies the layout mode for the width. The possible values for this attribute are defined by the ST_LayoutMode simple type (§21.2.3.20).

[Note: The W3C XML Schema definition of this element's content model ([CT_LayoutMode](#)) is located in §A.5.1. *end note*]

21.2.2.234 xVal (X Values)

This element specifies the x values which shall be used to define the location of data markers on a chart.

[Note: The W3C XML Schema definition of this element's content model ([CT_AxDataSource](#)) is located in §A.5.1. *end note*]

21.2.2.235 y (Top)

This element specifies the top of the chart element as a fraction of the height of the chart. If Top Mode is Factor, then the position is relative to the default position for the chart element.

Attributes	Description
val (Floating Point Value)	Specifies that the contents of this attribute contain a floating point number. The contents of this number are interpreted based on the context of the parent XML element. The possible values for this attribute are defined by the W3C XML Schema double datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Double](#)) is located in §A.5.1. *end note*]

21.2.2.236 yMode (Top Mode)

This element specifies how to interpret the Top element for this manual layout.

Attributes	Description
val (Layout Mode Value)	Specifies the layout mode for the width. The possible values for this attribute are defined by the ST_LayoutMode simple type (§21.2.3.20).

[Note: The W3C XML Schema definition of this element's content model ([CT_LayoutMode](#)) is located in §A.5.1. *end note*]

21.2.2.237 yVal (Y Values)

This element specifies the y values which shall be used to define the location of data markers on a chart.

[Note: The W3C XML Schema definition of this element's content model ([CT_NumDataSource](#)) is located in §A.5.1. *end note*]

21.2.3 Simple Types

This is the complete list of simple types dedicated to DrawingML – Charts.

21.2.3.1 ST_AxisUnit (Axis Unit)

This simple type specifies that its contents contain a positive floating point number.

This simple type's contents are a restriction of the W3C XML Schema double datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than 0.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_AxisUnit](#)) is located in §A.5.1. *end note*]

21.2.3.2 ST_AxPos (Axis Position)

This simple type specifies the possible positions for an axis.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
b (Bottom)	Specifies that the axis shall be displayed at the bottom of the plot area.
l (Left)	Specifies that the axis shall be displayed at the left of the plot area.
r (Right)	Specifies that the axis shall be displayed at the right of the plot area.

Enumeration Value	Description
t (Top)	Specifies that the axis shall be displayed at the top of the plot area.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_AxPos](#)) is located in §A.5.1. *end note*]

21.2.3.3 ST_BarDir (Bar Direction)

This simple type specifies the possible directions for a bar chart.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
bar (Bar)	Specifies that the chart is a bar chart - the data markers are horizontal rectangles.
col (Column)	Specifies that the chart is a column chart - the data markers are vertical rectangles.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_BarDir](#)) is located in §A.5.1. *end note*]

21.2.3.4 ST_BarGrouping (Bar Grouping)

This simple type specifies the possible groupings for a bar chart.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
clustered (Clustered)	Specifies that the chart series are drawn next to each other along the category axis.
percentStacked (100% Stacked)	Specifies that the chart series are drawn next to each other along the value axis and scaled to total 100%.
stacked (Stacked)	Specifies that the chart series are drawn next to each other on the value axis.
standard (Standard)	Specifies that the chart series are drawn next to each other on the depth axis.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_BarGrouping](#)) is located in §A.5.1. *end note*]

21.2.3.5 ST_BubbleScale (Bubble Scale)

This simple type specifies that its contents contain a percentage between 0% and 300%.

This simple type is a union of the following types:

- ST_BubbleScalePercent simple type (§21.2.3.58).

[Note: The W3C XML Schema definition of this simple type’s content model (ST_BubbleScale) is located in §A.5.1. *end note*]

21.2.3.6 ST_BuiltInUnit (Built-In Unit)

This simple type specifies the built in display units for an axis.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
billions (Billions)	Specifies the values on the chart shall be divided by 1,000,000,000.
hundredMillions (Hundred Millions)	Specifies the values on the chart shall be divided by 100,000,000.
hundreds (Hundreds)	Specifies the values on the chart shall be divided by 100.
hundredThousands (Hundred Thousands)	Specifies the values on the chart shall be divided by 100,000.
millions (Millions)	Specifies the values on the chart shall be divided by 1,000,000.
tenMillions (Ten Millions)	Specifies the values on the chart shall be divided by 10,000,000.
tenThousands (Ten Thousands)	Specifies the values on the chart shall be divided by 10,000.
thousands (Thousands)	Specifies the values on the chart shall be divided by 1,000.
trillions (Trillions)	Specifies the values on the chart shall be divided by 1,000,000,000.

[Note: The W3C XML Schema definition of this simple type’s content model (ST_BuiltInUnit) is located in §A.5.1. *end note*]

21.2.3.7 ST_CrossBetween (Cross Between)

This simple type specifies the possible crossing states of an axis.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
between (Between)	Specifies the value axis shall cross the category axis between data markers.
midCat (Midpoint of Category)	Specifies the value axis shall cross the category axis at the midpoint of a category.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_CrossBetween](#)) is located in §A.5.1. *end note*]

21.2.3.8 [ST_Crosses \(Crosses\)](#)

This simple type specifies the possible crossing points for an axis.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
autoZero (Axis Crosses at Zero)	The category axis crosses at the zero point of the value axis (if possible), or the minimum value (if the minimum is greater than zero) or the maximum (if the maximum is less than zero).
max (Maximum)	The axis crosses at the maximum value
min (Minimum)	Axis crosses at the minimum value of the chart.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Crosses](#)) is located in §A.5.1. *end note*]

21.2.3.9 [ST_DepthPercent \(Depth Percent\)](#)

This simple type specifies that its contents contain a percentage between 20% and 2000%.

This simple type is a union of the following types:

- [ST_DepthPercentWithSymbol](#) simple type (§21.2.3.51).

[Note: The W3C XML Schema definition of this simple type's content model ([ST_DepthPercent](#)) is located in §A.5.1. *end note*]

21.2.3.10 [ST_DisbBlanksAs \(Display Blanks As\)](#)

This simple type specifies the possible ways to display blanks.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
gap (Gap)	Specifies that blank values shall be left as a gap.
span (Span)	Specifies that blank values shall be spanned with a line.
zero (Zero)	Specifies that blank values shall be treated as zero.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_DisplanksAs](#)) is located in §A.5.1. *end note*]

21.2.3.11 ST_DLblPos (Data Label Position)

This simple type specifies the possible positions for a data label.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
b (Bottom)	Specifies that data labels shall be displayed below the data marker.
bestFit (Best Fit)	Specifies that data labels shall be displayed in the best position.
ctr (Center)	Specifies that data labels shall be displayed centered on the data marker.
inBase (Inside Base)	Specifies that data labels shall be displayed inside the base of the data marker.
inEnd (Inside End)	Specifies that data labels shall be displayed inside the end of the data marker.
l (Left)	Specifies that data labels shall be displayed to the left of the data marker.
outEnd (Outside End)	Specifies that data labels shall be displayed outside the end of the data marker.
r (Right)	Specifies that data labels shall be displayed to the right of the data marker.
t (Top)	Specifies that data labels shall be displayed above the data marker.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_DLblPos](#)) is located in §A.5.1. *end note*]

21.2.3.12 ST_ErrBarType (Error Bar Type)

This simple type specifies the possible ways to draw an error bar.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
both (Both)	Specifies that error bars shall be shown in the positive and negative directions.
minus (Minus)	Specifies that error bars shall be shown in the negative direction only.
plus (Plus)	Specifies that error bars shall be shown in the positive direction only.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ErrBarType](#)) is located in §A.5.1. *end note*]

21.2.3.13 ST_ErrDir (Error Bar Direction)

This simple type specifies the possible directions for error bars.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
x (X)	Specifies that error bars shall be shown in the x direction.
y (Y)	Specifies that error bars shall be shown in the y direction.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ErrDir](#)) is located in §A.5.1. *end note*]

21.2.3.14 ST_ErrValType (Error Value Type)

This simple type specifies the possible ways to determine the length of the error bars

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
cust (Custom Error Bars)	Specifies that the length of the error bars shall be determined by the Plus and Minus elements.

Enumeration Value	Description
fixedVal (Fixed Value)	Specifies that the length of the error bars shall be the fixed value determined by Error Bar Value.
percentage (Percentage)	Specifies that the length of the error bars shall be Error Bar Value percent of the data.
stdDev (Standard Deviation)	Specifies that the length of the error bars shall be Error Bar Value standard deviations of the data.
stdErr (Standard Error)	Specifies that the length of the error bars shall be Error Bar Value standard errors of the data.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ErrValType](#)) is located in §A.5.1. *end note*]

21.2.3.15 ST_FirstSliceAng (First Slice Angle)

This simple type specifies that its contents contain an integer between 0 and 360.

This simple type's contents are a restriction of the W3C XML Schema unsignedShort datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 0.
- This simple type has a maximum value of less than or equal to 360.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_FirstSliceAng](#)) is located in §A.5.1. *end note*]

21.2.3.16 ST_GapAmount (Gap Amount)

This simple type specifies that its contents contain a percentage between 0% and 500%.

This simple type is a union of the following types:

- ST_GapAmountPercent simple type (§21.2.3.53).

[Note: The W3C XML Schema definition of this simple type's content model ([ST_GapAmount](#)) is located in §A.5.1. *end note*]

21.2.3.17 ST_Grouping (Grouping)

This simple type specifies the possible groupings for a bar chart.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
percentStacked (100% Stacked)	Specifies that the chart series are drawn next to each other along the value axis and scaled to total 100%.
stacked (Stacked)	Specifies that the chart series are drawn next to each other on the value axis.
standard (Standard)	Specifies that the chart series are drawn on the value axis.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_Grouping](#)) is located in §A.5.1.
end note]

21.2.3.18 ST_HoleSize (Hole Size)

This simple type specifies that its contents contain a percentage between 1% and 90%.

This simple type is a union of the following types:

- ST_HoleSizePercent simple type (§21.2.3.55).

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_HoleSize](#)) is located in §A.5.1.
end note]

21.2.3.19 ST_HPercent (Height Percent)

This simple type specifies that its contents contain a percentage between 5% and 500%.

This simple type is a union of the following types:

- ST_HPercentWithSymbol simple type (§21.2.3.52).

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_HPercent](#)) is located in §A.5.1.
end note]

21.2.3.20 ST_LayoutMode (Layout Mode)

This simple type specifies the possible ways to store a chart element's position.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
edge (Edge)	Specifies that the Width or Height shall be interpreted as the Right or Bottom of the chart element.
factor (Factor)	Specifies that the Width or Height shall be interpreted as the Width or Height of the chart element.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_LayoutMode](#)) is located in §A.5.1. *end note*]

21.2.3.21 [ST_LayoutTarget \(Layout Target\)](#)

This simple type specifies the possible ways to layout the plot area.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
inner (Inner)	Specifies that the plot area size shall determine the size of the plot area, not including the tick marks and axis labels.
outer (Outer)	Specifies that the plot area size shall determine the size of the plot area, the tick marks, and the axis labels.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_LayoutTarget](#)) is located in §A.5.1. *end note*]

21.2.3.22 [ST_LblAlgn \(Label Alignment\)](#)

This simple type specifies the possible ways to align the tick labels.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
ctr (Center)	Specifies that the text shall be centered.
l (Left)	Specifies that the text shall be left justified.
r (Right)	Specifies that the text shall be right justified.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_LblAlgn](#)) is located in §A.5.1. *end note*]

21.2.3.23 [ST_LblOffset \(Label Offset\)](#)

This simple type specifies that its contents contain a percentage of the default value, between 0% and 1000%.

This simple type is a union of the following types:

- [ST_LblOffsetPercent](#) simple type (§21.2.3.56).

[Note: The W3C XML Schema definition of this simple type's content model ([ST_LblOffset](#)) is located in §A.5.1.
end note]

21.2.3.24 ST_LegendPos (Legend Position)

This simple type specifies the possible positions for a legend.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
b (Bottom)	Specifies that the legend shall be drawn at the bottom of the chart.
l (Left)	Specifies that the legend shall be drawn at the left of the chart.
r (Right)	Specifies that the legend shall be drawn at the right of the chart.
t (Top)	Specifies that the legend shall be drawn at the top of the chart.
tr (Top Right)	Specifies that the legend shall be drawn at the top right of the chart.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_LegendPos](#)) is located in §A.5.1.
end note]

21.2.3.25 ST_LogBase (Logarithmic Base)

This simple type specifies that its contents contain a floating point number greater than or equal to two.

This simple type's contents are a restriction of the W3C XML Schema double datatype.

This simple type also specifies the following restrictions:

- This simple type has a maximum value of less than or equal to 1000.
- This simple type has a minimum value of greater than or equal to 2.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_LogBase](#)) is located in §A.5.1.
end note]

21.2.3.26 ST_MarkerSize (Marker Size)

This simple type specifies that its contents contain an integer between 2 and 72, whose contents are a size in points.

This simple type's contents are a restriction of the W3C XML Schema unsignedByte datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 2.
- This simple type has a maximum value of less than or equal to 72.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_MarkerSize](#)) is located in §A.5.1.
end note]

21.2.3.27 ST_MarkerStyle (Marker Style)

This picture shows each of the marker styles. Black is used as the line color, while red is used as the fill color. The height of the dash and the dot are 1/5th of the height of the marker. The width of the dot is 1/2 the width of the marker. The dash and dot have fills as well, but the markers need to be made quite large before these are visible.



This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
circle (Circle)	Specifies a circle shall be drawn at each data point.
dash (Dash)	Specifies a dash shall be drawn at each data point.
diamond (Diamond)	Specifies a diamond shall be drawn at each data point.
dot (Dot)	Specifies a dot shall be drawn at each data point.
none (None)	Specifies nothing shall be drawn at each data point.
picture (Picture)	Specifies a picture shall be drawn at each data point.
plus (Plus)	Specifies a plus shall be drawn at each data point.
square (Square)	Specifies a square shall be drawn at each data point.
star (Star)	Specifies a star shall be drawn at each data point.
triangle (Triangle)	Specifies a triangle shall be drawn at each data point.
x (X)	Specifies an X shall be drawn at each data point.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_MarkerStyle](#)) is located in §A.5.1. *end note*]

21.2.3.28 [ST_OfPieType \(Pie of Pie or Bar of Pie Type\)](#)

This simple type specifies the possible modes of Pie of Pie or Bar of Pie charts.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
bar (Bar)	Specifies that the chart is a bar of pie chart, not a pie of pie chart.
pie (Pie)	Specifies that the chart is pie of pie chart, not a bar of pie chart.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_OfPieType](#)) is located in §A.5.1. *end note*]

21.2.3.29 [ST_Order \(Order\)](#)

This simple type specifies that its contents contain an integer between 2 and 6, whose contents are the order of the trendline polynomial.

This simple type's contents are a restriction of the W3C XML Schema unsignedByte datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 2.
- This simple type has a maximum value of less than or equal to 6.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Order](#)) is located in §A.5.1. *end note*]

21.2.3.30 [ST_Orientation \(Orientation\)](#)

This simple type specifies the possible ways to place a picture on a data point, series, wall, or floor.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
maxMin (Maximum to Minimum)	Specifies that the values on the axis shall be reversed so they go from maximum to minimum.

Enumeration Value	Description
minMax (Minimum to Maximum)	Specifies that the axis values shall be in the usual order, minimum to maximum.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_Orientation](#)) is located in §A.5.1. *end note*]

21.2.3.31 ST_Overlap (Overlap)

This simple type specifies that its contents contain a percentage between -100% and 100%.

This simple type is a union of the following types:

- ST_OverlapPercent simple type (§21.2.3.57).

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_Overlap](#)) is located in §A.5.1. *end note*]

21.2.3.32 ST_PageSetupOrientation (Printed Page Orientation)

This simple type specifies the page orientation of the printed page(s) on which this chart shall appear.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
default (Default Page Orientation)	Specifies that the page orientation shall be the default orientation of the system.
landscape (Landscape Page)	Specifies that the printed page shall have landscape orientation.
portrait (Portrait Page)	Specifies that the printed page shall have portrait orientation.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_PageSetupOrientation](#)) is located in §A.5.1. *end note*]

21.2.3.33 ST_Period (Period)

This simple type specifies that its contents contain an integer greater than or equal to 2.

This simple type's contents are a restriction of the W3C XML Schema unsignedInt datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 2.

Enumeration Value	Description
auto (Auto)	Specifies an application-specific marker shall be drawn at each data point.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Period](#)) is located in §A.5.1. *end note*]

21.2.3.34 ST_Perspective (Perspective)

This simple type specifies that its contents contain an integer between 0 and 100, whose contents are a percentage.

This simple type's contents are a restriction of the W3C XML Schema unsignedByte datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 0.
- This simple type has a maximum value of less than or equal to 240.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Perspective](#)) is located in §A.5.1. *end note*]

21.2.3.35 ST_PictureFormat (Picture Format)

This simple type specifies the possible ways to place a picture on a data point, series, wall, or floor.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
stack (Stack)	Specifies that the picture shall be stacked.
stackScale (Stack and Scale)	Specifies that the picture shall be stacked after being scaled so that it's height is one Picture Stack Unit. Does not apply to walls or floor.
stretch (Stretch)	Specifies that the picture shall be anisotropic stretched to fill the data point, series, wall or floor.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_PictureFormat](#)) is located in §A.5.1. *end note*]

21.2.3.36 ST_PictureStackUnit (Picture Stack Unit)

This simple type specifies that its contents contain a floating point number greater than zero.

This simple type's contents are a restriction of the W3C XML Schema double datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than 0.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_PictureStackUnit](#)) is located in §A.5.1. *end note*]

21.2.3.37 ST_RadarStyle (Radar Style)

This simple type specifies the possible styles of radar chart.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
filled (Filled)	Specifies that the radar chart shall be filled and have lines but no markers.
marker (Marker)	Specifies that the radar chart shall have lines and markers but no fill.
standard (Standard)	Specifies that the radar chart shall have lines but no markers and no fill.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_RadarStyle](#)) is located in §A.5.1. *end note*]

21.2.3.38 ST_RotX (X Rotation)

This simple type specifies that its contents contain an integer between -90 and 90, whose contents are an angle in degrees.

This simple type's contents are a restriction of the W3C XML Schema byte datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to -90.
- This simple type has a maximum value of less than or equal to 90.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_RotX](#)) is located in §A.5.1. *end note*]

21.2.3.39 ST_RotY (Y Rotation)

This simple type specifies that its contents contain an integer between 0 and 360, whose contents are an angle in degrees.

This simple type's contents are a restriction of the W3C XML Schema unsignedShort datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 0.
- This simple type has a maximum value of less than or equal to 360.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_RotY](#)) is located in §A.5.1. *end note*]

21.2.3.40 ST_ScatterStyle (Scatter Style)

This simple type specifies the possible styles of scatter chart.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
line (Line)	Specifies the points on the scatter chart shall be connected with straight lines but markers shall not be drawn.
lineMarker (Line with Markers)	Specifies the points on the scatter chart shall be connected with straight lines and markers shall be drawn.
marker (Marker)	Specifies the points on the scatter chart shall not be connected with lines and markers shall be drawn.
none (None)	Specifies the points on the scatter chart shall not be connected with straight lines and markers shall not be drawn.
smooth (Smooth)	Specifies the the points on the scatter chart shall be connected with smoothed lines and markers shall not be drawn.
smoothMarker (Smooth with Markers)	Specifies the the points on the scatter chart shall be connected with smoothed lines and markers shall be drawn.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_ScatterStyle](#)) is located in §A.5.1. *end note*]

21.2.3.41 [ST_SecondPieSize \(Second Pie Size\)](#)

This simple type specifies that its contents contain a percentage between 5% and 200%, whose contents consist of a percentage.

This simple type is a union of the following types:

- [ST_SecondPieSizePercent](#) simple type (§21.2.3.55).

[*Note: The W3C XML Schema definition of this simple type’s content model ([ST_SecondPieSize](#)) is located in §A.5.1. end note*]

21.2.3.42 [ST_Shape \(Shape\)](#)

This simple type specifies the possible shapes for a 3-D data marker.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
box (Box)	Specifies the chart shall be drawn with a box shape.
cone (Cone)	Specifies the chart shall be drawn as a cone, with the base of the cone on the floor and the point of the cone at the top of the data marker.
coneToMax (Cone to Max)	Specifies the chart shall be drawn with truncated cones such that the point of the cone would be the maximum data value.
cylinder (Cylinder)	Specifies the chart shall be drawn as a cylinder.
pyramid (Pyramid)	Specifies the chart shall be drawn as a rectangular pyramid, with the base of the pyramid on the floor and the point of the pyramid at the top of the data marker.
pyramidToMax (Pyramid to Maximum)	Specifies the chart shall be drawn with truncated cones such that the point of the cone would be the maximum data value.

[*Note: The W3C XML Schema definition of this simple type’s content model ([ST_Shape](#)) is located in §A.5.1. end note*]

21.2.3.43 [ST_SizeRepresents \(Size Represents\)](#)

This simple type specifies the possible ways to represent data as bubble chart sizes.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
area (Bubble Size Represents Area)	Specifies the area of the bubbles shall be proportional to the bubble size value.
w (Bubble Size Represents Width)	Specifies the radius of the bubbles shall be proportional to the bubble size value.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_SizeRepresents](#)) is located in §A.5.1. *end note*]

21.2.3.44 ST_Skip (Skip)

This simple type specifies that its contents contain an integer greater than or equal to one.

This simple type's contents are a restriction of the W3C XML Schema unsignedInt datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 1.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Skip](#)) is located in §A.5.1. *end note*]

21.2.3.45 ST_SplitType (Split Type)

This simple type specifies the possible ways to split a pie of pie or bar of pie chart.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
auto (Default Split)	Specifies the data points shall be split using the default mechanism for this chart type.
cust (Custom Split)	Specifies the data points shall be split between the pie and the second chart according to the Custom Split values.
percent (Split by Percentage)	Specifies the data points shall be split between the pie and the second chart by putting the points with percentage less than Split Position percent in the second chart.
pos (Split by Position)	Specifies the data points shall be split between the pie and the second chart by putting the last Split Position of the data points in the second chart
val (Split by Value)	Specifies the data points shall be split between the pie and the second chart by putting the data points with

Enumeration Value	Description
	value less than Split Position in the second chart

[Note: The W3C XML Schema definition of this simple type's content model ([ST_SplitType](#)) is located in §A.5.1. *end note*]

21.2.3.46 ST_Style (Style)

This simple type specifies that its contents contain an integer between 1 and 48. The value determines the default formatting for all chart elements through the tables described below.

The default font is the minor font as defined by the document's theme. The default font size for each element is the font size of the chart, except for the title which is always 120% the font size of the chart. If the chart does not have a font size set, then the default font size is 10. Axis titles and chart titles are bold by default, while all other chart elements are normal. The default font color is the same as the Axis & Major Gridlines Line Color.

The default line style, fill style, and effect style are determined by the tables below. Each of the default includes a themed line, fill, or effect (None, Subtle, Moderate, or Intense) and a color to be used when applying that line, fill, or effect. In some cases, both the themed formatting and the color vary per style, in other cases they do not. The default line width is determined by the theme, except for lines for data points it is multiplied by the line width value given in the table.

Table 1: Chart element defaults

This table lists whether the default is constant or whether it depends on the ST_Style using one of the later tables.

	Line		Fill		Effect	
Chart Element	Themed Line	Color	Themed Fill	Color	Themed Effect	Color
Axis	Subtle	Table 2	No Fill		No Effect	
Axis Title	No Line		No Fill		No Effect	
Chart Area	Table 2		Subtle	Table 3	No Effect	
Chart Title	No Line		No Fill		No Effect	
Data Labels	No Line		No Fill		No Effect	
Data Table	Subtle	Table 2	No Fill		No Effect	
Down Bars	Table 4		Table 4		Table 4	dk1
Fills for Data Points (2-D)	Subtle	Table 5	Table 5		Table 5	dk1
Fills for Data Points (3-D)	Subtle	Table 5	Table 5		Table 5	dk1
Floor	Table 2		Table 3		No Effect	
Legend	No Line		No Fill		No Effect	
Lines for Data Points	Subtle	Table 5	N/A		No Effect	

	Line		Fill		Effect	
Major Gridlines	Subtle	Table 2	N/A		No Effect	
Markers for Data Points	Subtle	Table 5	Table 5		Table 5	dk1
Minor Gridlines	Subtle	Table 2	N/A		No Effect	
Other Lines	Subtle	Table 2	N/A		No Effect	
Plot Area (2-D charts)	No Line		Subtle	Table 3	No Effect	
Plot Area (3-D charts)	No Line		No Fill		No Effect	
Trendline Labels	No Line		No Fill		No Effect	
Up Bars	Table 4		Table 4		Table 4	dk1
Walls	No Line		Table 3		No Effect	

Other Lines includes Drop Lines, Error Bars, High Low Lines, Leader Lines, Series Lines, and Trendlines.

Fills for Data Points (2-D) includes 2-D bar, filled radar, stock, bubble, pie, doughnut and area charts.

Fills for Data Points (3-D) includes all 3-D charts.

Lines for Data Points includes lines on 2-D line, scatter, bubble, and radar charts.

Markers for Data Points includes markers on 2-D line, scatter, and radar charts.

Table 2: Default line formatting per chart style

This table lists line formatting for several chart elements by style.

Style	Axis & Major Gridlines	Minor Gridlines	Chart Area, Data Table, & Floor	Other Lines	Floor & Chart Area
	Color	Color	Color	Color	Themed Line
1-32	tx1	50% tint of tx1	75% tint of tx1	tx1	Subtle
33-34	dk1	50% tint of tx1	75% tint of dk1	dk1	Subtle
35-40	dk1	50% tint of tx1	75% tint of dk1	25% shade of dk1	Subtle
41-48	dk1	90% tint of tx1	lt1	lt1	No Line

Table 3: Default fill formatting per chart style

This table lists fill formatting for several chart elements by style.

Style	Chart Area	Floor, Walls & Plot Area (2-D)	Floor & Walls
	Color	Color	Themed Fill
1-32	bg1	bg1	No Fill
33-34	lt1	20% tint of dk1	Subtle
35-40	lt1	accent1-6	Subtle
41-48	dk1	95% tint of dk1	Subtle

Table 4: Up and down bars default formatting per chart style

This table lists line, fill, and effect formatting for up and down bars by style. The color listed as accent1-6 means that the first style uses accent1, the next uses accent2, up to the sixth uses accent6.

	Up Bars	Down Bars	Up & Down Bars			
			Themed			
Style	Fill Color	Fill Color	Fill	Effect	Line	Line Color
1	25% tint of dk1	85% tint of dk1	Subtle	None	Subtle	tx1
2	5% tint of dk1	95% tint of dk1	Subtle	None	Subtle	tx1
3-8	25% tint of accent1-6	25% shade of accent1-6	Subtle	None	Subtle	tx1
9	25% tint of dk1	85% tint of dk1	Subtle	Subtle	Subtle	tx1
10	5% tint of dk1	95% tint of dk1	Subtle	Subtle	Subtle	tx1
11-16	25% tint of accent1-6	25% shade of accent1-6	Subtle	Subtle	Subtle	tx1
17	25% tint of dk1	85% tint of dk1	Intense	Moderate	No ne	None
18	5% tint of dk1	95% tint of dk1	Intense	Moderate	None	None
19-24	25% tint of accent1-6	25% shade of accent1-6	Intense	Moderate	None	None
25	25% tint of dk1	85% tint of dk1	Intense	Intense	None	None
26	5% tint of dk1	95% tint of dk1	Intense	Intense	None	None

	Up Bars	Down Bars	Up & Down Bars			
27-32	25% tint of accent1-6	25% shade of accent1-6	Intense	Intense	None	None
33	lt1	85% tint of dk1	Subtle	None	Subtle	dk1
34	lt1	95% tint of dk1	Subtle	None	Subtle	dk1
35-40	lt1	25% shade of accent1-6	Subtle	None	Subtle	25% shade of accent1-6
41	25% tint of dk1	85% tint of dk1	Intense	Intense	None	None
42	lt1	dk1	Intense	Intense	None	None
43-48	25% tint of accent1-6	25% shade of accent1-6	Intense	Intense	None	None

Table 5: Default data point formatting per chart style

This table lists line, fill, and effect formatting for data points by style. Some of the formatting is a repeating pattern described in the next table (denoted by "Pattern"). Other use a fade pattern in which the first series is a certain% shade of the color listed and the last series is an certain% tint of the color listed. The intermediate colors are linearly interpolated by shade and tint to the listed color. The starting shade% and ending tint% are determined by the spreadsheet application, where shades are always darker than tints.

[*Note:* A suggested way to implement this percentage is by using the formula: shade/tint percent = $-70 + 140 * (\text{SeriesFormattingIndex} / (\text{HighestFormattingIndexOfAllSeriesOnAllGraphs} + 1))$. In this case the series formatting index is the `idx` attribute value for the series. Negative outputs are shades, and positive outputs are tints. *end note*]

[*Note:* The arrows across the top of the table indicate which columns apply for that row: i.e., for Fills, Lines, or Markers. So, for example, only the last two columns for Lines for Data Points apply. *end note*]

Fills for Data Points (2-D)	↓	↓	↓	↓		
Fills for Data Points (3-D)		↓	↓	↓	↓	
Lines for Data Points					↓	↓
Markers for Data Points	↓	↓				↓

	Effect	Fill	Fill	Fill	Line	Line	Line	Line
Style	Themed Effect	Themed Fill	Pattern	Themed Fill	Themed Line	Color or Pattern	Width	Pattern
1	No Effect	Subtle	1	Subtle	No Line		3	1
2	No Effect	Subtle	2	Subtle	No Line		3	2
3	No Effect	Subtle	accent1 fade	Subtle	No Line		3	accent1 fade
4	No Effect	Subtle	accent2 fade	Subtle	No Line		3	accent2 fade
5	No Effect	Subtle	accent3 fade	Subtle	No Line		3	accent3 fade
6	No Effect	Subtle	accent4 fade	Subtle	No Line		3	accent4 fade
7	No Effect	Subtle	accent5 fade	Subtle	No Line		3	accent5 fade
8	No Effect	Subtle	accent6 fade	Subtle	No Line		3	accent6 fade
9	Subtle	Subtle	1	Subtle	Subtle	lt1	5	1
10	Subtle	Subtle	2	Subtle	Subtle	lt1	5	2
11	Subtle	Subtle	accent1 fade	Subtle	Subtle	lt1	5	accent1 fade
12	Subtle	Subtle	accent2 fade	Subtle	Subtle	lt1	5	accent2 fade
13	Subtle	Subtle	accent3 fade	Subtle	Subtle	lt1	5	accent3 fade
14	Subtle	Subtle	accent4 fade	Subtle	Subtle	lt1	5	accent4 fade
15	Subtle	Subtle	accent5 fade	Subtle	Subtle	lt1	5	accent5 fade
16	Subtle	Subtle	accent6 fade	Subtle	Subtle	lt1	5	accent6 fade

21. DrawingML - Components Reference Material

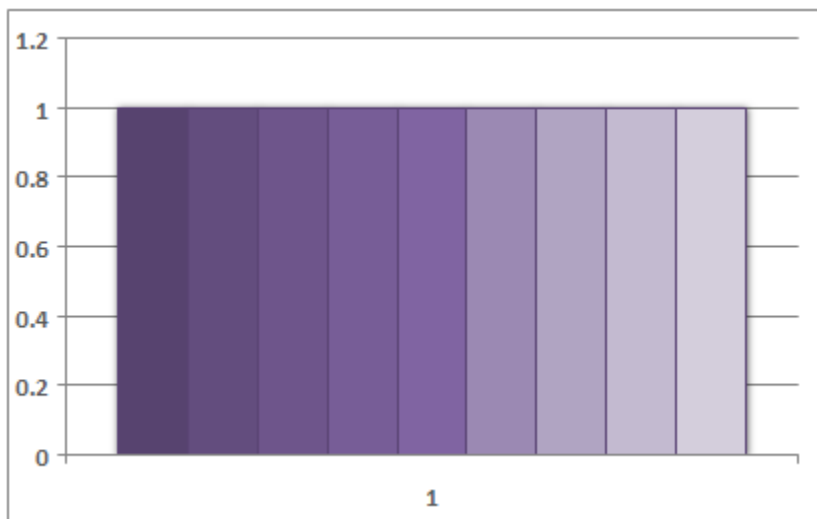
			fade				fade
17	Moderate	Intense	1	Subtle	No Line	5	1
18	Moderate	Intense	2	Intense	No Line	5	2
			accent1				accent1
19	Moderate	Intense	fade	Subtle	No Line	5	fade
			accent2				accent2
20	Moderate	Intense	fade	Subtle	No Line	5	fade
			accent3				accent3
21	Moderate	Intense	fade	Subtle	No Line	5	fade
			accent4				accent4
22	Moderate	Intense	fade	Subtle	No Line	5	fade
			accent5				accent5
23	Moderate	Intense	fade	Subtle	No Line	5	fade
			accent6				accent6
24	Moderate	Intense	fade	Subtle	No Line	5	fade
25	Intense	Intense	1	Subtle	No Line	7	1
26	Intense	Intense	2	Intense	No Line	7	2
			accent1				accent1
27	Intense	Intense	fade	Subtle	No Line	7	fade
			accent2				accent2
28	Intense	Intense	fade	Subtle	No Line	7	fade
			accent3				accent3
29	Intense	Intense	fade	Subtle	No Line	7	fade
			accent4				accent4
30	Intense	Intense	fade	Subtle	No Line	7	fade
			accent5				accent5
31	Intense	Intense	fade	Subtle	No Line	7	fade
			accent6				accent6
32	Intense	Intense	fade	Subtle	No Line	7	fade
33	No Effect	Subtle	1	Subtle	Subtle	5	1
					50% shade		

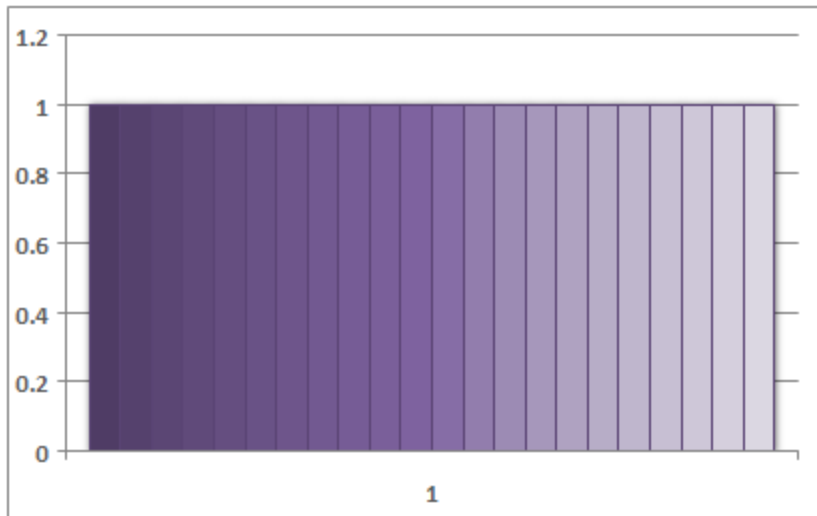
						of dk1		
34	No Effect	Subtle	2	Subtle	Subtle	Pattern 3	5	2
35	No Effect	Subtle	accent1 fade	Subtle	Subtle	50% shade of accent1	5	accent1 fade
36	No Effect	Subtle	accent2 fade	Subtle	Subtle	50% shade of accent2	5	accent2 fade
37	No Effect	Subtle	accent3 fade	Subtle	Subtle	50% shade of accent3	5	accent3 fade
38	No Effect	Subtle	accent4 fade	Subtle	Subtle	50% shade of accent4	5	accent4 fade
39	No Effect	Subtle	accent5 fade	Subtle	Subtle	50% shade of accent5	5	accent5 fade
40	No Effect	Subtle	accent6 fade	Subtle	Subtle	50% shade of accent6	5	accent6 fade
41	Intense	Intense	4	Subtle	No Line		5	4
42	Intense	Intense	2	Intense	No Line		5	2
43	Intense	Intense	accent1 fade	Subtle	No Line		5	accent1 fade
44	Intense	Intense	accent2 fade	Subtle	No Line		5	accent2 fade
45	Intense	Intense	accent3 fade	Subtle	No Line		5	accent3 fade
46	Intense	Intense	accent4 fade	Subtle	No Line		5	accent4 fade
47	Intense	Intense	accent5 fade	Subtle	No Line		5	accent5 fade
48	Intense	Intense	accent6 fade	Subtle	No Line		5	accent6 fade

Table 6: Default data point formatting per data point

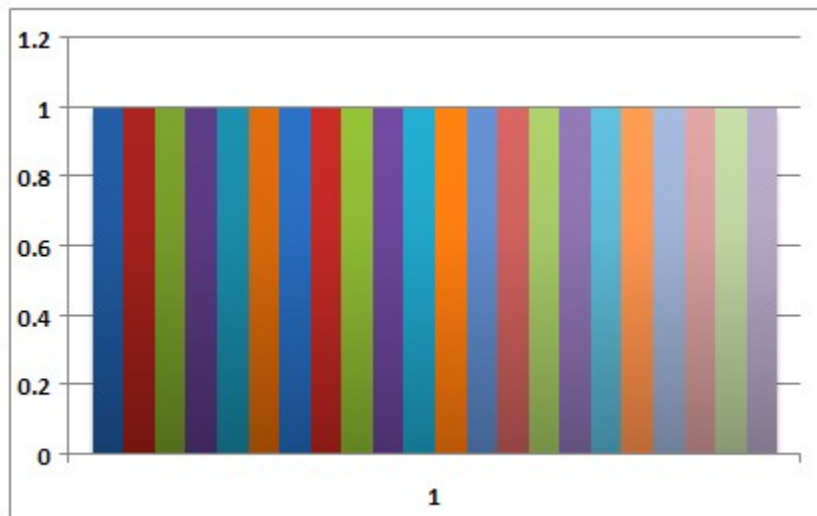
This table contains the formatting patterns used for each data point when there are is one series, or each series when there is just one series. The patterns in this table can repeat, see the pictures below the table for an illustration.

Pattern	Data Point 1	Data Point 2	Data Point 3	Data Point 4	Data Point 5	Data Point 6
1	88.5% tint of dk1	55% tint of dk1	78% tint of dk1	92.5% tint of dk1	70% tint of dk1	30% tint of dk1
2	accent1	accent2	accent3	accent4	Accent5	accent6
3	50% shade of accent1	50% shade of accent2	50% shade of accent3	50% shade of accent4	50% shade of accent5	50% shade of accent6
4	5% tint of dk1	55% tint of dk1	78% tint of dk1	15% tint of dk1	70% tint of dk1	30% tint of dk1





Above are two charts showing the same monochromatic pattern, just with a different number of series. [Note: These charts just have tint and shade adjusted for each series beginning and ending at the same values. *end note*]



Above is a pattern that has 6 distinct accent colors. The colors repeat every 6 data points, but the tint/shade is changed for each set.

This simple type's contents are a restriction of the W3C XML Schema unsignedByte datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 1.
- This simple type has a maximum value of less than or equal to 48.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Style](#)) is located in §A.5.1. *end note*]

21.2.3.47 ST_TickLblPos (Tick Label Position)

This simple type specifies the possible positions for tick labels.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
high (High)	Specifies the axis labels shall be at the high end of the perpendicular axis.
low (Low)	Specifies the axis labels shall be at the low end of the perpendicular axis.
nextTo (Next To)	Specifies the axis labels shall be next to the axis.
none (None)	Specifies the axis labels are not drawn.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TickLblPos](#)) is located in §A.5.1. end note]

21.2.3.48 ST_TickMark (Tick Mark)

This simple type specifies the possible positions for tick marks.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
cross (Cross)	Specifies the tick marks shall cross the axis.
in (Inside)	Specifies the tick marks shall be inside the plot area.
none (None)	Specifies there shall be no tick marks.
out (Outside)	Specifies the tick marks shall be outside the plot area.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TickMark](#)) is located in §A.5.1. end note]

21.2.3.49 ST_TimeUnit (Time Unit)

This simple type specifies a unit of time.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
days (Days)	Specifies the chart data shall be shown in days.

Enumeration Value	Description
months (Months)	Specifies the chart data shall be shown in months.
years (Years)	Specifies the chart data shall be shown in years.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TimeUnit](#)) is located in §A.5.1. *end note*]

21.2.3.50 [ST_TrendlineType](#) (Trendline Type)

This simple type specifies all styles of trendline which are available for series in a chart.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
exp (Exponential)	Specifies the trendline shall be an exponential curve in the form $y = ab^x$.
linear (Linear)	Specifies the trendline shall be a line in the form $y = mx + b$.
log (Logarithmic)	Specifies the trendline shall be a logarithmic curve in the form $y = a \log x + b$, where log is the natural logarithm.
movingAvg (Moving Average)	Specifies the trendline shall be a moving average of period Period.
poly (Polynomial)	Specifies the trendline shall be a polynomial curve of order Order in the form $y = ax^6 + bx^5 + cx^4 + dx^3 + ex^2 + fx + g$.
power (Power)	Specifies the trendline shall be a power curve in the form $y = ax^b$.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TrendlineType](#)) is located in §A.5.1. *end note*]

21.2.3.51 [ST_DepthPercentWithSymbol](#) (Depth Percent with Symbol)

This simple type specifies that its contents contain a percentage between 20% and 2000%.

The simple type's contents shall match the following regular expression pattern:

$0^*(([2-9][0-9])|([1-9][0-9][0-9])|(1[0-9][0-9][0-9])|2000)\%$.

21.2.3.52 [ST_HPercentWithSymbol](#) (Height Percent with Symbol)

This simple type specifies that its contents contain a percentage between 5% and 500%.

The simple type's contents shall match the following regular expression pattern:

`0*([5-9]|([1-9][0-9])|([1-4][0-9][0-9])|500)%`.

21.2.3.53 ST_GapAmountPercent (Gap Amount Percentage)

This simple type specifies that its contents contain a percentage between 0% and 500%.

The simple type's contents shall match the following regular expression pattern:

`0*([0-9]|([1-9][0-9])|([1-4][0-9][0-9])|500)%`.

21.2.3.54 ST_SecondPieSizePercent (Second Pie Size Percentage)

This simple type specifies that its contents contain a percentage between 5% and 200%.

The simple type's contents shall match the following regular expression pattern:

`0*([5-9]|([1-9][0-9])|(1[0-9][0-9])|200)%`.

21.2.3.55 ST_HoleSizePercent (Hole Size Percentage)

This simple type specifies that its contents contain a percentage between 1% and 90%.

The simple type's contents shall match the following regular expression pattern: `0*([1-9]|([1-8][0-9])|90)%`.

21.2.3.56 ST_LblOffsetPercent (Label Offset Percentage)

This simple type specifies that its contents contain a percentage between 0% and 1000%.

The simple type's contents shall match the following regular expression pattern:

`0*([0-9]|([1-9][0-9])|([1-9][0-9][0-9])|1000)%`.

21.2.3.57 ST_OverlapPercent (Overlap Percentage)

This simple type specifies that its contents contain a percentage between -100% and 100%.

The simple type's contents shall match the following regular expression pattern:

`(-?0*([0-9]|([1-9][0-9])|100))%`.

21.2.3.58 ST_BubbleScalePercent (Bubble Scale Percentage)

This simple type specifies that its contents contain a percentage between 0% and 300%.

The simple type's contents shall match the following regular expression pattern:

`0*([0-9]|([1-9][0-9])|([1-2][0-9][0-9])|300)%`.

21.2.3.59 ST_Thickness (Thickness Percentage)

This simple type specifies that its contents contain a percentage.

This simple type is a union of the following types:

- ST_ThicknessPercent simple type (§21.2.3.60).

21.2.3.60 ST_ThicknessPercent (Thickness Percentage)

This simple type specifies that its contents contain a percentage.

The simple type’s contents shall match the following regular expression pattern: ([0-9]+)%.

21.3 DrawingML - Chart Drawings

Within a chart, it is sometimes necessary to include DrawingML elements (shapes or pictures) which should be a child object within the parent chart. This relationship allows those elements to optionally be resized with the chart, automatically moved with the chart, etc.

The Chart Drawing namespace acts in this capacity, specifying all information necessary to anchor and display DrawingML objects within a chart.

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End of informative text.

21.3.2 Elements

The following element define the contents of the ChartDrawing namespace:

21.3.2.1 absSizeAnchor (Absolute Anchor Shape Size)

This element specifies that the shape described here to reside within a chart should be sized based on relative anchor points. This is achieved via two elements. The from element specifies the top left corner of the shape bounding box in a RTL(right-to-left) implementation. The ext element then specifies the bottom right corner of the shape bounding box in a RTL(right-to-left) implementation and thus the size of the shape.

[*Note:* The W3C XML Schema definition of this element's content model ([CT AbsSizeAnchor](#)) is located in §A.5.2. *end note*]

21.3.2.2 blipFill (Picture Fill)

This element specifies the kind of picture fill that the picture object has. Because a picture has a picture fill already by default, it is possible to have two fills specified for a picture object. An example of this is shown below.

[*Example:* Consider the picture below that has a blip fill applied to it. The image used to fill this picture object has transparent pixels instead of white pixels.

```
<pic:pic>
...
<pic:blipFill>
  <a:blip r:embed="rId2"/>
  <a:stretch>
    <a:fillRect/>
  </a:stretch>
</pic:blipFill>
...
</pic:pic>
```



The above picture object is shown as an example of this fill kind. *end example*

[*Example:* Consider now the same picture object but with an additional gradient fill applied within the shape properties portion of the picture.

```
<pic:pic>
...
<pic:blipFill>
  <a:blip r:embed="rId2"/>
  <a:stretch>
    <a:fillRect/>
  </a:stretch>
</pic:blipFill>
<pic:spPr>
  <a:gradFill>
    <a:gsLst>
      <a:gs pos="0">
        <a:schemeClr val="tx2">
          <a:shade val="50000"/>
        </a:schemeClr>
      </a:gs>
      <a:gs pos="39999">
        <a:schemeClr val="tx2">
          <a:tint val="20000"/>
        </a:schemeClr>
      </a:gs>
      <a:gs pos="70000">
        <a:srgbClr val="C4D6EB"/>
      </a:gs>
      <a:gs pos="100000">
        <a:schemeClr val="bg1"/>
      </a:gs>
    </a:gsLst>
  </a:gradFill>
</pic:spPr>
```

```
</a:gs>
</a:gsLst>
</a:gradFill>
</pic:spPr>
...
</pic:pic>
```



The above picture object is shown as an example of this double fill kind. *End example*]

Attributes	Description
dpi (DPI Setting) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies the DPI (dots per inch) used to calculate the size of the blip. If not present or zero, the DPI in the blip is used. [<i>Note</i> : This attribute is primarily used to keep track of the picture quality within a document. There are different levels of quality needed for print than on-screen viewing and thus a need to track this information. <i>end note</i>] The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
rotWithShape (Rotate With Shape) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies that the fill should rotate with the shape. That is, when the shape that has been filled with a picture and the containing shape (say a rectangle) is transformed with a rotation then the fill is transformed with the same rotation. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_BlipFillProperties](#)) is located in §A.4.1. *end note*]

21.3.2.3 cNvCxnSpPr (Non-Visual Connection Shape Drawing Properties)

This element specifies the non-visual drawing properties for a connector shape. These non-visual properties are properties that the generating application would utilize when rendering the parent chart.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_NonVisualConnectorProperties](#)) is located in §A.4.1. *end note*]

21.3.2.4 cNvGraphicFramePr (Non-Visual Graphic Frame Drawing Properties)

This element specifies the non-visual drawing properties for a graphic frame. These non-visual properties are properties that the generating application would utilize when rendering the chart.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_NonVisualGraphicFrameProperties](#)) is located in §A.4.1. *end note*]

21.3.2.5 cNvGrpSpPr (Non-Visual Group Shape Drawing Properties)

This element specifies the non-visual drawing properties for a group shape. These non-visual properties are properties that the generating application would utilize when rendering the chart.

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_NonVisualGroupDrawingShapeProps](#)) is located in §A.4.1. *end note*]

21.3.2.6 cNvPicPr (Non-Visual Picture Drawing Properties)

This element specifies the non-visual properties for the picture canvas. These properties are to be used by the generating application to determine how certain properties are to be changed for the picture object in question.

[*Example*: Consider the following DrawingML.

```
<pic:pic>
...
<pic:nvPicPr>
  <pic:cNvPr id="4" name="Lilly_by_Lisher.jpg"/>
  <pic:cNvPicPr>
    <a:picLocks noChangeAspect="1"/>
  </pic:cNvPicPr>
  <pic:nvPr/>
</pic:nvPicPr>
...
</pic:pic>
```

End example]

Attributes	Description
preferRelativeResi ze (Relative Resize	Specifies if the user interface should show the resizing of the picture based on the picture's current size or its original size. If this attribute is set to true, then scaling is

Attributes	Description
Preferred) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>relative to the original picture size as opposed to the current picture size.</p> <p>[<i>Example</i>: Consider the case where a picture has been resized within a document and is now 50% of the originally inserted picture size. Now if the user chooses to make a later adjustment to the size of this picture within the generating application, then the value of this attribute should be checked.</p> <p>If this attribute is set to true then a value of 50% is shown. Similarly, if this attribute is set to false, then a value of 100% should be shown because the picture has not yet been resized from its current (smaller) size. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_NonVisualPictureProperties](#)) is located in §A.4.1. *end note*]

21.3.2.7 cNvPr (Non-Visual Drawing Properties)

This element specifies non-visual canvas properties. This allows for additional information that does not affect the appearance of the picture to be stored.

[*Example*: Consider the following ChartDrawingML.

```
<cdr:pic>
...
<cdr:nvPicPr>
  <cdr:cNvPr id="4" name="Lilly_by_Lisher.jpg"/>
</cdr:nvPicPr>
...
</cdr:pic>
```

end example]

Attributes	Description
descr (Alternative Text for Object) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies alternative text for the current DrawingML object, for use by assistive technologies or applications which do not display the current object.</p> <p>If this element is omitted, then no alternative text is present for the parent object.</p> <p>[<i>Example</i>: Consider a DrawingML object defined as follows:</p> <pre><... descr="A picture of a bowl of fruit"></pre> <p>The descr attribute contains alternative text which can be used in place of the actual</p>

Attributes	Description
	<p>DrawingML object. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
<p>hidden (Hidden)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies whether this DrawingML object is displayed. When a DrawingML object is displayed within a document, that object can be hidden (i.e., present, but not visible). This attribute determines whether the object is rendered or made hidden. [Note: An application can have settings which allow this object to be viewed. <i>end note</i>]</p> <p>If this attribute is omitted, then the parent DrawingML object shall be displayed (i.e., not hidden).</p> <p>[Example: Consider an inline DrawingML object which must be hidden within the document's content. This setting would be specified as follows:</p> <pre><... hidden="true" /></pre> <p>The hidden attribute has a value of true, which specifies that the DrawingML object is hidden and not displayed when the document is displayed. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>id (Unique Identifier)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies a unique identifier for the current DrawingML object within the current document. This ID can be used to assist in uniquely identifying this object so that it can be referred to by other parts of the document.</p> <p>If multiple objects within the same document share the same id attribute value, then the document shall be considered non-conformant.</p> <p>[Example: Consider a DrawingML object defined as follows:</p> <pre><... id="10" ... ></pre> <p>The id attribute has a value of 10, which is the unique identifier for this DrawingML object. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_DrawingElementId simple type (§20.1.10.21).</p>
<p>name (Name)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies the name of the object. [Note: Typically, this is used to store the original file name of a picture object. <i>end note</i>]</p> <p>[Example: Consider a DrawingML object defined as follows:</p> <pre>< ... name="foo.jpg" ></pre>

Attributes	Description
	<p>The name attribute has a value of <code>foo.jpg</code>, which is the name of this DrawingML object. <i>end example</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
<p>title (Title)</p> <p>Namespace: <code>http://purl.oclc.org/ooxml/drawingml/main</code></p>	<p>Specifies the title (caption) of the current DrawingML object.</p> <p>If this attribute is omitted, then no title text is present for the parent object.</p> <p>[<i>Example:</i> Consider a DrawingML object defined as follows:</p> <pre><... title="Process Flow Diagram"></pre> <p><i>end example</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_NonVisualDrawingProps](#)) is located in §A.4.1. *end note*]

21.3.2.8 cNvSpPr (Non-Visual Shape Drawing Properties)

This element specifies the non-visual drawing properties for a shape. These properties are to be used by the generating application to determine how the shape should be dealt with.

[*Example:* Consider the shape that has a shape lock applied to it.

```
<cdr:sp>
  <cdr:nvSpPr>
    <cdr:cNvPr id="2" name="Rectangle 1"/>
    <cdr:cNvSpPr>
      <a:spLocks noGrp="1"/>
    </cdr:cNvSpPr>
  </cdr:nvSpPr>
  ...
</cdr:sp>
```

This shape lock is stored within the non-visual drawing properties for this shape. *end example*

Attributes	Description
<p>txBox (Text Box)</p> <p>Namespace:</p>	<p>Specifies that the corresponding shape is a text box and thus should be treated as such by the generating application. If this attribute is omitted then it is assumed that the corresponding shape is not specifically a text box.</p>

Attributes	Description
http://purl.oclc.org/ooxml/drawingml/main	<p>[<i>Note</i>: Because a shape is not specified to be a text box does not mean that it cannot have text attached to it. A text box is merely a specialized shape with specific properties. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note*: The W3C XML Schema definition of this element’s content model ([CT_NonVisualDrawingShapeProps](#)) is located in §A.4.1. *end note*]

21.3.2.9 cxnSp (Connection Shape)

This element specifies a connection shape that is used to connect two sp elements. Once a connection is specified using a cxnSp, it is left to the generating application to determine the exact path the connector takes. That is the connector routing algorithm is left up to the generating application as the desired path might be different depending on the specific needs of the application.

[*Example*:



end example]

[*Example*: Consider the following connector shape that connects two regular shapes.

```
<cdr:grpSp>
...
<cdr:sp>
  <cdr:nvSpPr>
    <cdr:cNvPr id="1" name="Rectangle 1"/>
    <cdr:cNvSpPr/>
    <cdr:nvPr/>
  </cdr:nvSpPr>
  ...
</cdr:sp>
<cdr:sp>
  <cdr:nvSpPr>
    <cdr:cNvPr id="2" name="Rectangle 2"/>
    <cdr:cNvSpPr/>
    <cdr:nvPr/>
```

```

    </cdr:nvSpPr>
    ...
</cdr:sp>
<cdr:cxnSp>
  <cdr:nvCxnSpPr>
    <cdr:cNvPr id="3" name="Elbow Connector 3"/>
    <cdr:cNvCxnSpPr>
      <a:stCxn id="1" idx="3"/>
      <a:endCxn id="2" idx="1"/>
    </cdr:cNvCxnSpPr>
    <cdr:nvPr/>
  </cdr:nvCxnSpPr>
  ...
</cdr:cxnSp>
</cdr:grpSp>

```

end example]

Attributes	Description
fPublished (Publish to Server)	<p>Specifies whether the shape shall be published with the worksheet when sent to the spreadsheet server. This is for use when interfacing with a document server.</p> <p><i>[Example: Consider the following shape that is not published with the worksheet when it is published back on the spreadsheet server.</i></p> <pre> <cdr:relSizeAnchor> ... <cdr:sp fPublished="0"> .. </cdr:sp> ... </cdr:relSizeAnchor> </pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
macro (Reference to Custom Function)	<p>This element specifies the custom function associated with the chart. <i>[Example: A macro script, add-in function, and so on. end example]</i></p> <p>The format of this string shall be application-defined, and should be ignored if not understood.</p> <p><i>[Example:</i></p> <pre> <... macro="DoWork()" > </pre> <p><i>end example]</i></p>

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema string datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Connector](#)) is located in §A.5.2. *end note*]

21.3.2.10 [ext \(Shape Extent\)](#)

This element describes the length and width properties for how far a drawing element should extend for.

Attributes	Description
cx (Extent Length) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies the length of the extents rectangle in EMUs. This rectangle shall dictate the size of the object as displayed (the result of any scaling to the original object).</p> <p>[Example: Consider a DrawingML object specified as follows:</p> <pre><... cx="1828800" cy="200000"/></pre> <p>The cx attributes specifies that this object has a height of 1828800 EMUs (English Metric Units). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>
cy (Extent Width) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies the width of the extents rectangle in EMUs. This rectangle shall dictate the size of the object as displayed (the result of any scaling to the original object).</p> <p>[Example: Consider a DrawingML object specified as follows:</p> <pre>< ... cx="1828800" cy="200000"/></pre> <p>The cy attribute specifies that this object has a width of 200000 EMUs (English Metric Units). <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_PositiveSize2D](#)) is located in §A.4.1. *end note*]

21.3.2.11 [from \(Starting Anchor Point\)](#)

This element specifies the first anchor point for the drawing element. This is used to anchor the top and left sides of the shape within the chart. That is when the corresponding chart is adjusted, the shape is also adjusted.

[*Example:* Consider the following Chart Drawing content:

```
<cdr:relSizeAnchor>
  <cdr:from>
    <cdr:x>0.04583</cdr:x>
    <cdr:y>0.53125</cdr:y>
  </cdr:from>
  <cdr:to>
    <cdr:x>0.24583</cdr:x>
    <cdr:y>0.86458</cdr:y>
  </cdr:to>
  <cdr:sp macro="" textlink="">
    ...
  </cdr:sp>
</cdr:relSizeAnchor>
```

The above example shows the first anchor point being specified via the from element. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Marker](#)) is located in §A.5.2. *end note*]

21.3.2.12 graphicFrame (Graphic Frame)

This element specifies the existence of a graphics frame. This frame contains a graphic that was generated by an external source and needs a container in which to be displayed on the slide surface.

Attributes	Description
fPublished (Publish To Server)	<p>Specifies whether the shape shall be published with the worksheet when sent to the spreadsheet server. This is for use when interfacing with a document server.</p> <p>[<i>Example:</i> Consider the following shape that is not published with the worksheet when it is published back on the spreadsheet server.</p> <pre><cdr:relSizeAnchor> ... <cdr:sp fPublished="0"> ... </cdr:sp> ... </cdr:relSizeAnchor></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
macro (Reference to Custom Function)	<p>This element specifies the custom function associated with the chart. [<i>Example:</i> A macro script, add-in function, and so on. <i>end example</i>]</p>

Attributes	Description
	<p>The format of this string shall be application-defined, and should be ignored if not understood.</p> <p>[Example:</p> <p style="padding-left: 40px;"><... macro="DoWork()" ></p> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_GraphicFrame](#)) is located in §A.5.2.
end note]

21.3.2.13 **grpSp (Group Shape)**

This element specifies a group shape that represents many shapes grouped together. This shape is to be treated just as if it were a regular shape but instead of being described by a single geometry it is made up of all the shape geometries encompassed within it. Within a group shape each of the shapes that make up the group are specified just as they normally would. The idea behind grouping elements however is that a single transform can apply to many shapes at the same time.

[Example: Consider the following group shape.

```
<cdr:grpSp>
  <cdr:nvGrpSpPr>
    <cdr:cNvPr id="10" name="Group 9"/>
    <cdr:cNvGrpSpPr/>
    <cdr:nvPr/>
  </cdr:nvGrpSpPr>
  <cdr:grpSpPr>
    <a:xfrm>
      <a:off x="838200" y="990600"/>
      <a:ext cx="2426208" cy="978408"/>
      <a:chOff x="838200" y="990600"/>
      <a:chExt cx="2426208" cy="978408"/>
    </a:xfrm>
  </cdr:grpSpPr>
  <cdr:sp>
    ...
  </cdr:sp>
  <cdr:sp>
```



```

...
</cdr:sp>
<cdr:sp>
...
</cdr:sp>
</cdr:grpSp>

```

In the above example we see three shapes specified within a single group. These three shapes have their position and sizes specified just as they normally would within the shape tree. The generating application should apply the transformation after the bounding box for the group shape has been calculated. *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_GroupShape](#)) is located in §A.5.2. *end note*]

21.3.2.14 [grpSpPr \(Group Shape Properties\)](#)

This element specifies the properties that are to be common across all of the shapes within the corresponding group. If there are any conflicting properties within the group shape properties and the individual shape properties then the individual shape properties should take precedence.

Attributes	Description
bwMode (Black and White Mode) Namespace: http://purl.oclc.org/ooxml/drawingml/main	<p>Specifies that the group shape should be rendered using only black and white coloring. That is the coloring information for the group shape should be converted to either black or white when rendering the corresponding shapes.</p> <p>No gray is to be used in rendering this image, only stark black and stark white.</p> <p>[<i>Note:</i> This does not mean that the group shapes themselves are stored with only black and white color information. This attribute instead sets the rendering mode that the shapes use when rendering. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_BlackWhiteMode simple type (§20.1.10.10).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_GroupShapeProperties](#)) is located in §A.4.1. *end note*]

21.3.2.15 [nvCxnSpPr \(Connector Non Visual Properties\)](#)

This element specifies all non-visual properties for a connection shape. This element is a container for the non-visual identification properties, shape properties and application properties that are to be associated with a connection shape. This allows for additional information that does not affect the appearance of the connection shape to be stored.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ConnectorNonVisual](#)) is located in §A.5.2. *end note*]

21.3.2.16 [nvGraphicFramePr \(Non-Visual Graphic Frame Properties\)](#)

This element specifies all non-visual properties for a graphic frame. This element is a container for the non-visual identification properties, shape properties and application properties that are to be associated with a graphic frame. This allows for additional information that does not affect the appearance of the graphic frame to be stored.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_GraphicFrameNonVisual](#)) is located in §A.5.2. *end note*]

21.3.2.17 [nvGrpSpPr \(Non-Visual Group Shape Properties\)](#)

This element specifies all non-visual properties for a group shape. This element is a container for the non-visual identification properties, shape properties and application properties that are to be associated with a group shape. This allows for additional information that does not affect the appearance of the group shape to be stored.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_GroupShapeNonVisual](#)) is located in §A.5.2. *end note*]

21.3.2.18 [nvPicPr \(Non-Visual Picture Properties\)](#)

This element specifies the non visual properties for a picture. This allows for additional information that does not affect the appearance of the picture to be stored.

[*Example:* Consider the following DrawingML.

```
<pic:pic>
  ...
  <pic:nvPicPr>
    ...
  </pic:nvPicPr>
  ...
</pic:pic>
```

End example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_PictureNonVisual](#)) is located in §A.5.2. *end note*]

21.3.2.19 [nvSpPr \(Non-Visual Shape Properties\)](#)

This element specifies all non-visual properties for a shape. This element is a container for the non-visual identification properties, shape properties and application properties that are to be associated with a shape. This allows for additional information that does not affect the appearance of the shape to be stored.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ShapeNonVisual](#)) is located in §A.5.2. *end note*]

21.3.2.20 `pic` (Picture)

This element specifies the existence of a picture object within the document.

[*Example:* Consider the following ChartDrawingML that specifies the existence of a picture within a document. This picture can have non-visual properties, a picture fill as well as shape properties attached to it.

```
<cdr:pic>
  <cdr:nvPicPr>
    <cdr:cNvPr id="4" name="lake.JPG" descr="Picture of a Lake" />
    <cdr:cNvPicPr>
      <a:picLocks noChangeAspect="1"/>
    </cdr:cNvPicPr>
    <cdr:nvPr/>
  </cdr:nvPicPr>
  <cdr:blipFill>
    ...
  </cdr:blipFill>
  <cdr:spPr>
    ...
  </cdr:spPr>
</cdr:pic>
```

end example]

Attributes	Description
fPublished (Publish to Server)	<p>Specifies whether the shape shall be published with the worksheet when sent to the spreadsheet server. This is for use when interfacing with a document server.</p> <p>[<i>Example:</i> Consider the following shape that is not published with the worksheet when it is published back on the spreadsheet server.</p> <pre><cdr:relSizeAnchor> ... <cdr:sp fPublished="0"> ... </cdr:sp> ... </cdr:relSizeAnchor></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
macro (Reference to Custom Function)	<p>This element specifies the custom function associated with the chart. [<i>Example:</i> A macro script, add-in function, and so on. <i>end example]</i></p> <p>The format of this string shall be application-defined, and should be ignored if not</p>

Attributes	Description
	<p>understood.</p> <p>[Example:</p> <pre><... macro="DoWork()" ></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Picture](#)) is located in §A.5.2. end note]

21.3.2.21 relSizeAnchor (Relative Anchor Shape Size)

This element specifies that the shape described here to reside within a chart should be sized based on relative anchor points. This is achieved via two elements. The from element specifies the top left corner of the shape bounding box in a RTL(right-to-left) implementation. The to element then specifies the bottom right corner of the shape bounding box in a RTL(right-to-left) implementation and thus the size of the shape.

[Note: The W3C XML Schema definition of this element's content model ([CT_RelSizeAnchor](#)) is located in §A.5.2. end note]

21.3.2.22 sp (Shape)

This element specifies the existence of a single shape. A shape can either be a preset or a custom geometry, defined using the DrawingML framework. In addition to geometry, each shape can have both visual and non-visual properties attached. Text and corresponding styling information can also be attached to a shape. This shape is specified along with all other shapes within either the shape tree or group shape elements.

Attributes	Description
fLocksText (Lock Text)	<p>Specifies whether to allow for the editing of text within this shape when the worksheet on which the shape resides has been protected as defined by SpreadsheetML. This allows for the specifying of locked or "protected" text on a per-shape basis within a spreadsheet document. If this attribute is not specified then a value of 0, or false is assumed.</p> <p>[Example: Consider the following shape that does not have locked text on.</p> <pre><cdr:relSizeAnchor> ... <cdr:sp fLocksText="0"> ... </cdr:sp> ... </cdr:relSizeAnchor></pre>

Attributes	Description
	<p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
fPublished (Publish to Server)	<p>Specifies whether the shape shall be published with the worksheet when sent to the spreadsheet server. This is for use when interfacing with a document server.</p> <p>[<i>Example:</i> Consider the following shape that is not published with the worksheet when it is published back on the spreadsheet server.</p> <pre> <cdr:relSizeAnchor> ... <cdr:sp fPublished="0"> ... </cdr:sp> ... </cdr:relSizeAnchor> </pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
macro (Reference to Custom Function)	<p>This element specifies the custom function associated with the chart. [<i>Example:</i> A macro script, add-in function, and so on. <i>end example]</i></p> <p>The format of this string shall be application-defined, and should be ignored if not understood.</p> <p>[<i>Example:</i></p> <pre> <... macro="DoWork()" > </pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
textlink (Text Link)	<p>Specifies whether the text contained within this shape is linked to a cell within the spreadsheet. That is the text within the shape has the value defined in the referenced spreadsheet cell.</p> <p>[<i>Example:</i> Consider the following shape with text linked to cell A1.</p> <pre> <cdr:relSizeAnchor> ... <cdr:sp macro="" textlink="A1"> ... </cdr:sp> ... </cdr:relSizeAnchor> </pre>

Attributes	Description
	<p><i>end example</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_Shape](#)) is located in §A.5.2. *end note*]

21.3.2.23 [spPr \(Shape Properties\)](#)

This element specifies the visual shape properties that can be applied to a special shape such as a connector shape or picture. These are the same properties that are allowed to describe the visual properties of a shape but are used here to describe additional object-specific properties within a document. This allows for these shapes to have both the properties of a shape as well as specific properties that are unique to only them.

Attributes	Description
bwMode (Black and White Mode) Namespace: http://purl.oclc.org/ooxml/drawing ml/main	<p>Specifies that the picture should be rendered using only black and white coloring. That is the coloring information for the picture should be converted to either black or white when rendering the picture.</p> <p>No gray is to be used in rendering this image, only stark black and stark white.</p> <p>[<i>Note</i>: This does not mean that the picture itself that is stored within the file is necessarily a black and white picture. This attribute instead sets the rendering mode that the picture has applied to when rendering. <i>end note</i>]</p> <p>The possible values for this attribute are defined by the ST_BlackWhiteMode simple type (§20.1.10.10).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_ShapeProperties](#)) is located in §A.4.1. *end note*]

21.3.2.24 [style \(Shape Style\)](#)

The element specifies the style that is applied to a shape and the corresponding references for each of the style components such as lines and fills.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_ShapeStyle](#)) is located in §A.4.1. *end note*]

21.3.2.25 to (Ending Anchor Point)

This element specifies the second anchor point for the drawing element. This is used to anchor the bottom and right sides of the shape within the spreadsheet. That is when the corresponding chart is adjusted, the shape is also adjusted.

[Example: Consider the following ChartDrawingML

```
<cdr:relSizeAnchor>
  <cdr:from>
    <cdr:x>0.04583</cdr:x>
    <cdr:y>0.53125</cdr:y>
  </cdr:from>
  <cdr:to>
    <cdr:x>0.24583</cdr:x>
    <cdr:y>0.86458</cdr:y>
  </cdr:to>
  <cdr:sp macro="" textlink="">
    ...
  </cdr:sp>
</cdr:relSizeAnchor>
```

The above example shows the second anchor point being specified via the to element. *end example*]

[Note: The W3C XML Schema definition of this element's content model ([CT_Marker](#)) is located in §A.5.2. *end note*]

21.3.2.26 txBody (Shape Text Body)

This element specifies the existence of text to be contained within the corresponding shape. All visible text and visible text related properties are contained within this element. There can be multiple paragraphs and within paragraphs multiple runs of text.

[Note: The W3C XML Schema definition of this element's content model ([CT_TextBody](#)) is located in §A.4.1. *end note*]

21.3.2.27 x (Relative X Coordinate)



This element specifies the relative x coordinate that is used to define the percentage-based horizontal position for a shape within a chart drawing object. The coordinate boundaries are specified within the corresponding simple type listed below.

The possible values for this element are defined by the ST_MarkerCoordinate simple type (§21.3.3.1).

[Note: The W3C XML Schema definition of this element's content model ([ST_MarkerCoordinate](#)) is located in §A.5.2. *end note*]

21.3.2.28 xfrm (Graphic Frame Transform)

This element specifies a 2-D transform to be applied to a Graphic Frame.

Attributes	Description
<p>flipH (Horizontal Flip)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies a horizontal flip. When true, this attribute defines that the shape is flipped horizontally about the center of its bounding box.</p> <p>[<i>Example:</i> The following illustrates the effect of a horizontal flip.</p> <div></div> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>flipV (Vertical Flip)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies a vertical flip. When true, this attribute defines that the group is flipped vertically about the center of its bounding box.</p> <p>[<i>Example:</i> The following illustrates the effect of a vertical flip.</p> <div></div> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
<p>rot (Rotation)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Specifies the rotation of the Graphic Frame. The units for which this attribute is specified in reside within the simple type definition referenced below.</p> <p>The possible values for this attribute are defined by the ST_Angle simple type (§20.1.10.3).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Transform2D](#)) is located in §A.4.1.
end note]

21.3.2.29 y (Relative Y Coordinate)

This element specifies the relative y coordinate that is used to define the percentage-based vertical position for a shape within a chart drawing object. The coordinate boundaries are specified within the corresponding simple type listed below.

The possible values for this element are defined by the `ST_MarkerCoordinate` simple type (§21.3.3.1).

[Note: The W3C XML Schema definition of this element's content model (`ST_MarkerCoordinate`) is located in §A.5.2. *end note*]

21.3.3 Simple Types

This is the complete list of simple types dedicated to DrawingML – Chart Drawings.

21.3.3.1 ST_MarkerCoordinate (Chart Marker Coordinate Value)

This simple type specifies the chart marker coordinate value. It is to be represented as a fractional position between 0.0 and 1.0 of the chart width or height with 0.0 being the left or top edge.

This simple type's contents are a restriction of the W3C XML Schema double datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 0.0.
- This simple type has a maximum value of less than or equal to 1.0.

[Note: The W3C XML Schema definition of this simple type's content model (`ST_MarkerCoordinate`) is located in §A.5.2. *end note*]

21.4 DrawingML - Diagrams

A DrawingML diagram allows the definition of diagrams using DrawingML objects and constructs. This namespace defines the contents of a DrawingML diagram.

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End of informative text.

21.4.2 Diagram Definition

This section specifies the elements which define the layout and hierarchy of a diagram based on its constituent nodes and connections.

21.4.2.1 adj (Shape Adjust)

Shape adjust value. These can be used to modify the adjust handles supported on various auto shapes. It is only possible to set the initial value, not to modify it using constraints and rules.

[*Example:* Consider the following example of the adj element in a DrawingML diagram:

```
<adjLst>
  <adj idx="2" val=".35" />
</adjLst>
```

In this example we have a single adjust handle being modified by setting its value to 0.35. *end example]*

Attributes	Description
idx (Adjust Handle Index)	Adjust value index. Different shapes support different adjust handles. The possible values for this attribute are defined by the ST_Index1 simple type (§21.4.7.39).
val (Value)	An absolute value. The possible values for this attribute are defined by the W3C XML Schema double datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Adj](#)) is located in §A.5.3. *end note]*

21.4.2.2 adjLst (Shape Adjust List)

This element is simply a list of shape adjusts.

[*Example:* Consider the following example of the adjLst element in a DrawingML diagram:

```
<adjLst>
  <adj idx="1" val="1.35" />
  <adj idx="2" val=".35" />
</adjLst>
```

In this example we have a two adjust handle being modified for the containing shape. *end example]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_AdjLst](#)) is located in §A.5.3. *end note]*

21.4.2.3 **alg (Algorithm)**

The algorithm used by the containing layout node. The algorithm defines the behavior of the layout node along with the behavior and layout of the nested layout nodes.

[*Example:* Consider the following example of alg being used in a DrawingML diagram:

```
<layoutNode name="arrow">
  <varLst/>
  <alg type="tx" />
  <shape type="upArrow">
    <adjLst>
      <adj idx="2" val=".35" />
    </adjLst>
  </shape>
  <presOf axis="desOrSelf" ptType="node" />
  <ruleLst/>
</layoutNode>
```

In this example, the tx algorithm is being used to layout text within the containing layout node. *end example]*

Attributes	Description
rev (Revision Number)	The revision number of an algorithm. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.
type (Algorithm Type)	Specifies the algorithm type. The possible values for this attribute are defined by the ST_AlgorithmType simple type (§21.4.7.1).

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Algorithm](#)) is located in §A.5.3. *end note]*

21.4.2.4 **cat (Category)**

This element specifies a category in the user interface where this layout definition displays to the user.

[*Example:* Consider the following example of a cat in a DrawingML diagram:

```
<catLst>
  <cat type="relationship" pri="19000" />
</catLst>
```

In this example we define a single category called relationship which has a priority of 19000. *end example]*

Attributes	Description
pri (Priority)	<p>The priority within the category for this diagram determines the order in which it displays in the user interface. Lower numbers are displayed at the beginning of the list.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
type (Category Type)	<p>Specifies the category type associated with the element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema anyURI datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Category](#)) is located in §A.5.3. *end note*]

21.4.2.5 [catLst \(Category List\)](#)

This element is simply a list of cat elements.

[Example: Consider the following example of a catLst element in a DrawingML diagram:

```
<catLst>
  <cat type="list" pri="18000" />
  <cat type="relationship" pri="19000" />
</catLst>
```

In this example we define two different categories which are to be displayed in the user interface. *end example*]

[Note: The W3C XML Schema definition of this element's content model ([CT_Categories](#)) is located in §A.5.3. *end note*]

21.4.2.6 [choose \(Choose Element\)](#)

The choose element wraps if/else blocks into a choose block.

[Example: Consider the following example of a choose element in a DrawingML diagram:

```
<choose name="Name1">
  <if name="Name2" func="var" arg="dir" op="equ" val="norm">
    <alg type="snake">
      <param type="grDir" val="tL"/>
      <param type="flowDir" val="row"/>
      <param type="contDir" val="sameDir"/>
      <param type="off" val="ctr"/>
    </alg>
  </if>
  <else name="Name3">
```

```

    <alg type="snake">
      <param type="grDir" val="tR"/>
      <param type="flowDir" val="row"/>
      <param type="contDir" val="sameDir"/>
      <param type="off" val="ctr"/>
    </alg>
  </else>
</choose>

```

In this example, a choose element is used to define two different sets of parameters associated with a snake algorithm depending upon the direction in which the user wants the algorithm to flow (RTL or LTR). *end example]*

Attributes	Description
name (Name)	<p>A unique name associated with the choose statement.</p> <p>[<i>Example:</i> Consider the following example of a choose element in a DrawingML diagram:</p> <pre><choose name="Name1"></pre> <p>...</p> <pre></choose></pre> <p>In this example, the choose element is named Name1. <i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Choose](#)) is located in §A.5.3. *end note]*

21.4.2.7 **clrData (Color Transform Sample Data)**

This element defines the sample data that is to be used in the user interface controls regarding displaying color transforms for a given diagram. This sample data predefines a data model to be combined with a layout definition in order to create a diagram which a color transform can be applied and displayed to the user as an example of the color transform.

[*Example:* Consider the following example of a clrData element in a DrawingML diagram:

```

<clrData>
  <dataModel>
    <ptLst>

```



```

    <pt modelId="0" type="doc"/>
    <pt modelId="1"/>
    <pt modelId="2"/>
    <pt modelId="3"/>
    <pt modelId="4"/>
    <pt modelId="5"/>
    <pt modelId="6"/>
  </ptLst>
  <cxnLst>
    <cxn modelId="7" srcId="0" destId="1" srcOrd="0" destOrd="0"/>
    <cxn modelId="8" srcId="0" destId="2" srcOrd="1" destOrd="0"/>
    <cxn modelId="9" srcId="0" destId="3" srcOrd="2" destOrd="0"/>
    <cxn modelId="10" srcId="0" destId="4" srcOrd="3" destOrd="0"/>
    <cxn modelId="11" srcId="0" destId="5" srcOrd="4" destOrd="0"/>
    <cxn modelId="12" srcId="0" destId="6" srcOrd="5" destOrd="0"/>
  </cxnLst>
  <bg/>
  <whole/>
</dataModel>
</clrData>

```

In this example we define 6 points which all connect back to a seventh document type point. *end example*]

Attributes	Description
useDef (Use Default)	<p>If the value of this attribute is <code>true</code>, the data model defined in the <code>clrData</code> element is ignored and a default data model is used instead.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SampleData](#)) is located in §A.5.3. *end note*]

21.4.2.8 `constr` (Constraint)

This element is used to specify size, position of nodes, text values, and layout dependencies between nodes in a layout definition.

[*Example:* Consider the following example of a constraint list which contains some example constraints being defined and applied to layout nodes in the layout definition:

```

<constrLst>
  <constr type="w" for="ch" forName="node1" refType="w" refForName=""/>

```

```

    <constr type="h" for="ch" forName="node1" refType="w" refFor="ch"
refForName="node1" op="equ" fact="0.6"/>
    <constr type="w" for="ch" forName="transition1" refType="w" refFor="ch"
refForName="node1" op="equ" fact="0.1"/>
    <constr type="primFontSz" for="ch" forName="node1" refForName="" op="equ"
val="100"/>
</constrLst>

```

In this example we can see constraints being defined for the width and height along with the primary font size for a layout node referenced by node1. The width for a transition is also specified. *end example*]

Attributes	Description
fact (Factor)	<p>Factor used in a reference constraint or a rule in order to modify a referenced value by the factor defined.</p> <p>[<i>Example:</i> Consider the following example of fact in use in a DrawingML diagram:</p> <pre> <constr type="w" for="ch" forName="transition1" refType="w" refFor="ch" refForName="node1" op="equ" fact="0.1"/> </pre> <p>In this example, the width for transition1 is being defined as one-tenth the width of node1. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>
for (For)	<p>Specifies the axis of layout nodes to apply a constraint or rule to.</p> <p>[<i>Example:</i> Consider the following example of for in use in a DrawingML diagram:</p> <pre> <constr type="w" for="ch" forName="transition1" refType="w" refFor="ch" refForName="node1" op="equ" fact="0.1"/> </pre> <p>In this example, the for attribute is specifying that node1 is a child node to the current layout node. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ConstraintRelationship simple type (§21.4.7.20).</p>
forName (For Name)	<p>Specifies the name of the layout node to apply a constraint or rule to.</p> <p>[<i>Example:</i> Consider the following example of forName in use in a DrawingML diagram:</p> <pre> <constr type="w" for="ch" forName="transition1" refType="w" refFor="ch" refForName="node1" op="equ" fact="0.1"/> </pre> <p>In this example, forName is specifying the layout node named transition1 for its reference. <i>end example</i>]</p>

Attributes	Description
	<p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
op (Operator)	<p>The operator constraint used to evaluate the condition.</p> <p>[<i>Example:</i> Consider the following example of op in use in a DrawingML diagram:</p> <pre><constr type="w" for="ch" forName="transition1" refType="w" refFor="ch" refForName="node1" op="equ" fact="0.1"/></pre> <p>In this example, op is specifying an equality defined between the two referencing values. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_BoolOperator simple type (§21.4.7.10).</p>
ptType (Data Point Type)	<p>Specifies the type of data point to select.</p> <p>The possible values for this attribute are defined by the ST_ElementType simple type (§21.4.7.27).</p>
refFor (Reference For)	<p>The for value of the referenced constraint.</p> <p>[<i>Example:</i> Consider the following example of refFor in use in a DrawingML diagram:</p> <pre><constr type="w" for="ch" forName="transition1" refType="w" refFor="ch" refForName="node1" op="equ" fact="0.1"/></pre> <p>In this example, refFor is specifying the reference constraint is a child of the current layout node. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ConstraintRelationship simple type (§21.4.7.20).</p>
refForName (Reference For Name)	<p>The name of the layout node referenced by a reference constraint.</p> <p>[<i>Example:</i> Consider the following example of refForName in use in a DrawingML diagram:</p> <pre><constr type="w" for="ch" forName="transition1" refType="w" refFor="ch" refForName="node1" op="equ" fact="0.1"/></pre> <p>In this example, refForName is specifying the layout node named node1 for its reference. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

Attributes	Description
refPtType (Reference Point Type)	<p>The point type used in the referenced constraint.</p> <p>The possible values for this attribute are defined by the ST_ElementType simple type (§21.4.7.27).</p>
refType (Reference Type)	<p>Specifies the type of a reference constraint.</p> <p>[<i>Example:</i> Consider the following example of refType in use in a DrawingML diagram:</p> <pre><constr type="w" for="ch" forName="transition1" refType="w" refFor="ch" refForName="node1" op="equ" fact="0.1"/></pre> <p>In this example, refType is specifying referencing the width attribute of node1. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ConstraintType simple type (§21.4.7.21).</p>
type (Constraint Type)	<p>Specifies the constraint to apply to this layout node.</p> <p>[<i>Example:</i> Consider the following example of type in use in a DrawingML diagram:</p> <pre><constr type="w" for="ch" forName="transition1" refType="w" refFor="ch" refForName="node1" op="equ" fact="0.1"/></pre> <p>In this example, type is specifying the width attribute of transition1. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ConstraintType simple type (§21.4.7.21).</p>
val (Value)	<p>Specifies an absolute value instead of reference another constraint.</p> <p>[<i>Example:</i> Consider the following example of forName in use in a DrawingML diagram:</p> <pre><constr type="w" for="ch" forName="transition1" val="10"/></pre> <p>In this example, val is specifying the absolute value of the width of transition1. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Constraint](#)) is located in §A.5.3. *end note*]

21.4.2.9 [constrLst \(Constraint List\)](#)

This element is simply a list of constraints.

[*Example:* Consider the following example of a constraint list which contains some example constraints which are being defined and applied to layout nodes in the layout definition:

```
<constrLst>
  <constr type="w" for="ch" forName="node1" refType="w" refForName=""/>
  <constr type="h" for="ch" forName="node1" refType="w" refFor="ch"
refForName="node1" op="equ" fact="0.6"/>
  <constr type="w" for="ch" forName="transition1" refType="w" refFor="ch"
refForName="node1" op="equ" fact="0.1"/>
  <constr type="primFontSz" for="ch" forName="node1" refForName="" op="equ"
val="100"/>
</constrLst>
```

In this example we can see constraints being defined for the width and height along with the primary font size for a layout node referenced by node1. The width for a transition is also specified. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Constraints](#)) is located in §A.5.3. *end note*]

21.4.2.10 dataModel (Data Model)

The data for this instance of the diagram. Either a sample data model, or the data the user has entered.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DataModel](#)) is located in §A.5.3. *end note*]

21.4.2.11 desc (Description)

This element holds a description for a layout definition. The description can be used to describe the qualities associated with a particular layout definition.

Attributes	Description
lang (Language)	<p>The natural language of the title or description of this layout definition.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
val (Value)	<p>The string which is used as the description of the layout definition.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Description](#)) is located in §A.5.3. *end note*]

21.4.2.12 else (Else)

This element is similar to an else statement in a programming language in that it wraps elements which are to be used when the if conditionals are not true.

[Example: Consider the following example of an else element in a DrawingML diagram within the context of a choose statement:

```
<choose name="Name1">
  <if name="Name2" func="var" arg="dir" op="equ" val="norm">
    <alg type="snake">
      <param type="grDir" val="tL"/>
      <param type="flowDir" val="row"/>
      <param type="contDir" val="sameDir"/>
      <param type="off" val="ctr"/>
    </alg>
  </if>
  <else name="Name3">
    <alg type="snake">
      <param type="grDir" val="tR"/>
      <param type="flowDir" val="row"/>
      <param type="contDir" val="sameDir"/>
      <param type="off" val="ctr"/>
    </alg>
  </else>
</choose>
```

In this example, a else element is used to define a set of parameters associated with the snake algorithm when the diagram is reversed. *end example*]

Attributes	Description
name (Name)	<p>A unique name associated with the choose statement.</p> <p>[Example: Consider the following example of a else element in a DrawingML diagram:</p> <pre><else name="Name1"></pre> <p>...</p> <pre></else></pre> <p>In this example, the else element is named Name1. <i>end example</i>].</p> <p>The possible values for this attribute are defined by the W3C XML Schema string</p>

Attributes	Description
	datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Otherwise](#)) is located in §A.5.3. *end note*]

21.4.2.13 `extLst` (Extension List)

This element specifies an extension list, within which all future extensions are defined within `ext` elements.

The extension list along with corresponding future extensions is used to extend the storage capabilities of the DrawingML framework. This allows for various new types of data to be stored natively within the existing diagram syntax.

[Note: The W3C XML Schema definition of this element's content model ([CT_OfficeArtExtensionList](#)) is located in §A.4.1. *end note*]

21.4.2.14 `forEach` (For Each)

A looping structure, similar to a `for` loop in a programming language, which defines what data model points use this layout node.

[Example: Consider the following example of a `forEach` being used within a DrawingML diagram:

```
<forEach name="Name5" ref="" axis="ch" ptType="node">
  <layoutNode name="node1" styleLbl="" moveWith="">
    <alg type="sp"/>
    <shape
xmlns:r="http://purl.oclc.org/ooxml/officeDocument/relationships" r:blip="">
      <adjLst/>
    </shape>
    <constrLst/>
  </layoutNode>
</forEach>
```

In this example, the `forEach` element creates a layout node, referenced by the name `node1`, for every associated data model point in the diagram. In this particular instance the `forEach` creates the layout node for every child of the current point node. *end example*]

Attributes	Description
axis (Axis)	Specifies the axis on which to select data from the data model. [Example: <code>axis="ch"</code> selects children of the current point node and <code>axis="des"</code> selects all descendants. <i>end example</i>]

Attributes	Description
	The possible values for this attribute are defined by the ST_AxisTypes simple type (§21.4.7.7).
cnt (Count)	<p>Specifies the count of items to use in a data set.</p> <p>[<i>Example:</i> Consider the following example of a forEach in a DrawingML diagram:</p> <pre><forEach name="Name5" ref="" axis="ch" ptType="node" cnt="2"></pre> <p>...</p> <pre></forEach></pre> <p>In this example, up to two children are obtained through this forEach. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_UnsignedInts simple type (§21.4.7.63).</p>
hideLastTrans (Hide Last Transition)	<p>In algorithms that support transitions, this attribute specifies that the last transition is not rendered. This allows for diagrams that start and end with a node.</p> <p>The possible values for this attribute are defined by the ST_Booleans simple type (§21.4.7.9).</p>
name (Name)	<p>A unique identifier for the layout node.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
ptType (Data Point Type)	<p>Specifies the type of data point to select.</p> <p>[<i>Example:</i> Consider the following example of a forEach in a DrawingML diagram:</p> <pre><forEach name="Name5" ref="" axis="ch" ptType="node" cnt="2"></pre> <p>...</p> <pre></forEach></pre> <p>In this example, the forEach selects all node type points in the set. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ElementTypes simple type (§21.4.7.28).</p>
ref (Reference)	<p>When used on a for-each element, causes the specified for-each element to be used instead.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

Attributes	Description
st (Start)	<p>Specifies where to start in a data set.</p> <p>[<i>Example:</i> Consider the following example of a <code>forEach</code> in a DrawingML diagram:</p> <pre><presOf axis="desOrSelf" ptType="node" st="2"/></pre> <p>In this example, the second element in the set is the first point returned. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_Ints</code> simple type (§21.4.7.40).</p>
step (Step)	<p>Specifies the step to use in a data set. A step with a value of 2 returns every other item in the set.</p> <p>The possible values for this attribute are defined by the <code>ST_Ints</code> simple type (§21.4.7.40).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ForEach](#)) is located in §A.5.3. *end note*]

21.4.2.15 if (If)

Like an if statement in a programming language, wraps elements which are to be used under the conditions defined by its attributes.

[*Example:* Consider the following example of an if element in a DrawingML diagram within the context of a choose statement:

```
<choose name="Name1">
  <if name="Name2" func="var" arg="dir" op="equ" val="norm">
    <alg type="snake">
      <param type="grDir" val="tL"/>
      <param type="flowDir" val="row"/>
      <param type="contDir" val="sameDir"/>
      <param type="off" val="ctr"/>
    </alg>
  </if>
  <else name="Name3">
    <alg type="snake">
      <param type="grDir" val="tR"/>
      <param type="flowDir" val="row"/>
      <param type="contDir" val="sameDir"/>
      <param type="off" val="ctr"/>
    </alg>
  </else>
</choose>
```

In this example, a if element is used to define a set of parameters associated with the snake algorithm when the diagram is in the normal direction. *end example*]

Attributes	Description
arg (Argument)	<p>Specifies the variable to use as part of the test in an if element. Ignored unless the function attribute is set to "var".</p> <p>The possible values for this attribute are defined by the ST_FunctionArgument simple type (§21.4.7.31).</p>
axis (Axis)	<p>Specifies the axis on which to select data from the data model.</p> <p>[<i>Example</i>: axis="ch" selects children of the current point node and axis="des" selects all descendants. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_AxisTypes simple type (§21.4.7.7).</p>
cnt (Count)	<p>Specifies the count of items to use in a data set.</p> <p>[<i>Example</i>: Consider the following example of a forEach in a DrawingML diagram:</p> <pre data-bbox="451 951 1433 1119"><forEach name="Name5" ref="" axis="ch" ptType="node" cnt="2"> ... </forEach></pre> <p>In this example, up to two children are obtained through this forEach. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_UnsignedInts simple type (§21.4.7.63).</p>
func (Function)	<p>The function used to evaluate the if condition.</p> <p>[<i>Example</i>: Consider the following example of func being used in DrawingML:</p> <pre data-bbox="451 1455 1385 1560"><if name="Name2" func="var" arg="dir" op="equ" val="norm"> ... </if></pre> <p>In this example, func is set to var. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_FunctionType simple type (§21.4.7.33).</p>
hideLastTrans (Hide Last Transition)	<p>In algorithms that support transitions, this attribute specifies that the last transition is not rendered. This allows for diagrams that start and end with a node.</p> <p>The possible values for this attribute are defined by the ST_Booleans simple type</p>

Attributes	Description
	(§21.4.7.9).
name (Name)	<p>A unique identifier for the layout node.</p> <p>The function used to evaluate the if condition.</p> <p>[<i>Example:</i> Consider the following example of name being used in DrawingML:</p> <pre><if name="Name2" func="var" arg="dir" op="equ" val="norm"> ... </if></pre> <p>In this example, the name attribute is set to Name2. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
op (Operator)	<p>The operator used to evaluate the condition.</p> <p>[<i>Example:</i> Consider the following example of op being used in DrawingML:</p> <pre><if name="Name2" func="var" arg="dir" op="equ" val="norm"> ... </if></pre> <p>In this example, op is being used to test the equality of the argument and value. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_FunctionOperator simple type (§21.4.7.32).</p>
ptType (Data Point Type)	<p>Specifies the type of data point to select.</p> <p>[<i>Example:</i> Consider the following example of a forEach in a DrawingML diagram:</p> <pre><forEach name="Name5" ref="" axis="ch" ptType="node" cnt="2"> ... </forEach></pre> <p>In this example, the forEach selects all node type points in the set. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ElementTypes simple type (§21.4.7.28).</p>
st (Start)	<p>Specifies where to start in a data set.</p> <p>[<i>Example:</i> Consider the following example of a forEach in a DrawingML diagram:</p>

Attributes	Description
	<pre><presOf axis="desOrSelf" ptType="node" st="2"/></pre> <p>In this example, the second element in the set is the first point returned. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_Ints simple type (§21.4.7.40).</p>
step (Step)	<p>Specifies the step to use in a data set. A step with a value of 2 returns every other item in the set.</p> <p>The possible values for this attribute are defined by the ST_Ints simple type (§21.4.7.40).</p>
val (Value)	<p>An absolute value.</p> <p>The possible values for this attribute are defined by the ST_FunctionValue simple type (§21.4.7.34).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_When](#)) is located in §A.5.3. *end note*]

21.4.2.16 layoutDef (Layout Definition)

This element is the root element for defining a layout definition. The layout definition is defined through a set of nested layout nodes. The layout definition is responsible for defining the look of a diagram.

Attributes	Description
defStyle (Default Style)	<p>This attribute defines a reference to a default style which is to be applied to the diagram.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
minVer (Minimum Version)	<p>Minimum product version that can support this layout definition.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
uniqueId (Unique Identifier)	<p>The unique identifier for this layout definition.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_DiagramDefinition](#)) is located in §A.5.3. *end note*]

21.4.2.17 layoutDefHdr (Layout Definition Header)

This element is the header information representing the minimum knowledge needed by an application to preload information about a layout definition. This preloading allows for the actual load of the layout definition to occur at a later time which helps with any performance concerns an application might have.

[*Example:* Consider the following example of a layoutDefHdr within a DrawingML diagram:

```
<layoutDefHdr uniqueId="urn:layout/default">
  <title val="Basic Block List" />
  <desc val="" />
  <catLst>
    <cat type="list" pri="1000" />
  </catLst>
</layoutDefHdr>
```

In this example we define a title along with a category and prioritization for the diagram referenced by the uniqueId of urn:layout:default. *end example*]

Attributes	Description
defStyle (Default Style)	This attribute defines a reference to a default style which is to be applied to the diagram. The possible values for this attribute are defined by the W3C XML Schema string datatype.
minVer (Minimum Version)	Minimum product version that can support this Diagram Layout. The possible values for this attribute are defined by the W3C XML Schema string datatype.
resId (Resource Identifier)	Resource ID used internally. The possible values for this attribute are defined by the W3C XML Schema int datatype.
uniqueId (Unique Identifier)	The unique identifier for this layout definition. The possible values for this attribute are defined by the W3C XML Schema string datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DiagramDefinitionHeader](#)) is located in §A.5.3. *end note*]

21.4.2.18 layoutDefHdrLst (Diagram Layout Header List)

This element is simply a list of layout definition headers. This list of headers is used internally as a way to group all of the layout definition headers together into a single structure.

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_DiagramDefinitionHeaderLst](#)) is located in §A.5.3. *end note*]

21.4.2.19 [layoutNode \(Layout Node\)](#)

The layout node is the basic building block of diagrams. The layout node is responsible for defining how shapes are arranged in a diagram and how the data maps to a particular shape in a diagram.

[*Example:* Consider the following example of a basic layout node defined in a DrawingML diagram:

```
<layoutNode name="node">
  <varLst>
    <bulletEnabled val="1"/>
  </varLst>
  <presOf axis="desOrSelf" ptType="node"/>
  <alg type="tx"/>
  <shape type="rect"
xmlns:r="http://purl.oclc.org/ooxml/officeDocument/relationships" r:blip="">
    <adjLst/>
  </shape>
  <constrLst/>
  <ruleLst>
    <rule type="primFontSz" forName="" val="2" fact="NaN" max="NaN"/>
  </ruleLst>
</layoutNode>
```

In this example we define a layout node which holds text and is a rectangle. *end example*]

Attributes	Description
chOrder (Child Order)	Specifies the ordering of the child layout nodes for a given layout node. The possible values for this attribute are defined by the ST_ChildOrderType simple type (§21.4.7.15).
moveWith (Move With)	Reference to another layout node that this layout node moves with. The possible values for this attribute are defined by the W3C XML Schema string datatype.
name (Name)	A unique identifier for the layout node. The possible values for this attribute are defined by the W3C XML Schema string datatype.
styleLbl (Style Label)	Specify which formatting option from a style or color variation should be applied to this layout node. The possible values for this attribute are defined by the W3C XML Schema string

Attributes	Description
	datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_LayoutNode](#)) is located in §A.5.3. *end note*]

21.4.2.20 param (Parameter)

The parameter element modifies the default behavior of an algorithm.

[Example: Consider the following example of a param being used in a DrawingML diagram:

```
<alg type="snake">
  <param type="grDir" val="tL"/>
  <param type="flowDir" val="row"/>
  <param type="contDir" val="sameDir"/>
  <param type="off" val="ctr"/>
</alg>
```

In this example we see the snake algorithm being utilized and four parameters being set which are associated with the snake algorithm and modify its behavior. *end example*]

Attributes	Description
type (Parameter Type)	Specifies the parameter which is being modified. The possible values for this attribute are defined by the ST_ParameterId simple type (§21.4.7.49).
val (Value)	Specifies the actual value to be given to the parameter type defined by the type attribute. The possible values for this attribute are defined by the ST_ParameterVal simple type (§21.4.7.50).

[Note: The W3C XML Schema definition of this element's content model ([CT_Parameter](#)) is located in §A.5.3. *end note*]

21.4.2.21 presOf (Presentation Of)

This element specifies a particular data model point which is to be mapped to the containing layout node. This attribute is responsible for defining the mapping of data to the layout nodes in a diagram.

[Example: Consider the following example of presOf in use within a DrawingML diagram:

```
<presOf axis="desOrSelf" ptType="node"/>
```

In this example the presOf element is mapping to a particular data model point. *end example*]

Attributes	Description
axis (Axis)	<p>Specifies the axis on which to select data from the data model.</p> <p>[<i>Example:</i> axis="ch" selects children of the current point node and axis="des" selects all descendants. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_AxisTypes simple type (§21.4.7.7).</p>
cnt (Count)	<p>Specifies the count of items to use in a data set.</p> <p>[<i>Example:</i> Consider the following example of a forEach in a DrawingML diagram:</p> <pre data-bbox="451 716 1435 890"><forEach name="Name5" ref="" axis="ch" ptType="node" cnt="2"> ... </forEach></pre> <p>In this example, up to two children are obtained through this forEach. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_UnsignedInts simple type (§21.4.7.63).</p>
hideLastTrans (Hide Last Transition)	<p>In algorithms that support transitions, this attribute specifies that the last transition is not rendered. This allows for diagrams that start and end with a node.</p> <p>The possible values for this attribute are defined by the ST_Booleans simple type (§21.4.7.9).</p>
ptType (Data Point Type)	<p>Specifies the type of data point to select.</p> <p>[<i>Example:</i> Consider the following example of a forEach in a DrawingML diagram:</p> <pre data-bbox="451 1409 1435 1583"><forEach name="Name5" ref="" axis="ch" ptType="node" cnt="2"> ... </forEach></pre> <p>In this example, the forEach selects all node type points in the set. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ElementTypes simple type (§21.4.7.28).</p>
st (Start)	<p>Specifies where to start in a data set.</p> <p>[<i>Example:</i> Consider the following example of a forEach in a DrawingML diagram:</p>

Attributes	Description
	<p><code><presOf axis="desOrSelf" ptType="node" st="2"/></code></p> <p>In this example, the second element in the set is the first point returned. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_Ints simple type (§21.4.7.40).</p>
step (Step)	<p>Specifies the step to use in a data set. A step with a value of 2 returns every other item in the set.</p> <p>The possible values for this attribute are defined by the ST_Ints simple type (§21.4.7.40).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_PresentationOf](#)) is located in §A.5.3. *end note*]

21.4.2.22 relIds (Explicit Relationships to Diagram Parts)

This element specifies the relationship IDs used to explicitly reference each of the four constituent parts of a DrawingML diagram:

- Diagram Colors (cs attribute)
- Diagram Data (dm attribute)
- Diagram Layout Definition (lo attribute)
- Diagram Style (qs attribute)

Attributes	Description
cs (Explicit Relationship to Diagram Colors Part) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	<p>Specifies the relationship ID for the explicit relationship to the Diagram Colors part used by this diagram.</p> <p>This relationship shall be of type http://schemas.openxmlformats.org/officeDocument/2006/relationships/diagramColors or the document shall be considered non-conformant.</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
dm (Explicit Relationship to Diagram Data Part) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	<p>Specifies the relationship ID for the explicit relationship to the Diagram Data part used by this diagram.</p> <p>This relationship shall be of type http://schemas.openxmlformats.org/officeDocument/2006/relationships/diagramData or the document shall be considered non-conformant.</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>

Attributes	Description
lo (Explicit Relationship to Diagram Layout Definition Part) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	<p>Specifies the relationship ID for the explicit relationship to the Diagram Layout Definition part used by this diagram.</p> <p>This relationship shall be of type http://schemas.openxmlformats.org/officeDocument/2006/relationships/diagramLayout or the document shall be considered non-conformant.</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>
qs (Explicit Relationship to Style Definition Part) Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships	<p>Specifies the relationship ID for the explicit relationship to the Diagram Style part used by this diagram.</p> <p>This relationship shall be of type http://schemas.openxmlformats.org/officeDocument/2006/relationships/diagramQuickStyle or the document shall be considered non-conformant.</p> <p>The possible values for this attribute are defined by the ST_RelationshipId simple type (§22.8.2.1).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_RelIds](#)) is located in §A.5.3. *end note*]

21.4.2.23 [resizeHandles](#) (Shape Resize Style)

This element defines the behavior when resizing shapes within a diagram. Because the size of the shape plays a large role in the overall layout of other nodes within the diagram, there are two ways resize can occur on a node.

Attributes	Description
val (Shape Resize Style Type)	<p>Specifies the behavior for a shape when resizing shapes within a diagram.</p> <p>If this attribute is not specified, the default value shall be <code>re1</code>.</p> <p>The possible values for this attribute are defined by the ST_ResizeHandlesStr simple type (§21.4.7.54).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_ResizeHandles](#)) is located in §A.5.3. *end note*]

21.4.2.24 [rule](#) (Rule)

This element allows for a rule to be specified which changes the value of an existing constraint.

[*Example:* Consider the following example of a rule in a DrawingML diagram:

```
<ruleLst>
  <rule type="primFontSz" val="2" />
</ruleLst>
```

In this example a rule is being defined that shrinks the primary font size down to a lower limit of 2pt font when the text no longer fits correctly in the layout node. *end example*]

Attributes	Description
fact (Factor)	<p>Factor used in a reference constraint or a rule in order to modify a referenced value by the factor defined.</p> <p>[<i>Example:</i> Consider the following example of fact in use in a DrawingML diagram:</p> <pre><constr type="w" for="ch" forName="transition1" refType="w" refFor="ch" refForName="node1" op="equ" fact="0.1"/></pre> <p>In this example, the width for transition1 is being defined as one-tenth the width of node1. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>
for (For)	<p>Specifies the axis of layout nodes to apply a constraint or rule to.</p> <p>[<i>Example:</i> Consider the following example of for in use in a DrawingML diagram:</p> <pre><constr type="w" for="ch" forName="transition1" refType="w" refFor="ch" refForName="node1" op="equ" fact="0.1"/></pre> <p>In this example, the for attribute is specifying that node1 is a child node to the current layout node. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ConstraintRelationship simple type (§21.4.7.20).</p>
forName (For Name)	<p>Specifies the name of the layout node to apply a constraint or rule to.</p> <p>[<i>Example:</i> Consider the following example of forName in use in a DrawingML diagram:</p> <pre><constr type="w" for="ch" forName="transition1" refType="w" refFor="ch" refForName="node1" op="equ" fact="0.1"/></pre> <p>In this example, forName is specifying the layout node named transition1 for its reference. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

Attributes	Description
max (Max Value)	<p>Sets the maximum value for a constraint so rules can no longer increase the constraint beyond that value.</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>
ptType (Data Point Type)	<p>Specifies the type of data point to select.</p> <p>The possible values for this attribute are defined by the ST_ElementType simple type (§21.4.7.27).</p>
type (Constraint Type)	<p>Specifies the constraint to apply to this layout node.</p> <p>[<i>Example:</i> Consider the following example of type in use in a DrawingML diagram:</p> <pre data-bbox="451 737 1398 800"><constr type="w" for="ch" forName="transition1" refType="w" refFor="ch" refForName="node1" op="equ" fact="0.1"/></pre> <p>In this example, type is specifying the width attribute of transition1. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ConstraintType simple type (§21.4.7.21).</p>
val (Value)	<p>Specifies an absolute value instead of reference another constraint.</p> <p>[<i>Example:</i> Consider the following example of forName in use in a DrawingML diagram:</p> <pre data-bbox="451 1136 1382 1167"><constr type="w" for="ch" forName="transition1" val="10"/></pre> <p>In this example, val is specifying the absolute value of the width of transition1. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_NumericRule](#)) is located in §A.5.3. *end note*]

21.4.2.25 ruleLst (Rule List)

This element is simply a list of rules.

This element allows for a rule to be specified which changes the value of an existing constraint.

[*Example:* Consider the following example of a ruleLst in a DrawingML diagram:

```
<ruleLst>
  <rule type="primFontSz" val="2" />
```

```
</ruleLst>
```

In this example a single rule is being defined in the ruleLst that shrinks the primary font size down to a lower limit of 2pt font when the text no longer fits correctly in the layout node. *end example]*

[*Note:* The W3C XML Schema definition of this element's content model ([CT Rules](#)) is located in §A.5.3. *end note]*

21.4.2.26 sampData (Sample Data)

This element defines the sample data model which is used to pre-populate a diagram with placeholder data in order for the diagram to display itself in the user interface which shows all of the available diagrams to a user.

[*Example:* Consider the following example of a sampData element within a DrawingML diagram:

```
<sampData>
  <dataModel>
    <ptLst>
      <pt modelId="0" type="doc"/>
      <pt modelId="1">
        <prSet phldr="1"/>
      </pt>
      <pt modelId="2">
        <prSet phldr="1"/>
      </pt>
      <pt modelId="3">
        <prSet phldr="1"/>
      </pt>
      <pt modelId="4">
        <prSet phldr="1"/>
      </pt>
      <pt modelId="5">
        <prSet phldr="1"/>
      </pt>
    </ptLst>
    <cxnLst>
      <cxn modelId="6" srcId="0" destId="1" srcOrd="0" destOrd="0"/>
      <cxn modelId="7" srcId="0" destId="2" srcOrd="1" destOrd="0"/>
      <cxn modelId="8" srcId="0" destId="3" srcOrd="2" destOrd="0"/>
      <cxn modelId="9" srcId="0" destId="4" srcOrd="3" destOrd="0"/>
      <cxn modelId="10" srcId="0" destId="5" srcOrd="4" destOrd="0"/>
    </cxnLst>
    <bg/>
    <whole/>
  </dataModel>
```

</sampData>

In this example we define the sample data to consist of five nodes all attached to a document point type node. When displayed, this diagram shows five shapes in the diagram. *end example*]

Attributes	Description
useDef (Use Default)	<p>If the value of this attribute is <code>true</code>, the data model defined in the <code>clrData</code> element is ignored and a default data model is used instead.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_SampleData](#)) is located in §A.5.3. *end note*]

21.4.2.27 shape (Shape)

The shape displayed by the containing layout node. Not all layout nodes display shapes.

Attributes	Description
<p>blip (Relationship to Image Part)</p> <p>Namespace: http://purl.oclc.org/ooxml/officeDocument/relationships</p>	<p>Specifies the relationship ID of the explicit relationship to an image which shall be used as the image for the contents of this shape.</p> <p>This relationship shall be of type http://schemas.openxmlformats.org/officeDocument/2006/relationships/image or the document shall be considered non-conformant.</p> <p>The possible values for this attribute are defined by the <code>ST_RelationshipId</code> simple type (§22.8.2.1).</p>
blipPhldr (Image Placeholder)	<p>Specifies whether to use an image placeholder or not.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
hideGeom (Hide Geometry)	<p>When set to <code>"true"</code>, hides the geometry of the shape. The text is still visible.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
lkTxEntry (Prevent Text Editing)	<p>Prevents text editing on this shape.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
rot (Rotation)	<p>Rotates the shape by the specified number of degrees.</p> <p>The possible values for this attribute are defined by the W3C XML Schema double datatype.</p>

Attributes	Description
type (Shape Type)	Specifies the type of shape. The possible values for this attribute are defined by the ST_LayoutShapeType simple type (§21.4.7.41).
zOrderOff (Z-Order Offset)	Offsets the shape from its default z-order stacking, which is based on the order the layout nodes appear in the XML. The possible values for this attribute are defined by the W3C XML Schema int datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_Shape](#)) is located in §A.5.3. *end note*]

21.4.2.28 style (Shape Style)

This element specifies the style information for a shape, as defined by its DrawingML child elements.

[Note: The W3C XML Schema definition of this element's content model ([CT_ShapeStyle](#)) is located in §A.4.1. *end note*]

21.4.2.29 styleData (Style Data)

This element defines the style data model which is used to pre-populate a diagram with placeholder data in order for the diagram to display itself in the user interface which shows a quick style applied to the diagram.

[Example: Consider the following example of a styleData being used within a DrawingML diagram:

```
<styleData>
  <dataModel>
    <ptLst>
      <pt modelId="0" type="doc"/>
      <pt modelId="1"/>
      <pt modelId="2"/>
    </ptLst>
    <cxnLst>
      <cxn modelId="3" srcId="0" destId="1" srcOrd="0" destOrd="0"/>
      <cxn modelId="4" srcId="0" destId="2" srcOrd="1" destOrd="0"/>
    </cxnLst>
    <bg/>
    <whole/>
  </dataModel>
</styleData>
```

In this example we define a data model which has only two nodes which are shown in the user interface when a layout definition is combined with this data model. *end example*]

Attributes	Description
useDef (Use Default)	<p>If the value of this attribute is <code>true</code>, the data model defined in the <code>clrData</code> element is ignored and a default data model is used instead.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_SampleData](#)) is located in §A.5.3. *end note*]

21.4.2.30 title (Title)

Title of the Diagram Layout.

Attributes	Description
lang (Language)	<p>Specifies the language of the title or description of this layout definition.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
val (Value)	<p>Specifies the title or description of this layout definition.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_Name](#)) is located in §A.5.3. *end note*]

21.4.2.31 varLst (Variable List)

This element consists of a list of variables which interact with user interface components.

[*Example*: Consider the following example of a `varLst` in a DrawingML diagram:

```
<varLst>
  <chMax val="2" />
  <dir val="norm" />
  <resizeHandles val="exact" />
</varLst>
```

In this example we see different variables being defined which modify the behavior of user interface components directly. *end example*]

[*Note*: The W3C XML Schema definition of this element's content model ([CT_LayoutVariablePropertySet](#)) is located in §A.5.3. *end note*]

21.4.3 Data

This section specifies the data that is to be contained within a diagram.

21.4.3.1 `bg` (Background Formatting)

This element defines formatting that can be applied to the background shape of the entire diagram. The background shape can hold formatting options just as a normal shape can hold within DrawingML.

[*Example:* Consider the following example of a `bg` in DiagramML:

```
<bg>
  <solidFill>
    <schemeClr val="tx1"/>
  </solidFill>
  <effectLst>
    <glow rad="152400">
      <schemeClr val="accent1">
        <alpha val="75000"/>
      </schemeClr>
    </glow>
  </effectLst>
</bg>
```

In this example we see a solid fill applied to the background of the diagram along with a glow. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_BackgroundFormatting](#)) is located in §A.4.1. *end note*]

21.4.3.2 `cxn` (Connection)

This element defines a connection between two points. A connection defines a relationship between two points in a diagram.

[*Example:* Consider the following example of a `cxn` in DiagramML:

```
<cxnLst>
  <cxn modelId="7" srcId="0" destId="1" srcOrd="0" destOrd="0"/>
  <cxn modelId="8" srcId="0" destId="2" srcOrd="1" destOrd="0"/>
  <cxn modelId="9" srcId="0" destId="3" srcOrd="2" destOrd="0"/>
  <cxn modelId="10" srcId="0" destId="4" srcOrd="3" destOrd="0"/>
  <cxn modelId="11" srcId="0" destId="5" srcOrd="4" destOrd="0"/>
  <cxn modelId="12" srcId="0" destId="6" srcOrd="5" destOrd="0"/>
</cxnLst>
```

In this example we see 6 `cxn` elements defined within a `cxnLst` element (§21.4.3.3). In this example, a relationship is being defined between point 0 and every other point in the diagram. *end example*]

Attributes	Description
destId (Destination Identifier)	<p>The model identifier of the destination point for a connection.</p> <p>[<i>Example:</i> Consider the following example cxn within DiagramML:</p> <pre><cxn modelId="10" srcId="0" destId="4" srcOrd="3" destOrd="0"/></pre> <p>In this example we see the destination identifier referencing a point who's model identifier is 4. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ModelId simple type (§21.4.7.43).</p>
destOrd (Destination Position)	<p>The relative position of the destination point among it's siblings.</p> <p>[<i>Example:</i> Consider the following example cxn within DiagramML:</p> <pre><cxn modelId="10" srcId="0" destId="4" srcOrd="3" destOrd="0"/></pre> <p>In this example we see the destination position is 0. This means that it is ranked first among its siblings if there are sibling points present. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
modelId (Model Identifier)	<p>The unique identifier associated with this cxn.</p> <p>[<i>Example:</i> Consider the following example cxn within DiagramML:</p> <pre><cxn modelId="10" srcId="0" destId="4" srcOrd="3" destOrd="0"/></pre> <p>In this example we see the model identifier is 10. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ModelId simple type (§21.4.7.43).</p>
parTransId (Parent Transition Identifier)	<p>The model identifier of the point representing the parent transition. [<i>Example:</i> One example of a parent transition can be thought of as the shape connecting two points, such as an arrow in the diagram. <i>end example</i>]</p> <p>The unique identifier associated with this cxn.</p> <p>[<i>Example:</i> Consider the following example cxn within DiagramML:</p> <pre><cxn modelId="10" srcId="0" destId="4" srcOrd="3" destOrd="0" parTransId="9" sibTransId="5"/></pre> <p>In this example we see the parent transition identifier is referencing a point who's model identifier is 9. <i>end example</i>]</p>

Attributes	Description
	<p>The possible values for this attribute are defined by the ST_ModelId simple type (§21.4.7.43).</p>
<p>presId (Presentation Identifier)</p>	<p>The unique identifier of the layout associated to the cxn (only the active presentation (layout) is saved so all the presId's in the file should be the same).</p> <p>[<i>Example:</i> Consider the following example cxn within DiagramML:</p> <pre><cxn modelId="10" type="presParOf" srcId="0" destId="4" srcOrd="3" destOrd="0" presId="urn:sampleLayouts/layout1"/></pre> <p>In this example we see the presentation identifier is urn:sampleLayouts/layout1. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
<p>sibTransId (Sibling Transition Identifier)</p>	<p>The model identifier of the point representing the sibling transition. [<i>Example:</i> An example of a sibling transition can be thought of as the shape connecting two points, such as an arrow in the diagram. <i>end example</i>]</p> <p>[<i>Example:</i> Consider the following example cxn within DiagramML:</p> <pre><cxn modelId="10" srcId="0" destId="4" srcOrd="3" destOrd="0" parTransId="9" sibTransId="5"/></pre> <p>In this example we see the sibling transition identifier is referencing a point who's model identifier is 5. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ModelId simple type (§21.4.7.43).</p>
<p>srcId (Source Identifier)</p>	<p>The model identifier of the source point for a connection.</p> <p>[<i>Example:</i> Consider the following example cxn within DiagramML:</p> <pre><cxn modelId="10" srcId="0" destId="4" srcOrd="3" destOrd="0"/></pre> <p>In this example we see the souce identifier referencing a point who's model identifier is 0. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ModelId simple type (§21.4.7.43).</p>
<p>srcOrd (Source Position)</p>	<p>The relative position of the source point among it's siblings.</p> <p>[<i>Example:</i> Consider the following example cxn within DiagramML:</p>

Attributes	Description
	<p><code><cxn modelId="10" srcId="0" destId="4" srcOrd="3" destOrd="0"/></code></p> <p>In this example we see the source position is 3. This means that it is ranked third among its siblings. <i>end example</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
type (Point Type)	<p>The type of point, which corresponds to a connection in this case.</p> <p>[<i>Example:</i> Consider the following example cxn within DiagramML:</p> <p><code><cxn modelId="10" type="presParOf" srcId="0" destId="4" srcOrd="3" destOrd="0" presId="urn:sampleLayouts/layout1"/></code></p> <p>In this example we see the point type is defined as presParOf. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_CxnType simple type (§21.4.7.23).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Cxn](#)) is located in §A.5.3. *end note*]

21.4.3.3 [cxnLst \(Connection List\)](#)

This element defines a group of connections. There can be a connection list defined for any data model which holds all of the connections between points defined in the diagram.

[*Example:* Consider the following example of a cxnLst in DiagramML:

```
<cxnLst>
  <cxn modelId="7" srcId="0" destId="1" srcOrd="0" destOrd="0"/>
  <cxn modelId="8" srcId="0" destId="2" srcOrd="1" destOrd="0"/>
  <cxn modelId="9" srcId="0" destId="3" srcOrd="2" destOrd="0"/>
  <cxn modelId="10" srcId="0" destId="4" srcOrd="3" destOrd="0"/>
  <cxn modelId="11" srcId="0" destId="5" srcOrd="4" destOrd="0"/>
  <cxn modelId="12" srcId="0" destId="6" srcOrd="5" destOrd="0"/>
</cxnLst>
```

In this example we see 6 cxn elements (§21.4.3.2) defined within a cxnLst element. In this example, a relationship is being defined between point 0 and every other point in the diagram. *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CxnList](#)) is located in §A.5.3. *end note*]

21.4.3.4 prSet (Property Set)

This element holds properties and customizations which are used throughout certain elements in DiagramML. The properties can be grouped into the following general categories:

- Presentation Properties - presLayoutVars, style, presAssocId, presName, presStyleLbl, presStyleIdx, presStyleCnt
- Document Properties - loTypeId, loCatId, qsTypeId, qaCatId, csTypeId, coherent3DOff
- Semantic Element Properties - phldrT, phldr
- Customization Properties - custAng, custFlipVert, custFlipHor, custSzX, custSzY, custScaleX, custScaleY, custT, custLinFactX, custLinFactY, custLinFactNeighborX, custLinFactNeighborY, custRadScaleRad, custRadScaleInc

[Example: Consider the basic example of prSet in use in DrawingML on a document point type:

```
<prSet loTypeId="urn:microsoft.com/office/officart/2005/8/layout/default"
loCatId="list"
qsTypeId="urn:microsoft.com/office/officart/2005/8/quickstyle/3d1" qsCatId="3D"
csTypeId="urn:microsoft.com/office/officart/2005/8/colors/colorful2"
csCatId="colorful" phldr="1"/>
```

In this example we define the layout identifier, the category of the layout, the quick style identifier, the quick style category, along with the color style and color style category. *end example*]

Attributes	Description
coherent3DOff (Coherent 3D Behavior)	Enables or disables the Coherent 3D behavior for styles that specify this property. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
csCatId (Color Transform Category)	This attribute specifies the identifier of the current color transform category. The possible values for this attribute are defined by the W3C XML Schema string datatype.
csTypeId (Color Transform Type Identifier)	This attribute specifies the identifier of the currently applied color transform. The possible values for this attribute are defined by the W3C XML Schema string datatype.
custAng (Custom Rotation)	Specifies the amount that rotation is customized by. The possible values for this attribute are defined by the W3C XML Schema int datatype.
custFlipHor (Custom Horizontal Flip)	Specifies if there is a custom horizontal flip applied. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
custFlipVert	Specifies if there is a custom vertical flip applied.

Attributes	Description
(Custom Vertical Flip)	The possible values for this attribute are defined by the W3C XML Schema boolean datatype.
custLinFactNeighborX (Neighbor Offset Width)	<p>Specifies the percentage of the neighbor's width used for offsetting shape.</p> <p>The possible values for this attribute are defined by ST_PrSetCustVal simple type (§21.4.7.66).</p>
custLinFactNeighborY (Neighbor Offset Height)	<p>Specifies the percentage of the neighbor's height used for offsetting shape.</p> <p>The possible values for this attribute are defined by ST_PrSetCustVal simple type (§21.4.7.66).</p>
custLinFactX (Custom Factor Width)	<p>Specifies the percentage of the current shape width used for offsetting the shape.</p> <p>The possible values for this attribute are defined by ST_PrSetCustVal simple type (§21.4.7.66).</p>
custLinFactY (Custom Factor Height)	<p>Specifies the percentage of the current shape height used for offsetting the shape.</p> <p>The possible values for this attribute are defined by ST_PrSetCustVal simple type (§21.4.7.66).</p>
custRadScaleInc (Include Angle Scale)	<p>Specifies the amount that the include angle has been scaled by.</p> <p>The possible values for this attribute are defined by ST_PrSetCustVal simple type (§21.4.7.66).</p>
custRadScaleRad (Radius Scale)	<p>Specifies how much the radius has been scaled.</p> <p>The possible values for this attribute are defined by ST_PrSetCustVal simple type (§21.4.7.66).</p>
custScaleX (Width Scale)	<p>Specifies the amount that the width has been scaled by.</p> <p>The possible values for this attribute are defined by ST_PrSetCustVal simple type (§21.4.7.66).</p>
custScaleY (Height Scale)	<p>Specifies the amount that the height has been scaled by.</p> <p>The possible values for this attribute are defined by ST_PrSetCustVal simple type (§21.4.7.66).</p>
custSzX (Fixed Width Override)	<p>Specifies a fixed width override for a shape.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
custSzY (Fixed Height Override)	<p>Specifies a fixed height override for a shape.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
custT (Text	Specifies if the text has been customized which allows layout to ignore automatic

Attributes	Description
Changed)	<p>formatting options available to the text.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
loCatId (Current Diagram Category)	<p>Specifies the current identifier of the layout category applied to the diagram.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
loTypeId (Current Diagram Type)	<p>Specifies the identifier for the layout currently applied to the diagram.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
phldr (Placeholder)	<p>Indicates that the point is a placeholder or sample item.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>
phldrT (Placeholder Text)	<p>The text used for display in the element if the placeholder flag is set to true. If this property is not set then the default placeholder text is used.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
presAssocID (Presentation Element Identifier)	<p>The point associated with this presentation element. This identifier is used together with presName to create a unique key for presentation element indexing.</p> <p>The possible values for this attribute are defined by the ST_ModelId simple type (§21.4.7.43).</p>
presName (Presentation Name)	<p>The layout node name of this presentation element. This name is used together with presAssocID to create a unique key for presentation element indexing.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
presStyleCnt (Presentation Style Count)	<p>Specifies the layout node style count of this presentation element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
presStyleIdx (Presentation Style Index)	<p>Specifies the layout node style index of this presentation element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
presStyleLbl (Presentation Style Label)	<p>Specifies the layout node style label of this presentation element.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
qsCatId (Current	<p>Specifies the identifier of the category of the currently applied quick style.</p>

Attributes	Description
Style Category)	The possible values for this attribute are defined by the W3C XML Schema string datatype.
qsTypeId (Current Style Type)	Specifies the identifier of the currently applied quick style. The possible values for this attribute are defined by the W3C XML Schema string datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ElemPropSet](#)) is located in §A.5.3. *end note*]

21.4.3.5 pt (Point)

This element defines a point in DiagramML. A point in DiagramML is defined to hold data associated with a particular point or node in a diagram. Transitions between nodes in a diagram along with the nodes themselves are defined as different types of points. A point is not only responsible for holding the data associated with a node in a diagram, but also for holding customization properties made to the text and shape associated with the particular node.

[*Example:* Consider the following example of a pt in DiagramML:

```
<pt modelId="{C6A8900D-3F1B-4F1D-A514-4E8BDD964568}">
  <prSet phldrT="[Text]"/>
  <spPr/>
  <t>
    <bodyPr/>
    <lstStyle/>
    <p>
      <r>
        <rPr lang="en-US" smtClean="0"/>
        <t>Text 2</t>
      </r>
      <endParaRPr lang="en-US" dirty="0"/>
    </p>
  </t>
</pt>
```

In this example we define a point which holds the data associated with a node in a diagram. The actual text in the diagram is defined in the text body, t, tag and consists of the string "Text 2". There are no overrides made to the shape properties and placeholder text defined for this node when there is no text body present. *end example*]

Attributes	Description
cxnId (Connection Identifier)	<p>The model identifier of the connection that represents the transition node.</p> <p>[<i>Example:</i> Consider the following example of a cxnId:</p> <pre><dgm:pt modelId="5" type="parTrans" cxnId="9"> <dgm:prSet/> <dgm:spPr/> </dgm:pt></pre> <p>In this example we define the connection related to this point to reference connection 9. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_ModelId simple type (§21.4.7.43).</p>
modelId (Model Identifier)	<p>The unique identifier of the element within the data model. This identifier should be unique only relative to the containing data model.</p> <p>[<i>Example:</i> Consider the following example of a cxnId:</p> <pre><dgm:pt modelId="5" type="parTrans" cxnId="9"> <dgm:prSet/> <dgm:spPr/> </dgm:pt></pre> <p>In this example we define the point type is to be 5. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_ModelId simple type (§21.4.7.43).</p>
type (Point Type)	<p>The type of point.</p> <p>[<i>Example:</i> Consider the following example of a cxnId:</p> <pre><dgm:pt modelId="5" type="parTrans" cxnId="9"> <dgm:prSet/> <dgm:spPr/> </dgm:pt></pre> <p>In this example the point type is defined as a parTrans point type. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_PtType simple type (§21.4.7.51).</p>

[*Note:* The W3C XML Schema definition of this element's content model (CT_Pt) is located in §A.5.3. *end note]*

21.4.3.6 ptLst (Point List)

This element simply holds a list of points within the data model.

[Example: Consider the following example of a very simple point list in DiagramML:

```
<dgm:ptLst>
  <dgm:pt modelId="0" type="doc"/>
  <dgm:pt modelId="1"/>
  <dgm:pt modelId="2"/>
  <dgm:pt modelId="3"/>
  <dgm:pt modelId="4"/>
  <dgm:pt modelId="5"/>
  <dgm:pt modelId="6"/>
</dgm:ptLst>
```

In this example we define a single document type point and five node type points. *end example]*

[Note: The W3C XML Schema definition of this element’s content model ([CT_PtList](#)) is located in §A.5.3. *end note]*

21.4.3.7 spPr (Shape Properties)

This element specifies the properties for a single shape in a diagram's data, as defined using DrawingML child elements.

Attributes	Description
bwMode (Black and White Mode) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Specifies that the picture should be rendered using only black and white coloring. That is the coloring information for the picture should be converted to either black or white when rendering the picture. No gray is to be used in rendering this image, only stark black and stark white. [Note: This does not mean that the picture itself that is stored within the file is necessarily a black and white picture. This attribute instead sets the rendering mode that the picture has applied to when rendering. <i>end note]</i> The possible values for this attribute are defined by the ST_BlackWhiteMode simple type (§20.1.10.10).

[Note: The W3C XML Schema definition of this element’s content model ([CT_ShapeProperties](#)) is located in §A.4.1. *end note]*

21.4.3.8 t (Text Body)

Text body containing the default body, paragraph and character properties. There should be a single paragraph and no text runs. Any runs in the first paragraph and paragraphs in addition to the first are ignored.

[Note: The W3C XML Schema definition of this element's content model ([CT_TextBody](#)) is located in §A.4.1. *end note*]

21.4.3.9 whole (Whole E2O Formatting)

Formatting that applies to the entire diagram object, and not just the background, includes line and effect properties.

[Note: The W3C XML Schema definition of this element's content model ([CT_WholeE2oFormatting](#)) is located in §A.4.1. *end note*]

21.4.4 Color Information

This section defines the coloring information that is to be associated with a diagram.

21.4.4.1 cat (Color Transform Category)

This element specifies the category in the user interface that a color transform is to be displayed within.

[Example: Consider the following example of a cat in DiagramML:

```
<dgm:cat type="mainScheme" pri="10300"/>
```

In this example we see a cat defined with a category type and priority. *end example*]

Attributes	Description
pri (Priority)	<p>The priority within the category for this color variation determines the order in which it displays in the user interface. The lower numbers are to be displayed at the beginning of the list.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
type (Category Type)	<p>The category type used to organize the color transforms in the user interface.</p> <p>The possible values for this attribute are defined by the W3C XML Schema anyURI datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_CTCategory](#)) is located in §A.5.3. *end note*]

21.4.4.2 catLst (Color Transform Category List)

This element defines a list of color transform categories. This list can be used to populate user interface components which could separate color transforms into categories.

[Example: Consider the following example of a catLst in DiagramML:

```
<dgm:catLst>
```

```
<dgm:cat type="mainScheme" pri="10300"/>
</dgm:catLst>
```

In this example we see a catLst defined which holds a single *color transform category* (§21.4.4.1). *end example*]

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_CTCategories](#)) is located in §A.5.3. *end note*]

21.4.4.3 colorsDef (Color Transform Definitions)

This element is the root element for color transforms. Held within this element are all of the available color transforms themselves along with other elements and attributes associated with defining the general color transform properties and attributes.

[*Example:* Consider the following example of a colorsDef in DiagramML:

```
<dgm:colorsDef
xmlns:dgm="http://schemas.openxmlformats.org/drawingml/2006/diagram"
xmlns:a="http://schemas.openxmlformats.org/drawingml/2006/main"
uniqueId="urn:microsoft.com/office/officeart/2005/8/colors/accent0_3"
minVer="12.0">
  <dgm:title lang="" val=""/>
  <dgm:desc lang="" val=""/>
  <dgm:catLst>
    <dgm:cat type="mainScheme" pri="10300"/>
  </dgm:catLst>
  <dgm:styleLbl name="node0">
    ...
  </dgm:styleLbl>
  ...
</dgm:colorsDef>
```

In this example we see a sampling of a colorsDef being defined with a number of styleLbl elements held within the colorsDef. *end example*]

Attributes	Description
minVer (Minimum Version)	<div>The minimum product version that can support this color transform.</div> <div>[<i>Example:</i> Consider the following example:</div> <div><colorsDef uniqueId="urn:colors/accent0_3" minVer="12.0"></div> <div>...</div> <div></colorsDef></div>

Attributes	Description
	<p>In this example we see the minVer set to 12.0. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
uniqueId (Unique ID)	<p>A unique id associated with the color transform definition.</p> <p>[<i>Example:</i> Consider the following example:</p> <pre><colorsDef uniqueId="urn:colors/accent0_3" minVer="12.0"> ... </colorsDef></pre> <p>In this example we see the uniqueId set to urn:colors/accent0_3. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ColorTransform](#)) is located in §A.5.3. *end note*]

21.4.4.4 colorsDefHdr (Color Transform Definition Header)

This element specifies header information associated with a color transform definition. The header information is used by an application to preprocess required data in order to help with possible performance concerns associated with an initial full load of a color transform definition.

[*Example:* Consider the following example of a colorsDefHdr within DiagramML:

```
<colorsDefHdr uniqueId="urn:colors/accent0_1">
  <title val="Main 1" />
  <desc val="" />
  <catLst>
    <cat type="mainScheme" pri="10100" />
  </catLst>
</colorsDefHdr>
```

In this example we see a color transform definition header which defines a title and category for a set of color transforms. *end example*]

Attributes	Description
minVer (Minimum Version)	<p>The minimum product version that can support the associated color transform definition.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

Attributes	Description
resId (Resource ID)	<p>This attribute is the id which associates this header to the actual color transform definition.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
uniqueId (Unique ID)	<p>This attribute defines a unique identifier for the associated color transform definition.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ColorTransformHeader](#)) is located in §A.5.3. *end note*]

21.4.4.5 colorsDefHdrLst (Color Transform Header List)

This element is simply a list of color transform definition headers and is used to consolidate multiple headers in a group.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_ColorTransformHeaderLst](#)) is located in §A.5.3. *end note*]

21.4.4.6 desc (Description)

This element holds a description for a color definition. The description can be used to describe the qualities associated with a particular color transform definition.

Attributes	Description
lang (Language)	<p>The natural language of the color transform definition.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
val (Description Value)	<p>The string which is used as the description of the color transform definition.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CTDescription](#)) is located in §A.5.3. *end note*]

21.4.4.7 effectClrLst (Effect Color List)

This element defines a list of colors applied to effects within a color transform.

[*Example:* Consider the following example of an effectClrLst in DiagramML:

```

<dgm:effectClrLst meth="repeat">
  <a:schemeClr val="dk2">
    <a:tint val="60000"/>
  </a:schemeClr>
</dgm:effectClrLst>

```

In this example we see a single color defined in the effectClrLst, more specifically we see a scheme color being utilized with a tint applied to the color. *end example*]

Attributes	Description
hueDir (Hue Direction)	<p>The direction around the color wheel the hue shift (if defined) occurs.</p> <p>[<i>Example:</i> Consider the following example of a hueDir in use:</p> <pre> <dgm:lnClrLst hueDir="cw" meth="repeat"> <a:schemeClr val="dk2"> <a:tint val="60000"/> </a:schemeClr> </dgm:lnClrLst> </pre> <p>In this example an lnClrLst is defined with a hue direction defined as clockwise. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_HueDir simple type (§21.4.7.38).</p>
meth (Color Application Method Type)	<p>The method used to apply the color transform.</p> <p>[<i>Example:</i> Consider the following example of a meth in use:</p> <pre> <dgm:lnClrLst hueDir="cw" meth="repeat"> <a:schemeClr val="dk2"> <a:tint val="60000"/> </a:schemeClr> </dgm:lnClrLst> </pre> <p>In this example and lnClrLst is defined using the repeat color application method. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_ClrAppMethod simple type (§21.4.7.16).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Colors](#)) is located in §A.5.3. *end note*]

21.4.4.8 fillClrLst (Fill Color List)

This element defines a list of colors which are used as fill colors in the color transform. The fill colors define the color of the nodes in a diagram.

[Example: Consider the following example of a fillClrLst in DiagramML:

```
<dgm:fillClrLst meth="repeat">
  <a:schemeClr val="dk2"/>
</dgm:fillClrLst>
```

In this example the fillClrList contains a single scheme color and is utilizing the repeat method for color application. *end example]*

Attributes	Description
hueDir (Hue Direction)	<p>The direction around the color wheel the hue shift (if defined) occurs.</p> <p>[Example: Consider the following example of a hueDir in use:</p> <pre><dgm:lnClrLst hueDir="cw" meth="repeat"> <a:schemeClr val="dk2"> <a:tint val="60000"/> </a:schemeClr> </dgm:lnClrLst></pre> <p>In this example an lnClrLst is defined with a hue direction defined as clockwise. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_HueDir simple type (§21.4.7.38).</p>
meth (Color Application Method Type)	<p>The method used to apply the color transform.</p> <p>[Example: Consider the following example of a meth in use:</p> <pre><dgm:lnClrLst hueDir="cw" meth="repeat"> <a:schemeClr val="dk2"> <a:tint val="60000"/> </a:schemeClr> </dgm:lnClrLst></pre> <p>In this example and lnClrLst is defined using the repeat color application method. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_ClrAppMethod simple type (§21.4.7.16).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Colors](#)) is located in §A.5.3. *end note*]

21.4.4.9 `lnClrLst` (Line Color List)

This element defines a list of colors which are used as line colors in the color transform. The line colors define the color of the lines used on a given node in a diagram

[Example: Consider the following example of a `lnClrLst` in DiagramML:

```
<dgm:lnClrLst meth="repeat">
  <a:schemeClr val="dk2"/>
</dgm:lnClrLst>
```

In this example the `lnClrLst` contains a single scheme color and is utilizing the repeat method for color application. *end example*]

Attributes	Description
hueDir (Hue Direction)	<p>The direction around the color wheel the hue shift (if defined) occurs.</p> <p>[Example: Consider the following example of a hueDir in use:</p> <pre><dgm:lnClrLst hueDir="cw" meth="repeat"> <a:schemeClr val="dk2"> <a:tint val="60000"/> </a:schemeClr> </dgm:lnClrLst></pre> <p>In this example an <code>lnClrLst</code> is defined with a hue direction defined as clockwise. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_HueDir</code> simple type (§21.4.7.38).</p>
meth (Color Application Method Type)	<p>The method used to apply the color transform.</p> <p>[Example: Consider the following example of a meth in use:</p> <pre><dgm:lnClrLst hueDir="cw" meth="repeat"> <a:schemeClr val="dk2"> <a:tint val="60000"/> </a:schemeClr> </dgm:lnClrLst></pre> <p>In this example and <code>lnClrLst</code> is defined using the <code>repeat</code> color application method. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the <code>ST_ClrAppMethod</code> simple type</p>

Attributes	Description
	(§21.4.7.16).

[Note: The W3C XML Schema definition of this element’s content model ([CT_Colors](#)) is located in §A.5.3. *end note*]

21.4.4.10 styleLbl (Style Label)

This element defines a style label. The style label is used to define a color transform that is applied to a given node in a diagram.

[Example: Consider the following example of a styleLbl in DiagramML:

```
<dgm:styleLbl name="exampleStyleLabel">
  <dgm:fillClrLst>
    <a:schemeClr val="accent2"/>
    <a:schemeClr val="accent3"/>
  </dgm:fillClrLst>
  <dgm:linClrLst meth="repeat">
    <a:schemeClr val="lt1"/>
  </dgm:linClrLst>
  <dgm:effectClrLst/>
  <dgm:txLinClrLst/>
  <dgm:txFillClrLst/>
  <dgm:txEffectClrLst/>
</dgm:styleLbl>
```

In this example we see a style label defined in its entirety. This style label can be used on a layout node in order to define the color transform that is to be applied to the node. *end example*]

Attributes	Description
name (Name)	<p>A name given to the style label. This name can be referenced by layout nodes in order to apply the style label to the layout node.</p> <p>[Example: Consider the following example of a styleLbl in DiagramML:</p> <pre><dgm:styleLbl name="exampleStyleLabel"> ... </dgm:styleLbl></pre> <p>In this example we see a style label defined with the name exampleStyleLabel defined. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CTStyleLabel](#)) is located in §A.5.3. *end note*]

21.4.4.11 title (Title)

The name or title given to the color definition header.

Attributes	Description
lang (Language)	The natural language of the title or description of a color transform definition. The possible values for this attribute are defined by the W3C XML Schema string datatype.
val (Description Value)	A string used for a description of a color transform definition. The possible values for this attribute are defined by the W3C XML Schema string datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CTName](#)) is located in §A.5.3. *end note*]

21.4.4.12 txEffectClrLst (Text Effect Color List)

This element defines a list of colors which are used as text effect colors in the color transform. The text effect colors define the color of the text effects used on a given node in a diagram

[*Example:* Consider the following example of a txEffectClrLst in DiagramML:

```
<dgm:txEffectClrLst meth="repeat">
  <a:schemeClr val="dk2"/>
</dgm:txEffectClrLst>
```

In this example the txEffectClrLst contains a single scheme color and is utilizing the repeat method for color application. *end example*]

Attributes	Description
hueDir (Hue Direction)	The direction around the color wheel the hue shift (if defined) occurs. [<i>Example:</i> Consider the following example of a hueDir in use: <pre><dgm:lnClrLst hueDir="cw" meth="repeat"> <a:schemeClr val="dk2"> <a:tint val="60000"/> </a:schemeClr> </dgm:lnClrLst></pre> In this example an lnClrLst is defined with a hue direction defined as clockwise. <i>end</i>

Attributes	Description
	<p><i>example]</i></p> <p>The possible values for this attribute are defined by the ST_HueDir simple type (§21.4.7.38).</p>
meth (Color Application Method Type)	<p>The method used to apply the color transform.</p> <p>[<i>Example:</i> Consider the following example of a meth in use:</p> <pre><dgm:lnClrLst hueDir="cw" meth="repeat"> <a:schemeClr val="dk2"> <a:tint val="60000"/> </a:schemeClr> </dgm:lnClrLst></pre> <p>In this example and lnClrLst is defined using the repeat color application method. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_ClrAppMethod simple type (§21.4.7.16).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Colors](#)) is located in §A.5.3. *end note]*

21.4.4.13 txFillClrLst (Text Fill Color List)

This element defines a list of colors which are used as text colors in the color transform. The text colors define the color of the text used in a given node in a diagram

[*Example:* Consider the following example of a txFillClrLst in DiagramML:

```
<dgm:txFillClrLst meth="repeat">
  <a:schemeClr val="dk2"/>
</dgm:txFillClrLst>
```

In this example the txFillClrLst contains a single scheme color and is utilizing the repeat method for color application. *end example]*

Attributes	Description
hueDir (Hue Direction)	<p>The direction around the color wheel the hue shift (if defined) occurs.</p> <p>[<i>Example:</i> Consider the following example of a hueDir in use:</p> <pre><dgm:lnClrLst hueDir="cw" meth="repeat"> <a:schemeClr val="dk2"> <a:tint val="60000"/> </a:schemeClr> </dgm:lnClrLst></pre>

Attributes	Description
	<pre></a:schemeClr> </dgm:lnClrLst></pre> <p>In this example an lnClrLst is defined with a hue direction defined as clockwise. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_HueDir simple type (§21.4.7.38).</p>
meth (Color Application Method Type)	<p>The method used to apply the color transform.</p> <p>[Example: Consider the following example of a meth in use:</p> <pre><dgm:lnClrLst hueDir="cw" meth="repeat"> <a:schemeClr val="dk2"> <a:tint val="60000"/> </a:schemeClr> </dgm:lnClrLst></pre> <p>In this example and lnClrLst is defined using the repeat color application method. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_ClrAppMethod simple type (§21.4.7.16).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Colors](#)) is located in §A.5.3. *end note*]

21.4.4.14 txLinClrLst (Text Line Color List)

This element defines a list of colors which are used as text line colors in the color transform. The text line colors define the color of the line on text used in a given node in a diagram

[Example: Consider the following example of a txLinClrLst in DiagramML:

```
<dgm:txLinClrLst meth="repeat">
  <a:schemeClr val="dk2"/>
</dgm:txLinClrLst>
```

In this example the txLinClrLst contains a single scheme color and is utilizing the repeat method for color application. *end example*

Attributes	Description
hueDir (Hue Direction)	<p>The direction around the color wheel the hue shift (if defined) occurs.</p> <p>[Example: Consider the following example of a hueDir in use:</p>

Attributes	Description
	<pre data-bbox="451 283 1096 451"><dgm:lnClrLst hueDir="cw" meth="repeat"> <a:schemeClr val="dk2"> <a:tint val="60000"/> </a:schemeClr> </dgm:lnClrLst></pre> <p data-bbox="414 489 1421 556">In this example an lnClrLst is defined with a hue direction defined as clockwise. <i>end example</i></p> <p data-bbox="414 594 1356 661">The possible values for this attribute are defined by the ST_HueDir simple type (§21.4.7.38).</p>
meth (Color Application Method Type)	<p data-bbox="414 678 971 709">The method used to apply the color transform.</p> <p data-bbox="414 747 1128 779"><i>[Example: Consider the following example of a meth in use:</i></p> <pre data-bbox="451 821 1096 989"><dgm:lnClrLst hueDir="cw" meth="repeat"> <a:schemeClr val="dk2"> <a:tint val="60000"/> </a:schemeClr> </dgm:lnClrLst></pre> <p data-bbox="414 1026 1464 1094">In this example and lnClrLst is defined using the repeat color application method. <i>end example</i></p> <p data-bbox="414 1131 1448 1199">The possible values for this attribute are defined by the ST_ClrAppMethod simple type (§21.4.7.16).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_Colors](#)) is located in §A.5.3. *end note*]

21.4.5 Style Definitions

This section describes the styling information to be associated with a diagram.

21.4.5.1 cat (Category)

The category in the user interface where this quick style displays in the user interface.

[Example: Consider the following example of a cat in use in DiagramML:

```
<catLst>
  <cat type="3D" pri="11100"/>
</catLst>
```

In this example we see a 3D category type being defined with a priority of 11100. *end example*

Attributes	Description
pri (Priority)	<p>The priority within the category for this style determines the order in which it displays in the user interface. Lower numbers are displayed at the beginning of the list.</p> <p>The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.</p>
type (Category Type)	<p>Category type. This is used to organize the quick style in the user interface.</p> <p>The possible values for this attribute are defined by the W3C XML Schema anyURI datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SDCategory](#)) is located in §A.5.3. *end note*]

21.4.5.2 catLst (Category List)

This element is simply a list of categories.

[*Example:* Consider the following example of a catLst in use in DiagramML:

```
<catLst>
  <cat type="Simple" pri="10000"/>
  <cat type="3D" pri="11100"/>
</catLst>
```

In this example two categories defined in the category list. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SDCategories](#)) is located in §A.5.3. *end note*]

21.4.5.3 desc (Style Label Description)

This element defines a description for a style label definition. The description is simply a string describing the characteristics of the style label definition.

[*Example:* Consider the following example of the desc element in DiagramML:

```
<desc lang="" val="3-D Style 1"/>
```

In this example we define the description to be 3-D Style 1. *end example*]

Attributes	Description
lang (Natural Language)	<p>The natural language of the title or description of this quick style.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

Attributes	Description
val (Description Value)	<p>The string used for the description.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SDDescription](#)) is located in §A.5.3. *end note*]

21.4.5.4 presLayoutVars (Presentation Layout Variables)

This element specifies the layout property set. This set of properties determine different aspects concerning the layout of a diagram. All of the elements associated with enabling or disabling aspects of the user interface are also defined here.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_LayoutVariablePropertySet](#)) is located in §A.5.3. *end note*]

21.4.5.5 scene3d (3-D Scene)

The 3-D scene which consists of a camera, a light rig, and an optional backdrop to catch shadows.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Scene3D](#)) is located in §A.4.1. *end note*]

21.4.5.6 sp3d (3-D Shape Properties)

A set of 3-D properties which a shape can contain.

Attributes	Description
contourW (Contour Width) Namespace: http://purl.oclc.org/ooxml/drawing/ml/main	<p>Defines the width of the contour on the shape.</p> <p>[<i>Example:</i> Consider the following example of a contourW in use within the sp3d element:</p> <pre><a:sp3d extrusionH="165100" contourW="50800" prstMaterial="plastic"> <a:bevelT w="254000" h="254000"/> <a:bevelB w="254000" h="254000"/> <a:extrusionClr> <a:srgbClr val="FF0000"/> </a:extrusionClr> <a:contourClr> <a:schemeClr val="accent3"/> </a:contourClr> </a:sp3d></pre>

Attributes	Description
	<p>In this example, we see a countourW defined as 50800. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>
<p>extrusionH (Extrusion Height)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Defines the height of the extrusion applied to the shape.</p> <p>[Example: Consider the following example of an extrusionH in use within the sp3d element:</p> <pre><a:sp3d extrusionH="165100" contourW="50800" prstMaterial="plastic"> <a:bevelT w="254000" h="254000"/> <a:bevelB w="254000" h="254000"/> <a:extrusionClr> <a:srgbClr val="FF0000"/> </a:extrusionClr> <a:contourClr> <a:schemeClr val="accent3"/> </a:contourClr> </a:sp3d></pre> <p>In this example, we see a extrusionH defined as 165100. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_PositiveCoordinate simple type (§20.1.10.41).</p>
<p>prstMaterial (Preset Material Type)</p> <p>Namespace: http://purl.oclc.org/ooxml/drawingml/main</p>	<p>Defines the preset material which is combined with the lighting properties to give the final look and feel of a shape.</p> <p>[Example: Consider the following example of a prstMaterial in use within the sp3d element:</p> <pre><a:sp3d extrusionH="165100" contourW="50800" prstMaterial="plastic"> <a:bevelT w="254000" h="254000"/> <a:bevelB w="254000" h="254000"/> <a:extrusionClr> <a:srgbClr val="FF0000"/> </a:extrusionClr> <a:contourClr> <a:schemeClr val="accent3"/> </a:contourClr> </a:sp3d></pre> <p>In this example, we see a prstMaterial defined as plastic. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_PresetMaterialType simple</p>

Attributes	Description
	type (§20.1.10.49).
z (Shape Depth) Namespace: http://purl.oclc.org/ooxml/drawingml/main	Defines the z coordinate for the 3D shape. The possible values for this attribute are defined by the ST_Coordinate simple type (§20.1.10.16).

[Note: The W3C XML Schema definition of this element's content model ([CT_Shape3D](#)) is located in §A.4.1. *end note*]

21.4.5.7 styleDef (Style Definition)

This element is the root tag for a style definition.

[Example: Consider the following example of a styleDef in DiagramML:

```
<dgm:styleDef
xmlns:dgm="http://schemas.openxmlformats.org/drawingml/2006/diagram"
xmlns:a="http://schemas.openxmlformats.org/drawingml/2006/main"
uniqueId="urn:microsoft.com/office/officeart/2005/8/quickstyle/3d1"
minVer="12.0">
  <dgm:title lang="" val="3-D Style 1"/>
  <dgm:desc lang="" val="3-D Style 1"/>
  <dgm:catLst>
    <dgm:cat type="3D" pri="11100"/>
  </dgm:catLst>
  <dgm:scene3d>
    <a:camera prst="orthographicFront"/>
    <a:lightRig rig="threePt" dir="t"/>
  </dgm:scene3d>
  <dgm:style>
    ...
  </dgm:style>
  <dgm:styleLbl name="node0">
    <dgm:scene3d>
      <a:camera prst="orthographicFront"/>
      <a:lightRig rig="flat" dir="t"/>
    </dgm:scene3d>
    <dgm:sp3d prstMaterial="flat">
      <a:bevelT w="120900" h="88900"/>
      <a:bevelB w="88900" h="31750" prst="angle"/>
    </dgm:sp3d>
  </dgm:styleLbl>
</dgm:styleDef>
```

```

<dgm:txPr/>
<dgm:style>
  <a:lnRef idx="0">
    <a:scrgbClr r="0" g="0" b="0"/>
  </a:lnRef>
  <a:fillRef idx="3">
    <a:scrgbClr r="0" g="0" b="0"/>
  </a:fillRef>
  <a:effectRef idx="2">
    <a:scrgbClr r="0" g="0" b="0"/>
  </a:effectRef>
  <a:fontRef idx="minor">
    <a:schemeClr val="lt1"/>
  </a:fontRef>
</dgm:style>
</dgm:styleLbl>
...
</dgm:styleDef>

```

In this example we see a styleDef being defined along with many properties. *end example*]

Attributes	Description
minVer (Minimum Version)	<p>The minimum product version that can support this quick style.</p> <p>[<i>Example:</i> Consider the following example of a styleDef in DiagramML:</p> <pre> <styleDef uniqueId="urn:quickstyle/3d1" minVer="12.0"> ... </styleDef> </pre> <p>In this example we see the minVer defined to be 12.0. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
uniqueId (Unique Style ID)	<p>Unique ID that identifies a style.</p> <p>[<i>Example:</i> Consider the following example of a styleDef in DiagramML:</p> <pre> <styleDef uniqueId="urn:quickstyle/3d1" minVer="12.0"> ... </pre>

Attributes	Description
	<p><code></styleDef></code></p> <p>In this example we see the <code>uniqueId</code> defined to be <code>urn:quickstyle/3d1</code>. <i>end example]</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_StyleDefinition](#)) is located in §A.5.3. *end note]*

21.4.5.8 styleDefHdr (Style Definition Header)

This element specifies header information associated with a style definition. The header information is used by an application to preprocess required data in order to help with possible performance concerns associated with an initial full load of a color transform definition.

[*Example:* Consider the following example of a `styleDefHdr` element within DiagramML:

```
<styleDefHdr uniqueId="urn:quickstyle/3d1">
  <title val="3D" />
  <desc val="" />
  <catLst>
    <cat type="3D" pri="10100" />
  </catLst>
</ styleDefHdr >
```

In this example we see a style definition header which defines a title and category for a set of style definitions. *end example]*

Attributes	Description
<code>minVer</code> (Minimum Version)	<p>The minimum product version that can support this quick style.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
<code>resId</code> (Resource ID)	<p>This attribute is the id which associates this header to the actual style definition part.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
<code>uniqueId</code> (Unique Style ID)	<p>This attribute defines a unique identifier for the associated style definition.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_StyleDefinitionHeader](#)) is located in §A.5.3. *end note*]

21.4.5.9 styleDefHdrLst (List of Style Definition Headers)

This element is simply a list of style definition headers and is used to consolidate multiple headers into one group.

[Note: The W3C XML Schema definition of this element's content model ([CT_StyleDefinitionHeaderLst](#)) is located in §A.5.3. *end note*]

21.4.5.10 styleLbl (Style Label)

This element defines the actual style which is applied to a node in a diagram. The style is referenced from within layout node. The style label contains formatting (without defining color) such as the 3D properties and text properties associated with a shape.

[Example: Consider the following example of a styleLbl in DiagramML:

```
<styleLbl name="node0">
  <scene3d>
    <camera prst="orthographicFront"/>
    <lightRig rig="flat" dir="t"/>
  </scene3d>
  <sp3d prstMaterial="flat">
    <bevelT w="120900" h="88900"/>
    <bevelB w="88900" h="31750" prst="angle"/>
  </sp3d>
  <txPr/>
  <style>
    <lnRef idx="0">
      <scrgbClr r="0" g="0" b="0"/>
    </lnRef>
    <fillRef idx="3">
      <scrgbClr r="0" g="0" b="0"/>
    </fillRef>
    <effectRef idx="2">
      <scrgbClr r="0" g="0" b="0"/>
    </effectRef>
    <fontRef idx="minor">
      <schemeClr val="lt1"/>
    </fontRef>
  </style>
</styleLbl>
```

In this example we see a `styleLbl` defined which sets 3D properties for the scene, shape 3D properties, line, fill, effect and font properties. *end example*]

Attributes	Description
name (Style Name)	The name of the style. This appears as the tooltip in the user interface. The possible values for this attribute are defined by the W3C XML Schema string datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_StyleLabel](#)) is located in §A.5.3. *end note*]

21.4.5.11 title (Title)

This element defines the title given to a style definition header. The title is simply a name for the style definition.

[*Example:* Consider the following example of title being used in DiagramML:

```
<styleDefHdr uniqueId="urn:quickstyle/3d1" minVer="12.0">
  <title val="My Title"/>
  <desc val="My Description"/>
  ...
</styleDefHdr>
```

In this example we see the title being set to `My Title`. *end example*]

Attributes	Description
lang (Natural Language)	The natural language of the title or description of this quick style. The possible values for this attribute are defined by the W3C XML Schema string datatype.
val (Description Value)	The string used for the description. The possible values for this attribute are defined by the W3C XML Schema string datatype.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SDName](#)) is located in §A.5.3. *end note*]

21.4.5.12 txPr (Text Properties)

This element defines special text formatting that can be applied to text through a style label.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_TextProps](#)) is located in §A.5.3. *end note*]

21.4.6 Layout Definition

This section specifies the node layout information to be associated with a diagram.

21.4.6.1 animLvl (Level Animation)

This variable is used to indicate the animate by level string which is displayed to a user in the user interface.

[*Example:* Consider the following example of animLvl in use in DiagramML:

```
<varLst>
  <chMax val="1" />
  <dir val="norm" />
  <animLvl val="ctr" />
  <resizeHandles val="exact" />
</varLst>
```

In this example we see that the animLvl is set to ctr. This is being defined in a radial type diagram which allows the user to specify that animation is to start at the center of the diagram. *end example*]

Attributes	Description
val (Level Animation Value)	<p>This attribute indicates the string to use for level animation in the user interface.</p> <p>The possible values for this attribute are defined by the ST_AnimLvlStr simple type (§21.4.7.2).</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_AnimLvl](#)) is located in §A.5.3. *end note*]

21.4.6.2 animOne (One by One Animation String)

This variable is used to indicate the string to use for one-by-one animation in the user interface. This is used primarily when defining hierarchical diagrams to specify different ways animations applies to different levels of the diagram.

[*Example:* Consider the following example of animOne used in a hierarchical type diagram:

```
<varLst>
  <chPref val="1" />
  <dir val="norm" />
  <animOne val="branch" />
  <animLvl val="lvl" />
  <resizeHandles val="exact" />
</varLst>
```

In this example we see that the animOne element is defined to animate the diagram per branch. *end example*]

Attributes	Description
val (One By One Animation Value)	Specifies the type of one-by-one animation to use for a diagram. The possible values for this attribute are defined by the ST_AnimOneStr simple type (§21.4.7.3).

[Note: The W3C XML Schema definition of this element's content model ([CT_AnimOne](#)) is located in §A.5.3. *end note*]

21.4.6.3 [bulletEnabled \(Show Insert Bullet\)](#)

This element is used to indicate when to enable the 'Insert Bullet' button in the user interface.

[Example: Consider the following example of bulletEnabled in DiagramML:

```
<varLst>
  <bulletEnabled val="true" />
</varLst>
```

In this example we see that the insert button in the user interface is to be enabled when the focus is within the containing layout node. *end example*]

Attributes	Description
val (Show Insert Bullet Value)	This attribute is used to indicate when to enable the 'Insert Bullet' button. A value of true enables the insert bullet button. The possible values for this attribute are defined by the W3C XML Schema boolean datatype.

[Note: The W3C XML Schema definition of this element's content model ([CT_BulletEnabled](#)) is located in §A.5.3. *end note*]

21.4.6.4 [chMax \(Maximum Children\)](#)

This element is used to indicate when to enable and disable the user interface components associated with adding a new shape to a diagram. This element defines a max number of nodes a diagram can support through the user interface directly.

[Example: Consider the following example of chMax usage in DiagramML:

```
<varLst>
  <chMax val="5"/>
  <dir val="norm"/>
```



```
<resizeHandles val="exact" />
</varLst>
```

In this example we define the user interface to only be enabled to insert five nodes. *end example*]

Attributes	Description
val (Maximum Children Value)	<p>This attribute indicates the maximum number of children the node can have before the user interface should be disabled. A value of -1 indicates an infinite number of children. Default value is -1.</p> <p>The possible values for this attribute are defined by the ST_NodeCount simple type (§21.4.7.44).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_ChildMax](#)) is located in §A.5.3. *end note*]

21.4.6.5 chPref (Preferred Number of Children)

This variable indicates the number of children that the current node prefers to have. This determines what the next action of the 'Add Shape' button should be in the user interface.

[Example: Consider the following example of chPref being used in DiagramML:

```
<varLst>
  <chMax val="3" />
  <chPref val="1" />
  <dir val="norm" />
  <animLvl val="lvl" />
  <resizeHandles val="rel" />
</varLst>
```

In this example, chPref is set to a single node and the user interface disables after a single node has been inserted. *end example*]

Attributes	Description
val (Preferred Number of Children Value)	<p>This attribute indicates the number of children that the current node prefers to have. This determines what the next action of the 'Add Shape' button should be. A value of -1 indicates an infinite number of children. Default value is -1.</p> <p>The possible values for this attribute are defined by the ST_NodeCount simple type (§21.4.7.44).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_ChildPref](#)) is located in §A.5.3. *end note*]

21.4.6.6 `dir` (Diagram Direction)

This element indicates whether the diagram should switch direction. This element provides the ability to define different behavior for diagrams considering LTR or RTL directions.

Attributes	Description
val (Diagram Direction Value)	<p>This variable indicates whether the diagram should switch direction.</p> <p>The possible values for this attribute are defined by the <code>ST_Direction</code> simple type (§21.4.7.26).</p>

[Note: The W3C XML Schema definition of this element's content model (`CT_Direction`) is located in §A.5.3. *end note*]

21.4.6.7 `hierBranch` (Organization Chart Branch Style)

This element defines the layout style of a branch in an organizational chart.

[Example: Consider the following example of `hierBranch` being used in DiagramML:

```
<varLst>
  <hierBranch val="init" />
</varLst>
```

In this example the value of `hierBranch` is defined as `init` which is a kind of not set state, or initial state. *end example*]

Attributes	Description
val (Organization Chart Branch Style Value)	<p>The value of this attribute indicates the layout style of a branch in an organization chart. The default value is <code>std</code>.</p> <p>The possible values for this attribute are defined by the <code>ST_HierBranchStyle</code> simple type (§21.4.7.37).</p>

[Note: The W3C XML Schema definition of this element's content model (`CT_HierBranchStyle`) is located in §A.5.3. *end note*]

21.4.6.8 `orgChart` (Show Organization Chart User Interface)

This element is used to indicate when to show user interface controls specifically associated with organizational charts such as being able to add an assistant to a selected node.

[Example: Consider the following example of `orgChart` used in DiagramML:

```
<varLst>
  <orgChart val="true" />
</varLst>
```

```

<chPref val="1" />
<dir val="norm" />
<animOne val="branch" />
<animLvl val="lvl" />
<resizeHandles val="rel" />
</varLst>

```

In this example we set the `orgChart` value to `true` indicating that the organizational chart specific user interface controls are to be enabled when the containing diagram is used. *end example*]

Attributes	Description
val (Show Organization Chart User Interface Value)	<p>This attribute value specifies when to show the 'Insert Assistant' user interface control and the 'Change Layout' user interface for this diagram.</p> <p>The possible values for this attribute are defined by the W3C XML Schema boolean datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_OrgChart](#)) is located in §A.5.3. *end note*]

21.4.7 Simple Types

This is the complete list of simple types dedicated to DrawingML – Diagrams.

21.4.7.1 ST_AlgorithmType (Algorithm Types)

Types of available algorithms.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
composite (Composite)	The composite algorithm specifies the size and position for all child layout nodes. You can use it to create graphics with a predetermined layout or in combination with other algorithms to create more complex shapes.
conn (Connector Algorithm)	The connector algorithm lays out and routes connecting lines, arrows, and shapes between layout nodes.
cycle (Cycle Algorithm)	The cycle algorithm lays out child layout nodes around a circle or portion of a circle using equal angle spacing.
hierChild (Hierarchy Child Algorithm)	The hierarchy child algorithm works with the hierRoot algorithm to create hierarchical tree layouts. This algorithm aligns and positions its child layout nodes in

Enumeration Value	Description
	a linear path under the hierRoot layout node.
hierRoot (Hierarchy Root Algorithm)	The hierarchy root algorithm works with the hierChild algorithm to create hierarchical tree layouts. The hierRoot algorithm aligns and positions the hierRoot layout node in relation to the hierChild layout nodes.
lin (Linear Algorithm)	The linear algorithm lays out child layout nodes along a linear path.
pyra (Pyramid Algorithm)	The pyramid algorithm lays out child layout nodes along a vertical path and works with the trapezoid shape to create a pyramid.
snake (Snake Algorithm)	The snake algorithm lays out child layout nodes along a linear path in two dimensions, allowing the linear flow to continue across multiple rows or columns.
sp (Space Algorithm)	The space algorithm is used to specify a minimum space between other layout nodes or as an indication to do nothing with the layout node's size and position.
tx (Text Algorithm)	The text algorithm sizes text to fit inside a shape and controls its margins and alignment.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_AlgorithmType](#)) is located in §A.5.3. *end note*]

21.4.7.2 ST_AnimLvlStr (Animation Level String Definition)

This simple type specifies the possible values for the string that should be displayed by a consumer for level animation of this diagram.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
ctr (From Center Animation)	This value specifies that the consumer shall allow "From Center At Once" or "From Center One by One" animation styles for this diagram.
lvl (By Level Animation)	This value specifies that the consumer shall display "By Level" animation types for this diagram.
none (Disable Level At Once)	This value specifies that the consumer shall disable level at once animation.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_AnimLvlStr](#)) is located in §A.5.3. *end note*]

21.4.7.3 ST_AnimOneStr (One by One Animation Value Definition)

This simple type defines the possible values for the string to use for one by one animation in the UI. Default value is one.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
branch (By Branch One By One)	This value specifies that the one by one animation string in the user interface should read "By Branch One By One".
none (Disable One-by-One)	This value specifies that the consumer should disable one by one animation.
one (One By One)	This value specifies that the one by one animation string in the user interface should read "One By One".

[Note: The W3C XML Schema definition of this simple type's content model ([ST_AnimOneStr](#)) is located in §A.5.3. *end note*]

21.4.7.4 ST_ArrowheadStyle (Arrowhead Styles)

This simple type defines different arrowhead style types for connectors.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
arr (Arrowhead Present)	Specifies that an arrowhead is to be used on the connector.
auto (Auto)	Specifies that the algorithm defines if an arrowhead is to be used on a connector.
noArr (No Arrowhead)	Specifies no arrowhead is to be used on the connector.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ArrowheadStyle](#)) is located in §A.5.3. *end note*]

21.4.7.5 ST_AutoTextRotation (Auto Text Rotation)

This simple type defines how text rotates within a shape when the shape is rotated by an algorithm during layout.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
grav (Gravity)	Specifies that when the angle of the text hits the threshold of 90 degrees and 180 degrees, the text rotates by 180 degrees.
none (None)	Specifies that text always rotates with the shape.
upr (Upright)	Specifies that when the text angle hits 45, 135, 225, or 315 degree thresholds, then it rotates by negative 90 degrees.

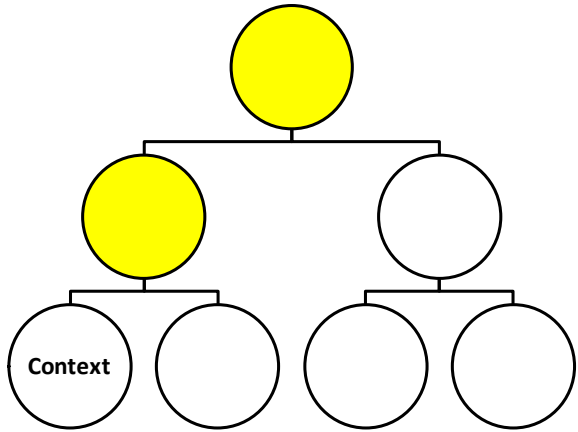
[Note: The W3C XML Schema definition of this simple type’s content model ([ST_AutoTextRotation](#)) is located in §A.5.3. *end note*]

21.4.7.6 ST_AxisType (Axis Type)

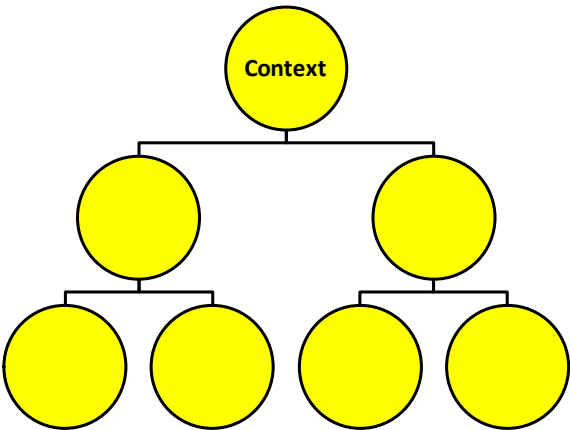
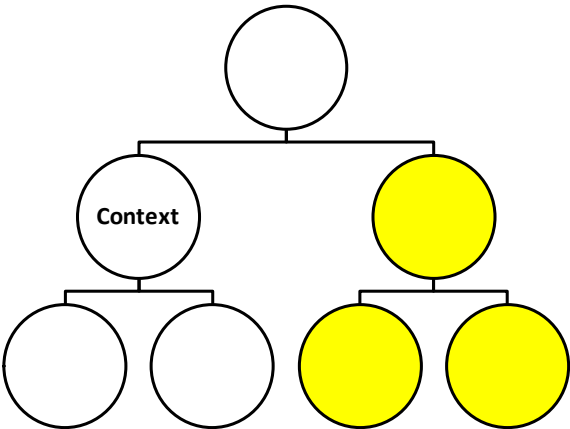
This simple type defines different node sets in relation to the current context node.

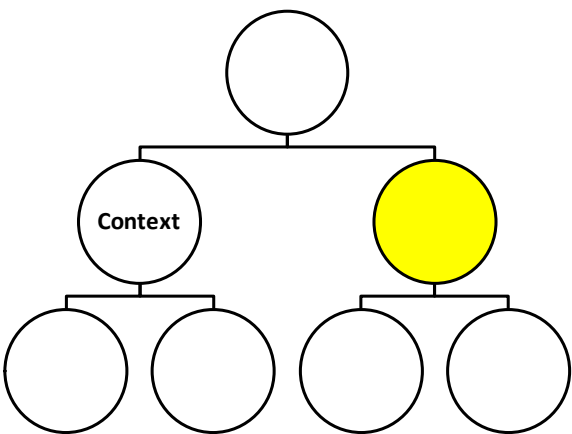
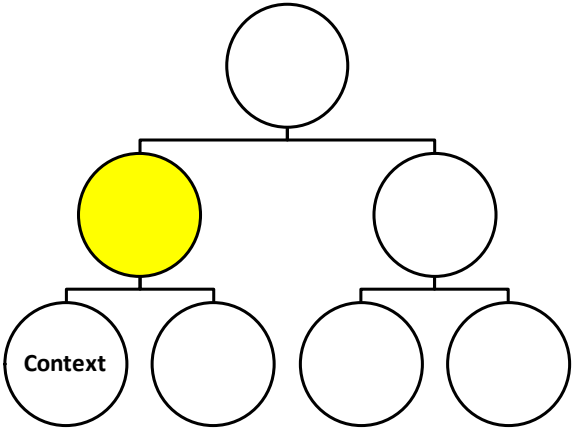
This simple type's contents are a restriction of the W3C XML Schema token datatype.

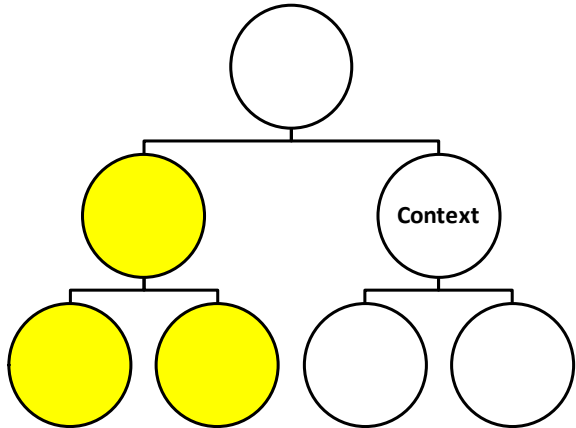
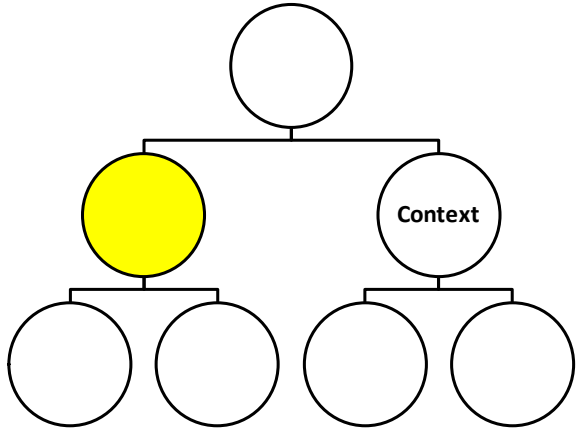
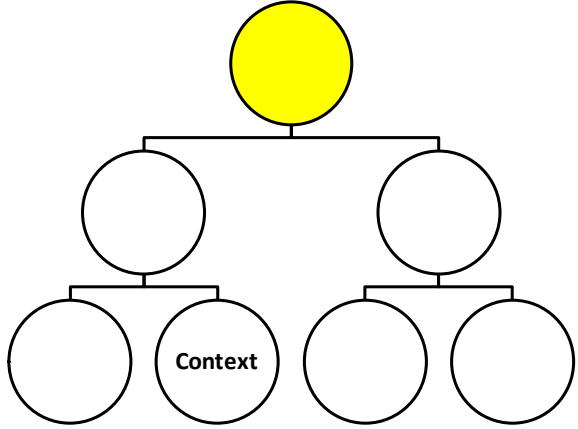
This simple type is restricted to the values listed in the following table:

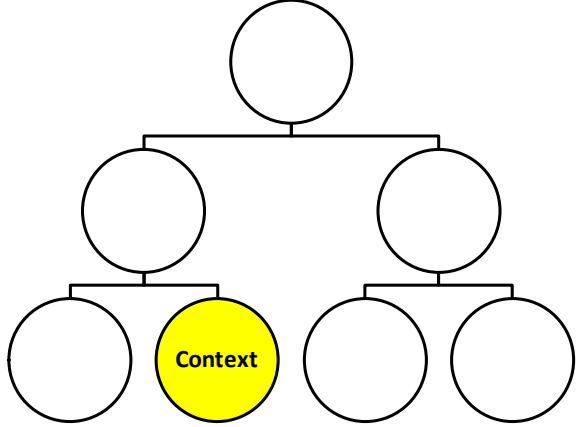
Enumeration Value	Description
ancst (Ancestor)	<p>Specifies a set of nodes between the current context node and the root node, including the root node.</p> <p>[Example: Consider the following example</p>  <p><i>end example</i>]</p>
ancstOrSelf (Ancestor or Self)	<p>Specifies a set of nodes between the current context node and the root node, including the root node and the context node.</p> <p>[Example: Consider the following example</p>

Enumeration Value	Description
	<p><i>end example]</i></p>
ch (Child)	<p>Specifies a set of children of the current context node.</p> <p>[Example: Consider the following example</p> <p><i>end example]</i></p>
des (Descendant)	<p>Specifies a set of all nodes beneath the current context node.</p> <p>[Example: Consider the following example</p> <p></p>

Enumeration Value	Description
	<i>end example]</i>
desOrSelf (Descendant or Self)	<p>Specifies a set of all nodes beneath the current context node, including the context node.</p> <p>[<i>Example:</i> Consider the following example</p>  <p><i>end example]</i></p>
follow (Follow)	<p>Specifies the set of nodes which are peers after the context node and all descendants of the peers.</p> <p>[<i>Example:</i> Consider the following example</p>  <p><i>end example]</i></p>
followSib (Follow Sibling)	<p>Specifies the set of nodes which are peers after the context node.</p> <p>[<i>Example:</i> Consider the following example</p>

Enumeration Value	Description
	 <p><i>end example]</i></p>
none (None)	Specifies no node.
par (Parent)	<p>Specifies the parent node.</p> <p>[<i>Example:</i> Consider the following example</p>  <p><i>end example]</i></p>
preced (Preceding)	<p>Specifies the set of nodes which are peers before the context node and all the descendants of the peers.</p> <p>[<i>Example:</i> Consider the following example</p>

Enumeration Value	Description
	 <p>end example]</p>
precedSib (Preceding Sibling)	<p>Specifies the set of nodes which are peers before the context node.</p> <p>[Example: Consider the following example</p>  <p>end example]</p>
root (Root)	<p>Specifies the top-most node of the diagram.</p> <p>[Example: Consider the following example</p>  <p>end example]</p>

Enumeration Value	Description
	<i>end example]</i>
self (Self)	<p>Specifies the calling context node.</p> <p>[<i>Example:</i> Consider the following example</p>  <p><i>end example]</i></p>

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_AxisType](#)) is located in §A.5.3.
end note]

21.4.7.7 [ST_AxisTypes](#) (Axis Type List)

This simple type represents a list of axis types.

This simple type allows a list of items of the [ST_AxisType](#) simple type (§21.4.7.6).

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_AxisTypes](#)) is located in §A.5.3.
end note]

21.4.7.8 [ST_BendPoint](#) (Bend Point)

This simple type defines where a bend is to occur within a connection between two nodes.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
beg (Beginning)	The bend is to occur at the beginning of the connection.
def (Default)	The default bend is used. By default connections bend in the center.
end (End)	The bend is to occur at the end of the connection.

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_BendPoint](#)) is located in §A.5.3. end note*]

21.4.7.9 [ST_Booleans \(Boolean List.\)](#)

A list of booleans.

This simple type allows a list of items of the W3C XML Schema boolean datatype.

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_Booleans](#)) is located in §A.5.3. end note*]

21.4.7.10 [ST_BoolOperator \(Boolean Constraint\)](#)

This simple type specified Boolean operations which can be applied to compare constraints.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
equ (Equal)	Equal operator.
gte (Greater Than or Equal to)	Specifies the greater than or equal to Boolean operator.
lte (Less Than or Equal to)	Specifies the less than or equal to Boolean operator.
none (None)	Specifies a none Boolean operator

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_BoolOperator](#)) is located in §A.5.3. end note*]

21.4.7.11 [ST_Breakpoint \(Breakpoint\)](#)

This simple type defines at what point the wrapping of nodes occurs for the snake algorithm.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
bal (Balanced)	Specifies that the number of nodes in every row and every column should be equal.
endCnv (End of Canvas)	Specifies that nodes are added to the next column or row after filling the current column or row's space.
fixed (Fixed)	Specifies to use a user defined number of nodes in a column or row.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_Breakpoint](#)) is located in §A.5.3. *end note*]

21.4.7.12 [ST_CenterShapeMapping \(Center Shape Mapping\)](#)

This simple type defines the behavior of the cycle algorithm.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
fNode (First Node)	Specifies a node which is always in the center of a cycle diagram.
none (None)	Specifies the normal layout of a cycle diagram.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_CenterShapeMapping](#)) is located in §A.5.3. *end note*]

21.4.7.13 [ST_ChildAlignment \(Child Alignment\)](#)

This simple type defines how to align a node in its allocated space.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
b (Bottom)	Specifies to align the node to the bottom.
l (Left)	Specifies to align the node to the left.
r (Right)	Specifies to align the node to the right.
t (Top)	Specifies to align the node to the top.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_ChildAlignment](#)) is located in §A.5.3. *end note*]

21.4.7.14 [ST_ChildDirection \(Child Direction\)](#)

This simple type defines the layout direction of child nodes related to a specific parent node.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
horz (Horizontal)	Specifies that the child nodes are to be laid out

Enumeration Value	Description
	horizontally.
vert (Vertical)	Specifies that the child nodes are to be laid out vertically.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_ChildDirection](#)) is located in §A.5.3. *end note*]

21.4.7.15 ST_ChildOrderType (Child Order)

This simple type specifies the child order for a given layout node.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
b (Bottom)	Child order along the bottom.
t (Top)	Top child order.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_ChildOrderType](#)) is located in §A.5.3. *end note*]

21.4.7.16 ST_ClrAppMethod (Color Application Method Type)

This simple type defines the way a given set of colors is applied to a set of nodes or items across a diagram.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
cycle (Cycle)	<p>The colors apply from A to B to A if A and B were the colors present.</p> <p>[<i>Example:</i> Consider the following image as an example of cycle applied to a diagram:</p>

Enumeration Value	Description
	<div><div><div>1</div><div>2</div><div>3</div></div><div><div>4</div><div>5</div><div>6</div></div><div><div>7</div><div>8</div><div>9</div></div><div><div>10</div></div></div> <div>Colors</div> <div><div>A</div><div>B</div></div> <p>In this example, the color A is applied to node 1 and node 10. Color B is considered the node color between A and A across the diagram. Colors interpolate across the diagram from A to B back to A. <i>end example</i></p>
repeat (Repeat)	<p>The colors apply from A through B to A through B if A through B were the colors present.</p> <p>[<i>Example:</i> Consider the following image as an example of repeat applied to a diagram:</p> <div><div><div>1</div><div>2</div><div>3</div></div><div><div>4</div><div>5</div><div>6</div></div><div><div>7</div><div>8</div><div>9</div></div><div><div>10</div></div></div> <div>Colors</div> <div><div>A</div><div></div><div></div><div></div><div>B</div></div> <p>In this example, the color A is applied to node 1, the next color to node 2, and so on through color B, then this coloring is repeated until there are no more nodes to color. <i>end example</i></p>
span (Span)	<p>The colors interpolate from A to B across the entire diagram if A and B were the colors present.</p> <p>[<i>Example:</i> Consider the following image as an example of span applied to a diagram:</p>

Enumeration Value	Description
	<div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div><div>6</div><div>7</div><div>8</div><div>9</div><div>10</div><div>Colors<div>A</div><div>B</div></div></div> <p>In this example, the color A is applied to node 1, the color B is applied to node 10 and the colors applied to nodes 2 through 9 are interpolated between colors A and B. <i>end example</i></p>

[Note: The W3C XML Schema definition of this simple type’s content model ([ST_ClrAppMethod](#)) is located in §A.5.3. *end note*]

21.4.7.17 ST_ConnectorDimension (Connector Dimension)

This simple type defines the dimensionality of the connection between two nodes.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
1D (1 Dimension)	Specifies a one dimensional connection, or rather a line.
2D (2 Dimensions)	Specifies a two dimensional connection which has both width and height.
cust (Custom)	Specifies a custom connection type.

[Note: The W3C XML Schema definition of this simple type’s content model ([ST_ConnectorDimension](#)) is located in §A.5.3. *end note*]

21.4.7.18 ST_ConnectorPoint (Connector Point)

This simple type defines different connection sites available on a node.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
auto (Auto)	Specifies that the algorithm determines the best connection site to use.
bCtr (Bottom Center)	Specifies that the bottom, center connection site is to be used.
bL (Bottom Left)	Specifies that the bottom, left connection site is to be used.
bR (Bottom Right)	Specifies that the bottom right connection site is to be used.
ctr (Center)	Specifies that the center connection site is to be used.
midL (Middle Left)	Specifies that the middle left connection site is to be used.
midR (Middle Right)	Specifies that the middle right connection site is to be used.
radial (Radial)	Specifies connections along a radial path to support the use of connections in cycle diagrams.
tCtr (Top Center)	Specifies that the top center connection site is to be used.
tL (Top Left)	Specifies that the top left connection site is to be used.
tR (Top Right)	Specifies that the top right connection site is to be used.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ConnectorPoint](#)) is located in §A.5.3. *end note*]

21.4.7.19 ST_ConnectorRouting (Connector Routing)

This simple type defines how the routing of a connection between two nodes is supposed to progress from node 1 to node 2.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
bend (Bending)	Specifies a bending connection which bends at a right angle.
curve (Curve)	Specifies a connection which is curved.
longCurve (Long Curve)	Specifies a connection that is curved that has a greater radius than a simple curved connection.
stra (Straight)	Specifies a straight connection.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ConnectorRouting](#)) is located in §A.5.3. *end note*]

21.4.7.20 ST_ConstraintRelationship (Constraint Relationship)

This simple type specifies the types of constraint relationships which are present and can be used.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
ch (Child)	The constraint should reference a child node.
des (Descendant)	The layout node can map to the descendants of the data point.
self (Self)	The layout node maps to the current data point.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ConstraintRelationship](#)) is located in §A.5.3. *end note*]

21.4.7.21 ST_ConstraintType (Constraint Type)

This simple type defines the list of possible constraints available for use.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
alignOff (Alignment Offset)	This value defines the alignment offset for a node.
b (Bottom)	The bottom of the node.
begMarg (Beginning Margin)	Specifies the beginning margin.
begPad (Beginning Padding)	Specifies the beginning padding.
bendDist (Bending Distance)	Specifies the distance from the start of a connector to a bend in the connector.
bMarg (Bottom Margin)	Specifies the bottom margin.
bOff (Bottom Offset)	Specifies the bottom offset.
connDist (Connection Distance)	Specifies the connection distance.
ctrX (Center Height)	Specifies the center of the height.
ctrXOff (Center X Offset)	Specifies the center x coordinate offset.
ctrY (Center Width)	Specifies the center of the width.
ctrYOff (Center Y Offset)	Specifies the center y coordinate offset.

Enumeration Value	Description
diam (Diameter)	Specifies the diameter.
endMarg (End Margin)	Specifies the ending margin.
endPad (End Padding)	Specifies the end padding.
h (Height)	Specifies the height.
hArH (Arrowhead Height)	Specifies the height of the arrowhead portion of the connector.
hOff (Height Offset)	Specifies the amount to offset the height.
l (Left)	Specifies the left constraint.
lMarg (Left Margin)	Specifies the left margin.
lOff (Left Offset)	Specifies the left offset.
none (Unknown)	Unknown constraint.
primFontSz (Primary Font Size)	The primary font size.
pyraAcctRatio (Pyramid Accent Ratio)	Specifies the fraction of the width of the diagram that is reserved for the fly outs at their shortest distance.
r (Right)	Specifies the right constraint.
rMarg (Right Margin)	Specifies the right margin constraint.
rOff (Right Offset)	Specifies the right offset constraint.
secFontSz (Secondary Font Size)	The secondary font size.
secSibSp (Secondary Sibling Spacing)	The secondary sibling spacing.
sibSp (Sibling Spacing)	Specifies the minimum distance between sibling shapes.
sp (Spacing)	Specifies the spacing defined.
stemThick (Stem Thickness)	Specifies the thickness of the arrow's shaft.
t (Top)	Specifies the top constraint.
tMarg (Top Margin)	Top margin constraint.
tOff (Top Offset)	Top offset constraint.
userA (User Defined A)	User defined information.
userB (User Defined B)	User defined information.
userC (User Defined C)	User defined information.
userD (User Defined D)	User defined information.
userE (User Defined E)	User defined information.
userF (User Defined F)	User defined information.
userG (User Defined G)	User defined information.
userH (User Defined H)	User defined information.
userI (User Defined I)	User defined information.

Enumeration Value	Description
userJ (User Defined J)	User defined information.
userK (User Defined K)	User defined information.
userL (User Defined L)	User defined information.
userM (User Defined M)	User defined information.
userN (User Defined N)	User defined information.
userO (User Defined O)	User defined information.
userP (User Defined P)	User defined information.
userQ (User Defined Q)	User defined information.
userR (User Defined R)	User defined information.
userS (User Defined S)	User defined information.
userT (User Defined T)	User defined information.
userU (User Defined U)	User defined information.
userV (User Defined V)	User defined information.
userW (User Defined W)	User defined information.
userX (User Defined X)	User defined information.
userY (User Defined Y)	User defined information.
userZ (User Defined Z)	User defined information.
w (Width)	The width parameter.
wArH (Arrowhead Width)	Specifies the width of the arrowhead portion of the connector.
wOff (Width Offset)	Offsets the width by the specified amount.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ConstraintType](#)) is located in §A.5.3. *end note*]

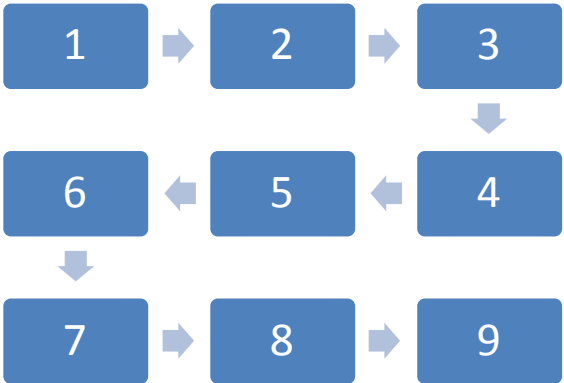
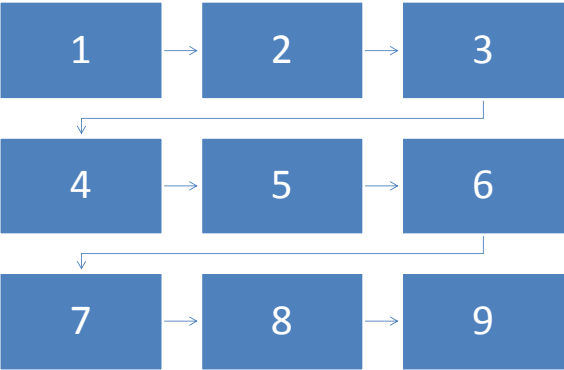
21.4.7.22 ST_ContinueDirection (Continue Direction)

This simple type specifies the behavior of the direction that additional nodes are added to new rows or columns in the snake algorithm.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
revDir (Reverse Direction)	Specifies that the direction is to be reversed on a subsequent row or column. [Example: Consider the following diagram as an

Enumeration Value	Description
	<p>example of reverse direction</p>  <p><i>end example]</i></p>
sameDir (Same Direction)	<p>Specifies that the direction is to be maintained on a subsequent row or column.</p> <p><i>[Example: Consider the following diagram as an example of same direction</i></p>  <p><i>end example]</i></p>

[Note: The W3C XML Schema definition of this simple type’s content model ([ST_ContinueDirection](#)) is located in §A.5.3. *end note*]

21.4.7.23 ST_CxnType (Connection Type)

This simple type defines the different types of relationships that can be defined between two nodes.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
parOf (Parent Of)	This defines a parent-child relationship in the sense that node X is a parent of node Y.
presOf (Presentation Of)	A presentation type relationship. This type of relationship exists to actually present data.
presParOf (Presentation Parent Of)	A relationship defining a parent of a presentation node.
unknownRelationship (Unknown Relationship)	The type of relationship is unknown.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_CxnType](#)) is located in §A.5.3. *end note*]

21.4.7.24 [ST_DiagramHorizontalAlignment \(Horizontal Alignment\)](#)

This simple type defines the horizontal alignment.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
ctr (Center)	Specifies center alignment.
l (Left)	Specifies left alignment.
none (None)	Specifies no alignment defined.
r (Right)	Specifies right alignment.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_DiagramHorizontalAlignment](#)) is located in §A.5.3. *end note*]

21.4.7.25 [ST_DiagramTextAlignment \(Text Alignment\)](#)

This simple type defines alignment types for text within a node.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
ctr (Center)	Specifies center aligned text.
l (Left)	Specifies left aligned text.
r (Right)	Specifies right aligned text.

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_DiagramTextAlignment](#)) is located in §A.5.3. end note*]

21.4.7.26 ST_Direction (Diagram Direction Definition)

This simple type defines the possible values for a diagram's direction when displayed in an application.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
norm (Normal Direction)	This value specifies that the direction of the diagram should not be switched.
rev (Reversed Direction)	This value specifies that the direction of the diagram should be switched.

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_Direction](#)) is located in §A.5.3. end note*]

21.4.7.27 ST_ElementType (Data Point Type)

This simple type defines the different types of data points which are supported.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
all (All)	Defined as utilizing all of the nodes.
asst (Assistant)	The assistant nodes.
doc (Document)	Specifies the a node on the document level.
node (Node)	Data nodes that are children of other data nodes.
nonAsst (Non Assistant)	Selects all of the non-assistant nodes.
nonNorm (Non Normal)	Selects the non-normal elements.
norm (Normal)	Selects a normal elements.
parTrans (Parent Transition)	The transition associated with the parent node.
pres (Presentation)	This refers to a presentation node.
sibTrans (Sibling Transition)	Use only sibling transitions between data nodes. These transitions represent sibling relationships between nodes, and are frequently mapped to arrows between shapes in the drawing. A sibTrans value is sometimes used to create white space between nodes.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_ElementType](#)) is located in §A.5.3. *end note*]

21.4.7.28 ST_ElementTypes (Diagram Layout Node Type List)

A list of diagram layout node types.

This simple type allows a list of items of the ST_ElementType simple type (§21.4.7.27).

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_ElementTypes](#)) is located in §A.5.3. *end note*]

21.4.7.29 ST_FallbackDimension (Fallback Dimension)

Specifies the dimensionality by which nodes can grow or shrink automatically.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
1D (1 Dimension)	Specifies that the node can grow or shrink by its height or its width, but not both.
2D (2 Dimensions)	Specifies that the node can grow or shrink by both height and width.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_FallbackDimension](#)) is located in §A.5.3. *end note*]

21.4.7.30 ST_FlowDirection (Flow Direction)

This simple type defines how the progression of new nodes are to be entered into the diagram.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
col (Column)	Specifies that the layout occurs in a column-based fashion. This would mean laying out the nodes from top to bottom, before moving left to right.
row (Row)	Specifies that the layout occurs in a row-based fashion. This would mean laying out the nodes from left to right before moving from top to bottom.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_FlowDirection](#)) is located in §A.5.3. *end note*]

21.4.7.31 ST_FunctionArgument (Function Argument)

Conditional expression function argument.

This simple type is a union of the following types:

- The ST_VariableType simple type (§21.4.7.64).

[Note: The W3C XML Schema definition of this simple type's content model ([ST_FunctionArgument](#)) is located in §A.5.3. *end note*]

21.4.7.32 ST_FunctionOperator (Function Operator)

This simple type defines the condition expression functions which can be used to perform operations.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
equ (Equal)	Equal function operator.
gt (Greater Than)	Specifies the greater than function operator.
gte (Greater Than or Equal to)	Specifies the greater than or equal to function operator.
lt (Less Than)	Specifies the less than function operator.
lte (Less Than or Equal to)	Specifies the less than or equal to function operator.
neq (Not Equal To)	Specifies the not equal to function operator.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_FunctionOperator](#)) is located in §A.5.3. *end note*]

21.4.7.33 ST_FunctionType (Function Type)

This simple type defines the set of available conditional expression function types present for use.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
cnt (Count)	Specifies a count.
depth (Depth)	Specifies the depth.
maxDepth (Max Depth)	Defines the maximum depth.
pos (Position)	Retrieves the position of the node in the specified set of nodes.
posEven (Position Even)	Returns 1 if the specified node is at an even numbered

Enumeration Value	Description
	position in the data model.
posOdd (Position Odd)	Returns 1 if the specified node is in an odd position in the data model.
revPos (Reverse Position)	Reverse position function.
var (Variable)	Used to reference a variable.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_FunctionType](#)) is located in §A.5.3. *end note*]

21.4.7.34 ST_FunctionValue (Function Value)

Conditional expression function value.

This simple type is a union of the following types:

- The ST_AnimLvlStr simple type (§21.4.7.2).
- The ST_AnimOneStr simple type (§21.4.7.3).
- The ST_Direction simple type (§21.4.7.26).
- The ST_HierBranchStyle simple type (§21.4.7.37).
- The ST_ResizeHandlesStr simple type (§21.4.7.54).
- The W3C XML Schema boolean datatype.
- The W3C XML Schema int datatype.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_FunctionValue](#)) is located in §A.5.3. *end note*]

21.4.7.35 ST_GrowDirection (Grow Direction)

This simple type defines different starting locations for nodes within the snake algorithm.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
bL (Bottom Left)	Specifies the placement of nodes is to start in the bottom left corner.
bR (Bottom Right)	Specifies the placement of nodes is to start in the bottom right corner.
tL (Top Left)	Specifies the placement of nodes is to start in the top left corner.
tR (Top Right)	Specifies the placement of nodes is to start in the top right corner.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_GrowDirection](#)) is located in §A.5.3. *end note*]

21.4.7.36 ST_HierarchyAlignment (Hierarchy Alignment)

This simple type defines different relative locations of child nodes and their descendants to a parent node within a hierarchy diagram.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
bCtrCh (Bottom Center Child)	Specifies the child nodes are placed below the parent node and that they are center aligned to the parent node.
bCtrDes (Bottom Center Descendant)	Specifies the descendant nodes are placed below the parent node and that they are center aligned to the parent node.
bL (Bottom Left)	Specifies the child and descendant nodes are placed below the parent node and that the set is left aligned.
bR (Bottom Right)	Specifies the child and descendant nodes are placed below the parent node and the set is right aligned.
lB (Left Bottom)	Specifies the child and descendant nodes are placed to the left of the parent node and that the set is bottom aligned.
lCtrCh (Left Center Child)	Specifies the child nodes are placed to the left of the parent node and that the set is center aligned.
lCtrDes (Left Center Descendant)	Specifies the descendant nodes are placed to the left of the parent node and that the set is center aligned.
lT (Left Top)	Specifies the child and descendant nodes are placed to the left of the parent node and that the set is top aligned.
rB (Right Bottom)	Specifies the child and descendant nodes are placed to the right of the parent node and that the set is bottom aligned.
rCtrCh (Right Center Children)	Specifies the child nodes are placed to the right of the parent node and that the set is center aligned.
rCtrDes (Right Center Descendants)	Specifies the descendant nodes are placed to the right of the parent node and that the set is center aligned.
rT (Right Top)	Specifies the child and descendant nodes are placed to the right of the parent node and that the set is top

Enumeration Value	Description
	aligned.
tCtrCh (Top Center Children)	Specifies the child nodes are placed above the parent node and that the set is center aligned.
tCtrDes (Top Center Descendants)	Specifies the descendant nodes are placed above the parent node and that the set is center aligned.
tL (Top Left)	Specifies the child and descendant nodes are placed above the parent node and that the set is left aligned.
tR (Top Right)	Specifies the child and descendant nodes are placed above the parent node and that the set is right aligned.

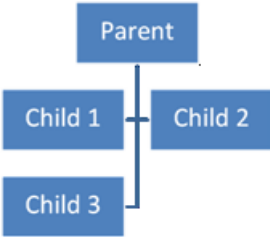
[Note: The W3C XML Schema definition of this simple type’s content model ([ST_HierarchyAlignment](#)) is located in §A.5.3. *end note*]

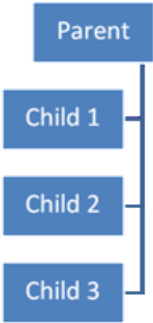
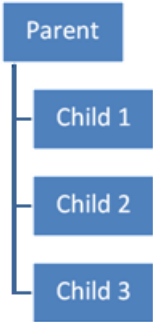
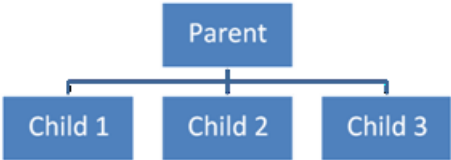
21.4.7.37 [ST_HierBranchStyle \(Hierarchy Branch Style Definition\)](#)

This simple type specifies the possible values for the branch style of a hierarchy diagram.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
hang (Hanging)	<p>The branch style is hanging from the parent.</p> <p>[Example: Consider the following image as an example of a hanging branch style:</p>  <p><i>end example</i>]</p>
init (Initial)	<p>This means that the value has not been set.</p>
l (Left)	<p>The branch style falls off the left.</p> <p>[Example: Consider the following image as an example of a left hanging branch style:</p>

Enumeration Value	Description
	<div><pre>graph TD; Parent[Parent] --- C1[Child 1]; Parent --- C2[Child 2]; Parent --- C3[Child 3];</pre></div> <p><i>end example]</i></p>
r (Right)	<p>The branch style falls off the right.</p> <p>[<i>Example:</i> Consider the following image as an example of a right hanging branch style:</p> <div><pre>graph TD; Parent[Parent] --- C1[Child 1]; Parent --- C2[Child 2]; Parent --- C3[Child 3];</pre></div> <p><i>end example]</i></p>
std (Standard)	<p>The standard branch style is to be used.</p> <p>[<i>Example:</i> Consider the following image as an example of a standard hanging branch style:</p> <div><pre>graph TD; Parent[Parent] --- C1[Child 1]; Parent --- C2[Child 2]; Parent --- C3[Child 3];</pre></div> <p><i>end example]</i></p>

[*Note: The W3C XML Schema definition of this simple type’s content model ([ST_HierBranchStyle](#)) is located in §A.5.3. end note*]

21.4.7.38 [ST_HueDir \(Hue Direction\)](#)

When given two colors to interpolate between, one can go in one of two directions around the color wheel to perform the interpolation. This simple type defines that direction.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
ccw (Counterclockwise Hue Direction)	A hue interpolation in the counterclockwise direction.
cw (Clockwise Hue Direction)	A hue interpolation in the clockwise direction.

[*Note: The W3C XML Schema definition of this simple type’s content model ([ST_HueDir](#)) is located in §A.5.3. end note*]

21.4.7.39 [ST_Index1 \(1-Based Index\)](#)

A 1-based index.

This simple type's contents are a restriction of the W3C XML Schema unsignedInt datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 1.

[*Note: The W3C XML Schema definition of this simple type’s content model ([ST_Index1](#)) is located in §A.5.3. end note*]

21.4.7.40 [ST_Ints \(Integer List\)](#)

A list of integers.

This simple type allows a list of items of the W3C XML Schema int datatype.

[*Note: The W3C XML Schema definition of this simple type’s content model ([ST_Ints](#)) is located in §A.5.3. end note*]

21.4.7.41 [ST_LayoutShapeType \(Layout Shape Type\)](#)

All of the available shape types.

This simple type is a union of the following types:

- The [ST_OutputShapeType](#) simple type (§21.4.7.48).
- The [ST_ShapeType](#) simple type (§20.1.10.55).

[Note: The W3C XML Schema definition of this simple type's content model ([ST_LayoutShapeType](#)) is located in §A.5.3. *end note*]

21.4.7.42 [ST_LinearDirection \(Linear Direction\)](#)

This simple type defines the direction of growth of new nodes.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
fromB (From Bottom)	Specifies growth to start from the bottom.
fromL (From Left)	Specifies growth to start from the left.
fromR (From Right)	Specifies growth to start from the right.
fromT (From Top)	Specifies growth to start from the Top

[Note: The W3C XML Schema definition of this simple type's content model ([ST_LinearDirection](#)) is located in §A.5.3. *end note*]

21.4.7.43 [ST_ModelId \(Model Identifier\)](#)

The unique ID of the element within the data model. Model Identifiers can be either longs or guids.

This simple type is a union of the following types:

- The ST_Guid simple type (§22.9.2.4).
- The W3C XML Schema int datatype.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ModelId](#)) is located in §A.5.3. *end note*]

21.4.7.44 [ST_NodeCount \(Number of Nodes Definition\)](#)

This simple type defines a count of the number of nodes for a property in a diagram. A value of -1 shall mean that the value is unbounded.

This simple type's contents are a restriction of the W3C XML Schema int datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to -1.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_NodeCount](#)) is located in §A.5.3. *end note*]

21.4.7.45 [ST_NodeHorizontalAlignment \(Node Horizontal Alignment\)](#)

This simple type defines the horizontal alignment of a node.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
ctr (Center)	Specifies center alignment.
l (Left)	Specifies left alignment.
r (Right)	Specifies right alignment.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_NodeHorizontalAlignment](#)) is located in §A.5.3. *end note*]

21.4.7.46 [ST_NodeVerticalAlignment \(Node Vertical Alignment\)](#)

This simple type defines the vertical alignment of a node.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
b (Bottom)	Specifies bottom alignment.
mid (Middle)	Specifies middle alignment.
t (Top)	Specifies top alignment.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_NodeVerticalAlignment](#)) is located in §A.5.3. *end note*]

21.4.7.47 [ST_Offset \(Offset\)](#)

This simple type defines whether or not subsequent rows or columns in the snake algorithm are offset from the preceding row or column.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
ctr (Center)	Specifies no offset.
off (Offset)	Specifies that the nodes are shifted by some amount relative to the preceding row or column.

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_Offset](#)) is located in §A.5.3. end note*]

21.4.7.48 [ST_OutputShapeType \(Output Shape Type\)](#)

Shapes which are special specifically for a DrawingML diagram.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
conn (Connection)	Connection shape type.
none (None)	None.

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_OutputShapeType](#)) is located in §A.5.3. end note*]

21.4.7.49 [ST_ParameterId \(Parameter Identifier\)](#)

This simple type defines algorithm parameters which can be modified in order to adjust the behavior of algorithms for use in layout nodes.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
alignTx (Text Alignment)	This value defines how the text is aligned in a node.
ar (Aspect Ratio)	Specifies the aspect ratio (width to height) of the composite node to use when determining child constraints. A value of 0 means leave the width and height constraints as is. The algorithm can temporarily shrink one dimension to achieve that ratio. [<i>Example: If a composite node has a width constraint of 20 and height constraint of 10, and if ar=1.5, composite uses a width value of 15 to calculate the composite node's child constraints. However, the algorithm does not propagate this value to other nodes. end example</i>]
autoTxRot (Auto Text Rotation)	Auto text rotation.
begPts (Beginning Points)	Beginning Points
begSty (Beginning Arrowhead Style)	Beginning Arrowhead Style
bendPt (Bend Point)	The bend point.
bkpt (Breakpoint)	Specifies the point at which the diagram starts to snake. The value bal specifies that snaking begin at an

Enumeration Value	Description
	even number of rows and columns. The value fixed specifies that snaking begin at a fixed point. The value endCnv specifies that snaking begin when there is no more room for a shape in the row.
bkPtFixedVal (Breakpoint Fixed Value)	Specifies where the snake should break, if bkpt=fixed.
chAlign (Child Alignment)	Specifies the alignment of the children.
chDir (Child Direction)	The child direction.
connRout (Connection Route)	The route of the connection.
contDir (Continue Direction)	Specifies the direction of the subsequent row or column. [Example: If the algorithm initially places the nodes from left to right, revDir places the nodes in the next row from right to left. However if the algorithm uses contDir, the nodes on the next row are arranged from left to right. end example]
ctrShpMap (Center Shape Mapping)	Specifies where to place nodes in relation to the center circle.
dim (Connector Dimension)	Specifies the connector dimension.
dstNode (Destination Node)	Specifies the name of the layout node from which to end the connection from.
endPts (End Points)	Specifies the end points.
endSty (End Style)	Specifies the end style.
fallback (Fallback Scale)	1D specifies fallback. It only scales in one dimension. 2D specifies fallback. It scales in both dimensions equally.
flowDir (Flow Direction)	Specifies whether nodes are arranged in rows or columns.
grDir (Grow Direction)	Specifies from which corner the snake grows. [Example: If the algorithm uses a top left value, the snake grows from the top left. end example]
hierAlign (Hierarchy Alignment)	The alignment of the hierarchy.
horzAlign (Horizontal Alignment)	Aligns all the child nodes within the space reserved for the parent and adjusts child positions in the x direction.
linDir (Linear Direction)	Specifies the linear direction.
lnSpAfChP (Line Spacing After Children Paragraph)	Line spacing after children.
lnSpAfParP (Line Spacing After Parent Paragraph)	Line spacing after the parent.
lnSpCh (Line Spacing Children)	Line spacing of the children
lnSpPar (Line Spacing Parent)	Line spacing of the parent.

Enumeration Value	Description
nodeHorzAlign (Node Horizontal Alignment)	Specifies how child nodes are aligned within the extents of the canvas. [<i>Example</i> : You can align the tops of all the child nodes, but center all of them within the canvas. <i>end example</i>]
nodeVertAlign (Node Vertical Alignment)	Specifies how child nodes are aligned within the extents of the canvas. Same as nodeHorzAlign, but in the y direction.
off (Offset)	Specifies the offset.
parTxLTRAlign (Parent Text Left-to-Right Alignment)	Specifies the paragraph alignment of parent text when the shape has only parent text. This parameter applies when the text direction is left to right.
parTxRTLAlign (Parent Text Right-to-Left Alignment)	Specifies the paragraph alignment of parent text when the shape has only parent text. This parameter applies when the text direction is right to left.
pyraAcctBkgdNode (Pyramid Accent Background Node)	If pyramid has a composite child node, specifies the name of the node that is a child of the composite that makes up the child flyout shape. If the node specifies a shape of the nonIsoscelesTrapezoid autoshape, it modifies the adjust handles in order to fit the flyout flush against the side of the pyramid.
pyraAcctPos (Pyramid Accent Position)	Specifies the placement of the flyout grandchildren.
pyraAcctTxMar (Pyramid Accent Text Margin)	Specifies the placement of one edge of the child text (grandchild node). If the value is step, the text is against the edge of the pyramid. If the value is stack, the text aligns.
pyraAcctTxNode (Pyramid Accent Text Node)	If pyramid has a composite child node, specifies the child node that should hold the child text.
pyraLvlNode (Pyramid Level Node)	If pyramid has a composite child node, specifies the name of the node that is a child of the composite that makes up the pyramid itself. If the node specifies a trapezoid shape, it modifies the adjustment handles to construct a pyramid.
rotPath (Rotation Path)	The rotation path specified.
rtShortDist (Route Shortest Distance)	If true, the connector is routed through the shortest distance between the points.
secChAlign (Secondary Child Alignment)	The secondary child alignment.
secLinDir (Secondary Linear Direction)	The secondary linear direction.
shpTxLTRAlignCh (Shape Text Left-to-Right Alignment)	Specifies the paragraph alignment of all text within the shape when the shape contains both parent and child text. This parameter applies when the text direction is left to right.

Enumeration Value	Description
shpTxRTLAlignCh (Shape Text Right-to-Left Alignment)	Specifies the paragraph alignment of all text within the shape when the shape contains both parent and child text. This parameter applies when the text direction is right to left.
spanAng (Span Angle)	Specifies the angle the cycle spans. Final shapealign text is placed at stAng+spanAng, unless spanAng=360. In that case, the algorithm places the text so that shapes do not overlap.
srcNode (Source Node)	Specifies the name of the layout node from which to start the connection.
stAng (Start Angle)	Specifies the angle at which the first shape is placed. Angles are in degrees, measured clockwise from a line pointing straight upward from the center of the cycle.
stBulletLvl (Start Bullets At Level)	Specifies whether bullets start at the top level (1) or with children (2).
stElem (Start Element)	Specifies the point type of the layout node to use as the first shape in the cycle.
txAnchorHorz (Text Anchor Horizontal)	Specifies the y-axis position of the text area within a shape.
txAnchorHorzCh (Text Anchor Horizontal With Children)	Specifies that the definition can allow a different text anchoring on the x-axis, if child nodes exist in the shape.
txAnchorVert (Text Anchor Vertical)	Specifies the x-axis position of the text area within a shape.
txAnchorVertCh (Text Anchor Vertical With Children)	Specifies that the definition can allow a different text anchoring on the y-axis, if child nodes exist in the shape.
txBIDir (Text Block Direction)	Specifies whether the text block is vertical or horizontal.
txDir (Text Direction)	Specifies where the text of the first node starts.
vertAlign (Vertical Alignment)	Aligns all the child nodes within the space reserved for the parent and adjusts child positions in the y direction.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ParameterId](#)) is located in §A.5.3. *end note*]

21.4.7.50 ST_ParameterVal (Parameter Values)

Specifies the list of parameter types that can be used by a diagram.

This simple type is a union of the following types:

- The ST_ArrowheadStyle simple type (§21.4.7.4).
- The ST_AutoTextRotation simple type (§21.4.7.5).
- The ST_BendPoint simple type (§21.4.7.8).
- The ST_Breakpoint simple type (§21.4.7.11).
- The ST_CenterShapeMapping simple type (§21.4.7.12).
- The ST_ChildAlignment simple type (§21.4.7.13).
- The ST_ChildDirection simple type (§21.4.7.14).
- The ST_ConnectorDimension simple type (§21.4.7.17).
- The ST_ConnectorPoint simple type (§21.4.7.18).
- The ST_ConnectorRouting simple type (§21.4.7.19).
- The ST_ContinueDirection simple type (§21.4.7.22).
- The ST_DiagramHorizontalAlignment simple type (§21.4.7.24).
- The ST_DiagramTextAlignment simple type (§21.4.7.25).
- The ST_FallbackDimension simple type (§21.4.7.29).
- The ST_FlowDirection simple type (§21.4.7.30).
- The ST_GrowDirection simple type (§21.4.7.35).
- The ST_HierarchyAlignment simple type (§21.4.7.36).
- The ST_LinearDirection simple type (§21.4.7.42).
- The ST_NodeHorizontalAlignment simple type (§21.4.7.45).
- The ST_NodeVerticalAlignment simple type (§21.4.7.46).
- The ST_Offset simple type (§21.4.7.47).
- The ST_PyramidAccentPosition simple type (§21.4.7.52).
- The ST_PyramidAccentTextMargin simple type (§21.4.7.53).
- The ST_RotationPath simple type (§21.4.7.55).
- The ST_SecondaryChildAlignment simple type (§21.4.7.56).
- The ST_SecondaryLinearDirection simple type (§21.4.7.57).
- The ST_StartingElement simple type (§21.4.7.58).
- The ST_TextAnchorHorizontal simple type (§21.4.7.59).
- The ST_TextAnchorVertical simple type (§21.4.7.60).
- The ST_TextBlockDirection simple type (§21.4.7.61).
- The ST_TextDirection simple type (§21.4.7.62).
- The ST_VerticalAlignment simple type (§21.4.7.65).
- The W3C XML Schema boolean datatype.
- The W3C XML Schema double datatype.
- The W3C XML Schema int datatype.
- The W3C XML Schema string datatype.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ParameterVal](#)) is located in §A.5.3. *end note*]

21.4.7.51 ST_PtType (Point Type)

This simple type defines the different point types which can be utilized to create diagrams in DiagramML.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
asst (Assistant Element)	This point type is used in a hierarchy diagram to represent an assistant element.
doc (Document)	This point type specifies a document type point. This point type can be thought of as the root node associated with the document itself.
node (Node)	The node point type specifies a basic point type.
parTrans (Parent Transition)	This point type specifies a parent transition element.
pres (Presentation)	Specifies a presentation point type.
sibTrans (Sibling Transition)	This point type specifies a sibling transition element.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_PtType](#)) is located in §A.5.3. *end note*]

21.4.7.52 ST_PyramidAccentPosition (Pyramid Accent Position)

This simple type defines different positioning for the accent shapes which can be associated with a pyramid algorithm.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
aft (Pyramid Accent After)	Specifies that the accent shapes are to be placed to the right of the pyramid.
bef (Before)	Specifies that the accent shapes are to be placed to the left of the pyramid.

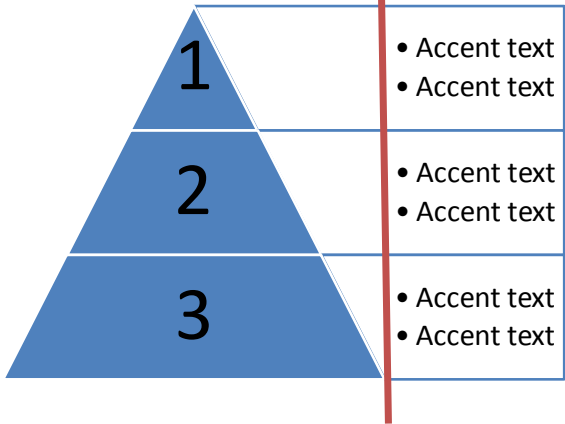
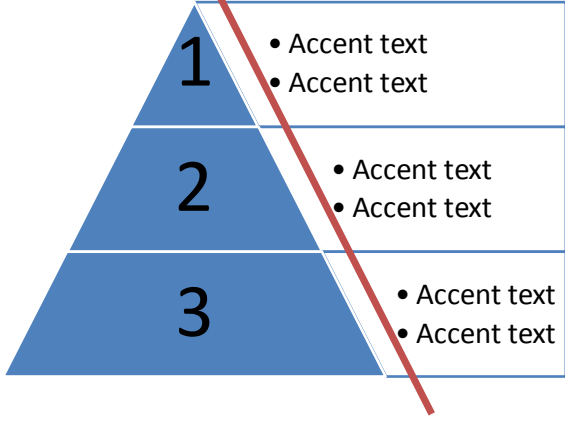
[Note: The W3C XML Schema definition of this simple type's content model ([ST_PyramidAccentPosition](#)) is located in §A.5.3. *end note*]

21.4.7.53 ST_PyramidAccentTextMargin (Pyramid Accent Text Margin)

This simple type defines different ways to lay out text in the accent shape for a pyramid algorithm.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
stack (Stack)	<p>Specifies that all accent shape text is to be left aligned.</p> <p>[Example: Consider the following example of a pyramid diagram</p>  <p>end example]</p> <p>The diagram shows a blue pyramid divided into three horizontal sections labeled 1, 2, and 3. To the right of the pyramid is a white rectangular box divided into three horizontal sections. Each section contains two bullet points, both labeled 'Accent text'. A vertical red line is positioned to the right of the pyramid, separating it from the text box.</p>
step (Step)	<p>Specifies that all accent shape text is to be relative to the pyramid.</p> <p>[Example: Consider the following example of a pyramid diagram</p>  <p>end example]</p> <p>The diagram shows a blue pyramid divided into three horizontal sections labeled 1, 2, and 3. To the right of the pyramid is a white rectangular box divided into three horizontal sections. Each section contains two bullet points, both labeled 'Accent text'. A diagonal red line is positioned to the right of the pyramid, separating it from the text box.</p>

[Note: The W3C XML Schema definition of this simple type’s content model ([ST_PyramidAccentTextMargin](#)) is located in §A.5.3. end note]

21.4.7.54 [ST_ResizeHandlesStr \(Resize Handle\)](#)

This simple type defines the possible behaviors when resizing shapes within a diagram. Because the size of the shape plays a large role in the overall layout of other nodes within the diagram, there are two ways resize can occur on a node.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
exact (Exact)	This value specifies that the resize of the shape occurs and sizes exactly to the size the user defines, which causes all other shapes in the diagram to shrink or grow accordingly.
rel (Relative)	This value specifies that resize operations happen relatively. This means that the relative size difference between nodes is maintained before and after the resize operation.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ResizeHandlesStr](#)) is located in §A.5.3. *end note*]

21.4.7.55 [ST_RotationPath \(Rotation Path\)](#)

This simple type defines rotation properties for nodes within the cycle algorithm.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
alongPath (Along Path)	Specifies that the nodes should rotate in relation to their placement along the cycle.
none (None)	Specifies that the nodes should not rotate.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_RotationPath](#)) is located in §A.5.3. *end note*]

21.4.7.56 [ST_SecondaryChildAlignment \(Secondary Child Alignment\)](#)

This simple type defines different alignment properties of the both hanging layout type of the hierarchy algorithm.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
b (Bottom)	Specifies that the children nodes should be bottom aligned.
l (Left)	Specifies that the children nodes should be left aligned.
none (None)	Specifies no alignment.
r (Right)	Specifies that the children nodes should be right aligned.
t (Top)	Specifies that the children nodes should be top aligned.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_SecondaryChildAlignment](#)) is located in §A.5.3. *end note*]

21.4.7.57 [ST_SecondaryLinearDirection \(Secondary Linear Direction\)](#)

This simple type defines different directions for the nodes in a both hanging layout in the hierarchy algorithm.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
fromB (From Bottom)	Specifies that the nodes begin from the bottom and move upward.
fromL (From Left)	Specifies that the nodes begin from the left and move right.
fromR (From Right)	Specifies that the nodes begin from the right and move left.
fromT (From Top)	Specifies that the nodes begin from the top and move downward.
none (None)	Specifies no direction.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_SecondaryLinearDirection](#)) is located in §A.5.3. *end note*]

21.4.7.58 [ST_StartingElement \(Starting Element\)](#)

This simple type defines behavior for the first node in a cycle algorithm.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
node (Node)	Specifies that a node should be placed first.
trans (Transition)	Specifies that a transition should be placed first.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_StartingElement](#)) is located in §A.5.3. *end note*]

21.4.7.59 [ST_TextAnchorHorizontal \(Text Anchor Horizontal\)](#)

This simple type defines horizontal anchor points for text.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
ctr (Center)	Specifies text to be anchored to the center.
none (None)	Specifies no horizontal text anchor.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_TextAnchorHorizontal](#)) is located in §A.5.3. *end note*]

21.4.7.60 [ST_TextAnchorVertical \(Text Anchor Vertical\)](#)

This simple type defines vertical anchor points for text.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
b (Bottom)	Specifies text to be anchored to the bottom.
mid (Middle)	Specifies text to be anchored to the middle.
t (Top)	Specifies text to be anchored to the top.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_TextAnchorVertical](#)) is located in §A.5.3. *end note*]

21.4.7.61 [ST_TextBlockDirection \(Text Block Direction\)](#)

This simple type defines different layout options for text within a node.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
horz (Horizontal)	Specifies that the text is to be horizontal.
vert (Vertical Direction)	Specifies that the text is to be vertical.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TextBlockDirection](#)) is located in §A.5.3. *end note*]

21.4.7.62 ST_TextDirection (Text Direction)

This simple type defines different way the growth of additional text can occur within a node.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
fromB (From Bottom)	Specifies additional text grows from the bottom.
fromT (From Top)	Specifies additional text grows from the top.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TextDirection](#)) is located in §A.5.3. *end note*]

21.4.7.63 ST_UnsignedInts (Unsigned Integer List)

A list of unsigned integers.

This simple type allows a list of items of the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_UnsignedInts](#)) is located in §A.5.3. *end note*]

21.4.7.64 ST_VariableType (Variable Type)

Conditional expression variable type.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
animLvl (Animation Level)	Specifies the animation level
animOne (Animate One)	Specifies animate as one.
bulEnabled (Bullets Enabled)	Specifies bullets enabled.
chMax (Child Max)	The maximum number of children.

Enumeration Value	Description
chPref (Child Preference)	The preferred number of children.
dir (Direction)	Specifies the direction of the diagram.
hierBranch (Hierarchy Branch)	The hierarchy branch.
none (Unknown)	Unknown variable type.
orgChart (Organizational Chart Algorithm)	Algorithm that lays out an org chart.
resizeHandles (Resize Handles)	Specifies the resize handles.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_VariableType](#)) is located in §A.5.3. *end note*]

21.4.7.65 ST_VerticalAlignment (Vertical Alignment)

This simple type defines different vertical alignment parameters.

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
b (Bottom)	Specifies bottom aligned.
mid (Middle)	Specifies middle aligned.
none (None)	Specifies no vertical alignment.
t (Top)	Specifies top aligned.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_VerticalAlignment](#)) is located in §A.5.3. *end note*]

21.4.7.66 ST_PrSetCustVal (Property Set Customized Value)

This simple type defines customization percentage values for certain elements in DrawingML.

This simple type is a union of the following types:

The ST_Percentage simple type (§22.9.2.9).

[Note: The W3C XML Schema definition of this simple type's content model (ST_PrSetCustVal) is located in §A.5.3. *end note*]

22. Shared MLs Reference Material

[No documentation has been entered for this section heading.]

22.1 Math

The following documentation specifies the XML representation of mathematical text for OOXML. This shared ML is known as that Office Math Markup Language (OMML). Mathematical text represented by OMML includes but is not limited to: equations, expressions, formulas, matrices, and other mathematical elements. The outermost OMML element of an instance of mathematical text in display mode is oMathPara, a math paragraph of one or more instances of mathematical text. Each instance of mathematical text inside the math paragraph is represented as a single oMath. Inside each oMath is a combination of mathematical runs (r) and objects or functions such as accents (acc) or fractions (f).

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End of informative text.

22.1.2 Elements

The following elements describe the contents of mathematical text.

22.1.2.1 acc (Accent)

This element specifies the accent function, consisting of a base and a combining diacritical mark. If accPr is omitted, the default accent is U+0302 (COMBINING CIRCUMFLEX ACCENT). [*Example*: Example accent functions are \grave{a} , \acute{a} , and \tilde{a} .

```
<m:acc>
  <m:accPr>
    <m:chr m:val="&#771;" />
    <m:ctrlPr />
  </m:accPr>
  <m:e>
    <m:r>
      <m:t>a</m:t>
    </m:r>
  </m:e>
</m:acc>
```

end example]

[*Note*: The W3C XML Schema definition of this element's content model ([CT_Acc](#)) is located in §A.6.1. *end note*]

22.1.2.2 `accPr` (Accent Properties)

This element specifies the properties of the Accent function. If `chr` is omitted, the default accent character is U+0302 (COMBINING CIRCUMFLEX ACCENT). [Example:

The diacritical mark ~ (tilde) is:

```
<m:accPr>
  <m:chr m:val="#771;" />
</m:accPr>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_AccPr](#)) is located in §A.6.1. *end note]*

22.1.2.3 `aln` (Alignment)

This element specifies the alignment property on the box object. It is utilized only when the box is designated as an operator emulator. When 1 or true, this operator emulator serves as an alignment point; that is, designated alignment points in other equations can be aligned with it.

When the element is absent, the default is for the parent structure to not be an alignment point.

When the element is present and the `val` attribute is absent, the default value of the `val` attribute is 1 meaning that this property's parent structure is an alignment point.

[Example: For example, the following equation uses the operator emulator as an alignment point: $a == b$.

Its XML representation is as follows:

```
<m:oMath>
  <m:r>
    <m:t>a</m:t>
  </m:r>
  <m:box>
    <m:boxPr>
      <m:opEmu m:val="1" />
      <m:aln m:val="1" />
      <m:ctrlPr />
    </m:boxPr>
    <m:e>
      <m:r>
        <m:t>==</m:t>
      </m:r>
    </m:e>
  </m:box>
```

```

<m:r>
  <m:t>b</m:t>
</m:r>
</m:oMath>

```

end example]

[Example:

Given the following equations:

$$a + b - c = 2$$

$$x - y + z = 3$$

Their associated XML representation is as follows:

```

<m:oMathPara>
  <m:oMath>
    <m:r>
      <m:t>a+b</m:t>
    </m:r>
    <m:r>
      <m:rPr>
        <m:aln/>
      </m:rPr>
      <m:t>-c=2</m:t>
    </m:r>
    <m:r>
      <m:rPr>
        <m:sty m:val="p"/>
      </m:rPr>
      <w:br/>
    </m:r>
  </m:oMath>
  <m:oMath>
    <m:r>
      <m:t>x</m:t>
    </m:r>
    <m:r>
      <m:rPr>
        <m:aln/>
      </m:rPr>
      <m:t>-y+z=3</m:t>
    </m:r>
  </m:oMath>

```

</m:oMathPara>

The subtraction symbols in each of the above equations have been identified as alignment points, so the equations are aligned at their subtraction symbols (because they are in the same Math paragraph).

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_OnOff](#)) is located in §A.6.1. *end note]*

22.1.2.4 [alnScr \(Align Scripts\)](#)

This element specifies the alignment of scripts in the subscript/superscript function. When 1 or true, subscripts and superscripts are aligned to each other. When 0 or false, they are kerned to the shape of the base. If this element is omitted, scripts are not aligned. In other words, when the element is absent, the default is for the sub-superscript object to not align the superscript and subscript with each other.

When the element is present and the val attribute is absent, the default value of the val attribute is 1 meaning that this property is applied.

[Example: Example (OFF): f_2^3 ; Example (ON): f_2^3 .

The XML representation of the second example above is:

```
<m:sSubSup>
  <m:sSubSupPr>
    <m:alnScr m:val="1"/>
  </m:sSubSupPr>
<m:e>
  <m:r>
    <m:t>f</m:t>
  </m:r>
</m:e>
```

```
<m:sub>
  <m:r>
    <m:rPr>
      <m:scr m:val="roman"/>
      <m:sty m:val="p"/>
    </m:rPr>
    <m:t>2</m:t>
  </m:r>
</m:sub>
<m:sup>
  <m:r>
    <m:rPr>
      <m:scr m:val="roman"/>
      <m:sty m:val="p"/>
    </m:rPr>
    <m:t>3</m:t>
  </m:r>
</m:sup>
</m:sSubSup>
```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model (CT_OnOff) is located in §A.6.1. *end note*]

22.1.2.5 **argPr (Argument Properties)**

This element specifies any properties of the math argument. [*Example:* The XML below represents the argSz attribute on the base element e of a box:

```

<m:box>
  <m:boxPr>
    <m:noBreak m:val="0"/>
    <m:ctrlPr/>
  </m:boxPr>
  <m:e>
    <m:argPr>
      <m:argSz m:val="-1"/>
    </m:argPr>
    <m:r>
      <m:t>abc</m:t>
    </m:r>
  </m:e>
</m:box>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_OMathArgPr](#)) is located in §A.6.1.
end note]

22.1.2.6 [argSz \(Argument Size\)](#)

This element specifies the size, or script level, of an argument. If the element is omitted, the default argument size is 0.

Whether the element is absent or present without the `val` attribute, the default value of the `val` attribute is always 0. However, this property does not specify an absolute size, rather it's absolute to its starting size. Most arguments begin at the normal size which will be defined as 0 in the list below, but some begin, by default smaller or larger than the normal size. For instance, 1 represents that it is one size larger than normal, 2 represents that it is two sizes larger than normal, -1 represents that it is one size smaller than normal, and -2 represents that it is two sizes smaller than normal. The list below indicates the default starting sizes for each argument, if it is not in this list, then the size cannot be changed on that argument.

- box base: 0
- group-character base: 0
- lower limit limit: -1
- upper limit limit: -1
- n-ary operator subscript: -1
- n-ary operator superscript: -1
- radical degree: -2
- pre-sub-superscript subscript: -1
- pre-sub-superscript superscript: -1
- subscript subscript: -1
- sub-superscript subscript: -1

- sub-supersript superscript: -1
- superscript superscript: -1

[Example: The following example contains three runs: regular mathematical text, a box object with the base at script size (val=-1) and a box object with the base at script-script size (val=-2).

$abc^{abc^{abc}}$

The XML below shows argSz used in the middle box.

```
<m:box>
  <m:boxPr>
    <m:noBreak m:val="0"/>
  </m:boxPr>
  <m:e>
    <m:argPr>
      <m:argSz m:val="-1"/>
    </m:argPr>
    <m:r>
      <m:t>abc</m:t>
    </m:r>
  </m:e>
</m:box>
```

Because the size is set to -1 on the degree argument, the degree argument is 1 size smaller normal.

end example]

Attributes	Description								
val (Value)	<p>Specifies a value between -2 and 2 for the property defined by the parent XML element. The positive or negative sign specifies in which direction to change argument size; the absolute value specifies by how much.</p> <p>The table below represents two cases in which argument size can be changed: superscripts and boxes.</p> <p>In the superscript object a^{b^c}, by default the term c has script-script size. Should the user wish for the c to be shown at script size, val should be set to +1 (that is, one size larger). Should the user wish for c to be shown at text size, val should be set to +2 (that is, two sizes larger).</p> <table><tr><th>val of c in a^{b^c}</th><th>Display</th></tr><tr><td>Default</td><td>a^{b^c}</td></tr><tr><td>+1</td><td>a^{b^c}</td></tr><tr><td>+2</td><td>a^{b^C}</td></tr></table>	val of c in a^{b^c}	Display	Default	a^{b^c}	+1	a^{b^c}	+2	a^{b^C}
val of c in a^{b^c}	Display								
Default	a^{b^c}								
+1	a^{b^c}								
+2	a^{b^C}								

Attributes	Description	
	val of <i>abc</i>	Display
	Default	<i>abc</i>
	-1	<i>abc</i>
	-2	<i>abc</i>
	The possible values for this attribute are defined by the ST_Integer2 simple type (§22.1.3.5).	

[Note: The W3C XML Schema definition of this element’s content model ([CT_Integer2](#)) is located in §A.6.1. *end note*]

22.1.2.7 [bar \(Bar\)](#)

This element specifies the bar function, consisting of a base argument and an overbar or underbar, as in \overline{a} and \underline{a} .

[Example: The XML below demonstrates the overbar in use.

```
<m:bar>
  <m:barPr>
    <m:pos m:val="top"/>
  </m:barPr>
  <m:e>
    <m:r>
      <m:t>a</m:t>
    </m:r>
  </m:e>
</m:bar>
```

end example]

[Note: The W3C XML Schema definition of this element’s content model ([CT_Bar](#)) is located in §A.6.1. *end note*]

22.1.2.8 [barPr \(Bar Properties\)](#)

This element specifies properties of the bar function. If this element is omitted, the bar assumes its default location of top (the mathematical overbar). [Example:

\underline{x} (x with an underbar) is represented by the following XML representation:

```
<m:bar>
  <m:barPr>
    <m:pos m:val="bot"/>
```

```

</m:barPr>
<m:e>
  <m:r>
    <m:t>x</m:t>
  </m:r>
</m:e>
</m:bar>

```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_BarPr](#)) is located in §A.6.1. *end note*]

22.1.2.9 baseJc (Matrix Base Justification)

This element specifies the justification of the matrix. Text outside of the matrix can be aligned with the bottom, top, or center of a matrix object. If this element is omitted, the matrix assumes center justification. In other words, whether the element is absent or present without the `val` attribute, the default of the `val` attribute is center.

[Example: This matrix has center baseJc: $\begin{pmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{pmatrix}$]

This matrix has top baseJc: $\begin{pmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{pmatrix}$

This matrix has bottom baseJc: $\begin{pmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{pmatrix}$

The XML below represents the matrix with top baseJC:

```

<m:d>
  <m:dPr>
    <m:shp m:val="match"/>
  </m:dPr>
<m:e>
  <m:m>
    <m:mPr>
      <m:baseJc m:val="top"/>
      <m:mcs>
        <m:mc>
          <m:mcPr>

            <m:count m:val="2"/>

```



```

        <m:mcJc m:val="center"/>
      </m:mcPr>
    </m:mc>
  </m:mcs>
</m:mPr>
<m:mr>
  <m:e>
    <m:r>
      <m:rPr>
        <m:scr m:val="roman"/>
        <m:sty m:val="p"/>
      </m:rPr>
      <m:t>1</m:t>
    </m:r>
  </m:e>
  <m:e>
    <m:r>
      <m:rPr>
        <m:scr m:val="roman"/>
        <m:sty m:val="p"/>
      </m:rPr>
      <m:t>2</m:t>
    </m:r>
  </m:e>
</m:mr>
<m:mr>
  <m:e>
    <m:r>
      <m:rPr>
        <m:scr m:val="roman"/>
        <m:sty m:val="p"/>
      </m:rPr>
      <m:t>3</m:t>
    </m:r>
  </m:e>

```

```
<m:e>
  <m:r>
    <m:rPr>
      <m:scr m:val="roman"/>
      <m:sty m:val="p"/>
    </m:rPr>
    <m:t>4</m:t>
  </m:r>
</m:e>
</m:mr>
<m:mr>
  <m:e>
    <m:r>
      <m:rPr>
        <m:scr m:val="roman"/>
        <m:sty m:val="p"/>
      </m:rPr>
      <m:t>5</m:t>
    </m:r>
  </m:e>
  <m:e>
    <m:r>
      <m:rPr>
        <m:scr m:val="roman"/>
        <m:sty m:val="p"/>
      </m:rPr>
      <m:t>6</m:t>
    </m:r>
  </m:e>
</m:mr>
</m:m>
</m:e>
</m:d>
```

Because the matrix base justification is top, the top row of the matrix is lined up with the baseline of the rest of the line.

end example]

Attributes	Description
val (Value)	Specifies the vertical justification parent element respect to surrounding text. Possible values are top, bottom, and center. <i>[Example: The following examples illustrate base]c</i> on the matrix object m.

Attributes	Description
	<p>This matrix has center baseJc: $\begin{pmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{pmatrix}$</p> <p>This matrix has top baseJc: $\begin{pmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{pmatrix}$</p> <p>This matrix has bottom baseJc: $\begin{pmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{pmatrix}$</p> <p>The possible values for this attribute are defined by the ST_YAlign simple type (§22.9.2.20).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_YAlign](#)) is located in §A.6.1. *end note*]

22.1.2.10 [begChr \(Delimiter Beginning Character\)](#)

This element specifies the beginning, or opening, delimiter character. Mathematical delimiters are enclosing characters such as parentheses, brackets, and braces. If this element is omitted, the default begChr is '('. In other words, when the element is absent, the default is for the delimiter object beginning character to be Unicode character U+0028 (LEFT PARENTHESIS).

When the element is present and the val attribute is absent, the default of the val attribute is empty which means the delimiter object beginning character is absent.

[Example: In the following example, {a} uses { and } as its enclosing characters:

```
<m:dPr>
  <m:begChr m:val="{"/>
  <m:endChr m:val="}"/>
</m:dPr>
```

end example]

Attributes	Description
val (value)	<p>Specifies the character used by the parent element. When it is omitted, the parent uses its assigned default.</p> <p>[Example: Accent object ã:</p> <pre><m:accPr> <m:chr m:val="&#771;"/> </m:accPr></pre> <p><i>end example]</i></p>

Attributes	Description
	The possible values for this attribute are defined by the ST_Char simple type (§22.1.3.3).

[Note: The W3C XML Schema definition of this element’s content model ([CT_Char](#)) is located in §A.6.1. *end note*]

22.1.2.11 [borderBox \(Border-Box Object\)](#)

This element specifies the Border Box object, consisting of a border drawn around an instance of mathematical text (such as a formula or equation), as in $a^2 + b^2 = c^2$. If borderBoxPr is omitted then the default behavior of borderBox is a rectangular border (as shown in the “abc” example below).

[Example: The following example shows the XML representation of the following Border Box: abc]

```
<m:borderBox>
  <m:e>
    <m:r>
      <m:t>abc</m:t>
    </m:r>
  </m:e>
</m:borderBox>
```

end example]

[Note: The W3C XML Schema definition of this element’s content model ([CT_BorderBox](#)) is located in §A.6.1. *end note*]

22.1.2.12 [borderBoxPr \(Border-Box Properties\)](#)

This element specifies the properties of the Border Box object, which dictate the types of lines that can be drawn as part of the border. [Example: $a^2 + b^2 = c^2$ (Diagonal Strikethrough from Top Left) and $a^2 + b^2 = c^2$ (no left or right edges). *end example*]

[Example:

x (left and bottom edges) is represented by the following XML:

```
<m:borderBox>
  <m:borderBoxPr>
    <m:hideTop m:val="1"/>
    <m:hideRight m:val="1"/>
  </m:borderBoxPr>
  <m:e>
    <m:r>
      <m:t>x</m:t>
```

```

    </m:r>
  </m:e>
</m:borderBox>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_BorderBoxPr](#)) is located in §A.6.1. *end note]*

22.1.2.13 box (Box Object)

This element specifies the box object, which is used to group components of an equation or other instance of mathematical text. A boxed object can (for example) serve as an operator emulator with or without an alignment point, serve as a line break point, have associated *argSz*, or be grouped such as not to allow line breaks within. If *boxPr* is omitted, all properties will be “false” by default.

[*Example:* The mathematical text $a == b$ uses a box around the double equal sign.

Its XML representation is as follows:

```

<m:r>
  <m:t>a</m:t>
</m:r>
<m:box>
  <m:boxPr>
    <m:opEmu    m:val="1"/>
    <m:aln/>
  </m:boxPr>
  <m:e>
    <m:r>
      <m:t>==</m:t>
    </m:r>
  </m:e>
</m:box>
<m:r>
  <m:t>b</m:t>
</m:r>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Box](#)) is located in §A.6.1. *end note]*

22.1.2.14 boxPr (Box Properties)

This element specifies properties of the Box object, for example, whether the Box serves as operator emulator with or without an alignment point, serves as a line break point, or receives the correct spacing for the mathematical differential. [*Example:*

$a \times b$ is partly represented by the following XML:

```
<m:box>
  <m:boxPr>
    <m:opEmu m:val="1"/>
  </m:boxPr>
  <m:e>
    <m:r>
      <m:t>x</m:t>
    </m:r>
  </m:e>
</m:box>
```

The x is set to be an operator emulator so it is given operator spacing around it.

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_BoxPr](#)) is located in §A.6.1. *end note*]

22.1.2.15 brk (Break)

This element specifies whether there is a line break at the start of a run, or at the start of the Box object, such that the line wraps at the start of the run or box object. These user-defined line breaks occur when the XML tag `<m:brk/>` is encountered and does not follow a mathematical "order of precedence". If this element is omitted, a manual break is not inserted. In other words, when the element is absent, the default is for the parent structure to not manually break onto the next line. When the element is present and the `val` attribute is absent, the default of the `val` attribute is 0 meaning that this property's parent structure manually breaks onto the next line and is aligned with the beginning of the previous line.

The line may happen to wrap at this point if the mathematical text exceeds the column width. OMML does not specify behaviour for any kind of automatic line breaking. Instead it delegates this functionality to the underlying rendering engine similarly to how it does with the choice of operator spacing and the determination of whether an operator is unary or binary.

[*Example:* The following example includes a manual user-defined line break at the operator emulator:

$$a \\ == b$$

```
<m:r>
  <m:t>a</m:t>
</m:r>
```

```
<m:box>
  <m:boxPr>
    <m:opEmu      m:val="1"/>
    <m:brk/>
  </m:boxPr>
  <m:e>
    <m:r>
      <m:t>==</m:t>
    </m:r>
  </m:e>
</m:box>
<m:r>
  <m:t>b</m:t>
</m:r>
```

There is a break on the == symbol so a manual line break occurs right before the == symbol.

end example]

Attributes	Description
alnAt (Index of Operator to Align To)	<p>Specifies the index of the operator on the previous line of mathematical text which shall be used as the alignment point for the current line of mathematical text . A line can be aligned to any operator on the previous line; this attribute specifies exactly which operator shall be the target of that alignment in cases where there are multiple operators. If alnAt is omitted, then all runs (r tag) that follow a brk tag will align with the left margin of the first run of mathematical text.</p> <p>[<i>Example:</i> For example, consider the break in this instance of mathematical text:</p> <div>$\begin{array}{r} a + b + c + d + e \\ + f + g \end{array}$</div> <p>The second line could theoretically be aligned to any of the four operators in the previous line.</p> <p>Specifying an alnAt value of 3 for the second line resolves this ambiguity; the second line is aligned to the third operator in the previous line. <i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Integer255 simple type (§22.1.3.6).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_ManualBreak](#)) is located in §A.6.1. *end note]*

22.1.2.16 brkBin (Break on Binary Operators)

This element specifies how binary operators are treated when they coincide with a line break. If this element is omitted, the line break occurs before the binary operator. That is, the binary operator is the first element on the wrapped line.

Whether the element is absent or present without the val attribute, the default of the val attribute is before.

[Example: For example:

$$f(x) = a_{11} + a_{12} + \cdots + a_{nn}$$

before

$$f(x) = a_{11} + a_{12} + \cdots + a_{nn}$$

after

$$f(x) = a_{11} + a_{12} + \cdots + a_{nn}$$

repeat

The above examples demonstrate how such an equation would look depending on the value of the brkBin document-property. These actual examples do not rely on the brkBin property of this document to maintain their configurations. This would be impossible because the brkBin property can only be set to one value for an entire document at any given time. Here we are demonstrating all three.

The XML below demonstrates brkBin in use under mathPr:

```
<m:mathPr>
  <m:mathFont m:val="Cambria Math"/>
  <m:brkBin m:val="before"/>
  <m:brkBinSub m:val="--"/>
  <m:smallFrac m:val="0"/>
  <m:dispDef/>
  <m:lMargin m:val="0"/>
  <m:rMargin m:val="0"/>
  <m:defJc m:val="centerGroup"/>
  <m:wrapIndent m:val="1440"/>
  <m:intLim m:val="subSup"/>
  <m:naryLim m:val="undOvr"/>
</m:mathPr>
```

end example]

Attributes	Description
val (Value)	Specifies where to break on binary operators. Possible values are before, after, and repeat. The possible values for this attribute are defined by the ST_BreakBin simple type (§22.1.3.1).

[Note: The W3C XML Schema definition of this element’s content model ([CT_BreakBin](#)) is located in §A.6.1. *end note*]

22.1.2.17 **brkBinSub (Break on Binary Subtraction)**

This element specifies how the subtraction operator is treated when it coincides with a line break, when brkBin is set to repeat. If this element is omitted, the subtraction operator is repeated before and after the break.

Whether the element is absent or present without the val attribute, the default of the val attribute is --.

[Example: The XML below demonstrates brkBinSub in use under mathPr:

```
<m:mathPr>
  <m:mathFont m:val="Cambria Math"/>
  <m:brkBin m:val="before"/>
  <m:brkBinSub m:val="--"/>
  <m:smallFrac m:val="0"/>
  <m:dispDef/>
  <m:lMargin m:val="0"/>
  <m:rMargin m:val="0"/>
  <m:defJc m:val="centerGroup"/>
  <m:wrapIndent m:val="1440"/>
  <m:intLim m:val="subSup"/>
  <m:naryLim m:val="undOvr"/>
</m:mathPr>
```

end example]

[Example:

Given the following XML representation using brkBinSub:

```
<m:brkBinSub m:val="-+"/>
```

Because the document option for break on binary subtraction is set to +-, any breaks in Math paragraphs on subtraction operators will display a – on the line before the break and a + on the line after the break.

end example]

Attributes	Description
val (Value)	<p>Specifies how the subtraction operator is treated when it coincides with a line break, when brkBin is set to repeat. Possible values are --, +-, and +-.</p> <p>The possible values for this attribute are defined by the ST_BreakBinSub simple type (§22.1.3.2).</p>

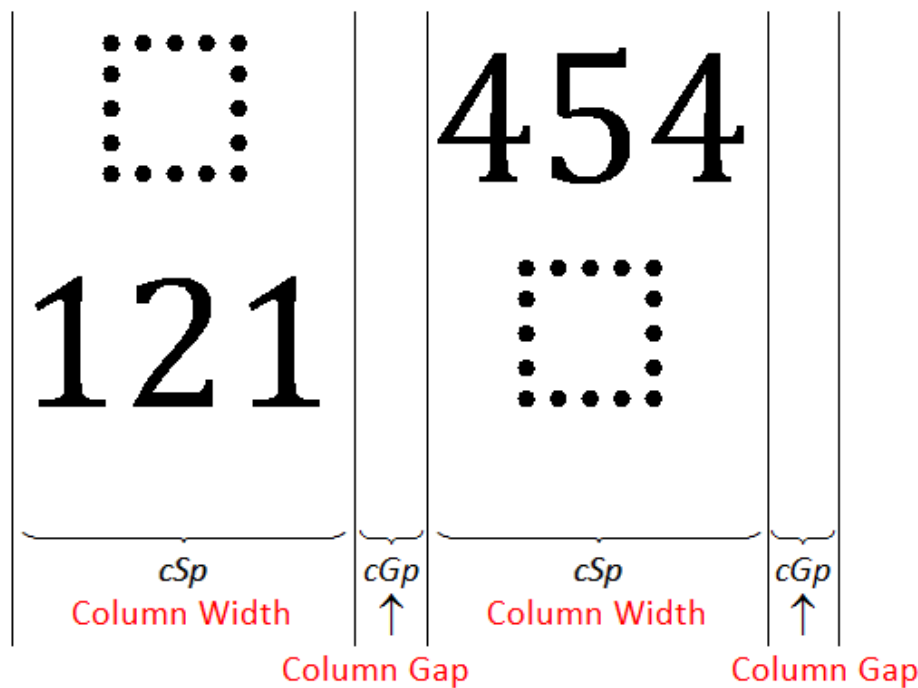
[Note: The W3C XML Schema definition of this element’s content model ([CT_BreakBinSub](#)) is located in §A.6.1.
end note]

22.1.2.18 cGp (Matrix Column Gap)

This element represents the (custom) column gap spacing information; the default value is 0 (which corresponds to 1 em). This value is interpreted differently depending on the value of cGpRule (§22.1.2.19). cGp is not used unless the value of cGpRule is 3 or 4. When cGpRule is omitted, the default spacing between matrix columns is 1 em (a val attribute value of 0).

Whether the element is absent or present without the val attribute, the default of the val attribute is 0.

The cGp gap spacing (also referred to as “Column Gap” or “Gap Width”) is added to the cSp (Minimum Matrix Column Width) to determine the total Matrix Column Spacing (distance between the same edges of different columns). The following image depicts how cGp and cSp work together to define matrix column spacing in a 2x2 matrix:



[Example: With a cGpRule value of 4, the matrix: $\frac{1}{3}$ $\frac{2}{4}$ has 3 ems of spacing between columns (3 ems = 6 * 0.5 ems). The matrix properties that demonstrate this element in use are:

```
<m:mPr>
  <m:cGpRule m:val="4"/>
  <m:cGp m:val="6"/>
  <m:mCS>
    <m:mc>
      <m:mcPr>
        <m:count m:val="2"/>
        <m:mcJc m:val="center"/>

      </m:mcPr>
    </m:mc>
  </m:mCS>
</m:mPr>
```

end example]

See the documentation for cGpRule for more information about how cGp is interpreted for each value of cGpRule.

Attributes	Description
val (Value)	<p>Specifies the amount of space between columns of the parent element (for cGp/cSp) or rows (for rSp). The manner in which this value is determined depends on the setting of the rule of the parent element.</p> <p>For cGp, if the rule is set to 3 (or "Exactly"), then the unit is interpreted as twips. If the rule is set to 4 (or "Multiple"), then the unit is interpreted as number of 0.5 em increments.</p> <p>For cSp, this value is measured in twips. There is no corresponding cSpRule.</p> <p>For rSp, if the rule is set to 3 (or "Exactly"), then the unit is interpreted as points. If the rule is set to 4 (or "Multiple"), then the unit is interpreted as half-lines.</p> <p>The possible values for this attribute are defined by the ST_UnSignedInteger simple type (§22.1.3.14).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_UnSignedInteger](#)) is located in §A.6.1. *end note*]

22.1.2.19 cGpRule (Matrix Column Gap Rule)

This element specifies the type of gap (horizontal spacing) between columns of a matrix; the default is 0. Horizontal spacing units can be ems or points (stored as twips).

Whether the element is absent or present without the val attribute, the default of the val attribute is 0 (or single spacing gap).

[Example: The following matrix has double spacing (2 ems) between columns:

12

34

The XML that represents this property in use is:

```
<m:mPr>
  <m:cGpRule m:val="2"/>
  <m:mCS>
    <m:mc>
      <m:mcPr>
        <m:count m:val="2"/>
        <m:mcJc m:val="center"/>

      </m:mcPr>
    </m:mc>
  </m:mCS>
</m:mPr>
```

end example]

Attributes	Description		
val (Value)	Specifies the type of spacing between rows and/or columns. Possible values are 0, 1, 2, 3, or 4, whose definitions are contained in the following table:		
	Value	Column/Row Gap	Example
	0	Single spacing gap (1 em)	1 2
	1	1.5 spacing gap (1.5 ems)	1 2
	2	2 spacing gap (2 ems)	1 2
	3	Exactly (for columns, rely on value of cGp, measured in twips) (for rows, rely on value of rSp, measured in points)	1 2
	4	Multiple (for columns, rely on value of cGp, measured in 0.5 em increments) (for rows, rely on value of rSp, measured in lines)	1 2

Attributes	Description
	The possible values for this attribute are defined by the ST_SpacingRule simple type (§22.1.3.11).

[Note: The W3C XML Schema definition of this element’s content model ([CT_SpacingRule](#)) is located in §A.6.1.
end note]

22.1.2.20 chr (Character)

This element specifies the character to be attached to the base of an accent object, a group character object, or an n-ary operator object. When the parent element is accPr, the chr value should be within the range of (U+0300–U+036F) or (U+20D0–U+20EF). When the parent element is groupChrPr, the chr value should be a horizontal stretch character, such as U+2190 (LEFTWARD ARROW). When the parent element is naryPr, the chr value should be an n-ary operator such as U+222B (INTEGRAL).

When the element is present and the val attribute is absent, the default of the val attribute is empty which means the corresponding objects character is absent.

If this property is omitted for accPr, the default accent character is U+0302 (ACCENT, COMBINING CIRCUMFLEX). If this property is omitted for groupChrPr, the default character is U+23DF (BOTTOM CURLY BRACKET). If this property is omitted for naryPr, the default character is U+222B (INTEGRAL).

In other words, when the element is absent, the defaults are as follows:

- accent object – Unicode character U+0302 (ACCENT, COMBINING CIRCUMFLEX)
- group-character object – Unicode character U+23DF (BOTTOM CURLY BRACKET)
- n-ary operator object – Unicode character U+222B (INTEGRAL)

[Example: Examples of accent characters are the dot, hat, and arrow in the following cases: *á â ã*.

For example, the following XML represents the acc *ã*.

```
<m:acc>
  <m:accPr>
    <m:chr m:val="#771;" />
  </m:accPr>
<m:e>
  <m:r>
    <m:t>a</m:t>
  </m:r>
</m:e>
</m:acc>
```

end example]

Attributes	Description
val (value)	<p>Specifies the character used by the parent element. When it is omitted, the parent uses its assigned default.</p> <p>[Example: Accent object ã:</p> <pre><m:accPr> <m:chr m:val="#771;" /> </m:accPr></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the ST_Char simple type (§22.1.3.3).</p>

[Note: The W3C XML Schema definition of this element’s content model (CT_Char) is located in §A.6.1. end note]

22.1.2.21 count (Matrix Column Count)

This element specifies the number of columns to which a property applies.

Whether the element is absent or present without the val attribute, the default of the val attribute is 1.

[Example: The example below specifies that two of the columns in the matrix described by the XML have the center property.

```
<m:mPr>
  <m:cSp m:val="120"/>
  <m:mCS>
    <m:mc>
      <m:mcPr>
        <m:count m:val="2"/>
        <m:mcJc m:val="center"/>

      </m:mcPr>
    </m:mc>
  </m:mCS>
</m:mPr>
```

end example]

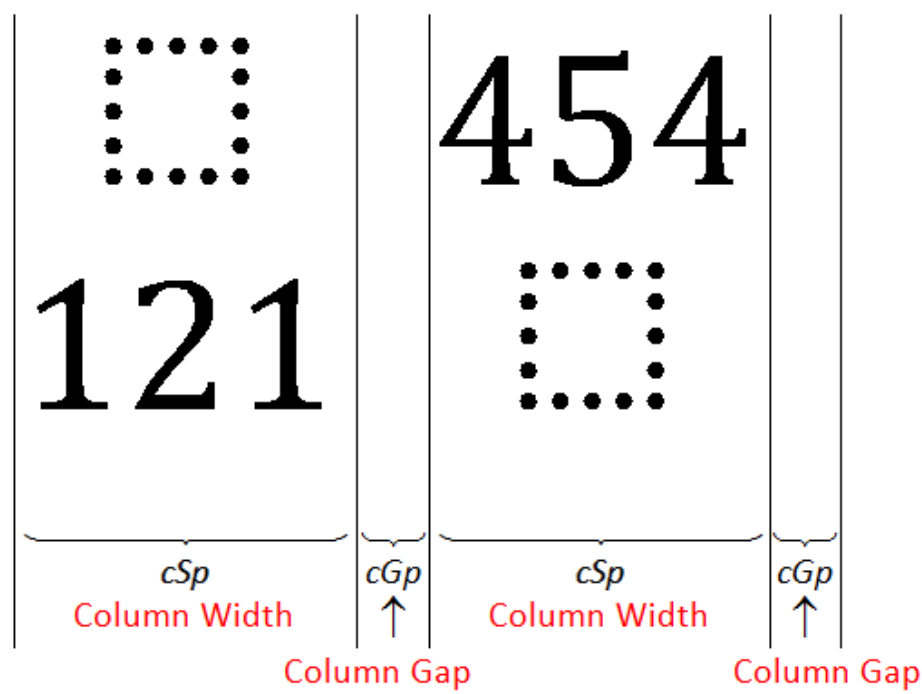
Attributes	Description
val (Value)	<p>Specifies the number of columns to which a column property applies.</p> <p>[Example: A count attribute value of 3 specifies that the property applies to the next three columns of the matrix. end example]</p>

Attributes	Description
	The possible values for this attribute are defined by the ST_Integer255 simple type (§22.1.3.6).

[Note: The W3C XML Schema definition of this element’s content model ([CT_Integer255](#)) is located in §A.6.1. end note]

22.1.2.22 cSp (Minimum Matrix Column Width)

This element specifies the minimum column width of a matrix. The actual column width of a matrix will be the greater of either the width of the column’s widest argument or cSp. This additional spacing can be added to enhance appearance. If this element is omitted, the default minimum column width is 0. Whether the element is absent or present without the val attribute, the default of the val attribute is 0. The cGp gap spacing (also referred to as “Column Gap” or “Gap Width”) is added to the cSp (Minimum Matrix Column Width) to determine the total Matrix Column Spacing (distance between the same edges of different columns). The value of cSp is interpreted as twips (a twip is 1/20th of a point). Therefore, a spacing of 1 point will be set by a cSp value of 20. This is the only use for cSp. There is no corresponding cSpRule. The following image depicts how cGp and cSp work together to define matrix column spacing in a 2x2 matrix:



[Example: The following XML specifies that there should never be fewer than 6 pts (120 twips) between adjacent column edges of the matrix:

1 2
3 4

```
<m:mPr>
  <m:cSp m:val="120"/>
  <m:mCS>
    <m:mc>
      <m:mcPr>
        <m:count m:val="2"/>
        <m:mcJc m:val="center"/>

      </m:mcPr>
    </m:mc>
  </m:mCS>
</m:mPr>
```

end example]

Attributes	Description
val (Value)	<p>Specifies the amount of space between columns of the parent element (for cGp/cSp) or rows (for rSp). The manner in which this value is determined depends on the setting of the rule of the parent element.</p> <p>For cGp, if the rule is set to 3 (or "Exactly"), then the unit is interpreted as twips. If the rule is set to 4 (or "Multiple"), then the unit is interpreted as number of 0.5 em increments.</p> <p>For cSp, this value is measured in twips. There is no corresponding cSpRule.</p> <p>For rSp, if the rule is set to 3 (or "Exactly"), then the unit is interpreted as points. If the rule is set to 4 (or "Multiple"), then the unit is interpreted as half-lines.</p> <p>The possible values for this attribute are defined by the ST_UnSignedInteger simple type (§22.1.3.14).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_UnSignedInteger](#)) is located in §A.6.1. end note]

22.1.2.23 ctrlPr (Control Properties)

This element specifies properties on control characters; that is, object characters that cannot be selected. Examples of control characters are n-ary operators (excluding their limits and bases), fraction bars (excluding the numerator and denominator), and grouping characters (excluding the base). ctrlPr allows formatting properties to be stored on these control characters. The control character inherits its formatting from the paragraph

formatting; `ctrlPr` contains the formatting differences between the control character and the paragraph formatting.

If this element is omitted, the character properties of the first control character are the same as the first character in the math object.

[*Example:* The example below shows that the control character is of font Cambria Math. All other formatting, such as text size and color, are the same as the paragraph.

```
<m:ctrlPr>
  <w:rPr>
    <w:rFonts w:ascii="Cambria Math" w:hAnsi="Cambria Math"/>
  </w:rPr>
</m:ctrlPr>
```

end example]

`CtrlPr` is also used to save properties on characters used in the built-down form of an instance of mathematical text that are not displayed in Professional form. For example, the mathematical text (in linear form) \int_0^1 might have color on the `_` or `^`. Though these characters are not displayed in Professional form, their formatting is stored such that their formatting will roundtrip through build up and build down.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_CtrlPr](#)) is located in §A.6.1. *end note]*

22.1.2.24 d (Delimiter Object)

This element specifies the delimiter object, consisting of opening and closing delimiters (such as parentheses, braces, brackets, and vertical bars), and an element contained inside. The delimiter may have more than one element, with a designated separator character between each element. [*Example:*

Delimiter with one base: (x^2)

Delimiter with more than one base and separators, whose XML is shown below: $(x^2|y^2)$

```
<m:d>
  <m:e>
    <m:sSup>
      <m:e>
        <m:r>
          <m:t>x</m:t>
        </m:r>
      </m:e>
    </m:sSup>
  </m:e>
</m:d>
```

```

    <m:sup>
      <m:r>
        <m:rPr>
          <m:scr m:val="roman"/>
          <m:sty m:val="p"/>
        </m:rPr>
        <m:t>2</m:t>
      </m:r>
    </m:sup>
  </m:sSup>
</m:e>
<m:e>
  <m:sSup>
    <m:e>
      <m:r>
        <m:t>y</m:t>
      </m:r>
    </m:e>
    <m:sup>
      <m:r>
        <m:rPr>
          <m:scr m:val="roman"/>
          <m:sty m:val="p"/>
        </m:rPr>
        <m:t>2</m:t>
      </m:r>
    </m:sup>
  </m:sSup>
</m:e>
</m:d>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_D](#)) is located in §A.6.1. *end note*]

22.1.2.25 [defjc](#) (Default Justification)

This element specifies the default justification of display math, at the document level. Individual instances of mathematical text can overrule the default setting. If this element is omitted, the default justification is centerGroup. Whether the element is absent or present without the val attribute, the default of the val attribute is centerGroup.

Display math can be left justified, right justified, centered, or centered as a group. When display math is centered as a group, the mathematical text is left aligned within a block, and the entire block is centered with respect to column margins. If this element is omitted, the mathematical text is centered as a group.

[Example: The XML below demonstrates defJc in use:

```
<m:mathPr>
  <m:mathFont m:val="Cambria Math"/>
  <m:brkBin m:val="before"/>
  <m:brkBinSub m:val="--"/>
  <m:smallFrac m:val="0"/>
  <m:dispDef/>
  <m:lMargin m:val="0"/>
  <m:rMargin m:val="0"/>
  <m:defJc m:val="centerGroup"/>
  <m:wrapIndent m:val="1440"/>
  <m:intLim m:val="subSup"/>
  <m:naryLim m:val="undOvr"/>
</m:mathPr>
```

end example]

Attributes	Description
val (Value)	Specifies the default justification of mathematical text in the document. Possible values are center, centerGroup, left, and right. The possible values for this attribute are defined by the ST_Jc simple type (§22.1.3.7).

[Note: The W3C XML Schema definition of this element’s content model ([CT_OMathJc](#)) is located in §A.6.1. end note]

22.1.2.26 deg (Degree)

This element specifies the degree in the mathematical radical. This element is optional. When omitted, the square root function, as in \sqrt{x} , is assumed. [Example:

The 3 in $\sqrt[3]{x}$ is represented by the XML below:

```
<m:rad>
  <m:deg>
    <m:r>
      <m:rPr>
        <m:scr m:val="roman"/>
        <m:sty m:val="p"/>
      </m:rPr>
      <m:t>3</m:t>
    </m:r>
  </m:deg>
```

```
<m:e>
  <m:r>
    <m:t>x</m:t>
  </m:r>
</m:e>
</m:rad>
```

end example]

[Note: The W3C XML Schema definition of this element’s content model ([CT_OMathArg](#)) is located in §A.6.1. *end note*]

22.1.2.27 `degHide` (Hide Degree)

This element specifies the per-object option to hide the degree of a radical. Every `rad` has a `deg`, but the `deg` can appear or not appear. When `degHide` is set to 1 or `true`, the degree is not shown, as in \sqrt{x} (XML shown below). When `degHide` is omitted, the default is 0 or `false`; that is, the degree is not hidden. In other words, when the element is absent, the default value of the property is 0 meaning that this property is not applied.

When the element is present and the `val` attribute is absent, the default of the `val` attribute is 1 meaning that this property is applied.

[Example:

```
<m:rad>
  <m:radPr>
    <m:degHide m:val="1"/>
  </m:radPr>
  <m:deg>
  </m:deg>
  <m:e>
    <m:r>
      <m:t>x</m:t>
    </m:r>
  </m:e>
</m:rad>
```

end example]

Attributes	Description
val (value)	Specifies a binary value for the property defined by the parent XML element. A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present. A value of 0 or false specifies that the property shall be explicitly turned off. This is

Attributes	Description
	<p>implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_OnOff](#)) is located in §A.6.1. *end note*]

22.1.2.28 `den` (Denominator)

This element specifies the denominator of a fraction. [Example: For example, the b in a/b :

```
<m:f>
  <m:fPr>
    <m:type m:val="skw"/>
  </m:fPr>
  <m:num>
    <m:r>
      <m:t>a</m:t>
    </m:r>
  </m:num>
  <m:den>
    <m:r>
      <m:t>b</m:t>
    </m:r>
  </m:den>
</m:f>
```

end example

[Note: The W3C XML Schema definition of this element's content model ([CT_OMathArg](#)) is located in §A.6.1. *end note*]

22.1.2.29 `diff` (Differential)

The element specifies the differential property on box. When 1 or true, the box acts as a differential (e.g., dx in an integrand), and receives the appropriate horizontal spacing for the mathematical differential. When this property is omitted, the box is not treated as a differential.

When the element is absent, the default value of the property is 0 meaning that this property is not applied.

When the element is present and the val attribute is absent, the default of the val attribute is 1 meaning that this property is applied.

[Example: The following example demonstrates a box set as differential in use, both in its proper form and in XML:

$$\int_0^1 x \, dx$$

```

<m:nary>
  <m:naryPr>
    <m:chr m:val="#8747;" />
  </m:naryPr>
  <m:sub>
    <m:r>
      <m:rPr>
        <m:scr m:val="roman" />
        <m:sty m:val="p" />
      </m:rPr>
      <m:t>0</m:t>
    </m:r>
  </m:sub>
  <m:sup>
    <m:r>
      <m:rPr>
        <m:scr m:val="roman" />
        <m:sty m:val="p" />
      </m:rPr>
      <m:t>1</m:t>
    </m:r>
  </m:sup>
<m:e>
  <m:r>
    <m:t>x</m:t>
  </m:r>
  <m:box>
    <m:boxPr>
      <m:diff m:val="1" />
    </m:boxPr>
    <m:e>
      <m:r>
        <m:t>dx</m:t>
      </m:r>
    </m:e>
  </m:box>
</m:e>
</m:nary>

```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model (CT_OnOff) is located in §A.6.1. *end note*]

22.1.2.30 dispDef (Use Display Math Defaults)

This element specifies the document-level property to overwrite paragraph settings for mathematical text. When omitted, this element is set to 1 or true and special math settings are applied. Whether the element is absent or present without the val attribute, the default of the val attribute is 1 meaning that this option is applied.

[Example: The XML below demonstrates dispDef in use:

```
<m:mathPr>
  <m:mathFont m:val="Cambria Math"/>
  <m:brkBin m:val="before"/>
  <m:brkBinSub m:val="--"/>
  <m:smallFrac m:val="0"/>
  <m:dispDef/>
  <m:lMargin m:val="0"/>
  <m:rMargin m:val="0"/>
  <m:defJc m:val="centerGroup"/>
  <m:wrapIndent m:val="1440"/>
  <m:intLim m:val="subSup"/>
  <m:naryLim m:val="undOvr"/>
</m:mathPr>
```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p>

Attributes	Description
	A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present. The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).

[Note: The W3C XML Schema definition of this element’s content model (CT_OnOff) is located in §A.6.1. *end note*]

22.1.2.31 dPr (Delimiter Properties)

This element specifies the properties of d, including the enclosing and separating characters, and the properties that affect the shape of the delimiters. [Example:

[*a + b*] is represented by the following XML:

```
<m:d>
  <m:dPr>
    <m:begChr m:val="["/>
    <m:endChr m:val="]"/>
  </m:dPr>
  <m:e>
    <m:r>
      <m:t>a+b</m:t>
    </m:r>
  </m:e>
</m:d>
```

end example]

[Note: The W3C XML Schema definition of this element’s content model (CT_DPr) is located in §A.6.1. *end note*]

22.1.2.32 e (Element (Argument))

This tag, which is an abbreviation for “element”, serves several functions (18 total) including that of the base argument of a mathematical object or function, the elements in an array, and the elements in boxes. If all subelements are omitted, this element specifies the presence of an empty argument. [Example: The numerator of this function is an empty argument: $\frac{1}{2}$. *end example*] [Note: The tag was shortened to e to improve readability over “element”. “Element” was preferred over “Base” because “Element” sounded more neutral and appropriate to its multiple uses. *end note*]

The following table shows the 18 different uses for e:

Parent Element	Use
acc	Accent base argument

Parent Element	Use
bar	Argument to which the bar is applied
borderBox	Argument around which the border box is drawn
box	Argument inside the abstract box
d	Argument inside the delimiters
eqArr	Each instance of mathematical text in the single-column array
func	Math argument list of the function
groupChr	Group character base
limLow	Base of the lower limit
limUpp	Base of the upper limit
mr	Each element in the matrix row
nary	n-ary and, e.g., integrand for an integral, summand for a summation
phant	Argument for the phantom
rad	Radicand
sPre	Base of the prescript object
sSub	Base of the subscript object
sSubSup	Base of the subsup object
sSup	Base of the superscript object

[Example: For example, the func $\sin x$ has fName \sin and e x :

```

<m:func>
  <m:fName>
    <m:r>
      <m:t>sin</m:t>
    </m:r>
  </m:fName>
  <m:e>
    <m:r>
      <m:t>x</m:t>
    </m:r>
  </m:e>
</m:func>

```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_OMathArg](#)) is located in §A.6.1. *end note]*

22.1.2.33 **endChr (Delimiter Ending Character)**

This element specifies the ending, or closing, delimiter character. Mathematical delimiters are enclosing characters such as parentheses, brackets, and braces. If this element is omitted, the default endChr is ')'. In other words, when the element is absent, the default is for the delimiter object beginning character to be Unicode character U+0029 (RIGHT PARENTHESIS).

When the element is present and the val attribute is absent, the default of the val attribute is empty which means the delimiter object beginning character is absent.

[*Example:* In the following example, {*a*} uses { and } as its enclosing characters:

```
<m:dPr>
  <m:begChr m:val="{"/>
  <m:endChr m:val="}"/>
</m:dPr>
```

end example]

Attributes	Description
val (value)	<p>Specifies the character used by the parent element. When it is omitted, the parent uses its assigned default.</p> <p>[<i>Example:</i> Accent object ã:</p> <pre><m:accPr> <m:chr m:val="&#771;"/> </m:accPr></pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Char simple type (§22.1.3.3).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Char](#)) is located in §A.6.1. *end note]*

22.1.2.34 **eqArr (Array Object)**

This element specifies the Array object (sometimes referred to as "Equation Array", despite its ability to hold mathematical text other than equations), an object consisting of one or more equations, expressions, or other mathematical text runs that can be vertically justified as a unit with respect to surrounding text on the line. Alignment of multiple points within each run of mathematical text can occur within the array through the use of align values and spacer values. An *align value* is an ampersand within the array which acts as an alignment point (as described in §22.1.2.3). A *spacer value* is an ampersand (represented by "&" in the example below) within the array which designates where space can be added in order to align the align values on different rows of the array. Within each argument in the array, every odd ampersand is an align value and every even

ampersand is a spacer value (as well, the beginning of each argument provides an implied spacer value). If eqArrPr is omitted then the default values for its properties will be used. These defaults are:

Property	Default Value
baseJc	"center"
ctrlPr	<The character property of the first control character will be the character property of the first character in the eqArr object >
maxDist	"0"
objDist	"0"
rSp	"0"
rSpRule	"0" <single>

[Example:

A simple array, $a = b + c$,
 $d + e = f$, is represented as follows:

```
<m:eqArr>
  <m:e>
    <m:r>
      <m:t>a=b+c</m:t>
    </m:r>
  </m:e>
  <m:e>
    <m:r>
      <m:t>d+e=f</m:t>
    </m:r>
  </m:e>
</m:eqArr>
```

A more complex array with alignment points, e.g.:

$$\begin{array}{rcl} x - y + z & = & 10 \\ 3x + y + 2z & = & 34 \\ -5x + 2y - z & = & -14 \end{array}$$

is represented as follows:

```
<m:eqArr>
  <m:e>
    <m:r>
      <m:t>& x+& & y+& & z+& & = & & 10</m:t>
    </m:r>
  </m:e>
```

```

<m:e>
  <m:r>
    <m:t>3&#x20;+&#x20;&#x20;y&#x20;2&#x20;z&#x20;&#x20;= &#x20;&#x20;34</m:t>
  </m:r>
</m:e>
<m:e>
  <m:r>
    <m:t>-5&#x20;+&#x20;2&#x20;y&#x20;-&#x20;&#x20;z&#x20;&#x20;= &#x20;&#x20;-
14</m:t>
  </m:r>
</m:e>
</m:eqArr>

```

Notice that the variables, operators, and digits of the sums line up properly, as the align values line up between each argument by adding space at the position of each spacer value.

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_EqArr](#)) is located in §A.6.1. *end note]*

22.1.2.35 eqArrPr (Array Properties)

This element specifies the properties of the array object, including the vertical justification of the object and layout inside the object. [*Example:*

$$\begin{array}{rcl}
 111a & = & c \\
 111a + 111b & = & 111c \\
 & b = & 111c
 \end{array}$$

```

<m:eqArr>
  <m:eqArrPr>
    <m:baseJc m:val="bottom"/>
  </m:eqArrPr>
  <m:e>
    <m:r>
      <m:t>111&#x20;a&#x20;&#x20;&#x20;&#x20;&#x20;&#x20;= &#x20;&#x20;c</m:t>
    </m:r>
  </m:e>
  <m:e>
    <m:r>
      <m:t>111&#x20;a&#x20;&#x20;+&#x20;111&#x20;b&#x20;&#x20;= &#x20;111&#x20;c</m:t>
    </m:r>
  </m:e>
  <m:e>
    <m:r>

```

```

      <m:t>&amp;&amp;&amp;&amp;&amp;b&amp;&amp;=&amp;111&amp;c</m:t>
    </m:r>
  </m:e>
</m:eqArr>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_EqArrPr](#)) is located in §A.6.1. *end note]*

22.1.2.36 [f](#) (Fraction Object)

This element specifies the fraction object, consisting of a numerator and denominator separated by a fraction bar. The fraction bar can be horizontal or diagonal, depending on the fraction properties. The fraction object is also used to represent the stack function, which places one element above another, with no fraction bar.

[*Example:* Examples of fractions are:

Bar Fraction: $\frac{a}{b}$

Skewed Fraction: $\frac{a}{b}$

Linear Fraction: a/b

No-Bar Fraction (Stack): $\frac{n}{k}$

The fraction $\frac{a}{b}$ is represented as:

```

<m:f>
  <m:fPr>
    <m:type m:val="skw"/>
  </m:fPr>
  <m:num>
    <m:r>
      <m:t>a</m:t>
    </m:r>
  </m:num>
  <m:den>
    <m:r>
      <m:t>b</m:t>
    </m:r>
  </m:den>
</m:f>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_F](#)) is located in §A.6.1. *end note]*

22.1.2.37 fName (Function Name)

This element specifies the name of the function in the Function-Apply object func. For example, function names are sin and cos.

[*Example:* As an example, the func sin x has fName sin and e x :

```
<m:func>
  <m:fName>
    <m:r>
      <m:t>sin</m:t>
    </m:r>
  </m:fName>
  <m:e>
    <m:r>
      <m:t>x</m:t>
    </m:r>
  </m:e>
</m:func>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_OMathArg](#)) is located in §A.6.1. *end note]*

22.1.2.38 fPr (Fraction Properties)

This element specifies the properties of the fraction object f. Properties of the Fraction object include the type or style of the fraction. The fraction bar can be horizontal or diagonal, depending on the fraction properties. The fraction object is also used to represent the stack function, which places one element above another, with no fraction bar. [*Example:* Examples of fractions are:

Bar Fraction: $\frac{a}{b}$

Skewed Fraction: $\frac{a}{b}$

Linear Fraction: a/b

No-Bar Fraction (Stack): $\frac{n}{k}$

The linear fraction c/d is represented by the following XML:

```
<m:f>
  <m:fPr>
    <m:type m:val="lin"/>
  </m:fPr>
  <m:num>
    <m:r>
```

```

        <m:t>c</m:t>
    </m:r>
</m:num>
<m:den>
    <m:r>
        <m:t>d</m:t>
    </m:r>
</m:den>
</m:f>

```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_FPr](#)) is located in §A.6.1. *end note*]

22.1.2.39 [func](#) (Function Apply Object)

This element specifies the Function-Apply object, which consists of a function name and an argument element (e) acted upon. It is often applied using a form of linear format. For example, in the linear format described in Unicode Technical Article #28, this object is applied by using the Function Application character (U+2061).

[Example: Examples of Function-Apply objects include: $\sin x$, $\tan^{-1} x^2$, and $\max_{0 \leq x \leq 1} x e^{-x^2}$.

As an example, the func $\sin x$ has fName sin and e x:

```

<m:func>
  <m:fName>
    <m:r>
      <m:t>sin</m:t>
    </m:r>
  </m:fName>
  <m:e>
    <m:r>
      <m:t>x</m:t>
    </m:r>
  </m:e>
</m:func>

```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_Func](#)) is located in §A.6.1. *end note*]

22.1.2.40 [funcPr](#) (Function Properties)

This element specifies properties such as ctrlPr that can be stored on the function apply object func. [Example:

$\tan x$ is represented by the following XML:

```

<m:func>
  <m:funcPr/>

```

```

<m:fName>
  <m:r>
    <m:rPr>
      <m:sty m:val="p"/>
    </m:rPr>
    <m:t>tan</m:t>
  </m:r>
</m:fName>
<m:e>
  <m:r>
    <m:t>x</m:t>
  </m:r>
</m:e>
</m:func>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_FuncPr](#)) is located in §A.6.1. *end note*]

22.1.2.41 [groupChr](#) (Group-Character Object)

This element specifies the Group-Character object, consisting of a character drawn above or below text, often with the purpose of visually grouping items. [*Example:* The following example demonstrates the `groupChr` in use, both in its proper form and in XML:



 $x+x+\cdots$

```

<m:groupChr>
  <m:groupChrPr>
    <m:chr m:val="&#9182;"/>
    <m:pos m:val="top"/>
  </m:groupChrPr>
<m:e>
  <m:r>
    <m:t>x+x+&#22EF;</m:t>
  </m:r>
</m:e>
</m:groupChr>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_GroupChr](#)) is located in §A.6.1. *end note*]

22.1.2.42 `groupChrPr` (Group-Character Properties)

This element specifies the properties of the Group-Character object `groupChr`. These properties can be used to specify the character placed above or below the argument, and the position of the character. When omitted, character `⏟` (U+23DF, BOTTOM CURLY BRACKET) is used as the `chr` and its `pos` is set to `bot`.

[Example:

$\overbrace{x+y}$ is represented by the following XML:

```
<m:groupChr>
  <m:groupChrPr>
    <m:chr m:val="⏟"/>
    <m:pos m:val="top"/>
    <m:vertJc m:val="bot"/>
  </m:groupChrPr>
  <m:e>
    <m:r>
      <m:t>x+y</m:t>
    </m:r>
  </m:e>
</m:groupChr>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_GroupChrPr](#)) is located in §A.6.1.
end note]

22.1.2.43 `grow` (n-ary Grow)

This element specifies the growth property of n-ary operators. When `0` or `false`, n-ary operators such as integrals and summations do not grow to match the size of their operand height. When `1` or `true`, the n-ary operator grows vertically to match its operand height. If this property is omitted, `grow` is set to `0`.

When the element is absent, the default value of the property when it is a child of a delimiter object is `1` (meaning that this property is applied) and when it is a child of an n-ary operator object it is `0` (meaning that this property is not applied).

When the element is present and the `val` attribute is absent, the default of the `val` attribute is `1` meaning that this property is applied.

[Example: The two integrals below demonstrate the difference between `grow = 0` and `grow = 1`.

$$\int_0^1 \frac{x^2}{x+y} dx \quad \int_0^1 \frac{y^2}{x+y} dy$$

The XML that defines nary growth is:

```
<m:naryPr>
  <m:chr m:val="&#8747;" />
  <m:grow m:val="1" />
</m:naryPr>
```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model (CT_OnOff) is located in §A.6.1. *end note]*

22.1.2.44 [hideBot \(Hide Bottom Edge\)](#)

This element specifies the hidden or shown state of the bottom edge of borderBox. When this element is omitted, the bottom edge is shown. In other words, when the element is absent, the default value of the property is 0 meaning that this property is not applied.

When the element is present and the val attribute is absent, the default of the val attribute is 1 meaning that this property is applied.

When applied, the bottom border is hidden, as in abc. [Example:

```
<m:borderBox>
  <m:borderBoxPr>
    <m:hideBot />
  </m:borderBoxPr>
<m:e>
  <m:r>
    <m:t>abc</m:t>
  </m:r>
</m:e>
</m:borderBox>
```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model (CT_OnOff) is located in §A.6.1. *end note*]

22.1.2.45 **hideLeft (Hide Left Edge)**

This element specifies the hidden or shown state of the left edge of borderBox. When this element is omitted, the edge is shown. In other words, when the element is absent, the default value of the property is 0 meaning that this property is not applied.

When the element is present and the val attribute is absent, the default of the val attribute is 1 meaning that this property is applied.

When applied, the left border is hidden, as in abc. [Example:

```
<m:borderBox>
  <m:borderBoxPr>
    <m:hideLeft/>
  </m:borderBoxPr>
  <m:e>
    <m:r>
      <m:t>abc</m:t>
    </m:r>
  </m:e>
</m:borderBox>
```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is</p>

Attributes	Description
	<p>implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_OnOff](#)) is located in §A.6.1. *end note*]

22.1.2.46 `hideRight` (Hide Right Edge)

This element specifies the hidden or shown state of the right edge of `borderBox`. When this element is omitted, the edge is shown. In other words, when the element is absent, the default value of the property is 0 meaning that this property is not applied.

When the element is present and the `val` attribute is absent, the default of the `val` attribute is 1 meaning that this property is applied.

When applied, the right border is hidden, as in `abc`.

[Example:

```
<m:borderBox>
  <m:borderBoxPr>
    <m:hideRight/>
  </m:borderBoxPr>
<m:e>
  <m:r>
    <m:t>abc</m:t>
  </m:r>
</m:e>
</m:borderBox>
```

end example]

Attributes	Description
<code>val</code> (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or <code>true</code> specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or <code>false</code> specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_OnOff](#)) is located in §A.6.1. *end note*]

22.1.2.47 [hideTop \(Hide Top Edge\)](#)

This element specifies the hidden or shown state of the top edge of `borderBox`. When this element is omitted, the edge is shown. In other words, when the element is absent, the default value of the property is `0` meaning that this property is not applied.

When the element is present and the `val` attribute is absent, the default of the `val` attribute is `1` meaning that this property is applied.

When applied, the top border is hidden, as in [\[abc\]](#). [Example:

```
<m:borderBox>
  <m:borderBoxPr>
    <m:hideTop/>
  </m:borderBoxPr>
<m:e>
  <m:r>
    <m:t>abc</m:t>
  </m:r>
</m:e>
</m:borderBox>
```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of <code>1</code> or <code>true</code> specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of <code>0</code> or <code>false</code> specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the <code>ST_OnOff</code> simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_OnOff](#)) is located in §A.6.1. *end note*]

22.1.2.48 [interSp \(Inter-Equation Spacing\)](#)

This element specifies spacing between equations, expressions, or other instances of mathematical text within a display math paragraph, in twips.

Attributes	Description
val (Value)	Specifies the value, in twips, of the parent element. The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).

[Note: The W3C XML Schema definition of this element’s content model ([CT_TwipsMeasure](#)) is located in §A.6.1.
end note]

22.1.2.49 intLim (Integral Limit Locations)

This element specifies the document setting for the default placement of integral limits, when converted from a linear form to a two-dimensional output (professional form). Limits can be either centered above and below the integral, or positioned just to the right of the operator, as in:

$$\int_a^b x \, dx \quad \int_a^b x \, dx$$

When this integral object is written linearly, as \int_a^b , the placement of limits is ambiguous. intLim is a document-level property that specifies the default positioning. When this element is omitted, the default placement of integral limits is subSup (that is, the location of subscripts and superscripts, or just to the right of the base or operator). Whether the element is absent or present without the val attribute, the default of the val attribute is subSup.

[Example: The XML that specifies this property in use is:

```
<m:mathPr>
  <m:mathFont m:val="Cambria Math"/>
  <m:brkBin m:val="before"/>
  <m:brkBinSub m:val="--"/>
  <m:smallFrac m:val="0"/>
  <m:dispDef/>
  <m:lMargin m:val="0"/>
  <m:rMargin m:val="0"/>
  <m:defJc m:val="centerGroup"/>
  <m:wrapIndent m:val="1440"/>
  <m:intLim m:val="subSup"/>
  <m:naryLim m:val="undOvr"/>
</m:mathPr>
```

end example]

Attributes	Description
val (Value)	Specifies the default location of limits on the parent object. Possible values are subSup

Attributes	Description
	<p>and undOvr.</p> <p>The possible values for this attribute are defined by the ST_LimLoc simple type (§22.1.3.8).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_LimLoc](#)) is located in §A.6.1. *end note*]

22.1.2.50 [intraSp \(Intra-Equation Spacing\)](#)

This element specifies the spacing between adjacent display math paragraphs, in twips. If this element is omitted, no spacing is applied between adjacent math paragraphs.

Attributes	Description
val (Value)	<p>Specifies the value, in twips, of the parent element.</p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_TwipsMeasure](#)) is located in §A.6.1. *end note*]

22.1.2.51 [jc \(Justification\)](#)

This element specifies justification of the math paragraph (a series of adjacent instances of mathematical text within the same paragraph). A math paragraph can be Left Justified, Right Justified, Centered, or Centered as Group. If this element is omitted, the math paragraph is Centered as Group. Whether the element is absent or present without the val attribute, the default of the val attribute is centerGroup. This means that the instances of mathematical text can be aligned with respect to each other, but the entire group of mathematical text is centered as a whole. [Example: An example of Centered as Group is the following example, in which each equation is left-aligned, but the series is centered:

$$\begin{aligned}
 x &= x_1 + x_2 + x_3 + \cdots \\
 y &= y_1 + y_2 + y_3 + y_4 + \cdots \\
 z &= z_1 + z_2 + z_3 + z_4 + z_5 + \cdots
 \end{aligned}$$

The XML that demonstrates jc in use is:

```

<m:oMathParaPr>
  <m:jc m:val="centerGroup"/>
</m:oMathParaPr>

```

end example

Attributes	Description
val (Value)	Specifies the default justification of mathematical text in the document. Possible values are center, centerGroup, left, and right. The possible values for this attribute are defined by the ST_Jc simple type (§22.1.3.7).

[Note: The W3C XML Schema definition of this element’s content model ([CT_OMathJc](#)) is located in §A.6.1. *end note*]

22.1.2.52 [lim \(Limit\)](#)

This element specifies the lower limit of the limLow object and the upper limit of the limUpp function.

[Example: For example, the limit of the limLow $\lim_{n \rightarrow \infty}$ is $n \rightarrow \infty$. The XML that specifies this object is:

```
<m:limLow>
  <m:e>
    <m:r>
      <m:rPr>
        <m:scr m:val="roman"/>
        <m:sty m:val="p"/>
      </m:rPr>
      <m:t>lim</m:t>
    </m:r>
  </m:e>
  <m:lim>
    <m:r>
      <m:t>n→∞</m:t>
    </m:r>
  </m:lim>
</m:limLow>
```

end example]

[Note: The W3C XML Schema definition of this element’s content model ([CT_OMathArg](#)) is located in §A.6.1. *end note*]

22.1.2.53 [limLoc \(n-ary Limit Location\)](#)

This element specifies the location of limits in n-ary operators. Limits can be either centered above and below the n-ary operator (shown in the first summation below), or positioned just to the right of the operator (shown in the second summation below).

$$\sum_{i=0}^n x_n \sum_{i=0}^n x_n$$

When the element is absent, the default value of this property is ignored and the intLim (for integral n-ary operator objects) and naryLim (for all other n-ary operator objects) options are looked to for the limit placement.

Ultimately, when this element is omitted, the default location is undOvr in display mode and subSup otherwise. When the element is present and the val attribute is absent, the default of the val attribute undOvr. [Example: The XML representing the relevant properties of the second summation above (subSup) is:

```
<m:naryPr>
  <m:chr m:val="&#8721;" />
  <m:limLoc m:val="subSup" />
  <m:grow m:val="1" />
</m:naryPr>
```

end example]

Attributes	Description
val (Value)	Specifies the default location of limits on the parent object. Possible values are subSup and undOvr. The possible values for this attribute are defined by the ST_LimLoc simple type (§22.1.3.8).

[Note: The W3C XML Schema definition of this element’s content model ([CT_LimLoc](#)) is located in §A.6.1. end note]

22.1.2.54 [limLow \(Lower-Limit Object\)](#)

This element specifies the Lower-Limit object, consisting of text on the baseline and reduced-size text immediately below it. Examples of limLow include $\lim_{n \rightarrow \infty}$ and $\max_{0 \leq x \leq 1}$. [Example: The XML that represents $\lim_{n \rightarrow \infty}$ is:

```
<m:limLow>
  <m:e>
    <m:r>
      <m:rPr>
        <m:scr m:val="roman" />
        <m:sty m:val="p" />
      </m:rPr>
      <m:t>lim</m:t>
    </m:r>
  </m:e>
```

```

<m:lim>
  <m:r>
    <m:t>n&#8594;&#8734;</m:t>
  </m:r>
</m:lim>
</m:limLow>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_LimLow](#)) is located in §A.6.1. *end note]*

22.1.2.55 [limLowPr \(Lower-Limit Properties\)](#)

This element specifies control properties (ctrlPr) that can be stored on the Lower Limit (limLow).

[*Example:*

$\lim_{a \rightarrow \infty}$ is represented by the following XML:

```

<m:limLow>
  <m:limLowPr/>
  <m:e>
    <m:r>
      <m:t>lim</m:t>
    </m:r>
  </m:e>
  <m:lim>
    <m:r>
      <m:t>a→∞</m:t>
    </m:r>
  </m:lim>
</m:limLow>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_LimLowPr](#)) is located in §A.6.1. *end note]*

22.1.2.56 [limUpp \(Upper-Limit Object\)](#)

This element specifies the Upper-Limit object, consisting of text on the baseline and reduced-size text

immediately above it. [*Example:* Examples of limUpp include $\overbrace{x+x+x}^{k \text{ times}}$ and $\overset{\text{def}}{=}$.

The XML that specifies the $\overset{\text{def}}{=}$ limUpp is:

```

<m:limUpp>
  <m:e>
    <m:r>
      <m:t>=</m:t>
    </m:r>
  </m:e>
  <m:lim>
    <m:r>
      <m:rPr>
        <m:nor/>
      </m:rPr>
      <m:t>def</m:t>
    </m:r>
  </m:lim>
</m:limUpp>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_LimUpp](#)) is located in §A.6.1. *end note]*

22.1.2.57 [limUppPr \(Upper-Limit Properties\)](#)

This element specifies control properties (ctrlPr) that can be stored on the Upper Limit (limUpp).

[*Example:*

$a \rightarrow \infty$
lim is represented by the following XML:

```

<m:limUpp>
  <m:limUppPr/>
  <m:e>
    <m:r>
      <m:t>lim</m:t>
    </m:r>
  </m:e>
  <m:lim>
    <m:r>
      <m:t> $a \rightarrow \infty$ </m:t>
    </m:r>
  </m:lim>
</m:limUpp>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_LimUppPr](#)) is located in §A.6.1. *end note*]

22.1.2.58 `lit` (Literal)

This element specifies that the characters in the run are literal; that is, they are to be interpreted literally and not be built up based on any implied mathematical meaning. This is especially useful for operators or other special characters that signal a need for build up to an OMML reader. These characters are often encountered during a given instance of mathematical text when presented in a 1-dimensional linear format, such as the linear format defined by Unicode Technical Note #28 (Sargent 2006).

When the element is absent, the default value of the property is 0 meaning that this property is not applied.

When the element is present and the `val` attribute is absent, the default of the `val` attribute is 1 meaning that this property is applied.

[*Example:* In the following XML, the `+` operator is treated literally and does not receive proper binary spacing:

```
<m:r>a</m:r>
<m:r>
  <m:rPr>
    <m:lit/>
  </m:rPr>
  <m:t>+</m:t>
</m:r>
<m:r>
  <m:t>b</m:t>
</m:r>
```

As another example, consider the following Office Open XML Math markup:

```
<m:r>
  <m:t>a</m:t>
</m:r>
<m:r>
  <m:rPr>
    <m:lit/>
  </m:rPr>
  <m:t>/</m:t>
</m:r>
<m:r>
  <m:t>b</m:t>
</m:r>
```

This would be displayed as: a/b . If built up, it would normally be converted to $\frac{a}{b}$; however, the presence of this element specifies that the solidus should be treated literally, resulting in a/b .

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model (CT_OnOff) is located in §A.6.1. *end note]*

22.1.2.59 lMargin (Left Margin)

This element specifies the left margin for math, in twips. If this element is omitted, no left margin is used. In other words, when the element is absent, the default value of the option is 0.

When the element is present and the val attribute is absent, the default of the val attribute is 1440 (or 1 inch).

Math margins are added to the paragraph settings for margins. If the sum of lMargin and rMargin exceed the width available, lMargin should be ignored. [Example: The following XML demonstrates an lMargin setting of 1".

```
<m:mathPr>
  <m:mathFont m:val="Cambria Math"/>
  <m:brkBin m:val="before"/>
  <m:brkBinSub m:val="--"/>
  <m:smallFrac m:val="0"/>
  <m:dispDef/>
  <m:lMargin m:val="1440"/>
  <m:rMargin m:val="0"/>
  <m:defJc m:val="centerGroup"/>
  <m:wrapIndent m:val="1440"/>
  <m:intLim m:val="subSup"/>
  <m:naryLim m:val="undOvr"/>
</m:mathPr>
```

end example]

Attributes	Description
val (Value)	Specifies the value, in twips, of the parent element.

Attributes	Description
	The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).

[Note: The W3C XML Schema definition of this element’s content model ([CT_TwipsMeasure](#)) is located in §A.6.1. end note]

22.1.2.60 m (Matrix Object)

This element specifies the Matrix object, consisting of one or more elements laid out in one or more rows and one or more columns. It is important to note that matrices do not have built in delimiters. Like other math elements, matrices are contained in a delimiter object (§22.1.2.24) when delimiters are desired. Empty arguments (see §22.1.2.32) can be used to create gaps in matrices. The plcHide tag (§22.1.2.83) can be used to indicate whether the empty arguments should be visible in the matrix (see the plcHide documentation for more information). If mPr is omitted, the values of baseJc, cGp, cGpRule, cSp, ctrlPr, mcs, plcHide, rSp, and rSpRule are shown in the following table:

Property	Default Value
baseJc	“center”
cGp	“0”
cGpRule	“0” <single>
cSp	“0”
ctrlPr	<The character property of the first control character shall be the character property of the first character in the m object >
mcs	<All columns will be vertically center aligned>
plcHide	“0”
rSp	“0”
rSpRule	“0” <single>

[Example: Examples of matrices are: $\begin{pmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{pmatrix}$ and $\begin{bmatrix} 1 & \\ & 1 \end{bmatrix}$. Below is an example of a 2x2 matrix and its XML in its proper form (surrounding delimiters are not a property of the matrix and are only shown to demonstrate their relationship with a matrix. See the documentation for the d tag for XML examples of delimiters).

$$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$$

<m:d>

```

<m:m>
  <m:mPr>
    <m:mCS>
      <m:mc>
        <m:mcPr>
          <m:count m:val="2"/>
          <m:mcJc m:val="center"/>

          </m:mcPr>
        </m:mc>
      </m:mCS>
    </m:mPr>
  <m:mr>
    <m:e>
      <m:r>
        <m:rPr>
          <m:scr m:val="roman"/>
          <m:sty m:val="p"/>
        </m:rPr>
        <m:t>1</m:t>
      </m:r >
    </m:e>
    <m:e>
      <m:r>
        <m:rPr>
          <m:scr m:val="roman"/>
          <m:sty m:val="p"/>
        </m:rPr>
        <m:t>2</m:t>
      </m:r >
    </m:e>
  </m:mr>
  <m:mr>
    <m:e>
      <m:r>
        <m:rPr>
          <m:scr m:val="roman"/>
          <m:sty m:val="p"/>
        </m:rPr>
        <m:t>3</m:t>
      </m:r >
    </m:e>
  </m:mr>

```

```

    <m:e>
      <m:r>
        <m:rPr>
          <m:scr m:val="roman"/>
          <m:sty m:val="p"/>
        </m:rPr>
        <m:t>4</m:t>
      </m:r>
    </m:e>
  </m:mr>
</m:m>
</m:d>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_M](#)) is located in §A.6.1. *end note*]

22.1.2.61 mathFont (Math Font)

This element specifies the default math font to be used in the document. If this element is omitted, font substitution (§17.8.2) should be used to determine the most appropriate font for use throughout the document.

[*Example:* The XML containing this property is:

```

<m:mathPr>
  <m:mathFont m:val="Cambria Math"/>
  <m:brkBin m:val="before"/>
  <m:brkBinSub m:val="--"/>
  <m:smallFrac m:val="0"/>
  <m:dispDef/>
  <m:lMargin m:val="1440"/>
  <m:rMargin m:val="0"/>
  <m:defJc m:val="centerGroup"/>
  <m:wrapIndent m:val="1440"/>
  <m:intLim m:val="subSup"/>
  <m:naryLim m:val="undOvr"/>
</m:mathPr>

```

end example]

[*Example:*

Given the following equation:

$$a + b = c$$

and the following XML:


```
<m:mathFont m:val="Cambria Math"/>
```

Because the document option for Math font is set to the mathematically enabled font Cambria Math, Math is formatted with that font.

end example]

Attributes	Description
val (value)	Specifies the default math font to be used in the document. The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element’s content model ([CT_String](#)) is located in §A.6.1. *end note]*

22.1.2.62 [mathPr \(Math Properties\)](#)

This element specifies the document-level properties for all math in the document.

[Example:

```
<m:mathPr>
  <m:mathFont m:val="Cambria Math"/>
  <m:brkBin m:val="before"/>
  <m:brkBinSub m:val="--"/>
  <m:smallFrac m:val="0"/>
  <m:dispDef/>
  <m:lMargin m:val="0"/>
  <m:rMargin m:val="0"/>
  <m:defJc m:val="centerGroup"/>
  <m:wrapIndent m:val="1440"/>
  <m:intLim m:val="subSup"/>
  <m:naryLim m:val="undOvr"/>
</m:mathPr>
```

These are the default settings for the math properties element and its children.

end example]

[Note: The W3C XML Schema definition of this element’s content model ([CT_MathPr](#)) is located in §A.6.1. *end note]*

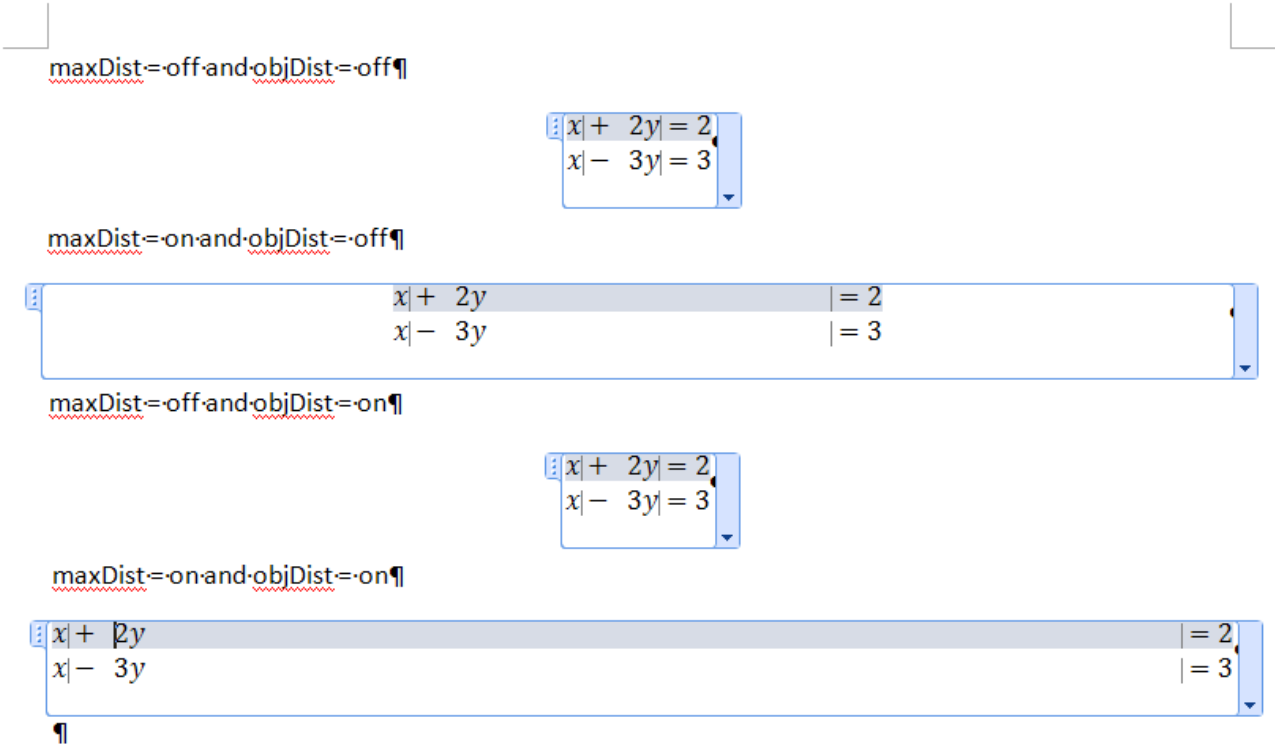
22.1.2.63 maxDist (Maximum Distribution)

This element specifies Array Maximum Distribution. When 1 or true, the array is spaced to the maximum width of the containing element (page, column, cell, etc.). The example image below illustrates an array expanded to fit the page, which is the containing element in this example. The maxDist option is commonly used with the objDist option. The objDist option is used to expand the distribution of mathematical text within the bounds of an array while not impacting the Array Distribution itself.

When the maxDist element is omitted, Array Maximum Distribution is off. In other words, when the element is absent, the default value of the property is 0 meaning that this property is not applied.

When the element is present and the val attribute is absent, the default of the val attribute is 1 meaning that this property is applied.

[Example: The following diagram illustrates all four possible combinations of maxDist and objDist:



XML for the fourth example shown in the above image is:

```
<m:oMathPara>
  <m:oMath>
    <m:eqArr>
      <m:eqArrPr>
        <m:maxDist m:val="1" />
```

```

    <m:objDist m:val="1" />
  </m:eqArrPr>
<m:e>
  <m:r>
    <m:t>x</m:t>
  </m:r>
  <m:r>
    <m:t>&+</m:t>
  </m:r>
  <m:r>
    <m:t>2y&=2</m:t>
  </m:r>
</m:e>
<m:e>
  <m:r>
    <m:t>x</m:t>
  </m:r>
  <m:r>
    <m:t>&-</m:t>
  </m:r>
  <m:r>
    <m:t>3y&=3</m:t>
  </m:r>
</m:e>
</m:eqArr>
</m:oMath>
</m:oMathPara>

```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model (CT_OnOff) is located in §A.6.1. *end note*]

22.1.2.64 `mc` (Matrix Column)

This element specifies a single column in a matrix `m`. [*Example*: An example of this element in use is:

$$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$$

```

<m:m>
  <m:mPr>
    <m:mCS>
      <m:mc>
        <m:mcPr>
          <m:count m:val="2"/>
          <m:mcJc m:val="center"/>

          </m:mcPr>
        </m:mc>
      </m:mCS>
    </m:mPr>
  <m:mr>
    <m:e>
      <m:r>
        <m:rPr>
          <m:scr m:val="roman"/>
          <m:sty m:val="p"/>
        </m:rPr>
        <m:t>1</m:t>
      </m:r>
    </m:e>
    <m:e>
      <m:r>
        <m:rPr>
          <m:scr m:val="roman"/>
          <m:sty m:val="p"/>
        </m:rPr>
        <m:t>2</m:t>
      </m:r>
    </m:e>
  </m:mr>

```

```

<m:mr>
  <m:e>
    <m:r>
      <m:rPr>
        <m:scr m:val="roman"/>
        <m:sty m:val="p"/>
      </m:rPr>
      <m:t>3</m:t>
    </m:r>
  </m:e>
  <m:e>
    <m:r>
      <m:rPr>
        <m:scr m:val="roman"/>
        <m:sty m:val="p"/>
      </m:rPr>
      <m:t>4</m:t>
    </m:r>
  </m:e>
</m:mr>
</m:m>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_MC](#)) is located in §A.6.1. *end note*]

22.1.2.65 mcJc (Matrix Column Justification)

This element specifies the justification of a matrix column (or group of matrix columns) mc. When this element is omitted, the column is centered. Whether the element is absent or present without the val attribute, the default of the val attribute is center. The matrix below has three columns. The leftmost column is left-justified,

the rightmost column is right-justified, and the center column is centered:
$$\begin{pmatrix} 1 & 1 & 1 \\ 23 & 23 & 23 \\ 456 & 456 & 456 \end{pmatrix}$$

[*Example:* A simple example of this property in use is a 2x2 matrix with both columns centered:

$$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$$

```

<m:m>
  <m:mPr>
    <m:mCS>
      <m:mc>
        <m:mcPr>

```

```

        <m:count m:val="2"/>
        <m:mcJc m:val="center"/>

        </m:mcPr>
    </m:mc>
</m:mcs>
</m:mPr>
<m:mr>
    <m:e>
        <m:r>
            <m:rPr>
                <m:scr m:val="roman"/>
                <m:sty m:val="p"/>
            </m:rPr>
            <m:t>1</m:t>
        </m:r >
    </m:e>
    <m:e>
        <m:r>
            <m:rPr>
                <m:scr m:val="roman"/>
                <m:sty m:val="p"/>
            </m:rPr>
            <m:t>2</m:t>
        </m:r >
    </m:e>
</m:mr>
<m:mr>
    <m:e>
        <m:r>
            <m:rPr>
                <m:scr m:val="roman"/>
                <m:sty m:val="p"/>
            </m:rPr>
            <m:t>3</m:t>
        </m:r >
    </m:e>

```

```
<m:e>
  <m:r>
    <m:rPr>
      <m:scr m:val="roman"/>
      <m:sty m:val="p"/>
    </m:rPr>
    <m:t>4</m:t>
  </m:r >
</m:e>
</m:mr>
</m:m>
```

end example]

Attributes	Description
val (Value)	Specifies the horizontal alignment of the parent element. Possible values are left, right, and center. [Example: <div data-bbox="456 846 886 978" data-label="Code-Block"><pre><m:mcPr> <m:mcJc m:val="center"/> <m:count m:val="2"/> </m:mcPr></pre></div> The possible values for this attribute are defined by the ST_XAlign simple type (§22.9.2.18).

[Note: The W3C XML Schema definition of this element’s content model ([CT_XAlign](#)) is located in §A.6.1. end note]

22.1.2.66 mcPr (Matrix Column Properties)

This element specifies the properties of the matrix column mn, including the number of columns and the type of justification. [Example: As an extreme example, the following matrix has two columns that are left justified

(count is 2) and three columns that are right justified (count is 3). $\begin{pmatrix} 1 & 1 & 1 & 1 & 1 \\ 23 & 23 & 23 & 23 & 23 \\ 456 & 456 & 456 & 456 & 456 \end{pmatrix}$ end

example]

[Example:

$\begin{pmatrix} 1 & 2222 & 3 \\ 4444 & 5 & 6666 \end{pmatrix}$ is represented by the following XML:

```
<m:m>
  <m:mPr>
    <m:mCS>
      <m:mc>
```

```

        <m:mcPr>
          <m:count m:val="3"/>
          <m:mcJc m:val="right"/>
        </m:mcPr>
      </m:mc>
    </m:mcs>
  </m:mPr>
  <m:mr>
    <m:e>
      <m:r>
        <m:t>1</m:t>
      </m:r>
    </m:e>
    <m:e>
      <m:r>
        <m:t>2222</m:t>
      </m:r>
    </m:e>
    <m:e>
      <m:r>
        <m:t>3</m:t>
      </m:r>
    </m:e>
  </m:mr>
  <m:mr>
    <m:e>
      <m:r>
        <m:t>4444</m:t>
      </m:r>
    </m:e>
    <m:e>
      <m:r>
        <m:t>5</m:t>
      </m:r>
    </m:e>
    <m:e>
      <m:r>
        <m:t>6666</m:t>
      </m:r>
    </m:e>
  </m:mr>
</m:m>

```

All three columns are right aligned.

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_MCPPr](#)) is located in §A.6.1. *end note*]

22.1.2.67 mcs (Matrix Columns)

This element specifies the collection of columns of the matrix m. [*Example*: An example of this element in use is:

$$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$$

```
<m:m>
  <m:mPr>
    <m:mCS>
      <m:mc>
        <m:mcPr>
          <m:count m:val="2"/>
          <m:mcJc m:val="center"/>

          </m:mcPr>
        </m:mc>
      </m:mCS>
    </m:mPr>
    <m:mr>
      <m:e>
        <m:r>
          <m:rPr>
            <m:scr m:val="roman"/>
            <m:sty m:val="p"/>
          </m:rPr>
          <m:t>1</m:t>
        </m:r >
      </m:e>
      <m:e>
        <m:r>
          <m:rPr>
            <m:scr m:val="roman"/>
            <m:sty m:val="p"/>
          </m:rPr>
          <m:t>2</m:t>
        </m:r >
      </m:e>
    </m:mr>
```

```

<m:mr>
  <m:e>
    <m:r>
      <m:rPr>
        <m:scr m:val="roman"/>
        <m:sty m:val="p"/>
      </m:rPr>
      <m:t>3</m:t>
    </m:r>
  </m:e>
  <m:e>
    <m:r>
      <m:rPr>
        <m:scr m:val="roman"/>
        <m:sty m:val="p"/>
      </m:rPr>
      <m:t>4</m:t>
    </m:r>
  </m:e>
</m:mr>
</m:m>

```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_MCS](#)) is located in §A.6.1. *end note*]

22.1.2.68 mPr (Matrix Properties)

This element specifies properties of the matrix *m*, including the justification of the matrix and the layout of elements within the matrix. [Example:

$a + 1 \quad 2 + b$ is represented by the following XML:
 $\begin{matrix} 3 & 4 \end{matrix}$

```

<m:oMath>
  <m:r>
    <m:t>a+</m:t>
  </m:r>
  <m:m>
    <m:mPr>
      <m:baseJc m:val="top"/>
    </m:mPr>
    <m:mr>
      <m:e>
        <m:r>
          <m:t>1</m:t>

```

```

    </m:r>
  </m:e>
<m:e>
  <m:r>
    <m:t>2</m:t>
  </m:r>
</m:e>
</m:mr>
<m:mr>
  <m:e>
    <m:r>
      <m:t>3</m:t>
    </m:r>
  </m:e>
  <m:e>
    <m:r>
      <m:t>4</m:t>
    </m:r>
  </m:e>
</m:mr>
</m:m>
<m:r>
  <m:t>+b</m:t>
</m:r>
</m:oMath>

```

This top row of the matrix is aligned with the rest of the baseline.

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_MPr](#)) is located in §A.6.1. *end note*]

22.1.2.69 [mr \(Matrix Row\)](#)

This element specifies a single row of the matrix *m*. [*Example:* An example of this element in use is the following example, a 2x2 matrix. There are two rows; the first contains the elements 1 and 2; the second contains 3 and 4.

$$\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$$

```

<m:m>
  <m:mPr>
    <m:mCS>
      <m:mc>
        <m:mcPr>

```

```

        <m:count m:val="2"/>
        <m:mcJc m:val="center"/>

        </m:mcPr>
    </m:mc>
</m:mcs>
</m:mPr>
<m:mr>
    <m:e>
        <m:r>
            <m:rPr>
                <m:scr m:val="roman"/>
                <m:sty m:val="p"/>
            </m:rPr>
            <m:t>1</m:t>
        </m:r >
    </m:e>
    <m:e>
        <m:r>
            <m:rPr>
                <m:scr m:val="roman"/>
                <m:sty m:val="p"/>
            </m:rPr>
            <m:t>2</m:t>
        </m:r >
    </m:e>
</m:mr>
<m:mr>
    <m:e>
        <m:r>
            <m:rPr>
                <m:scr m:val="roman"/>
                <m:sty m:val="p"/>
            </m:rPr>
            <m:t>3</m:t>
        </m:r >
    </m:e>
<m:e>

```

```

<m:r>
  <m:rPr>
    <m:scr m:val="roman"/>
    <m:sty m:val="p"/>
  </m:rPr>
  <m:t>4</m:t>
</m:r>
</m:e>
</m:mr>
</m:m>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_MR](#)) is located in §A.6.1. *end note*]

22.1.2.70 nary (n-ary Operator Object)

This element specifies an n-ary object, consisting of an n-ary object, a base (or operand), and optional upper and lower limits. Examples of n-ary objects are: $\int_0^1 x \, dx$, $\sum_k \binom{n}{k}$, $\prod_{k=1}^n A_k$, and $\bigcup_{n=1}^m (X_n \cap Y_n)$. [*Example:* The example below demonstrates an n-ary object in its proper form and XML representation:

$$\int_0^1 x \, dx$$

```

<m:nary>
  <m:naryPr>
    <m:chr m:val="∫"/>
  </m:naryPr>
  <m:sub>
    <m:r>
      <m:rPr>
        <m:scr m:val="roman"/>
        <m:sty m:val="p"/>
      </m:rPr>
      <m:t>0</m:t>
    </m:r>
  </m:sub>
</m:nary>

```

```

<m:sup>
  <m:r>
    <m:rPr>
      <m:scr m:val="roman"/>
      <m:sty m:val="p"/>
    </m:rPr>
    <m:t>1</m:t>
  </m:r>
</m:sup>
<m:e>
  <m:r>
    <m:t>x</m:t>
  </m:r>
  <m:box>
    <m:boxPr>
      <m:diff m:val="1"/>
    </m:boxPr>
    <m:e>
      <m:r>
        <m:t>dx</m:t>
      </m:r>
    </m:e>
  </m:box>
</m:e>
</m:nary>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Nary](#)) is located in §A.6.1. *end note*]

22.1.2.71 naryLim (n-ary Limit Location)

This element specifies the document setting for the default placement of n-ary limits other than integrals (since integrals are most often written as subSup and other n-ary operators are most often written as undOvr), when converted from a built down form to a two-dimensional output (professional form). Limits can be either centered above and below the n-ary operator, or positioned just to the right of the operator, as in:

$$\sum_{i=0}^n x_i \quad \sum_{i=0}^n x_i$$

When this summation object is written in built down form, as in $\sum_{i=0}^n$, for example, the placement of limits is ambiguous. naryLim specifies this positioning. When this element is omitted, the default placement of n-ary limits is undOvr (that is, the location of lower and upper limits). Whether the element is absent or present without the val attribute, the default of the val attribute is undOvr.

[*Example:* An example XML of this element in use is:

```
<m:mathPr>
  <m:mathFont m:val="Cambria Math"/>
  <m:brkBin m:val="before"/>
  <m:brkBinSub m:val="--"/>
  <m:smallFrac m:val="0"/>
  <m:dispDef/>
  <m:lMargin m:val="0"/>
  <m:rMargin m:val="0"/>
  <m:defJc m:val="centerGroup"/>
  <m:wrapIndent m:val="1440"/>
  <m:intLim m:val="subSup"/>
  <m:naryLim m:val="undOvr"/>
</m:mathPr>
```

end example]

Attributes	Description
val (Value)	Specifies the default location of limits on the parent object. Possible values are subSup and undOvr. The possible values for this attribute are defined by the ST_LimLoc simple type (§22.1.3.8).

[Note: The W3C XML Schema definition of this element’s content model ([CT_LimLoc](#)) is located in §A.6.1. *end note]*

22.1.2.72 **naryPr (n-ary Properties)**

This element specifies the properties of the n-ary object.

These include the n-ary operator character that is used (using the chr element), the shape and height of the operator (using the grow element), the location of limits (using the limLoc element), and whether empty limits display a placeholder character or are hidden (using the subHide and supHide elements). [Example: N-ary operators include: \sum , \int , \cup , \wedge . *end example]*

[Example:

$\sum_1^{20} x$ is represented by the following XML:

```
<m:nary>
  <m:naryPr>
    <m:chr m:val="Σ"/>
    <m:limLoc m:val="subSup"/>
  </m:naryPr>
  <m:sub>
```

```
<m:r>
  <m:t>1</m:t>
</m:r>
</m:sub>
<m:sup>
  <m:r>
    <m:t>20</m:t>
  </m:r>
</m:sup>
<m:e>
  <m:r>
    <m:t>x</m:t>
  </m:r>
</m:e>
</m:nary>
```

end example]

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_NaryPr](#)) is located in §A.6.1. *end note]*

22.1.2.73 **noBreak (No Break)**

This property specifies the "unbreakable" property on the Box object box. When 1 or true, no line breaks can occur within the box. This can be important for operator emulators that consist of more than one binary operator. When this element is not specified, breaks can occur inside box. Whether the element is absent or present without the val attribute, the default of the val attribute is 1 meaning that this property is applied.

[*Example:* Sample XML containing this element is below. In this box, breaks are allowed.

```
<m:boxPr>
  <m:noBreak m:val="0"/>
</m:boxPr>
```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[*Note*: The W3C XML Schema definition of this element's content model ([CT_OnOff](#)) is located in §A.6.1. *end note*]

22.1.2.74 `nor` (Normal Text)

This element specifies that the run is normal text, i.e., math italics and math spacing are not applied. In a normal text run, no characters will trigger reformatting of a linear expression into a two-dimensional expression.

When the element is absent, the default value of the property is 0 meaning that this property is not applied.

When the element is present and the `val` attribute is absent, the default of the `val` attribute is 1 meaning that this property is applied.

[*Example*: The example below illustrates three runs of normal text, along with the XML representation of the formula:

$$\text{rate} = \frac{\text{distance}}{\text{time}}$$

```
<m:r>
  <m:rPr>
    <m:nor/>
  </m:rPr>
  <m:t>rate</m:t>
</m:r>
<m:r>
  <m:t>=</m:t>
</m:r>
<m:f>
  <m:num>
    <m:r>
      <m:rPr>
        <m:nor/>
      </m:rPr>
      <m:t>distance</m:t>
    </m:r>
  </m:num>
```

```
<m:den>
  <m:r>
    <m:rPr>
      <m:nor/>
    </m:rPr>
    <m:t>time</m:t>
  </m:r>
</m:den>
</m:f>
```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model (CT_OnOff) is located in §A.6.1. *end note]*

22.1.2.75 num (Numerator)

This element specifies the numerator of the Fraction object f. [Example: The *a* in $\frac{a}{b}$:

```
<m:f>
  <m:fPr>
    <m:type m:val="skw"/>
  </m:fPr>
  <m:num>
    <m:r>
      <m:t>a</m:t>
    </m:r>
  </m:num>
  <m:den>
    <m:r>
      <m:t>b</m:t>
    </m:r>
  </m:den>
</m:f>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_OMathArg](#)) is located in §A.6.1. *end note]*

22.1.2.76 objDist (Object Distribution)

This element specifies Array Object Distribution. When 1 or true, the contents of the array are spaced to the maximum width of the array object. When this element is omitted, the array does not receive object distribution. In other words, when the element is absent, the default value of the property is 0 meaning that this property is not applied.

When the element is present and the val attribute is absent, the default of the val attribute is 1 meaning that this property is applied.

[Example:

$$\begin{array}{ccccc} 111a & & & = & c \\ 111a & + & 111b & = & 111c \\ & & b & = & 111c \end{array}$$

is represented by the

following XML:

```
<m:eqArr>
  <m:eqArrPr>
    <m:maxDist m:val="1"/>
      <m:objDist m:val="1"/>
    </m:eqArrPr>
  <m:e>
    <m:r>
      <m:t>111&a&&&&&&&=&&c</m:t>
    </m:r>
  </m:e>
  <m:e>
    <m:r>
      <m:t>111&a&&&+&111&b&&=&111&c</m:t>
    </m:r>
  </m:e>
  <m:e>
    <m:r>
      <m:t>&&&&&b&&=&111&c</m:t>
    </m:r>
  </m:e>
</m:eqArr>
```

Because object distribution and maximum distribution are applied, the equation array is expanded to fill the width that is allowed and the columns are distributed horizontally within the object to the bounds of the object.

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_OnOff](#)) is located in §A.6.1. *end note*]

22.1.2.77 **oMath (Office Math)**

This element specifies an instance of mathematical text. When used independently (not inside an oMathPara) with non-mathematical text preceding and/or following it, an independent oMath is interpreted as an inline math zone. All such math zones, including equations, expressions, arrays of equations or expressions, and formulas are represented by oMath blocks. When used in a display math zone (a math paragraph, oMathPara), oMath is a container for an instance of mathematical text that starts on its own line and is not an inline math zone. When an oMath block is part of a display math zone, it is not itself an inline math zone. When an oMath block is not part of a display math zone, it is interpreted as its own inline math zone. The contents of an oMath block do not differ between display zone containers and independent inline math zones.

[Example:

1 + 1 = 2

```
<m:oMath>
  <m:r>
    <m:t>1+1=2</m:t>
  </m:r>
</m:oMath>
```

end example]

[Note: The W3C XML Schema definition of this element’s content model ([CT_OMath](#)) is located in §A.6.1. *end note*]

22.1.2.78 oMathPara (Office Math Paragraph)

This element specifies a math paragraph, or display math zone, that contains one or more oMath elements that are in display mode. The oMath containers of a display math zone are not themselves considered inline math zones..

[Example:

$1 + 1 = 2$

$2 + 2 = 4$ is represented by the following XML:

```
<m:oMathPara>
  <m:oMath>
    <m:r>
      <m:t>1+1=2</m:t>
    </m:r>
    <m:r>
      <w:br/>
    </m:r>
  </m:oMath>
  <m:oMath>
    <m:r>
      <m:t>2+2=4</m:t>
    </m:r>
  </m:oMath>
</m:oMathPara>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_OMathPara](#)) is located in §A.6.1.
end note]

22.1.2.79 oMathParaPr (Office Math Paragraph Properties)

This property specifies properties of the math paragraph oMathPara, including justification jc.

[Example:

$1 + 1 = 2$

$2 + 2 = 4$ is represented by the following XML:

```
<m:oMathPara>
  <m:oMathParaPr>
    <m:jc m:val="right"/>
  </m:oMathParaPr>
  <m:oMath>
    <m:r>
```

```

        <m:t>1+1=2</m:t>
    </m:r>
    <m:r>
        <w:br/>
    </m:r>
</m:oMath>
<m:oMath>
    <m:r>
        <m:t>2+2=4</m:t>
    </m:r>
</m:oMath>
</m:oMathPara>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_OMathParaPr](#)) is located in §A.6.1.
end note]

22.1.2.80 opEmu (Operator Emulator)

This element specifies the Operator Emulator property on box. When 1 or true, the box and its contents behave as a single operator and inherit the properties of an operator. This means, for example, that the character can serve as a point for a line break and can be aligned to other operators. (For more details on the properties of an operator, see Unicode Technical Report #25, §3.2.2 and §3.2.3, and Unicode Technical Note #28.) Operator Emulators are often used when one or more glyphs combine to form an operator, such as ==.

When the element is absent, the default value of the property is 0 meaning that this property is not applied.

When the element is present and the val attribute is absent, the default of the val attribute is 1 meaning that this property is applied.

[*Example:* The following equation uses an Operator Emulator:

$$a == b$$

Its XML representation is as follows:

```

<m:r>
    <m:t>a</m:t>
</m:r>
<m:box>
    <m:boxPr>
        <m:opEmu m:val="1"/>
        <m:aln/>
    </m:boxPr>

```

```
<m:e>
  <m:r>
    <m:t>==</m:t>
  </m:r>
</m:e>
</m:box>
<m:r>
  <m:t>b</m:t>
</m:r>
```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model (CT_OnOff) is located in §A.6.1. end note]

22.1.2.81 phant (Phantom Object)

This element specifies the phantom object. This object has two primary uses: adding the spacing of the phantom base element e without displaying that base; and suppressing part of the glyphfor spacing considerations.
[Example: In the right column below, the descender of the y is suppressed (set to zero) while in the left column, it is shown. The presence or absence of the descender changes the shape of the \sqrt{y} .

Without <m:phant> \sqrt{y}	With <m:phant> \sqrt{y}
<pre><m:rad> <m:radPr> <m:degHide m:val="1" /> </m:radPr> <m:deg /> <m:e> <m:r> <m:t>y</m:t> </m:r> </m:e></pre>	<pre><m:rad> <m:radPr> <m:degHide m:val="1" /> </m:radPr> <m:deg /> <m:e> <m:phant> <m:phantPr> <m:zeroDesc m:val="1" /> </m:phantPr> </m:phant> </m:e></pre>

<code></m:rad></code>	<code><m:e> <m:r> <m:t>y</m:t> </m:r> </m:e> </m:phant> </m:e> </m:rad></code>
-----------------------------	--

end example]

[*Note:* In typography, a *glyph* is the shape given in a particular typeface to a specific symbol. Most scripts share the notion of a baseline: an imaginary horizontal line on which characters rest. In some scripts, parts of glyphs lie below the baseline. The *descent* spans the distance between the baseline and the lowest descending glyph in a typeface, and the part of a glyph that descends below the baseline has the name *descender*. Conversely, the *ascent* spans the distance between the baseline and the top of the glyph that reaches farthest from the baseline. *end note]*

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Phant](#)) is located in §A.6.1. *end note]*

22.1.2.82 [phantPr \(Phantom Properties\)](#)

This element specifies properties of the Phantom object, including whether the phantom is hidden or visible, and the amount of space that is taken into account when laying out text and objects around phantoms.

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_PhantPr](#)) is located in §A.6.1. *end note]*

22.1.2.83 [plcHide \(Hide Placeholders \(Matrix\)\)](#)

This element specifies the Hide Placeholders property on a matrix m. When this property is on, placeholders do not appear in the matrix. If this element is omitted, placeholders do appear such that the locations where text can be inserted are made visible. In other words, when the element is absent, the default value of the property is 0 meaning that this property is not applied.

When the element is present and the val attribute is absent, the default of the val attribute is 1 meaning that this property is applied.

[*Example:* The following two examples of matrices show the hidden (right matrix) and visible (left matrix) states of placeholders. The key difference between the placeholders in these matrices is that the left matrix contains visual representations for each placeholder in the matrix while the right matrix does not. However, the contents of each matrix remain the same between these two examples:

$$\begin{pmatrix} 1 & \square & \square \\ \square & 1 & \square \\ \square & \square & 1 \end{pmatrix} \begin{pmatrix} 1 & & \\ & 1 & \\ & & 1 \end{pmatrix}$$

The plcHide element does not specify how a placeholder should be visually represented. It only specifies whether placeholders should or should not be visualized. The above example (left) is only one possible visual representation.

In the matrix described by the XML below, placeholders will be hidden:

```
<m:mPr>
  <m:plcHide m:val="1"/>
  <m:mcs>
    <m:mc>
      <m:mcPr>
        <m:mcJc m:val="center"/>
        <m:count m:val="3"/>
      </m:mcPr>
    </m:mc>
  </m:mcs>
</m:mPr>
```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model (CT_OnOff) is located in §A.6.1. *end note*]

22.1.2.84 pos (Position)

This element specifies the position of the bar or group character in the parent object; the default is bot. Whether the element is absent or present without the val attribute, the default of the val attribute is bot. [Example: The XML representation for the mathematical overbar is:

```
<m:bar>
  <m:barPr>
    <m:pos    m:val="top"/>
  </m:barPr>
<m:e>
  <m:r>
    <m:t>a</m:t>
  </m:r>
</m:e>
</m:bar>
```

end example]

Attributes	Description
val (Value)	<p>Specifies the position of the parent element. Possible values are top and bot.</p> <p>[Example:</p> <pre><m:barPr> <m:pos m:val="top"/> </m:barPr></pre> <p>The possible values for this attribute are defined by the ST_TopBot simple type (§22.1.3.13).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_TopBot](#)) is located in §A.6.1. *end note]*

22.1.2.85 [postSp \(Post-Paragraph Spacing\)](#)

This element specifies the spacing after a math paragraph, in twips. If this element is omitted, no spacing is applied after the paragraph.

Attributes	Description
val (Value)	<p>Specifies the value, in twips, of the parent element.</p> <p>The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_TwipsMeasure](#)) is located in §A.6.1. *end note]*

22.1.2.86 [preSp \(Pre-Paragraph Spacing\)](#)

This element specifies the spacing before a math paragraph, in twips. If this element is omitted, no spacing is applied before the paragraph.

Attributes	Description
val (Value)	Specifies the value, in twips, of the parent element. The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).

[Note: The W3C XML Schema definition of this element’s content model ([CT_TwipsMeasure](#)) is located in §A.6.1. *end note*]

22.1.2.87 [r \(Run\)](#)

This element specifies a run of mathematical text.

[Example:

$j + k$ is represented by the following XML:

```
<m:oMath>
  <m:e>
    <m:r>
      <m:t>j+k</m:t>
    </m:r>
  </m:e>
</m:oMath>
```

end example]

[Note: The W3C XML Schema definition of this element’s content model ([CT_R](#)) is located in §A.6.1. *end note*]

22.1.2.88 [rad \(Radical Object\)](#)

This element specifies the radical object, consisting of a radical, a base e, and an optional degree deg. [Example: Examples of rad are $\sqrt[3]{x}$ (XML shown below) and \sqrt{x} .

```
<m:rad>
  <m:deg>
    <m:r>
      <m:rPr>
        <m:scr m:val="roman"/>
        <m:sty m:val="p"/>
      </m:rPr>
      <m:t>3</m:t>
    </m:r>
  </m:deg>
```

```

<m:e>
  <m:r>
    <m:t>x</m:t>
  </m:r>
</m:e>
</m:rad>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Rad](#)) is located in §A.6.1. *end note]*

22.1.2.89 [radPr \(Radical Properties\)](#)

This element specifies properties of the Radical object rad, including the hidden or shown state of the degree deg. [*Example:*

\sqrt{b} is represented by the following XML:

```

<m:rad>
  <m:radPr>
    <m:degHide m:val="1"/>
  </m:radPr>
  <m:deg/>
  <m:e>
    <m:r>
      <m:t>b</m:t>
    </m:r>
  </m:e>
</m:rad>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_RadPr](#)) is located in §A.6.1. *end note]*

22.1.2.90 [rMargin \(Right Margin\)](#)

This element specifies the right margin for math, in twips. If this element is omitted, no right margin is used. In other words, when the element is absent, the default value of the option is 0. When the element is present and the val attribute is absent, the default of the val attribute is 1440 (or 1 inch). Math margins are added to the paragraph settings for margins. If the sum of lMargin and rMargin exceed the width available, lMargin should be ignored. If rMargin exceeds the width available, a default indent of 1440 twips should be used. [*Example:* The following XML demonstrates an rmargin setting of 1".

```
<m:mathPr>
  <m:mathFont m:val="Cambria Math"/>
  <m:brkBin m:val="before"/>
  <m:brkBinSub m:val="--"/>
  <m:smallFrac m:val="0"/>
  <m:dispDef/>
  <m:lMargin m:val="0"/>
  <m:rMargin m:val="1440"/>
  <m:defJc m:val="centerGroup"/>
  <m:wrapIndent m:val="1440"/>
  <m:intLim m:val="subSup"/>
  <m:naryLim m:val="undOvr"/>
</m:mathPr>
```

end example]

Attributes	Description
val (Value)	Specifies the value, in twips, of the parent element. The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).

[Note: The W3C XML Schema definition of this element’s content model ([CT_TwipsMeasure](#)) is located in §A.6.1. *end note]*

22.1.2.91 **rPr (Run Properties)**

This element specifies the properties of the math run r.

[Example:

$\mathfrak{F} + \mathfrak{G}$ is represented by the following XML:

```
<m:r>
  <m:rPr>
    <m:scr m:val="fraktur"/>
    <m:sty m:val="b"/>
  </m:rPr>
  <m:t>F+G</m:t>
</m:r>
```

end example]

[Note: The W3C XML Schema definition of this element’s content model ([CT_RPR](#)) is located in §A.6.1. *end note]*

22.1.2.92 rSp (Row Spacing (Array))

This element specifies spacing between rows of an array eqArr; it is used only when rSpRule is set to 3 (exactly; in which case the unit of measure is points) or 4 (Multiple; in which case the unit of measure is half-lines). If this element is omitted, single line spacing is used in the array, and no additional spacing is used in the layout of rows. Whether the element is absent or present without the val attribute, the default of the val attribute is 0.

[Example: Below are three examples of the same array, with single line spacing, 1.5 line spacing, and double line spacing:

$$\left(\begin{array}{rcl} x - y + z & = & 10 \\ 3x + y + 2z & = & 34 \\ -5x + 2y - z & = & -14 \end{array}\right) \left(\begin{array}{rcl} x - y + z & = & 10 \\ 3x + y + 2z & = & 34 \\ -5x + 2y - z & = & -14 \end{array}\right) \left(\begin{array}{rcl} x - y + z & = & 10 \\ 3x + y + 2z & = & 34 \\ -5x + 2y - z & = & -14 \end{array}\right)$$

The following eqArr
$$\begin{array}{l} a = b + c \\ d + e = f \end{array}$$
 has rSp of 3 half-lines:

```
<m:eqArr>
  <m:eqArrPr>
    <m:rSpRule m:val="4"/>
    <m:rSp m:val="3"/>
  </m:eqArrPr>
  <m:e>
    <m:r>
      <m:t>a=b+c</m:t>
    </m:r>
  </m:e>
  <m:e>
    <m:r>
      <m:t>d+e=f</m:t>
    </m:r>
  </m:e>
</m:eqArr>
```

end example]

Attributes	Description
val (Value)	<p>Specifies the amount of space between columns of the parent element (for cGp/cSp) or rows (for rSp). The manner in which this value is determined depends on the setting of the rule of the parent element.</p> <p>For cGp, if the rule is set to 3 (or "Exactly"), then the unit is interpreted as twips. If the rule is set to 4 (or "Multiple"), then the unit is interpreted as number of 0.5 em increments.</p>

Attributes	Description
	<p>For cSp, this value is measured in twips. There is no corresponding cSpRule.</p> <p>For rSp, if the rule is set to 3 (or "Exactly"), then the unit is interpreted as points. If the rule is set to 4 (or "Multiple"), then the unit is interpreted as half-lines.</p> <p>The possible values for this attribute are defined by the ST_UnSignedInteger simple type (§22.1.3.14).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_UnSignedInteger](#)) is located in §A.6.1. *end note*]

22.1.2.93 rSpRule (Row Spacing Rule)

This element specifies the type of vertical spacing between columns in a matrix. The following table demonstrates possible values of rSpRule along with their definitions and examples.

Value	Line spacing between rows	Example (non-normative)
0	Single line gap	1 2 3 4
1	1.5 line gap	1 2 3 4
2	2 line gap	1 2 3 4
3	Exactly (rely on value of rGp, measured in points)	1 2 3 4
4	Multiple (rely on value of rGp, measured in lines)	1 2 3 4

Whether the element is absent or present without the val attribute, the default of the val attribute is 0 (or single line gap).

[Example:

```
1 2
3 4
is represented by the following XML:
<m:m>
  <m:mPr>
    <m:rSpRule m:val="2"/>
```

```
</m:mPr>
<m:mr>
  <m:e>
    <m:r>
      <m:t>1</m:t>
    </m:r>
  </m:e>
  <m:e>
    <m:r>
      <m:t>2</m:t>
    </m:r>
  </m:e>
</m:mr>
<m:mr>
  <m:e>
    <m:r>
      <m:t>3</m:t>
    </m:r>
  </m:e>
  <m:e>
    <m:r>
      <m:t>4</m:t>
    </m:r>
  </m:e>
</m:mr>
</m:m>
```

Because the row spacing rule is set to 2, there is twice as much space between the matrix rows as usual.

end example]

Attributes	Description		
val (Value)	Specifies the type of spacing between rows and/or columns. Possible values are 0, 1, 2, 3, or 4, whose definitions are contained in the following table:		
	Value	Column/Row Gap	Example
	0	Single spacing gap (1 em)	1 2
	1	1.5 spacing gap (1.5 ems)	1 2
	2	2 spacing gap (2 ems)	1 2
	3	Exactly (for columns, rely on value of cGp, measured in twips) (for rows, rely on value of	1 2

Attributes	Description		
		rSp, measured in points)	
	4	Multiple (for columns, rely on value of cGp, measured in 0.5 em increments) (for rows, rely on value of rSp, measured in lines)	1 2
	The possible values for this attribute are defined by the ST_SpacingRule simple type (§22.1.3.11).		

[Note: The W3C XML Schema definition of this element’s content model ([CT_SpacingRule](#)) is located in §A.6.1.
end note]

22.1.2.94 scr (Script)

This element describes the script applied to the characters in the run. The XML includes the Unicode value of the character (between U+0000 and U+007F), along with the script of the character. The application maps the value and script type to the appropriate Unicode range.

Whether the element is absent or present without the val attribute, the default of the val attribute is roman.

[Example: aǎ

```
<m:r>
  <m:rPr>
    <m:scr m:val="fraktur"/>
    <m:sty m:val="p"/>
  </m:rPr>
  <m:t>a</m:t>
</m:r>
<m:r>
  <m:rPr>
    <m:scr m:val="double-struck"/>
    <m:sty m:val="p"/>
  </m:rPr>
  <m:t>a</m:t>
</m:r>
```

end example]

Attributes	Description
val (Value)	<p>Specifies the script type of the parent element. Possible values are: double-struck, fraktur, monospace, roman, sans-serif, and script.</p> <p>The possible values for this attribute are defined by the ST_Script simple type (§22.1.3.9).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_Script](#)) is located in §A.6.1. *end note*]

22.1.2.95 sepChr (Delimiter Separator Character)

This element specifies the character that separates base arguments e in the delimiter object d. If this element is omitted, the default sepChr is '|'. In other words, when the element is absent, the default is for the delimiter object separator character to be U+2502 (BOX DRAWINGS LIGHT VERTICAL).

When the element is present and the val attribute is absent, the default of the val attribute is empty which means the delimiter object separator character is absent.

[Example: Examples of d, each with a different sepChr, are: $(a_1|a_2)(a_1:a_2)(a_1;a_2)$. The following example sets COLON (:) as the separator character:

```
<m:dPr>
  <m:sepChr val="&#0058;" />
</m:dPr>
```

end example]

Attributes	Description
val (value)	<p>Specifies the character used by the parent element. When it is omitted, the parent uses its assigned default.</p> <p>[Example: Accent object ã:</p> <pre><m:accPr> <m:chr m:val="&#771;" /> </m:accPr></pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the ST_Char simple type (§22.1.3.3).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_Char](#)) is located in §A.6.1. *end note*]

22.1.2.96 show (Phantom Show)

This element specifies the show property of the phantom phant. When 0 or false, the phant base e is hidden. If this element is omitted, the base e is shown. Whether the element is absent or present without the val attribute, the default of the val attribute is 1 meaning that this property is applied.

[Example: In the following example, there is a phantom of the fraction a/b in the second radical such that only the height is preserved. The fraction does not show.

$$\sqrt{\frac{a}{b}} = \sqrt{x}$$

```
<m:phantPr>
  <m:show m:val="0"/>
  <m:zeroDesc m:val="1"/>
</m:phantPr>
```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model (CT_OnOff) is located in §A.6.1. end note]

22.1.2.97 shp (Shape (Delimiters))

This element specifies the shape of delimiters in the delimiter object d. Delimiters can be centered around the math axis of the mathematical text and still be made to fit the entire height of their contents (see right-hand example below), or their height and shape can be altered to exactly match their contents (see left-hand example below). These settings significantly impact the shape of the mathematical text. When this element is omitted, delimiters are 'centered'. Whether the element is absent or present without the val attribute, the default of the val attribute is centered. [Example: In the examples below, delimiters will be matched to the exact shape of their contents contents on the left, and will be centered on the right:

Match

Centered

$$a + b = \left(\frac{\frac{a}{b}}{\frac{z}{r} + \frac{42}{z + y}} \right)$$

<m:dPr>

<m:shp m:val="match"/>

</m:dPr>

$$a + b = \left(\frac{\frac{a}{b}}{\frac{z}{r} + \frac{42}{z + y}} \right)$$

<m:dPr>

<m:shp m:val="centered"/>

</m:dPr>

end example]

Attributes	Description
val (Value)	Specifies the shape of the parent element. Possible values are match and centered. The possible values for this attribute are defined by the ST_Shp simple type (§22.1.3.10).

[Note: The W3C XML Schema definition of this element’s content model (CT_Shp) is located in §A.6.1. end note]

22.1.2.98 smallFrac (Small Fraction)

This element specifies a reduced fraction size display math, such that the numerator and denominator are written in script size instead of at the size of regular text.

When the element is absent, the default value of the option is 0 meaning that this option is not applied.

When the element is present and the val attribute is absent, the default of the val attribute is 1 meaning that this option is applied.

[Example: The XML containing this element in use is:

```
<m:mathPr>
  <m:mathFont m:val="Cambria Math"/>
  <m:brkBin m:val="before"/>
  <m:brkBinSub m:val="--"/>
  <m:smallFrac m:val="0"/>
  <m:dispDef/>
  <m:lMargin m:val="0"/>
  <m:rMargin m:val="0"/>
  <m:defJc m:val="centerGroup"/>
  <m:wrapIndent m:val="1440"/>
  <m:intLim m:val="subSup"/>
  <m:naryLim m:val="undOvr"/>
</m:mathPr>
```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model (CT_OnOff) is located in §A.6.1. *end note]*

22.1.2.99 **sPre (Pre-Sub-Superscript Object)**

This element specifies the Pre-Sub-Superscript object, which consists of a base e and a subscript and superscript placed to the left of the base, as in $\frac{2}{1}A$. [Example: The XML that specifies this function is:

```
<m:sPre>
  <m:sub>
    <m:r>
      <m:t>1</m:t>
    </m:r>
  </m:sub>
  <m:sup>
    <m:r>
      <m:t>2</m:t>
    </m:r>
  </m:sup>
  <m:e>
    <m:r>
      <m:t>A</m:t>
    </m:r>
  </m:e>
</m:sPre>
```

end example]

[Note: The W3C XML Schema definition of this element’s content model (CT_SPre) is located in §A.6.1. *end note]*

22.1.2.100 **sPrePr (Pre-Sub-Superscript Properties)**

This element specifies properties such as ctrlPr that can be stored on the Pre-Sub-Superscript object sPre.

[Example:

a_1^2 is represented by the following XML:

```
<m:sPre>
  <m:sPrePr/>
  <m:sub>
    <m:r>
      <m:t>1</m:t>
    </m:r>
  </m:sub>
  <m:sup>
    <m:r>
      <m:t>2</m:t>
    </m:r>
  </m:sup>
  <m:e>
    <m:r>
      <m:t>a</m:t>
    </m:r>
  </m:e>
</m:sPre>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_SPrePr](#)) is located in §A.6.1. end note]

22.1.2.101 sSub (Subscript Object)

This element specifies the subscript object sSub, which consists of a base e and a reduced-size scr placed below and to the right, as in x_n . [Example: The XML that specifies this object is:

```
<m:sSub>
  <m:e>
    <m:r>
      <m:t>x</m:t>
    </r>
  </m:e>
  <m:sub>
    <m:r>
      <m:t>n</m:t>
    </r>
  </m:sub>
</m:sSub>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SSub](#)) is located in §A.6.1. *end note*]

22.1.2.102 sSubPr (Subscript Properties)

This element specifies properties such as ctrlPr that can be stored on the Subscript object sSub.

[*Example:*

a_2 is represented by the following XML:

```
<m:sSub>
  <m:sSubPr/>
  <m:e>
    <m:r>
      <m:t>a</m:t>
    </m:r>
  </m:e>
  <m:sub>
    <m:r>
      <m:t>2</m:t>
    </m:r>
  </m:sub>
</m:sSub>
```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SSubPr](#)) is located in §A.6.1. *end note*]

22.1.2.103 sSubSup (Sub-Superscript Object)

This element specifies the sub-superscript object, which consists of a base e, a reduced-size scr placed below and to the right, and a reduced-size scr placed above and to the right, as in x_m^n .

[*Example:* The XML that specifies this function is:

```
<m:sSubSup>
  <m:e>
    <m:r>
      <m:t>x</m:t>
    </r>
  </m:e>
```

```

<m:sub>
  <m:r>
    <m:t>m</m:t>
  </r>
</m:sub>
<m:sup>
  <m:r>
    <m:t>n</m:t>
  </r>
</m:sup>
</m:sSubSup>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_sSubSup](#)) is located in §A.6.1. *end note*]

22.1.2.104 sSubSupPr (Sub-Superscript Properties)

This element specifies properties of the Sub-Superscript object, including the alignment of scripts.

[*Example:*

f_{100}^{200} is represented by the following XML:

```

<m:sSubSup>
  <m:sSubSupPr>
    <m:alnScr m:val="1"/>
  </m:sSubSupPr>
  <m:e>
    <m:r>
      <m:t>f</m:t>
    </m:r>
  </m:e>
  <m:sub>
    <m:r>
      <m:t>100</m:t>
    </m:r>
  </m:sub>
  <m:sup>
    <m:r>
      <m:t>200</m:t>
    </m:r>
  </m:sup>
</m:sSubSup>

```


end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_SSubSupPr](#)) is located in §A.6.1. *end note]*

22.1.2.105 sSup (Superscript Object)

This element specifies the superscript object sSup, which consists of a base e and a reduced-size scr placed above and to the right, as in x^n . [Example: The XML that specifies this object is:

```
<m:sSup>
  <m:e>
    <m:r>
      <m:t>x</m:t>
    </r>
  </m:e>
  <m:sup>
    <m:r>
      <m:t>n</m:t>
    </r>
  </m:sup>
</m:sSup>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_SSup](#)) is located in §A.6.1. *end note]*

22.1.2.106 sSupPr (Superscript Properties)

This element specifies properties such as ctrlPr that can be stored on the Superscript object sSup.

[Example:

a^2 is represented by the following XML:

```
<m:sSup>
  <m:sSupPr/>
  <m:e>
    <m:r>
      <m:t>a</m:t>
    </m:r>
  </m:e>
  <m:sup>
    <m:r>
      <m:t>2</m:t>
    </m:r>
  </m:sup>
```

</m:sSup>end example]

[Note: The W3C XML Schema definition of this element’s content model ([CT_SSupPr](#)) is located in §A.6.1. end note]

22.1.2.107 **strikeBLTR (Border Box Strikethrough Bottom-Left to Top-Right)**

This element specifies the hidden or shown state of a strikethrough diagonal line from the bottom-left corner to the top-right corner of borderBox. When this element is omitted, the strikethrough is not drawn. In other words, when the element is absent, the default value of the property is 0 meaning that this property is not applied. When the element is present and the val attribute is absent, the default of the val attribute is 1 meaning that this property is applied. When applied, a strikethrough is drawn, as in ~~abc~~. [Example:

```
<m:borderBox>
  <m:borderBoxPr>
    <m:hideTop   m:val="1"/>
    <m:hideBot   m:val="1"/>
    <m:hideLeft  m:val="1"/>
    <m:hideRight m:val="1"/>
    <m:strikeBLTR m:val="1"/>
  </m:borderBoxPr>
  <m:e>
    <m:r>
      <m:t>abc</m:t>
    </m:r>
  </m:e>
</m:borderBox>
```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_OnOff](#)) is located in §A.6.1. end note]

22.1.2.108 **strikeH (Border Box Strikethrough Horizontal)**

This element specifies the hidden or shown state of a strikethrough horizontal line in borderBox. When this element is omitted, the strikethrough is not drawn. In other words, when the element is absent, the default value of the property is 0 meaning that this property is not applied. When the element is present and the val attribute is absent, the default of the val attribute is 1 meaning that this property is applied. When on, a horizontal strikethrough is drawn, as in ~~abc~~. [Example:

```
<m:borderBox>
  <m:borderBoxPr>
    <m:hideTop m:val="1"/>
    <m:hideBot m:val="1"/>
    <m:hideLeft m:val="1"/>
    <m:hideRight m:val="1"/>
    <m:strikeH m:val="1"/>
  </m:borderBoxPr>
<m:e>
  <m:r>
    <m:t>abc</m:t>
  </m:r>
</m:e>
</m:borderBox>
```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model (CT_OnOff) is located in §A.6.1. end note]

22.1.2.109 **strikeTLBR (Border Box Strikethrough Top-Left to Bottom-Right)**

This element specifies the hidden or shown state of a strikethrough diagonal line from the top-left corner to the bottom-right corner of borderBox. When this element is omitted, the strikethrough is not drawn. In other words, when the element is absent, the default value of the property is 0 meaning that this property is not

applied. When the element is present and the val attribute is absent, the default of the val attribute is 1 meaning that this property is applied. When applied, a strikethrough is drawn, as in ~~abc~~. [Example:

```
<m:borderBox>
  <m:borderBoxPr>
    <m:hideTop m:val="1"/>
    <m:hideBot m:val="1"/>
    <m:hideLeft m:val="1"/>
    <m:hideRight m:val="1"/>
    <m:strikeTLBR m:val="1"/>
  </m:borderBoxPr>
<m:e>
  <m:r>
    <m:t>abc</m:t>
  </m:r>
</m:e>
</m:borderBox>
```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model (CT_OnOff) is located in §A.6.1. end note]

22.1.2.110 strikeV (Border Box Strikethrough Vertical)

This element specifies the hidden or shown state of a strikethrough vertical line in borderBox. When this element is omitted, the strikethrough is not drawn. In other words, when the element is absent, the default value of the property is 0 meaning that this property is not applied. When the element is present and the val attribute is absent, the default of the val attribute is 1 meaning that this property is applied. When applied, a strikethrough is drawn, as in q. [Example:

```
<m:borderBox>
  <m:borderBoxPr>
    <m:strikeV m:val="1"/>
  </m:borderBoxPr>
  <m:e>
    <m:r>
      <m:t>abc</m:t>
    </m:r>
  </m:e>
</m:borderBox>
```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_OnOff](#)) is located in §A.6.1. *end note*]

22.1.2.111 sty (style)

This element describes the script applied to the characters in the run. The XML includes the Unicode value of the character along with the style of the character. The application maps the value and style to the appropriate Unicode range. Whether the element is absent or present without the val attribute, the default of the val attribute is i.

[Example: ***ab***

```
<m:oMath>
  <m:r>
    <m:rPr>
      <m:scr m:val="roman"/>
      <m:sty m:val="b"/>
    </m:rPr>
    <m:t>ab</m:t>
  </m:r>
</m:oMath>
```

end example]

Attributes	Description
val (Value)	Specifies the style of the parent element. Possible values are b (bold), i (italic), bi (bold-italic), and p (plain). The possible values for this attribute are defined by the ST_Style simple type (§22.1.3.12).

[Note: The W3C XML Schema definition of this element’s content model ([CT_Style](#)) is located in §A.6.1. *end note*]

22.1.2.112 **sub (Subscript (Pre-Sub-Superscript))**

This element specifies the subscript of the Pre-Sub-Superscript object sPre. [Example: For example, the sub in the object ${}_1^2A$ is 1. An example of this element in use is:

```
<m:sPre>
  <m:sub>
    <m:r>
      <m:t>1</m:t>
    </m:r>
  </m:sub>
  <m:sup>
    <m:r>
      <m:t>2</m:t>
    </m:r>
  </m:sup>
  <m:e>
    <m:r>
      <m:t>A</m:t>
    </m:r>
  </m:e>
</m:sPre>
```

end example]

[Note: The W3C XML Schema definition of this element’s content model ([CT_OMathArg](#)) is located in §A.6.1. *end note*]

22.1.2.113 **subHide (Hide Subscript (n-ary))**

This element specifies the n-ary Hide Subscript property. When 1 or true, the lower limit does not appear, as in $\int^{\infty} \frac{x}{x+1} dx$. If this element is omitted, the lower limit appears.

When this element is omitted, the default is `false`. In other words, When the element is absent, the default value of the property is 0 meaning that this property is not applied.

When the element is present and the `val` attribute is absent, the default of the `val` attribute is 1 meaning that this property is applied.

[Example: An example of this element in use is:

```
<m:naryPr>
  <m:chr m:val="&#8747;" />
  <m:subHide m:val="1" />
</m:naryPr>
```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or <code>true</code> specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or <code>false</code> specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the <code>ST_OnOff</code> simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model (`CT_OnOff`) is located in §A.6.1. end note]

22.1.2.114 sup (Superscript (Superscript object))

This element specifies the superscript of the superscript object `sSup`. For example, the `sup` in the superscript object x^n is n . [Example: An example of this element in use is:

```
<m:sSup>
  <m:e>
    <m:r>
      <m:t>x</m:t>
    </m:r>
  </m:e>
```

```
<m:sup>
  <m:r>
    <m:t>n</m:t>
  </m:r>
</m:sup>
</m:sSup>
```

end example]

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_OMathArg](#)) is located in §A.6.1. *end note]*

22.1.2.115 **supHide (Hide Superscript (n-ary))**

This element specifies the n-ary Hide Superscript property. When 1 or true, the upper limit does not appear, as in $\int_0^x \frac{x}{x+1} dx$. If this element is omitted, the lower limit appears.

When this element is omitted, the default is false. In other words, when the element is absent, the default value of the property is 0 meaning that this property is not applied.

When the element is present and the val attribute is absent, the default of the val attribute is 1 meaning that this property is applied.

[*Example:* An example of this element in use is:

```
<m:naryPr>
  <m:chr m:val="&#8747;" />
  <m:supHide m:val="1" />
</m:naryPr>
```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_OnOff](#)) is located in §A.6.1. *end note]*

22.1.2.116 `t` (Text)

This element specifies the text in a math run `r`.

[*Example:*

$J + K + a + j$ is represented by the following XML:

```
<m:oMath>
  <m:e>
    <m:r>
      <m:t>J+K+a+j</m:t>
    </m:r>
  </m:e>
</m:oMath>
```

end example]

Attributes	Description
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	<p>Specifies how white space should be handled for the contents of this element using the W3C space preservation rules. [<i>Example:</i> Consider the following run contained within a WordprocessingML document:</p> <pre><w:r> <w:t> significant whitespace </w:t> </w:r></pre> <p>Although there are three spaces on each side of the text content in the run, that whitespace has not been specifically marked as significant, therefore it is subject to the space preservation rules currently specified in that run's scope. <i>end example]</i></p> <p>The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.</p>

[*Note:* The W3C XML Schema definition of this element's content model (`CT_Text`) is located in §A.6.1. *end note]*

22.1.2.117 `transp` (Transparent (Phantom))

This element specifies that the phantom is transparent for spacing. This means that if the contents of the phantom are belonging to a special spacing class (such as binary operators, relational operators, differentials, etc.), the contents of that phantom are taken into consideration when laying out text. If transparency is turned off, then the contents of the phantom are ignored during layout. When this element is omitted, transparency is 0 or false. In other words, when the element is absent, the default value of the property is 0 meaning that this property is not applied.

When the element is present and the `val` attribute is absent, the default of the `val` attribute is 1 meaning that this property is applied.

In the following example, transparency is not applied on the phantom around the differential term.
 $\int x dx$. The spacing is incorrect. In the following integral, the only difference is that transparency is applied:
 $\int x \, dx$. Now the spacing is correct.

[Example: An example of this element in XML is:

```
<m:phantPr>  
  <m:zeroAsc m:val="1"/>  
  <m:zeroDesc m:val="1"/>  
  <m:transp m:val="1"/>  
</m:phantPr>
```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model (CT_OnOff) is located in §A.6.1. end note]

22.1.2.118 type (Fraction type)

This element specifies the type of fraction f; the default is 'bar'. Whether the element is absent or present without the val attribute, the default of the val attribute is bar. Fractions types are:

Stacked Fraction: $\frac{a}{b}$

Skewed Fraction: $\overset{a}{/}b$

Linear Fraction: a/b

Stack Object (No-Bar Fraction): $\overset{n}{k}$

[Example:

$\overset{c}{/}d$ is represented by the following XML:

```
<m:f>
```

```
<m:fPr>
  <m:type m:val="skw"/>
</m:fPr>
<m:num>
  <m:r>
    <m:t>c</m:t>
  </m:r>
</m:num>
<m:den>
  <m:r>
    <m:t>d</m:t>
  </m:r>
</m:den>
</m:f>
```

end example]

Attributes	Description
val (Value)	Specifies the type of fraction. Possible values are bar (Bar Fraction), lin (Linear Fraction), noBar (No-Bar Fraction (Stack)), and skw (Skewed). The possible values for this attribute are defined by the ST_FType simple type (§22.1.3.4).

[Note: The W3C XML Schema definition of this element’s content model ([CT_FType](#)) is located in §A.6.1. *end note*]

22.1.2.119 **vertJc (Vertical Justification)**

This element, combined with pos of groupChrPr, specifies the vertical layout of the groupChr object. Where pos specifies the position of the grouping character, vertJc specifies the alignment of the object with respect to the baseline. For example, when the group character is above the object, vertJc of top signifies that the top of the object falls on the baseline; when vertJc is set to bot, the bottom of the object is on the baseline. The table below demonstrates the four possible combinations of groupChr layout:

Pos	vertJc	Layout
top	top	$a \overset{\longleftarrow}{\text{bcd}} e$
top	bot	$a \overbrace{\text{bcd}} e$
bot	top	$a \underbrace{\text{bcd}} e$
bot	bot	$a \overset{yields}{\longrightarrow} b$

When the element is absent, the default value of the property is top.

When the element is present and the val attribute is absent, the default of the val attribute is bot.

[Example:

$a + \overset{b+c}{\underbrace{\hspace{1cm}}} + d$ is represented by the following XML:

```
<m:oMath>
  <m:r>
    <m:t>a+</m:t>
  </m:r>
  <m:groupChr>
    <m:groupChrPr>
      <m:vertJc m:val="bot"/>
    </m:groupChrPr>
    <m:e>
      <m:r>
        <m:t>b+c</m:t>
      </m:r>
    </m:e>
  </m:groupChr>
  <m:r>
    <m:t>+d</m:t>
  </m:r>
</m:oMath>
```

Since the vertical justification property is set to bot on the group-character object, the bottom of the group-character object is aligned with the baseline.

end example]

Attributes	Description
val (Value)	<p>Specifies the position of the parent element. Possible values are top and bot.</p> <p>[Example:</p> <pre><m:barPr> <m:pos m:val="top"/> </m:barPr></pre> <p>The possible values for this attribute are defined by the ST_TopBot simple type (§22.1.3.13).</p>

[Note: The W3C XML Schema definition of this element’s content model ([CT_TopBot](#)) is located in §A.6.1. *end note*]

22.1.2.120 [wrapIndent \(Wrap Indent\)](#)

This element specifies the indent of the wrapped line of an instance of mathematical text. The line or lines of a wrapped instance of mathematical text after the line break can either be indented by a specified amount from the left margin, or right aligned. The default indent is 1". In other words, whether the element is absent or present without the val attribute, the default of the val attribute is 1440 twips (or 1 inch).

[Example: The XML below demonstrates wrapIndent in use:

```
<m:mathPr>
  <m:mathFont m:val="Cambria Math"/>
  <m:brkBin m:val="before"/>
  <m:brkBinSub m:val="--"/>
  <m:smallFrac m:val="0"/>
  <m:dispDef/>
  <m:lMargin m:val="0"/>
  <m:rMargin m:val="0"/>
  <m:defJc m:val="centerGroup"/>
  <m:wrapIndent m:val="1440"/>
  <m:intLim m:val="subSup"/>
  <m:naryLim m:val="undOvr"/>
</m:mathPr>
```

end example]

Attributes	Description
val (Value)	Specifies the value, in twips, of the parent element. The possible values for this attribute are defined by the ST_TwipsMeasure simple type (§22.9.2.14).

[Note: The W3C XML Schema definition of this element’s content model ([CT_TwipsMeasure](#)) is located in §A.6.1. *end note*]

22.1.2.121 [wrapRight \(Wrap Right\)](#)

This element specifies the right justification of the wrapped line of an instance of mathematical text. The line or lines of a wrapped instance of mathematical text after the line break can either be indented by a specified amount from the left margin, or right aligned. If this element is present, the continuation is right aligned.

When the element is absent, the default value of the option is 0 meaning that this option is not applied.

When the element is present and the val attribute is absent, the default of the val attribute is 1 meaning that this option is applied.

[Example: An example of this element in use is:

```
<m:mathPr>
  <m:mathFont m:val="Cambria Math"/>
  <m:brkBin m:val="before"/>
  <m:brkBinSub m:val="--"/>
  <m:smallFrac m:val="0"/>
  <m:dispDef/>
  <m:lMargin m:val="0"/>
  <m:rMargin m:val="0"/>
  <m:defJc m:val="centerGroup"/>
  <m:wrapRight/>
  <m:intLim m:val="subSup"/>
  <m:naryLim m:val="undOvr"/>
</m:mathPr>
```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model (CT_OnOff) is located in §A.6.1. end note]

22.1.2.122 zeroAsc (Phantom Zero Ascent)

This element specifies that the phantom has zero ascent. The ascent of the contents of the phantom is not taken into account during layout. When this property is omitted, the phantom does have ascent (zero ascent is not applied).

When the element is absent, the default value of the property is 0 meaning that this property is not applied.

When the element is present and the val attribute is absent, the default of the val attribute is 1 meaning that this property is applied.

In the following example, the differential term is contained in a phantom that zero ascent. As a result, spacing is reduced between the tip of the "d" and the radical bar: $\sqrt{x}dx$. [Example:

```
<m:phantPr>
  <m:zeroAsc m:val="1"/>
</m:phantPr>
```

end example]

Attributes	Description
val (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or true specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or false specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the ST_OnOff simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_OnOff](#)) is located in §A.6.1. end note]

22.1.2.123 zeroDesc (Phantom Zero Descent)

This element specifies that the phantom has zero descent. The descent of the contents of the phantom is not taken into account during layout. When this property is omitted, the phantom does have descent (zero descent is not applied).

When the element is absent, the default value of the property is 0 meaning that this property is not applied.

When the element is present and the val attribute is absent, the default of the val attribute is 1 meaning that this property is applied.

[Example: In the following two examples, only the second has zero descent around the "y". Note that the radical is smaller than in the first case. $\sqrt{y}\sqrt{y}$

```
<m:phantPr>
  <m:zeroDesc m:val="1"/>
</m:phantPr>
```

end example]

Attributes	Description
val (value)	Specifies a binary value for the property defined by the parent XML element.

Attributes	Description
	<p>A value of 1 or <code>true</code> specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or <code>false</code> specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the <code>ST_OnOff</code> simple type (§22.9.2.7).</p>

[Note: The W3C XML Schema definition of this element’s content model (`CT_OnOff`) is located in §A.6.1. *end note*]

22.1.2.124 zeroWid (Phantom Zero Width)

This element specifies that the phantom has zero width. The width of the contents of the phantom is not taken into account during layout. When this property is omitted, the phantom does have width (zero width is not applied).

When the element is absent, the default value of the property is 0 meaning that this property is not applied.

When the element is present and the `val` attribute is absent, the default of the `val` attribute is 1 meaning that this property is applied.

[Example: In the following example, the second radical contains a phantom of the fraction a/b . The phantom has zero width, such that only the height grows to accommodate the hidden fraction: $\sqrt{\frac{a}{b}} = \sqrt{x}$

```
<m:phantPr>
  <m:show m:val="0"/>
  <m:zeroDesc m:val="1"/>
</m:phantPr>
```

end example

Attributes	Description
<code>val</code> (value)	<p>Specifies a binary value for the property defined by the parent XML element.</p> <p>A value of 1 or <code>true</code> specifies that the property shall be explicitly applied. This is the default value for this attribute, and is implied when the parent element is present.</p> <p>A value of 0 or <code>false</code> specifies that the property shall be explicitly turned off. This is implied when the parent element is not present.</p> <p>The possible values for this attribute are defined by the <code>ST_OnOff</code> simple type (§22.9.2.7).</p>

[*Note: The W3C XML Schema definition of this element's content model ([CT_OnOff](#)) is located in §A.6.1. end note*]

22.1.3 Simple Types

This is the complete list of simple types dedicated to Math.

22.1.3.1 ST_BreakBin (Break Binary Operators)

This defines how to represent binary operators with respect to a line-wrapping break. The line can wrap before the operator or after the operator; alternately, the operator can appear both at the end of the first line and the beginning of the second.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
after (After)	When line-wrapping breaks occur on binary operators, the binary operator appears after the break (at the start of the next line).
before (Before)	When line-wrapping breaks occur on binary operators, the binary operator appears before the break (at the end of the first line).
repeat (Repeat)	When line-wrapping breaks occur on binary operators, the binary operator appears on both sides of the break (at the end of the first line and the start of the next line).

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_BreakBin](#)) is located in §A.6.1. end note*]

22.1.3.2 ST_BreakBinSub (Break on Binary Subtraction)

This simple type specifies how to represent subtraction on both sides of a line-wrapping break, when the Break Binary Operators option is set to repeat. The first character represents the sign at the end of the line with the break; the second represents the sign at the start of the wrapped line. Options are --, -+, and +-.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
+ - (Plus Minus)	Repetition of subtraction sign after a line-wrapping break is plus on the first line and minus on the second line.

Enumeration Value	Description
--+ (Minus Plus)	Repetition of subtraction sign after a line-wrapping break is minus on the first line and plus on the second line.
-- (Minus Minus)	Repetition of subtraction sign after a line-wrapping break is minus on the first and second lines.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_BreakBinSub](#)) is located in §A.6.1. *end note*]

22.1.3.3 ST_Char (Character)

This Simple Type specifies the single character used by the parent element.

[*Example:* In the following example, {*a*} uses { and } as its enclosing characters, instead of the default (and).

```
<m:dPr>
  <m:begChr m:val="{"/>
  <m:endChr m:val="}"/>
</m:dPr>
```

end example]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type also specifies the following restrictions:

- This simple type's contents have a maximum length of 1 characters.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_Char](#)) is located in §A.6.1. *end note*]

22.1.3.4 ST_FType (Fraction Type)

Fractions can be of type bar (horizontal fraction bar), skewed ("skw" - diagonal fraction bar with kerned and vertically adjusted numerator and denominator), linear ("lin" - diagonal fraction bar, takes up exactly one line of space), and the "stack" object ("noBar").

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
bar (Bar Fraction)	Fraction with a horizontal fraction bar.
lin (Linear Fraction)	Fraction with slanted fraction bar, that takes up no

Enumeration Value	Description
	additional vertical space.
noBar (No-Bar Fraction (Stack))	Stack object, which looks like a fraction with no fraction bar.
skw (Skewed)	Fraction with diagonal fraction bar.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_FType](#)) is located in §A.6.1. *end note*]

22.1.3.5 [ST_Integer2 \(Integer value \(-2 to 2\)\)](#)

This simple type contains a value from (-2,+2) which specifies the size of the argument. The effects of each value are described by the referencing element.

This simple type's contents are a restriction of the W3C XML Schema integer datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to -2.
- This simple type has a maximum value of less than or equal to 2.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_Integer2](#)) is located in §A.6.1. *end note*]

22.1.3.6 [ST_Integer255 \(Integer value \(1 to 255\)\)](#)

This simple type specifies an integer value. The semantics of each value are discussed by the referencing element.

This simple type's contents are a restriction of the W3C XML Schema integer datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 1.
- This simple type has a maximum value of less than or equal to 255.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_Integer255](#)) is located in §A.6.1. *end note*]

22.1.3.7 [ST_Jc \(Justification\)](#)

This Simple Type specifies the justification of Math Paragraphs. Justification of the Math Paragraph can be Left, Right, Centered, or Centered as Group.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
center (Center (Text))	Centers each instance of mathematical text individually with respect to margins.
centerGroup (Centered as Group (Text))	Justifies instances of mathematical text with respect to each other, and centers the group of mathematical text (the Math Paragraph) with respect to the page.
left (Left Justification)	Left justification of Math Paragraph
right (Right)	Right Justification of Math Paragraph

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Jc](#)) is located in §A.6.1. *end note*]

22.1.3.8 [ST_LimLoc \(Limit Location\)](#)

Limits can be in one of two positions: Under-Over (undOvr - above and below the base), and Subscript-Superscript (subSup - positioned to the side of the base, in the position of subscripts and superscripts).

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
subSup (Subscript-Superscript location)	Limits placed to the side of the base, as opposed to directly over and under.
undOvr (Under-Over location)	Limits placed to the directly above and below the base, as opposed to on the side.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_LimLoc](#)) is located in §A.6.1. *end note*]

22.1.3.9 [ST_Script \(Script\)](#)

Script can be of type Roman, Script, Fraktur, Double-Struck, Sans-Serif, or Monospace.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
double-struck (double-struck)	Double-Struck Script Type
fraktur (Fraktur)	Fraktur Script Type
monospace (Monospace)	Monospace Script Type

Enumeration Value	Description
roman (Roman)	Roman Script Type
sans-serif (Sans-Serif)	Sans-Serif Script Type
script (Script)	Script Type

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_Script](#)) is located in §A.6.1. *end note*]

22.1.3.10 ST_Shp (Shape (Delimiters))

Delimiters shape can be centered around the argument, or matched to the shape of the argument.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
centered (Centered (Delimiters))	Delimiters are centered around their argument.
match (Match)	Match shape of contents of delimiters.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_Shp](#)) is located in §A.6.1. *end note*]

22.1.3.11 ST_SpacingRule (Spacing Rule)

Integer value (0 to 4), representing the type of spacing between rows.

This simple type's contents are a restriction of the W3C XML Schema integer datatype.

This simple type also specifies the following restrictions:

- This simple type has a minimum value of greater than or equal to 0.
- This simple type has a maximum value of less than or equal to 4.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_SpacingRule](#)) is located in §A.6.1. *end note*]

22.1.3.12 ST_Style (Style)

Style of math can be plain, bold, italic, or bold-italic (p, bi, i, or bi).

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
b (Bold)	Bold
bi (Bold-Italic)	Bold-Italic
i (Italic)	Italic
p (Plain)	Plain

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Style](#)) is located in §A.6.1. *end note*]

22.1.3.13 ST_TopBot (Top-Bottom)

Possible values are top and bot.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
bot (Bottom Alignment)	Aligns the bottom of the object to the baseline of the surrounding text.
top (Top)	Aligns the top row of the object to the baseline of the surrounding text.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_TopBot](#)) is located in §A.6.1. *end note*]

22.1.3.14 ST_UnSignedInteger (Unsigned integer.)

Unsigned Integer

This simple type's contents are a restriction of the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_UnSignedInteger](#)) is located in §A.6.1. *end note*]

22.2 Extended Properties

Extended properties are a predefined set of metadata properties that are applicable to Office Open XML documents. These properties extend the set of core properties defined in Part 2: "Open Packaging Conventions" which are common to all packages.

Extended properties are stored within an Extended File Properties part with:

- Source Relationship: <http://purl.oclc.org/ooxml/officeDocument/relationships/extendedProperties>

- Content Type: application/vnd.openxmlformats-officedocument.extended-properties+xml

Each extended property is represented as an element in the extended properties part. Extended properties elements are non-repeatable and can be empty or omitted. If all extended property elements are omitted then the extended properties part can be excluded from a document.

[Example: A sample extended file properties part:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes"?>
<Properties xmlns="http://.../extended-properties"
  xmlns:vt="http://.../docPropsVTypes">
  ..<Template>Sales Report.dotm</Template>
  ..<TotalTime>0</TotalTime>
  ..<Pages>1</Pages>
  ..<Words>166</Words>
  ..<Characters>948</Characters>
  ..<Application>Microsoft Office Word</Application>
  ..<DocSecurity>0</DocSecurity>
  ..<Lines>7</Lines>
  ..<Paragraphs>2</Paragraphs>
  ..<ScaleCrop>>false</ScaleCrop>
  ..<Company>Northwind Traders</Company>
  ..<LinksUpToDate>>false</LinksUpToDate>
  ..<CharactersWithSpaces>1112</CharactersWithSpaces>
  ..<SharedDoc>>false</SharedDoc>
  ..<HyperlinksChanged>>false</HyperlinksChanged>
  ..<AppVersion>12.0000</AppVersion>
</Properties>
```

end example]

22.2.1 Table of Contents

This subclause is informative.

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End of informative text.

22.2.2 Elements

The following elements specify the contents of this namespace:

22.2.2.1 Application (Application Name)

This element specifies the name of the application that created this document.

The possible values for this element are defined by the W3C XML Schema string datatype.

22.2.2.2 AppVersion (Application Version)

This element specifies the version of the application which produced this document.

The content of this element shall be of the form XX.YYYY where X and Y represent numerical values, or the document shall be considered non-conformant.

[Note: The contents of this element do not represent absolute values, but rather qualify the contents of the Application element to differentiate between different versions of the same producer. Applications should use this information in an informative manner only (as document metadata). *end note*]

The possible values for this element are defined by the W3C XML Schema string datatype.

22.2.2.3 Characters (Total Number of Characters)

This element specifies the total number of characters in a document.

The possible values for this element are defined by the W3C XML Schema int datatype.

22.2.2.4 CharactersWithSpaces (Number of Characters (With Spaces))

This element specifies the last count of the number of characters (including spaces) in this document.

The possible values for this element are defined by the W3C XML Schema int datatype.

22.2.2.5 Company (Name of Company)

This element specifies the name of a company associated with the document.

The possible values for this element are defined by the W3C XML Schema string datatype.

22.2.2.6 DigSig (Digital Signature)

This element contains the signature of a digitally signed document.

[*Note:* This property is a mechanism used by legacy documents to store the digital signature of its binary representation, and should be avoided in favor of the well-defined mechanism defined in Part 2. Any use of this property should be for legacy compatibility only, and is application-defined. *end note*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DigSigBlob](#)) is located in §A.6.2. *end note*]

22.2.2.7 DocSecurity (Document Security)

This metadata element specifies the security level of a document as a numeric value. Document security is defined as:

DocSecurity	Security Level
1	Document is password protected.
2	Document is recommended to be opened as read-only.
4	Document is enforced to be opened as read-only.
8	Document is locked for annotation.

The possible values for this element are defined by the W3C XML Schema int datatype.

22.2.2.8 HeadingPairs (Heading Pairs)

Heading pairs indicates the grouping of document parts and the number of parts in each group. These parts are not document parts but conceptual representations of document sections.

[*Example:* A presentation composing of three slides with an applied theme can have the following HeadingPairs representation:

```

<HeadingPairs>
  <vt:vector size="4" baseType="variant">
    <vt:variant>
      <vt:lpstr>Theme</vt:lpstr>
    </vt:variant>
    <vt:variant>
      <vt:i4>1</vt:i4>
    </vt:variant>
    <vt:variant>
      <vt:lpstr>Slide Titles</vt:lpstr>
    </vt:variant>
    <vt:variant>
      <vt:i4>3</vt:i4>
    </vt:variant>
  </vt:vector>
</HeadingPairs>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_VectorVariant](#)) is located in §A.6.2.
end note]

22.2.2.9 HiddenSlides (Number of Hidden Slides)

This element specifies the number of hidden slides in a presentation document.

The possible values for this element are defined by the W3C XML Schema int datatype.

22.2.2.10 HLinks (Hyperlink List)

This element specifies the set of hyperlinks that were in this document when last saved.

[*Note:* The W3C XML Schema definition of this element's content model ([CT_VectorVariant](#)) is located in §A.6.2.
end note]

22.2.2.11 HyperlinkBase (Relative Hyperlink Base)

This element specifies the base string used for evaluating relative hyperlinks in this document.

The possible values for this element are defined by the W3C XML Schema string datatype.

22.2.2.12 HyperlinksChanged (Hyperlinks Changed)

This element specifies that one or more hyperlinks in this part were updated exclusively in this part by a producer. The next producer to open this document shall update the hyperlink relationships with the new hyperlinks specified in this part.

The possible values for this element are defined by the W3C XML Schema boolean datatype.

22.2.2.13 Lines (Number of Lines)

This element specifies the total number of lines in a document when last saved by a conforming producer if applicable.

The possible values for this element are defined by the W3C XML Schema int datatype.

22.2.2.14 LinksUpToDate (Links Up-to-Date)

This element indicates whether hyperlinks in a document are up-to-date. Set this element to TRUE to indicate that hyperlinks are updated. Set this element to FALSE to indicate that hyperlinks are outdated.

The possible values for this element are defined by the W3C XML Schema boolean datatype.

22.2.2.15 Manager (Name of Manager)

This element specifies the name of a supervisor associated with the document.

The possible values for this element are defined by the W3C XML Schema string datatype.

22.2.2.16 MMClips (Total Number of Multimedia Clips)

This element specifies the total number of sound or video clips that are present in the document.

The possible values for this element are defined by the W3C XML Schema int datatype.

22.2.2.17 Notes (Number of Slides Containing Notes)

This element specifies the number of slides in a presentation containing notes.

The possible values for this element are defined by the W3C XML Schema int datatype.

22.2.2.18 Pages (Total Number of Pages)

This element specifies the total number of pages of a document if applicable.

The possible values for this element are defined by the W3C XML Schema int datatype.

22.2.2.19 Paragraphs (Total Number of Paragraphs)

This element specifies the total number of paragraphs found in a document if applicable.

The possible values for this element are defined by the W3C XML Schema int datatype.

22.2.2.20 PresentationFormat (Intended Format of Presentation)

This element specifies the intended format for a presentation document. For example, a presentation intended to be shown on video has PresentationFormat "Video".

The possible values for this element are defined by the W3C XML Schema string datatype.

22.2.2.21 Properties (Application Specific File Properties)

This element specifies the application properties of a document. For properties of type string, NCR escape format (`_xHHHH_`) is used for any invalid XML characters.

[*Note*: The W3C XML Schema definition of this element's content model ([CT_Properties](#)) is located in §A.6.2. *end note*]

22.2.2.22 ScaleCrop (Thumbnail Display Mode)

This element indicates the display mode of the document thumbnail. Set this element to TRUE to enable scaling of the document thumbnail to the display. Set this element to FALSE to enable cropping of the document thumbnail to show only sections that fits the display.

The possible values for this element are defined by the W3C XML Schema boolean datatype.

22.2.2.23 SharedDoc (Shared Document)

This element indicates if this document is currently shared between multiple producers. If this element is set to TRUE, producers should take care when updating the document.

The possible values for this element are defined by the W3C XML Schema boolean datatype.

22.2.2.24 Slides (Slides Metadata Element)

This element specifies the total number of slides in a presentation document.

The possible values for this element are defined by the W3C XML Schema int datatype.

22.2.2.25 Template (Name of Document Template)

This element specifies the name of an external document template containing format and style information used to create the current document.

The possible values for this element are defined by the W3C XML Schema string datatype.

22.2.2.26 TitlesOfParts (Part Titles)

This element specifies the title of each document. These parts are not document parts but conceptual representations of document sections.

[*Example*: A presentation composing of three slides with an applied theme "Currency" can have the following TitlesOfParts representation:

```

<TitlesofParts>
  <vt:vector size="4" baseType="lpstr">
    <vt:lpstr>Currency</vt:lpstr>
    <vt:lpstr>Slide 1</vt:lpstr>
    <vt:lpstr>Slide 2</vt:lpstr>
    <vt:lpstr>Slide 3</vt:lpstr>
  </vt:vector>
</TitlesofParts>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_VectorLpstr](#)) is located in §A.6.2.
end note]

22.2.2.27 TotalTime (Total Edit Time Metadata Element)

Total time that a document has been edited. The default time unit is minutes.

The possible values for this element are defined by the W3C XML Schema int datatype.

22.2.2.28 Words (Word Count)

This element specifies the total number of words contained in a document when last saved.

The possible values for this element are defined by the W3C XML Schema int datatype.

22.3 Custom Properties

Custom properties enable users to define custom metadata properties through a set of well-defined data types.

Custom properties are represented by property elements (§22.3.2.2) stored in the Custom File Properties part with:

- Source Relationship: <http://purl.oclc.org/ooxml/officeDocument/relationships/customProperties>
- Content Type: `application/vnd.openxmlformats-officedocument.custom-properties+xml`

Custom property elements are non-repeatable and can be empty or omitted. If all custom property elements are omitted then the custom properties part can be excluded from a document.

The type and value of custom properties are specified by child XML elements in the File Properties Variant Types namespace (discussed in detail in §22.4). User defined properties are uniquely identified through the name attribute of the property element. Custom properties can be associated with OLE document properties through the fmtid and pid attributes.

[*Example:* A custom OLE Editor property of type string can be defined as follows:

```
<property fmtid="{D5CDD505-2E9C-101B-9397-08002B2CF9AE}" pid="2"
  name="Editor">
  <vt:lpwstr>John Smith</vt:lpwstr>
</property>
```

end example]

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This subclause is informative.

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End of informative text.

22.3.2 Elements

This subclause specifies the set of elements that define this namespace:

22.3.2.1 Properties (Custom File Properties)

Parent element for the custom file properties part.

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_Properties](#)) is located in §A.6.3. *end note*]

22.3.2.2 property (Custom File Property)

This element specifies a single custom file property. Custom file property type is defined through child elements in the File Properties Variant Type namespace. Custom file property value can be set by setting the appropriate Variant Type child element value.

Attributes	Description
fmtid (Format ID)	Uniquely relates a custom property with an OLE property. The value of this attribute is a Globally Unique Identifier in the form of {HHHHHHHH-HHHH-HHHH-HHHH-HHHHHHHH} where each H is a hexadecimal. The possible values for this attribute are defined by the ST_Guid simple type (§22.9.2.4).
linkTarget (Bookmark Link Target)	Specifies the name of a bookmark in the current document (for WordprocessingML), or a table or named cell (for SpreadsheetML) from which the value of this custom document property should be extracted. If this attribute is present, then any value under this element shall be considered a cache and replaced with the value of this bookmark (if present) on save. If the bookmark is not present, then this link shall be considered broken and the cached value shall be retained.

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema string datatype.
name (Custom File Property Name)	Specifies the name of this custom file property. The possible values for this attribute are defined by the W3C XML Schema string datatype.
pid (Property ID)	Uniquely relates a custom property with an OLE property. The possible values for this attribute are defined by the W3C XML Schema int datatype.

[Note: The W3C XML Schema definition of this element’s content model (CT_Property) is located in §A.6.3. *end note*]

22.4 Variant Types

This subclause specifies the set of data types which can be included within file properties that accept variant type structures.

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End of informative text.

22.4.2 Elements

The following elements define the contents of this namespace:

22.4.2.1 array (Array)

The array element defines the array variant type. Array contents shall be of uniform type as specified by the `baseType` attribute. The contents of an array are defined using repeated child elements of the appropriate variant type.

Multi-dimensional arrays can be defined by specifying the length of each dimension in the `lBound` and `uBound` attributes through the use of the `"`,`"` delimiter. Child elements of multi-dimensional arrays are indexed along each dimension in the order the dimensions are declared.

In other words, the array shall be filled as follows:

- The first index shall be incremented to its maximum value [*Example: [0,0,0] to [max,0,0] end example*]
- The second index shall be incremented to its maximum value [*Example: [0,1,0] to [0,max,0] end example*]
- Subsequent indices shall be filled until all provided values have been added
- All other values shall have null values within the array (i.e. no default value shall be assumed).

[*Example: A 2x3 variant type array of type "i4" is specified as follows:*


```

<vt:array lBounds="0,0" uBounds="1,2" baseType="i4">
  <vt:i4>0</vt:i4>
  <vt:i4>1</vt:i4>
  <vt:i4>2</vt:i4>
  <vt:i4>3</vt:i4>
  <vt:i4>4</vt:i4>
</vt:array>

```

The resulting array: [0,0] = 0, [1,0] = 1, [0,1] = 2, [1,1] = 3, [0,2] = 4. *end example*

Attributes	Description
baseType (Array Base Type)	<p>The baseType attribute specifies the base variant type of an array.</p> <p>The allowed values are: variant, i1, i2, i4, int, ui1, ui2, ui4, uint, r4, r8, decimal, bstr, date, bool, cy, and error.</p> <p>The possible values for this attribute are defined by the ST_ArrayBaseType simple type (§22.4.3.1).</p>
lBounds (Array Lower Bounds Attribute)	<p>The lBounds attribute specifies the lower bound of an array in the format: #, #, # ... # where each # represents an integer.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>
uBounds (Array Upper Bounds Attribute)	<p>The uBounds attribute specifies the upper bound of an array in the format: #, #, # ... # where each # represents an integer.</p> <p>The possible values for this attribute are defined by the W3C XML Schema int datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Array](#)) is located in §A.6.4. *end note*]

22.4.2.2 blob (Binary Blob)

This element specifies a base64 binary blob variant type.

This type is defined as follows: a DWORD count of bytes, followed by that many bytes of data. The byte count does not include the four bytes for the length of the count itself; an empty blob member would have a count of zero, followed by zero bytes.

The possible values for this element are defined by the W3C XML Schema base64Binary datatype.

22.4.2.3 bool (Boolean)

This element specifies a Boolean variant type.

The possible values for this element are defined by the W3C XML Schema boolean datatype.

22.4.2.4 `bstr` (Basic String)

This element defines a binary basic string variant type, which can store any valid Unicode character. Unicode characters that cannot be directly represented in XML as defined by the XML 1.0 specification, shall be escaped using the Unicode numerical character representation escape character format `_xHHHH_`, where H represents a hexadecimal character in the character's value. [*Example: The Unicode character 8 is not permitted in an XML 1.0 document, so it shall be escaped as `_x0008_`. end example*] To store the literal form of an escape sequence, the initial underscore shall itself be escaped (i.e. stored as `_x005F_`). [*Example: The string literal `_x0008_` would be stored as `_x005F_x0008_`. end example*]

The possible values for this element are defined by the W3C XML Schema string datatype.

22.4.2.5 `clsid` (Class ID)

This element specifies a class ID variant type. The value shall be a Globally Unique Identifier with format: {HHHHHHHH-HHHH-HHHH-HHHH-HHHHHHHH}.

The possible values for this element are defined by the `ST_Guid` simple type (§22.9.2.4).

[*Note: The W3C XML Schema definition of this element's content model (`ST_Guid`) is located in §A.6.9. end note*]

22.4.2.6 `cy` (Currency)

This element specifies a currency variant type with exactly four digits after the decimal point.

The possible values for this element are defined by the `ST_Cy` simple type (§22.4.3.2).

[*Note: The W3C XML Schema definition of this element's content model (`ST_Cy`) is located in §A.6.4. end note*]

22.4.2.7 `date` (Date and Time)

This element specifies a date variant type of type date-time as defined in RFC 3339.

The possible values for this element are defined by the W3C XML Schema `dateTime` datatype.

22.4.2.8 `decimal` (Decimal)

This element specifies a decimal variant type.

The possible values for this element are defined by the W3C XML Schema decimal datatype.

22.4.2.9 `empty` (Empty)

This element specifies an empty variant type. No values or child elements are allowed.

[*Note: The W3C XML Schema definition of this element's content model (`CT_Empty`) is located in §A.6.4. end note*]

22.4.2.10 error (Error Status Code)

The error element specifies a 32-bit error status code variant type of the form 0xHHHHHHHH. Each H represents a hexadecimal digit.

The possible values for this element are defined by the ST_Error simple type (§22.4.3.3).

[Note: The W3C XML Schema definition of this element's content model (ST_Error) is located in §A.6.4. *end note*]

22.4.2.11 filetime (File Time)

This element specifies a file-time variant type of type date-time as defined in RFC 3339.

The possible values for this element are defined by the W3C XML Schema dateTime datatype.

22.4.2.12 i1 (1-Byte Signed Integer)

This element specifies a 1-byte signed integer variant type.

The possible values for this element are defined by the W3C XML Schema byte datatype.

22.4.2.13 i2 (2-Byte Signed Integer)

This element specifies a 2-byte signed integer variant type.

The possible values for this element are defined by the W3C XML Schema short datatype.

22.4.2.14 i4 (4-Byte Signed Integer)

This element specifies a 4-byte signed integer variant type.

The possible values for this element are defined by the W3C XML Schema int datatype.

22.4.2.15 i8 (8-Byte Signed Integer)

This element specifies a 8-byte signed integer variant type.

The possible values for this element are defined by the W3C XML Schema long datatype.

22.4.2.16 int (Integer)

This element specifies an integer variant type.

The possible values for this element are defined by the W3C XML Schema int datatype.

22.4.2.17 lpstr (LPSTR)

This element specifies a string variant type. For all characters that cannot be represented in XML as defined by the XML 1.0 specification, the characters are escaped using the Unicode numerical character representation escape character format `_xHHHH_`, where H represents a hexadecimal character in the character's value.

[*Example:* The Unicode character 8 is not permitted in an XML 1.0 document, so it must be escaped as `_x0008_`.
end example]

The possible values for this element are defined by the W3C XML Schema string datatype.

22.4.2.18 `lpwstr` (LPWSTR)

This element specifies a string variant type. For all characters that cannot be represented in XML as defined by the XML 1.0 specification, the characters are escaped using the Unicode numerical character representation escape character format `_xHHHH_`, where H represents a hexadecimal character in the character's value.

[*Example:* The Unicode character 8 is not permitted in an XML 1.0 document, so it must be escaped as `_x0008_`.
end example]

The possible values for this element are defined by the W3C XML Schema string datatype.

22.4.2.19 `null` (Null)

This element specifies a null variant type.

[*Note:* The W3C XML Schema definition of this element's content model (`CT_Null`) is located in §A.6.4. *end note*]

22.4.2.20 `oblob` (Binary Blob Object)

This element specifies a base64 binary blob object variant type.

This type is defined as follows: A blob member that contains a serialized object in the same representation that would appear in the ostream element. That is, a DWORD byte count (where the byte count does not include the size of itself) which is in the format of a class identifier followed by initialization data for that class.

The possible values for this element are defined by the W3C XML Schema base64Binary datatype.

22.4.2.21 `ostorage` (Binary Storage Object)

This element specifies a base64 binary storage object variant type.

This type is defined as follows: Identical to the storage element, but indicates that the designated storage shall contain a loadable object.

The possible values for this element are defined by the W3C XML Schema base64Binary datatype.

22.4.2.22 `ostream` (Binary Stream Object)

This element specifies a binary stream object variant type.

This type is defined as follows: Identical to the definition of the stream element, but indicates that the stream contains a serialized object, which is a CLSID – see the ST_Guid simple type (§22.9.2.4) – followed by initialization data for the specified class.

The possible values for this element are defined by the W3C XML Schema base64Binary datatype.

22.4.2.23 `r4` (4-Byte Real Number)

This element specifies a 4-byte real number variant type.

The possible values for this element are defined by the W3C XML Schema float datatype.

22.4.2.24 `r8` (8-Byte Real Number)

This element specifies a 8-byte real number variant type.

The possible values for this element are defined by the W3C XML Schema double datatype.

22.4.2.25 `storage` (Binary Storage)

This element specifies a binary storage variant type.

This type is defined as follows: Contains the base64-encoded data for a structured storage.

The possible values for this element are defined by the W3C XML Schema base64Binary datatype.

22.4.2.26 `stream` (Binary Stream)

This element specifies a binary stream variant type.

This type is defined as follows: Contains the base64-encoded data for a structured storage stream.

The possible values for this element are defined by the W3C XML Schema base64Binary datatype.

22.4.2.27 `ui1` (1-Byte Unsigned Integer)

This element specifies a 1-byte unsigned integer variant type.

The possible values for this element are defined by the W3C XML Schema unsignedByte datatype.

22.4.2.28 `ui2` (2-Byte Unsigned Integer)

This element specifies a 2-byte unsigned integer variant type.

The possible values for this element are defined by the W3C XML Schema unsignedShort datatype.

22.4.2.29 `ui4` (4-Byte Unsigned Integer)

This element specifies a 4-byte unsigned integer variant type.

The possible values for this element are defined by the W3C XML Schema unsignedInt datatype.

22.4.2.30 `ui8` (8-Byte Unsigned Integer)

This element specifies a 8-byte unsigned integer variant type.

The possible values for this element are defined by the W3C XML Schema unsignedLong datatype.

22.4.2.31 uint (Unsigned Integer)

This element specifies an unsigned integer variant type.

The possible values for this element are defined by the W3C XML Schema unsignedInt datatype.

22.4.2.32 variant (Variant)

This element can contain exactly 1 child element of any variant type. This element is only valid as a child element of a vector or array variant type.

[Example: A vector of variant types:

```
<vt:vector baseType="variant">
  <vt:variant>
    <vt:i4>12</vt:i4>
  </vt:variant>
  <vt:variant>
    <vt:lpstr>WorkSheets</vt:lpstr>
  </vt:variant>
</vt:vector>
```

end example]

[Note: The W3C XML Schema definition of this element’s content model ([CT Variant](#)) is located in §A.6.4. end note]

22.4.2.33 vector (Vector)

This element defines the vector variant type. Vector contents shall be of uniform type as specified by the baseType attribute. The contents of a vector are defined using repeated child elements of the appropriate variant type.

[Example: A vector of lpstr variant types:

```
<vt:vector baseType="lpstr">
  <vt:lpstr>One</vt:lpstr>
  <vt:lpstr>Two</vt:lpstr>
  <vt:lpstr>Three</vt:lpstr>
</vt:vector>
```

end example]

Attributes	Description
baseType (Vector Base Type)	The baseType attribute specifies the base variant type of a vector. The allowed values are: variant, i1, i2, i4, i8, ui1, ui2, ui4, ui8, r4, r8, lpstr, lpwstr, bstr, date, filetime, bool, cy, error, and clsid.

Attributes	Description
	The possible values for this attribute are defined by the ST_VectorBaseType simple type (§22.4.3.4).
size (Vector Size)	Specifies the number of elements in the vector. The possible values for this attribute are defined by the W3C XML Schema unsignedInt datatype.

[Note: The W3C XML Schema definition of this element's content model (CT_Vector) is located in §A.6.4. *end note*]

22.4.2.34 vstream (Binary Versioned Stream)

This element specifies a binary versioned stream variant type.

This type is defined as follows: A stream element's content with a GUID version (the version attribute).

[Note: The W3C XML Schema definition of this element's content model (CT_Vstream) is located in §A.6.4. *end note*]

22.4.3 Simple Types

This is the complete list of simple types dedicated to Variant Types.

22.4.3.1 ST_ArrayBaseType (Array Base Type Simple Type)

The ST_ArrayBaseType simple type defines the allowed values for an array's baseType attribute as: variant, i1, i2, i4, int, ui1, ui2, ui4, uint, r4, r8, decimal, bstr, date, bool, cy, and error.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
bool (Boolean Base Type)	Specifies that the variant type for the contents of a array shall be bool.
bstr (Basic String Base Type)	Specifies that the variant type for the contents of a array shall be bstr.
cy (Currency Base Type)	Specifies that the variant type for the contents of a array shall be cy.
date (Date and Time Base Type)	Specifies that the variant type for the contents of a array shall be date.
decimal (Decimal Base Type)	Specifies that the variant type for the contents of a array shall be decimal.
error (Error Status Code Base Type)	Specifies that the variant type for the contents of a

Enumeration Value	Description
	array shall be error.
i1 (1-Byte Signed Integer Base Type)	Specifies that the variant type for the contents of a array shall be i1.
i2 (2-Byte Signed Integer Base Type)	Specifies that the variant type for the contents of a array shall be i2.
i4 (4-Byte Signed Integer Base Type)	Specifies that the variant type for the contents of a array shall be i4.
int (Integer Base Type)	Specifies that the variant type for the contents of a array shall be int.
r4 (4-Byte Real Number Base Type)	Specifies that the variant type for the contents of a array shall be r4.
r8 (8-Byte Real Number Base Type)	Specifies that the variant type for the contents of a array shall be r8.
ui1 (1-Byte Unsigned Integer Base Type)	Specifies that the variant type for the contents of a array shall be ui1.
ui2 (2-Byte Unsigned Integer Base Type)	Specifies that the variant type for the contents of a array shall be ui2.
ui4 (4-Byte Unsigned Integer Base Type)	Specifies that the variant type for the contents of a array shall be ui4.
uint (Unsigned Integer Base Type)	Specifies that the variant type for the contents of a array shall be uint.
variant (Variant Base Type)	Specifies that the variant type for the contents of a array shall be variant.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ArrayBaseType](#)) is located in §A.6.4. *end note*]

22.4.3.2 ST_Cy (Currency Simple Type)

The ST_Cy simple type defines the cy element as a currency variant type with exactly four digits after the decimal point.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type also specifies the following restrictions:

- This simple type's contents shall match the following regular expression pattern: `\s*[0-9]*\.[0-9]{4}\s*`.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Cy](#)) is located in §A.6.4. *end note*]

22.4.3.3 ST_Error (Error Status Code Simple Type)

The ST_Error simple type defines a 32-bit error status code variant type of the form 0xHHHHHHHH. Each H represents a hexadecimal.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type also specifies the following restrictions:

- This simple type's contents shall match the following regular expression pattern: `\s*0x[0-9A-Za-z]{8}\s*`.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_Error](#)) is located in §A.6.4. *end note*]

22.4.3.4 ST_VectorBaseType (Vector Base Type Simple Type)

The ST_VectorBaseType simple type defines the allowed values for a vector's baseType attribute as: variant, i1, i2, i4, i8, ui1, ui2, ui4, ui8, r4, r8, lpstr, lpwstr, bstr, date, filetime, bool, cy, error, and clsid.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
bool (Boolean Base Type)	Specifies that the variant type for the contents of a vector shall be bool.
bstr (Basic String Base Type)	Specifies that the variant type for the contents of a vector shall be bstr.
clsid (Class ID Base Type)	Specifies that the variant type for the contents of a vector shall be clsid.
cy (Currency Base Type)	Specifies that the variant type for the contents of a vector shall be cy.
date (Date and Time Base Type)	Specifies that the variant type for the contents of a vector shall be date.
error (Error Status Code Base Type)	Specifies that the variant type for the contents of a vector shall be error.
filetime (File Time Base Type)	Specifies that the variant type for the contents of a vector shall be filetime.
i1 (Vector Base Type Enumeration Value)	Specifies that the variant type for the contents of a vector shall be i1.
i2 (2-Byte Signed Integer Base Type)	Specifies that the variant type for the contents of a vector shall be i2.
i4 (4-Byte Signed Integer Base Type)	Specifies that the variant type for the contents of a vector shall be i4.

Enumeration Value	Description
i8 (8-Byte Signed Integer Base Type)	Specifies that the variant type for the contents of a vector shall be i8.
lpstr (LPSTR Base Type)	Specifies that the variant type for the contents of a vector shall be lpstr.
lpwstr (LPWSTR Base Type)	Specifies that the variant type for the contents of a vector shall be lpwstr.
r4 (4-Byte Real Number Base Type)	Specifies that the variant type for the contents of a vector shall be r4.
r8 (8-Byte Real Number Base Type)	Specifies that the variant type for the contents of a vector shall be r8.
ui1 (1-Byte Unsigned Integer Base Type)	Specifies that the variant type for the contents of a vector shall be ui1.
ui2 (2-Byte Unsigned Integer Base Type)	Specifies that the variant type for the contents of a vector shall be ui2.
ui4 (4-Byte Unsigned Integer Base Type)	Specifies that the variant type for the contents of a vector shall be ui4.
ui8 (8-Byte Unsigned Integer Base Type)	Specifies that the variant type for the contents of a vector shall be ui8.
variant (Variant Base Type)	Specifies that the variant type for the contents of a vector shall be variant.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_VectorBaseType](#)) is located in §A.6.4. *end note*]

22.5 Custom XML Data Properties

This namespace defines the set of properties that can be associated with one or more custom XML parts within an Office Open XML document. A *custom XML part* is a part within an Office Open XML document, that contains arbitrary custom XML markup not necessarily defined by ECMA-376, and which is kept independent from the presentation-specific markup within the package.

[*Rationale*: It is often necessary to include custom XML semantics with an Office Open XML document, to store a complex set of properties (e.g., a document management system's metadata) along with the file. This mechanism allows this custom XML to be stored in the document in a way that is independent of the type of document and separate from the presentation markup—only the custom XML is stored in this part. *end rationale*]

The properties that can be applied to a custom XML part are:

- A part ID
- (optionally) One or more associated custom XML schemas

22.5.1 Table of Contents

This subclause is informative.

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End of informative text.

22.5.2 Elements

The following information describes the elements in this namespace:

22.5.2.1 datastoreItem (Custom XML Data Properties)

This element specifies the properties for a single custom XML part inside of an Office Open XML document. The set of properties specified within this element are attached to the custom XML part that specifies a relationship to this part.

[Example: Consider the following content for a custom XML part properties part:

```
<ds:datastoreItem ds:itemID="{A67AC88A-A164-4ADE-8889-8826CE44DE6E}">
  <ds:schemaRefs>
    <ds:schemaRef ds:uri="http://www.example.com/exampleSchema" />
  </ds:schemaRefs>
</ds:datastoreItem>
```

The datastoreItem element contains the properties for the custom XML part that referenced it; specifically, a part ID of A67AC88A-A164-4ADE-8889-8826CE44DE6E, and a single XML Schema reference to a schema with a target namespace of http://www.example.com/exampleSchema. *end example*]

Attributes	Description
itemID (Custom XML Data ID)	<p>Specifies a globally unique identifier (GUID) that uniquely identifies a single custom XML part within an Office Open XML document.</p> <p>Each itemID value shall be unique among all custom XML data parts in this document. If a document contains duplicate itemID values, then the first value should be persisted, and subsequent values should be reassigned.</p> <p>[Example: Consider the following content for a custom XML part properties part:</p> <pre><w:datastoreItem w:itemID="{A67AC88A-A164-4ADE-8889-8826CE44DE6E}"> ... </w:datastoreItem></pre>

Attributes	Description
	<p>The itemID attribute specifies that the ID associated with the parent custom XML part is A67AC88A-A164-4ADE-8889-8826CE44DE6E. <i>end example</i></p> <p>The possible values for this attribute are defined by the ST_Guid simple type (§22.9.2.4).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_DatastoreItem](#)) is located in §A.6.5. *end note*]

22.5.2.2 schemaRef (Associated XML Schema)

This element specifies a single XML schema that is associated with the custom XML data part. This XML schema is identified using its target namespace, and can be located via any means available to an application processing the contents of this file.

If the custom XML part cannot be validated using the specified XML schema when it is opened, then this reference can be omitted when the file is subsequently saved.

[Example: Consider the following content for a custom XML part properties part:

```
<ds:datastoreItem ds:itemID="{A67AC88A-A164-4ADE-8889-8826CE44DE6E}">
  <ds:schemaRefs>
    <ds:schemaRef ds:uri="http://www.example.com/exampleSchema" />
  </ds:schemaRefs>
</ds:datastoreItem>
```

The schemaRef element contains a single XML Schema reference to a schema with a target namespace of <http://www.example.com/exampleSchema>. Applications can then locate and utilize a schema for this namespace using any means available. *end example*

Attributes	Description
uri (Target Namespace of Associated XML Schema)	<p>Specifies the target namespace for the XML Schema associated with this schema reference.</p> <p>[Example: Consider the following content for a custom XML part properties part:</p> <pre>... <w:schemaRef w:uri="http://www.example.com/schema1" /> <w:schemaRef w:uri="http://www.example.com/schema2" /> ...</pre> <p>The uri attribute specifies the target namespace of each XML schema reference:</p> <ul style="list-style-type: none"> http://www.example.com/schema1 http://www.example.com/schema2

Attributes	Description
	<p>Applications can then locate and utilize a schema for these namespaces using any means available. <i>end example</i></p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DatastoreSchemaRef](#)) is located in §A.6.5. *end note*]

22.5.2.3 schemaRefs (Set of Associated XML Schemas)

This element specifies the set of XML schemas that are associated with the parent custom XML part. Any number of XML schemas can be referenced, and this collection of schemas shall then be used to validate the contents of the corresponding custom XML part. If this element is present, then the set of XML schemas provided within should be used to validate the contents of the corresponding custom XML part (including the explicit presence of no child elements to specify that no custom XML schemas should be used even if one is present).

If this element is omitted, then applications can determine the set of XML schemas to be used to validate the contents of this part using any desired means.

[*Example:* Consider the following content for a custom XML part properties part:

```
<ds:datastoreItem ds:itemID="{A67AC88A-A164-4ADE-8889-8826CE44DE6E}">
  <ds:schemaRefs>
    <ds:schemaRef ds:uri="http://www.example.com/exampleSchema" />
  </ds:schemaRefs>
</ds:datastoreItem>
```

The schemaRefs element contains the set of XML Schema references that can be used to validate the contents of this part. *end example*

[*Note:* The W3C XML Schema definition of this element's content model ([CT_DatastoreSchemaRefs](#)) is located in §A.6.5. *end note*]

22.6 Bibliography

Within an Office Open XML document, it is possible to store an arbitrary amount of bibliographic data, the use of which can be determined by the application reading the content. This subclause defines the format and structure of that bibliographic data.

The outermost element of bibliographic data is Sources, which represents the collection of individual reference materials (Source) in the document.

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End of informative text.

22.6.2 Elements

The following elements define the contents of the Bibliography schema:

22.6.2.1 AbbreviatedCaseNumber (Abbreviated Case Number)

This element describes the abbreviated form of a case number. Typically, this field is used in the Case source type.

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.2 AlbumTitle (Album Title)

This element specifies the title of an album. Typically, this field is used in the Sound recording source type.

[Example:

```
<b:Source>
  <b:Tag>Bon96</b:Tag>
  <b:SourceType>SoundRecording</b:SourceType>
  <b:Author>
    <b:Performer>
      <b:NameList>
        <b:Person>
          <b:Last>Villaron</b:Last>
          <b:First>Shawn</b:First>
          <b:Middle>Alan</b:Middle>
        </b:Person>
      </b:NameList>
    </b:Performer>
  </b:Author>
  <b>Title>Title</b>Title>
  <b:Year>2004</b:Year>
  <b:City>London</b:City>
  <b:AlbumTitle>Album Title</b:AlbumTitle>
  <b:RefOrder>15</b:RefOrder>
  <b:Guid>{17722923-790D-47E7-BB5D-C5DC67FA83D6}</b:Guid>
  <b:LCID>0</b:LCID>
  <b:Comments>Comments</b:Comments>
</b:Source>
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.3 Artist (Artist)

This element specifies the artist of the source. Typically, this field is used in the Art and Sound Recording source types. [Example:


```

<b:Author>
  <b:Artist>
    <b:NameList>
      <b:Person>
        <b:Last>Jones</b:Last>
        <b:First>Brian</b:First>
      </b:Person>
    </b:NameList>
  </b:Artist>
</b:Author>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_NameType](#)) is located in §A.6.6.
end note]

22.6.2.4 Author (Contributors List)

This element specifies the contributors to the source. [*Example:*

```

<b:Author>
  <b:Author>
    <b:NameList>
      <b:Person>
        <b:Last>Rothschiller</b:Last>
        <b:First>Chad</b:First>
      </b:Person>
    </b:NameList>
  </b:Author>
  <b:Editor>
    <b:NameList>
      <b:Person>
        <b:Last>Jaeschke</b:Last>
        <b:First>Rex</b:First>
      </b:Person>
    </b:NameList>
  </b:Editor>

```

```
<b:Translator>
  <b:NameList>
    <b:Person>
      <b>Last>Davis</b>Last>
      <b:First>Tristan</b:First>
    </b:Person>
  </b:NameList>
</b:Translator>
</b:Author>
```

end example]

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_AuthorType](#)) is located in §A.6.6. *end note]*

22.6.2.5 [Author \(Author\)](#)

This element specifies the author of the source. [*Example:*

```
<b:Author>
  <b:Author>
    <b:NameList>
      <b:Person>
        <b>Last>Jones</b>Last>
        <b:First>Brian</b:First>
      </b:Person>
    </b:NameList>
  </b:Author>
</b:Author>
```

end example]

Attributes	Description
xml:space (Content Contains Significant Whitespace) Namespace: http://www.w3.org/XML/1998/namespace	Specifies how white space should be handled for the contents of this element using the W3C space preservation rules. The possible values for this attribute are defined by §2.10 of the XML 1.0 specification.

[*Note:* The W3C XML Schema definition of this element’s content model ([CT_NameOrCorporateType](#)) is located in §A.6.6. *end note]*

22.6.2.6 BookAuthor (Book Author)

This element specifies the author of a book, when the primary author has authored the book section. For example, if person X writes a chapter in a book by person Y, person X is the Author and person Y is the BookAuthor. [Example:

```
<b:Author>
  <b:BookAuthor>
    <b:NameList>
      <b:Person>
        <b:Last>Rothschiller</b:Last>
        <b:First>Chad</b:First>
      </b:Person>
    </b:NameList>
  </b:BookAuthor>
</b:Author>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_NameType](#)) is located in §A.6.6. *end note]*

22.6.2.7 BookTitle (Book Title)

This element specifies the title of a book, when the source is a book section. In this case, the title of the book section is the primary title. For example, if X is the title of a chapter in a book entitled , X is the Title and Y is the BookTitle. [Example:

```
<b:Source>
  ...
  <b:Year>1992</b:Year>
  <b:City>Paris</b:City>
  <b:Publisher>Publisher</b:Publisher>
  <b:Pages>51-84</b:Pages>
  <b:Comments>Comments</b:Comments>
  <b:BookTitle>Book Title</b:BookTitle>
</b:Source>
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note]*

22.6.2.8 Broadcaster (Broadcaster)

This element specifies the broadcaster of a source. Typically, this field is used in the Interview source type.

[Example:

```
<b:Source>
  ...
  <b:ProgramTitle>Program Title</b:ProgramTitle>
  <b:Broadcaster>Broadcaster</b:Broadcaster>
  <b:Station>Station</b:Station>
  <b:RefOrder>1</b:RefOrder>
  <b>Title>Title (Interview)</b>Title>
  <b:BroadcastTitle>Broadcast Title</b:BroadcastTitle>
  <b:StateProvince>State or Province</b:StateProvince>
  <b:CountryRegion>Country or Region</b:CountryRegion>
</b:Source>
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. end note]

22.6.2.9 BroadcastTitle (Broadcast Title)

This element specifies the broadcast title of a source. Typically, this field is used in the Interview source type.

[Example:

```
<b:Source>
  ...
  <b:ProgramTitle>Program Title</b:ProgramTitle>
  <b:Broadcaster>Broadcaster</b:Broadcaster>
  <b:Station>Station</b:Station>
  <b:RefOrder>1</b:RefOrder>
  <b>Title>Title (Interview)</b>Title>
  <b:BroadcastTitle>Broadcast Title</b:BroadcastTitle>
  <b:StateProvince>State/Province</b:StateProvince>
  <b:CountryRegion>Country/Region</b:CountryRegion>
</b:Source>
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. end note]

22.6.2.10 CaseNumber (Case Number)

This element specifies the case number of a source. Typically, this field is used in the Case source type.

[*Example:*

```
...
<b:Title>Title (Case)</b:Title>
<b:Year>Year</b:Year>
<b:City>Place Published</b:City>
<b:ShortTitle>Short Title</b:ShortTitle>
<b:CaseNumber>Case Number</b:CaseNumber>
<b:Court>Court</b:Court>
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[*Note:* The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note]*

22.6.2.11 ChapterNumber (Chapter Number)

This element specifies the number or index of the chapter being referenced. [*Example:*

```
...
<b:BookTitle>Title</b:BookTitle>
<b:Pages>23-65</b:Pages>
<b:Comments>Comments</b:Comments>
<b:ChapterNumber>6</b:ChapterNumber>
<b:RefOrder>1</b:RefOrder>
...
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[*Note:* The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note]*

22.6.2.12 City (City)

This element specifies the city in which the source was published, printed, or manufactured. [*Example:*

```

...
<b>Title>Title</b>Title>
<b:Year>1997</b:Year>
<b:City>London</b:City>
<b:Publisher>Publihser</b:Publisher>
...

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[*Note:* The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.13 Comments (Comments)

This element specifies any additional comments about the source. The documentation style determines whether the comments appear in the bibliography. [*Example:*

```

...
<b:ShortTitle>Short Title</b:ShortTitle>
<b:Comments>Comments</b:Comments>
<b:RefOrder>2</b:RefOrder>
...

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[*Note:* The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.14 Compiler (Compiler)

This element specifies the person who compiled the information in a source. [*Example:*

```

<b:Author>
  <b:Compiler>
    <b:NameList>
      <b:Person>
        <b>Last>Jones</b>Last>
        <b:First>Brian</b:First>
      </b:Person>
    </b:NameList>
  </b:Compiler>
</b:Author>

```

end example]

[*Note: The W3C XML Schema definition of this element's content model ([CT_NameType](#)) is located in §A.6.6. end note*]

22.6.2.15 Composer ([Composer](#))

This element specifies the composer of a sound recording. [*Example:*

```
<b:Author>
  <b:Composer>
    <b:NameList>
      <b:Person>
        <b:Last>Davis</b:Last>
        <b:First>Tristan</b:First>
      </b:Person>
    </b:NameList>
  </b:Composer>
</b:Author>
```

end example]

[*Note: The W3C XML Schema definition of this element's content model ([CT_NameType](#)) is located in §A.6.6. end note*]

22.6.2.16 Conductor ([Conductor](#))

This element specifies the conductor of a source. Typically, this field is used in the sound recording source type. [*Example:*

```
<b:Author>
  <b:Conductor>
    <b:NameList>
      <b:Person>
        <b:Last>Jones</b:Last>
        <b:First>Brian</b:First>
      </b:Person>
    </b:NameList>
  </b:Conductor>
</b:Author>
```

end example]

[*Note: The W3C XML Schema definition of this element's content model ([CT_NameType](#)) is located in §A.6.6. end note*]

22.6.2.17 ConferenceName ([Conference or Proceedings Name](#))

This element specifies the title of the proceedings from a conference. [*Example:*

```

...
<b:Comments>Comments</b:Comments>
<b:ConferenceName>Conference Name</b:ConferenceName>
<b:RefOrder>9</b:RefOrder>
...

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.18 Corporate (Corporate Author)

This element specifies the corporate author, performer, or any field that can be a name. The element is used when an organization, rather than a person, is used. [Example:

```

<b:Author>
  <b:Author>
    <b:Corporate>Corporate Author</b:Corporate>
  </b:Author>
</b:Author>

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.19 Counsel (Counsel)

This element specifies the counsel, attorney, or attorneys in a case.

[Note: The W3C XML Schema definition of this element's content model ([CT_NameType](#)) is located in §A.6.6. *end note*]

22.6.2.20 CountryRegion (Country or Region)

This element specifies the country or region of a source. [Example:

```

<b:Source>
  ...
  <b:ProgramTitle>Program Title</b:ProgramTitle>
  <b:Broadcaster>Broadcaster</b:Broadcaster>
  <b:Station>Station</b:Station>
  <b:RefOrder>1</b:RefOrder>

```



```

<b>Title>Title (Interview)</b>Title>
<b>BroadcastTitle>Broadcast Title</b>BroadcastTitle>
<b:StateProvince>State or Province</b:StateProvince>
<b:CountryRegion>Country or Region</b:CountryRegion>
</b:Source>

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.21 Court (Court)

This element specifies the court in which the case was presented. [Example:

```

...
<b:Year>1972</b:Year>
<b:CaseNumber>339 1018</b:CaseNumber>
<b:Court>Supreme Court</b:Court>
...

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.22 Day (Day)

This element specifies the day on which a source was created or published. [Example:

```

...
<b:PeriodicalTitle>Periodical Title</b:PeriodicalTitle>
<b:Month>November</b:Month>
<b:Day>10</b:Day>
...

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.23 DayAccessed (Day Accessed)

This element specifies the day of the month a source was accessed. [*Example:*

```
<b:MonthAccessed>October</b:MonthAccessed>
<b:DayAccessed>5</b:DayAccessed>
<b:YearAccessed>2000</b:YearAccessed>
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[*Note:* The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note]*

22.6.2.24 Department (Department)

This element specifies the department in which a source originated, or to which a source was submitted. Typically, this field is used in the Report source type, which includes theses and dissertations. [*Example:*

```
...
<b:Institution>Harvard University</b:Institution>
<b:ThesisType>Doctoral Dissertation</b:ThesisType>
<b:Department>Department of Mathematics</b:Department>
...
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[*Note:* The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note]*

22.6.2.25 Director (Director)

This element specifies the director of a source. Typically, this field is used in the Film source type. [*Example:*

```
<b:Author>
  <b:Director>
    <b:NameList>
      <b:Person>
        <b>Last>Jones</b>Last>
        <b:First>Brian</b:First>
      </b:Person>
    </b:NameList>
  </b:Director>
</b:Author>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_NameType](#)) is located in §A.6.6. *end note*]

22.6.2.26 Distributor (Distributor)

This element specifies the distributor of a source. Typically, this field is used in the Performance and Film source types. [Example:

```
...
<b:Distributor>Distributor</b:Distributor>
<b:Country>United States</b:Country>
<b:RefOrder>19</b:RefOrder>
...
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.27 Edition (Editor)

This element specifies the edition of a source. [Example:

```
...
<b:Pages>1-34</b:Pages>
<b:Edition>Edition</b:Edition>
<b:Issue>Issue</b:Issue>
...
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.28 Editor (Editor)

This element specifies the editor of a source. [Example:

```

<b:Author>
  <b:Editor>
    <b:NameList>
      <b:Person>
        <b>Last>Jaeschke</b>Last>
        <b:First>Rex</b:First>
      </b:Person>
    </b:NameList>
  </b:Editor>
</b:Author>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_NameType](#)) is located in §A.6.6. *end note*]

22.6.2.29 First (Person's First, or Given, Name)

This element specifies a person's first name. [*Example:*

```

<b:Author>
  <b:Editor>
    <b:NameList>
      <b:Person>
        <b>Last>Jaeschke</b>Last>
        <b:First>Rex</b:First>
      </b:Person>
    </b:NameList>
  </b:Editor>
</b:Author>

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[*Note:* The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.30 Guid (GUID)

This element specifies the GUID of a source. [*Example:*

```

<b:Source>

```

```

...
<b:RefOrder>2</b:RefOrder>
<b:Guid>{EE06CBFE-1989-4533-A274-D81DFA436D79}</b:Guid>
<b:LCID>0</b:LCID>
</b:Source>

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.31 Institution (Institution)

This element specifies the institution of the source. Typically, this field is used in the Report source type, where it signifies the university or institute, and in the Art source type, where it signifies the museum or institution where the art is housed. [Example:

```

<b:Source>
...
<b:Institution>Harvard University</b:Institution>
<b:ThesisType>Dissertation</b:ThesisType>
<b:RefOrder>12</b:RefOrder>
<b:Guid>{6CB80970-81D3-476D-90D5-5C9D64E77FAF}</b:Guid>
<b:LCID>0</b:LCID>
</b:Source>

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.32 InternetSiteTitle (Internet Site Title)

This element specifies the title of an internet site. Typically, this field is used in the Internet Site and Document from Internet Site source types. [Example:

```

...
<b>Title>Title</b>Title>
<b:InternetSiteTitle>Internet Site Title</b:InternetSiteTitle>
<b:Month>July</b:Month>
<b:Day>1</b:Day>
<b:Year>2001</b:Year>
<b:MonthAccessed>Sept.</b:MonthAccessed>
<b:DayAccessed>22</b:DayAccessed>
<b:YearAccessed>1999</b:YearAccessed>
...

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.33 Interviewee (Interviewee)

This element specifies the person being interviewed. Typically, this field is used in the Interview source type.

[Example:

```

<b:Interviewee>
  <b:NameList>
    <b:Person>
      <b>Last>Rothschiller</b>Last>
      <b:First>Chad</b:First>
    </b:Person>
  </b:NameList>
</b:Interviewee>

```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_NameType](#)) is located in §A.6.6. *end note*]

22.6.2.34 Interviewer (Interviewer)

This element specifies the person conducting an interview. Typically, this field is used in the Interview source type. [Example:

```

<b:Interviewer>
  <b:NameList>
    <b:Person>
      <b>Last>Davis</b>Last>
      <b:First>Tristan</b:First>
    </b:Person>
  </b:NameList>
</b:Interviewer>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_NameType](#)) is located in §A.6.6.
end note]

22.6.2.35 Inventor (Inventor)

This element specifies the inventor of a source. Typically, this field is used in the Patent source type. [*Example:*

```

<b:Author>
  <b:Inventor>
    <b:NameList>
      <b:Person>
        <b>Last>Jones</b>Last>
        <b:First>Brian</b:First>
      </b:Person>
    </b:NameList>
  </b:Inventor>
</b:Author>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_NameType](#)) is located in §A.6.6.
end note]

22.6.2.36 Issue (Issue)

This element specifies the issue of a source. Typically, this field is used in the Journal Article and Article in Periodical source types. [*Example:*

```

<b:Source>
  ...
  <b:Edition>Edition</b:Edition>
  <b:Issue>Issue</b:Issue>
  <b:RefOrder>28</b:RefOrder>
</b:Source>

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.37 [JournalName \(Journal Name\)](#)

This element specifies the name of the journal. Typically, this field is used in the Journal Article source type.

[Example:

```
...
<b>Title>Article Title</b>Title>
<b:Year>2000</b:Year>
<b:ShortTitle>Short Title</b:ShortTitle>
<b:Volume>100</b:Volume>
<b:Comments>Comments</b:Comments>
<b:JournalName>Journal Name</b:JournalName>
<b:Pages>91-160</b:Pages>
...
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.38 [Last \(Person's Last, or Family, Name\)](#)

This element specifies a person's last name. [Example:

```
<b:Author>
  <b:Editor>
    <b:NameList>
      <b:Person>
        <b>Last>Jaeschke</b>Last>
        <b:First>Tristan</b:First>
      </b:Person>
    </b:NameList>
  </b:Editor>
</b:Author>
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.39 LCID (Locale ID)

This element specifies the locale ID of a source, representing the source's language. The set of locale IDs shall be as specified in §22.9.2.6. [*Example:*

```
<b:LCID>ja-JP</b:LCID>
```

end example]

The possible values for this element are defined by the ST_Lang simple type (§22.9.2.6).

[*Note:* The W3C XML Schema definition of this element's content model ([ST_Lang](#)) is located in §A.6.9. *end note]*

22.6.2.40 Medium (Medium)

This element specifies the medium on or in which a source was created. Typically, this field is used in the Electronic source, sound recording, and film source types. [*Example:*

```
<b:Source>
...
<b:LCID>0</b:LCID>
<b:Medium>DVD</b:Medium>
</b:Source>
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[*Note:* The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note]*

22.6.2.41 Middle (Person's Middle, or Other, Name)

This element specifies a person's middle name. [*Example:*

```
<b:Author>
  <b:Editor>
    <b:NameList>
      <b:Person>
        <b>Last>Villaron</b>Last>
        <b:First>Shawn</b:First>
        <b:Middle>Alan</b:Middle>
      </b:Person>
    </b:NameList>
  </b:Editor>
</b:Author>
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.42 Month (Month)

This element specifies the month in which a source was created or published. [Example:

```
...
<b:PeriodicalTitle>Time</b:PeriodicalTitle>
<b:Month>November</b:Month>
<b:Day>10</b:Day>
...
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.43 MonthAccessed (Month Accessed)

This element specifies the month during which the source was accessed. [Example:

```
...
<b:MonthAccessed>October</b:MonthAccessed>
<b:DayAccessed>5</b:DayAccessed>
<b:YearAccessed>2000</b:YearAccessed>
...
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.44 NameList (Name List)

This element specifies a list containing one or more names of a type of contributor to a source, such as a list of authors, editors, or translators. [Example:

```

<b:Author>
  <b:Author>
    <b:NameList>
      <b:Person>
        <b:Last>Davis</b:Last>
        <b:First>Tristan</b:First>
      </b:Person>
    </b:NameList>
  </b:Author>
</b:Author>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_NameListType](#)) is located in §A.6.6. *end note*]

22.6.2.45 NumberVolumes (Number of Volumes)

This element specifies the number of volumes a source contains. [*Example:*

```

<b:Source>
  ...
  <b:NumberVolumes>10</b:NumberVolumes>
  <b:Comments>Comments</b:Comments>
</b:Source>

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[*Note:* The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.46 Pages (Pages)

This element specifies the page range being cited in a source. [*Example:*

```

...
<b>Title>Article Title</b>Title>
<b:Year>2000</b:Year>
<b:ShortTitle>Short Title</b:ShortTitle>
<b:Volume>100</b:Volume>
<b:Comments>Comments</b:Comments>
<b:JournalName>Journal Name</b:JournalName>
<b:Pages>91-160</b:Pages>
...

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.47 PatentNumber (Patent Number)

This element specifies the patent number of a source. Typically, this field is used in the Patent source type.

[Example:

```
<b:Source>
...
<b:PatentNumber>1,000,000</b:PatentNumber>
<b:RefOrder>26</b:RefOrder>
<b:Guid>{8295ABC5-2DFD-4FA7-A2A7-A748917C1755}</b:Guid>
<b:LCID>0</b:LCID>
</b:Source>
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.48 Performer (Performer)

This element specifies the performer. Typically, this field is used in the sound recording, performance, and film source types. [Example:

```
<b:Performer>
  <b:NameList>
    <b:Person>
      <b>Last>Rothschiller</b>Last>
      <b:First>Chad</b:First>
    </b:Person>
  </b:NameList>
</b:Performer>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_NameOrCorporateType](#)) is located in §A.6.6. *end note*]

22.6.2.49 PeriodicalTitle (Periodical Title)

This element specifies the title of a periodical. [Example:

```

...
<b:PeriodicalTitle>Periodical Title</b:PeriodicalTitle>
<b:Month>July</b:Month>
<b:Day>1</b:Day>
...

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.50 Person (Person)

This element specifies a person who contributed to a source. [Example:

```

<b:Author>
  <b:NameList>
    <b:Person>
      <b>Last>Villaron</b>Last>
      <b:First>Shawn</b:First>
      <b:Middle>Alan</b:Middle>
    </b:Person>
  </b:NameList>
</b:Author>

```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_PersonType](#)) is located in §A.6.6. *end note*]

22.6.2.51 ProducerName (Producer Name)

This element specifies the person who produced a source. Typically, this field is used in the Internet site, Doc from internet site, Electronic source, Sound recording, Performance, and Film source types. [Example:

```

<b:ProducerName>
  <b:NameList>
    <b:Person>
      <b>Last>Rothschiller</b>Last>
      <b:First>Chad</b:First>
    </b:Person>
  </b:NameList>
</b:ProducerName>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_NameType](#)) is located in §A.6.6. *end note*]

22.6.2.52 ProductionCompany (Production Company)

This element specifies the company that produced a source. Typically, this field is used in the Internet site, Document from internet site, Electronic source, Sound recording, Performance, and Film source types. [*Example:*

```
<b:Source>
  ...
  <b:City>Chicago</b:City>
  <b:ProductionCompany>Production Company</b:ProductionCompany>
  <b:Medium>CD</b:Medium>
  <b:RefOrder>16</b:RefOrder>
</b:Source>
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[*Note:* The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.53 PublicationTitle (Publication Title)

This element specifies the title of the publication that contains the source. Typically, this field is used in the Electronic Source source type. [*Example:*

```
...
<b:Volume>Volume</b:Volume>
<b:PublicationTitle>Publication Title</b:PublicationTitle>
<b:Month>June</b:Month>
<b:Day>2</b:Day>
...
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[*Note:* The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.54 Publisher (Publisher)

This element specifies the publisher of a source.

[*Example:*

```

...
<b:City>London</b:City>
<b:Publisher>Publisher</b:Publisher>
<b:ShortTitle>Short Title</b:ShortTitle>
<b:Volume>Volume</b:Volume>
...

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[*Note:* The W3C XML Schema definition of this element’s content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.55 RecordingNumber (Recording Number)

This element specifies the recording number of a source. Typically, this field is used in the sound recording source type.

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[*Note:* The W3C XML Schema definition of this element’s content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.56 RefOrder (Reference Order)

This element specifies the reference order of a source. [*Example:*

```

<b:Source>
  ...
  <b:City>Chicago</b:City>
  <b:ProductionCompany>Production Company</b:ProductionCompany>
  <b:Medium>CD</b:Medium>
  <b:RefOrder>16</b:RefOrder>
</b:Source>

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[*Note:* The W3C XML Schema definition of this element’s content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.57 Reporter (Reporter)

This element specifies the reporter of a source. Typically, this field is used in the Case source type. [*Example:*

```

<b:Source>

```

```

...
<b:Reporter>Reporter</b:Reporter>
<b:RefOrder>27</b:RefOrder>
<b:Guid>{CE314AB7-E824-4D10-B295-044C68EBED27}</b:Guid>
<b:LCID>0</b:LCID>
</b:Source>

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.58 ShortTitle (Short Title)

This element specifies the short title of a source. [*Example:*

```

...
<b:City>London</b:City>
<b:Publisher>Publisher</b:Publisher>
<b:ShortTitle>Short Title</b:ShortTitle>
<b:Volume>Volume</b:Volume>
...

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.59 Source (Source)

This element specifies the bibliography entry for a source or reference work. [*Example:*

```

<b:Source>
...
<b:NumberVolumes>10</b:NumberVolumes>
<b:Comments>Comments</b:Comments>
</b:Source>

```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_SourceType](#)) is located in §A.6.6. *end note*]

22.6.2.60 Sources (Sources)

This element specifies the sources in a collection.

Attributes	Description														
SelectedStyle (Selected Style)	<p>Specifies the filename of a file which can be used to format the bibliographies and citations within this document.</p> <p>If this file is of an unknown form or cannot be located, then the other attributes on this element can be used to determine the format to use.</p> <p>[Example:</p> <pre><b:Sources SelectedStyle="\APA.XSL" StyleName="APA" URI="http://purl.oclc.org/ooxml/bibliographicStyle/APA"></pre> <p>end example]</p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>														
StyleName (Documentation Style Name)	<p>Specifies the name of the documentation style in which the bibliography and citations are formatted.</p> <p>The following values shall be well-defined:</p> <table> <tr> <th>Value</th><th>Reference</th></tr> <tr> <td>APA</td><td>American Psychological Association. http://www.apa.org/. Publication Manual of the American Psychological Association, Fifth Edition.</td></tr> <tr> <td>Chicago</td><td>Chicago Manual of Style, 15th Edition GB7714: GB7714-1987, Standardization Administration of China, 1987-05-05 (http://www.sac.gov.cn)</td></tr> <tr> <td>GOST - Name Soft</td><td>ГОСТ 7.1-2003 (GOST 7.1-2003) - The Federal Agency of the Russian Federation on Technical Regulating and Metrology - published by ИПК Издательство стандартов 2004</td></tr> <tr> <td>GOST - Title Sort</td><td>ГОСТ 7.1-2003 (GOST 7.1-2003) - The Federal Agency of the Russian Federation on Technical Regulating and Metrology - published by ИПК Издательство стандартов 2004</td></tr> <tr> <td>ISO 690 - First Element and Date</td><td>ISO 690-1987(E)-International Organization for Standardization-Second Edition 1987-08-15 (http://www.iso.org) ISO 690-2:1997(E)-International Organization for Standardization-First Edition 1997-11-15 (http://www.iso.org)</td></tr> <tr> <td>ISO 690 - Numerical Reference</td><td>ISO 690-1987(E)-International Organization for Standardization-Second Edition 1987-08-15 (http://www.iso.org) ISO 690-2:1997(E)-International Organization for Standardization-</td></tr> </table>	Value	Reference	APA	American Psychological Association. http://www.apa.org/ . Publication Manual of the American Psychological Association, Fifth Edition.	Chicago	Chicago Manual of Style, 15th Edition GB7714: GB7714-1987, Standardization Administration of China, 1987-05-05 (http://www.sac.gov.cn)	GOST - Name Soft	ГОСТ 7.1-2003 (GOST 7.1-2003) - The Federal Agency of the Russian Federation on Technical Regulating and Metrology - published by ИПК Издательство стандартов 2004	GOST - Title Sort	ГОСТ 7.1-2003 (GOST 7.1-2003) - The Federal Agency of the Russian Federation on Technical Regulating and Metrology - published by ИПК Издательство стандартов 2004	ISO 690 - First Element and Date	ISO 690-1987(E)-International Organization for Standardization-Second Edition 1987-08-15 (http://www.iso.org) ISO 690-2:1997(E)-International Organization for Standardization-First Edition 1997-11-15 (http://www.iso.org)	ISO 690 - Numerical Reference	ISO 690-1987(E)-International Organization for Standardization-Second Edition 1987-08-15 (http://www.iso.org) ISO 690-2:1997(E)-International Organization for Standardization-
Value	Reference														
APA	American Psychological Association. http://www.apa.org/ . Publication Manual of the American Psychological Association, Fifth Edition.														
Chicago	Chicago Manual of Style, 15th Edition GB7714: GB7714-1987, Standardization Administration of China, 1987-05-05 (http://www.sac.gov.cn)														
GOST - Name Soft	ГОСТ 7.1-2003 (GOST 7.1-2003) - The Federal Agency of the Russian Federation on Technical Regulating and Metrology - published by ИПК Издательство стандартов 2004														
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ISO 690 - First Element and Date	ISO 690-1987(E)-International Organization for Standardization-Second Edition 1987-08-15 (http://www.iso.org) ISO 690-2:1997(E)-International Organization for Standardization-First Edition 1997-11-15 (http://www.iso.org)														
ISO 690 - Numerical Reference	ISO 690-1987(E)-International Organization for Standardization-Second Edition 1987-08-15 (http://www.iso.org) ISO 690-2:1997(E)-International Organization for Standardization-														

Attributes	Description
	First Edition 1997-11-15 (http://www.iso.org)
	MLA Modern Language Association. http://www.mla.org/ . MLA Handbook for Writers of Research Papers, Sixth Edition.
	SIST02 Standard for Information of Science and Technology by Japan Science and Technology Agency, 2003(http://www.jst.go.jp/SIST/handbook/sist02sup/index.htm).
	Turabian A Manual for Writers of Term Papers, Theses, and Dissertations (Chicago Guides to Writing, Editing, and Publishing), by Kate L. Turabian, 1996.
	Any other value Implementation-defined.
	<p>[Example:</p> <p style="padding-left: 40px;"><code><b:Sources SelectedStyle="\APA.XSL" StyleName="APA" URI="123"></code></p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>
URI (Uniform Resource Identifier)	<p>Specifies a URI or unique identifier with which a documentation style is associated; can be used to uniquely identify versions of styles that share a StyleName.</p> <p>[Example:</p> <p style="padding-left: 40px;"><code><b:Sources SelectedStyle="\APA.XSL" StyleName="APA" URI="123"></code></p> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_String simple type (§22.9.2.13).</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Sources](#)) is located in §A.6.6. *end note]*

22.6.2.61 SourceType (Source Type)

This element specifies the type of source being cited.

The possible values for this element are defined by the ST_SourceType simple type (§22.6.3.1).

[Note: The W3C XML Schema definition of this element's content model ([ST_SourceType](#)) is located in §A.6.6. *end note]*

22.6.2.62 StandardNumber (Standard Number)

This element specifies the standard number, such as ISBN or ISSN, of a source. [*Example:*

```
<b:Source>
  ...
  <b:NumberVolumes>10</b:NumberVolumes>
  <b:StandardNumber>ISBN or ISSN</b:StandardNumber>
  <b:Comments>Comments</b:Comments>
</b:Source>
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[*Note:* The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note]*

22.6.2.63 StateProvince (State or Province)

This element specifies the state or province in which a source was created or published. [*Example:*

```
<b:Source>
  ...
  <b:ProgramTitle>Program Title</b:ProgramTitle>
  <b:Broadcaster>Broadcaster</b:Broadcaster>
  <b:Station>Station</b:Station>
  <b:RefOrder>1</b:RefOrder>
  <b>Title>Title (Interview)</b>Title>
  <b:BroadcastTitle>Broadcast Title</b:BroadcastTitle>
  <b:StateProvince>State/Province</b:StateProvince>
  <b:CountryRegion>Country/Region</b:CountryRegion>
</b:Source>
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[*Note:* The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note]*

22.6.2.64 Station (Station)

This element specifies the station on which an interview was broadcasted. Typically, this field is used in the Interview source type. [*Example:*

```

...
<b:Month>November</b:Month>
<b:Day>18</b:Day>
<b:Broadcaster>ABC</b:Broadcaster>
<b:Station>WABC</b:Station>
...

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.65 Tag (Tag)

This element specifies the tag name of a source. [Example:

```

<b:Source>
  <b:Tag>New01</b:Tag>
  ...
</b:Source>

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.66 Theater (Theater)

This element specifies the theater in which a source was performed or viewed. Typically, this field is used in the Performer source type. [Example:

```

...
<b:Theater>Theater Name</b:Theater>
<b:Month>October</b:Month>
<b:Day>25</b:Day>
<b:RefOrder>19</b:RefOrder>
...

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.67 ThesisType (Thesis Type)

This element specifies the type of report being cited, such as Thesis, Dissertation, or Book Report. Typically, this field is used in the Report source type. *[Example:*

```
...
<b:Institution>Harvard University</b:Institution>
<b:ThesisType>Doctoral Dissertation</b:ThesisType>
<b:Department>Department of Mathematics</b:Department>
...
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note]*

22.6.2.68 Title (Title)

This element specifies the title of a source. *[Example:*

```
...
</b:Author>
<b>Title>Title</b>Title>
<b:Year>2005</b:Year>
<b:City>Seattle</b:City>
...
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note]*

22.6.2.69 Translator (Translator)

This element specifies the translator of a source. *[Example:*

```

<b:Author>
  <b:Translator>
    <b:NameList>
      <b:Person>
        <b:Last>Davis</b:Last>
        <b:First>Tristan</b:First>
      </b:Person>
    </b:NameList>
  </b:Translator>
</b:Author>

```

end example]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_NameType](#)) is located in §A.6.6. *end note*]

22.6.2.70 Type (Patent Type)

This element specifies the type of patent. Typically, this field is used in the Patent source type.

[*Example:*

```

<Source>
  <b:Type>Patent Type</b:Type>
  <b:Guid>{8295ABC5-2DFD-4FA7-A2A7-A748917C1755}</b:Guid>
  <b:LCID>0</b:LCID>
</Source>

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[*Note:* The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.71 URL (URL)

This element specifies the URL of the source. Typically, this field is used in the Internet Site and Document from Internet Site source types. [*Example:*

```

...
<b:MonthAccessed>September</b:MonthAccessed>
<b:DayAccessed>1</b:DayAccessed>
<b:YearAccessed>1998</b:YearAccessed>
<b:URL>URL</b:URL>
<b:RefOrder>29</b:RefOrder>
...

```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.72 Version (Version)

This element specifies the version of the source. Typically, this field is used in the Internet Site and Document from Internet Site source types. [Example:

```
<b:Source>
  ...
  <b:Version>3.0</b:Version>
  <b:RefOrder>31</b:RefOrder>
  <b:Guid>{F06D8D48-7FD7-4515-88E9-EC70AB9BE792}</b:Guid>
  <b:LCID>0</b:LCID>
</b:Source>
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.73 Volume (Volume)

This element specifies the volume of the source. [Example:

```
...
<b>Title>Article Title</b>Title>
<b:Year>2000</b:Year>
<b:ShortTitle>Short Title</b:ShortTitle>
<b:Volume>100</b:Volume>
<b:Comments>Comments</b:Comments>
<b:JournalName>Journal Name</b:JournalName>
<b:Pages>91-160</b:Pages>
...
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. *end note*]

22.6.2.74 Writer (Writer)

This element specifies the writer of the source. Typically, this field is used in the Performance and Film source types. *[Example:*

```
<b:Author>
  <b:Writer>
    <b:NameList>
      <b:Person>
        <b:Last>Jones</b:Last>
        <b:First>Brian</b:First>
      </b:Person>
    </b:NameList>
  </b:Writer>
</b:Author>
```

end example]

[Note: The W3C XML Schema definition of this element's content model ([CT_NameType](#)) is located in §A.6.6. end note]

22.6.2.75 Year (Year)

This element specifies the year in which a source was created or published.

[Example:

```
...
<b>Title>Title</b>Title>
<b:InternetSiteTitle>Internet Site Title</b:InternetSiteTitle>
<b:Month>July</b:Month>
<b:Day>1</b:Day>
<b:Year>2001</b:Year>
<b:MonthAccessed>Sept.</b:MonthAccessed>
<b:DayAccessed>22</b:DayAccessed>
<b:YearAccessed>1999</b:YearAccessed>
...
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element's content model ([ST_String](#)) is located in §A.6.9. end note]

22.6.2.76 YearAccessed (Year Accessed)

This element specifies the month during which the source was accessed. *[Example:*


```
...
<b>Title>Title</b>Title>
<b:InternetSiteTitle>Internet Site Title</b:InternetSiteTitle>
<b:Month>July</b:Month>
<b:Day>1</b:Day>
<b:Year>2001</b:Year>
<b:MonthAccessed>Sept.</b:MonthAccessed>
<b:DayAccessed>22</b:DayAccessed>
<b:YearAccessed>1999</b:YearAccessed>
...
```

end example]

The possible values for this element are defined by the ST_String simple type (§22.9.2.13).

[Note: The W3C XML Schema definition of this element’s content model ([ST_String](#)) is located in §A.6.9. *end note]*

22.6.3 Simple Types

This is the complete list of simple types dedicated to Bibliography.

22.6.3.1 ST_SourceType (Bibliographic Data Source Types)

This simple type specifies the possible types of sources that can be used within bibliographic data in an Office Open XML document.

[Note: The Office Open XML formats support a collection of predefined source types based on the categories most commonly used in various citation and bibliography style guidelines . The set of predefined source types can be extended as needed. The recommended approach for extending this set is to use the Misc type, and then leverage the methods described in ECMA-376-3 for extending the format with new attributes or elements. *end note.*]

This simple type's contents are a restriction of the ST_String datatype (§22.9.2.13).

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
Art (Art)	Art
ArticleInAPeriodical (Article in a Periodical)	Article in a Periodical
Book (Book)	Book
BookSection (Book Section)	Book Section
Case (Case)	Case
ConferenceProceedings (Conference Proceedings)	Conference Proceedings
DocumentFromInternetSite (Document from Internet Site)	Document from Internet Site

Enumeration Value	Description
ElectronicSource (Electronic Source)	Electronic Source
Film (Film)	Film
InternetSite (Internet Site)	Internet Site
Interview (Interview)	Interview
JournalArticle (Journal Article)	Journal Article
Misc (Miscellaneous)	Miscellaneous
Patent (Patent)	Patent
Performance (Performance)	Performance
Report (Reporter)	Report
SoundRecording (Sound Recording)	Sound Recording

[Note: The W3C XML Schema definition of this simple type’s content model ([ST_SourceType](#)) is located in §A.6.6.
end note]

22.7 Additional Characteristics

In order to allow producers of Office Open XML to describe specific contextual conditions under which the document was created, additional characteristics can be provided within the Additional Characteristics part using the syntax defined below.

The set of additional characteristics is designed to be an extensible list, and can provide a consumer with more information on how to interpret the file. ECMA-376 defines one set of characteristics; however, additional grammars can be created and associated with a unique URI via the vocabulary attribute.

22.7.1 Table of Contents

This subclause is informative.

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 22.7.2.2 characteristic (Single Characteristic) 3771

22.7.3 Simple Types 3773

 22.7.3.1 ST_Relation (Characteristic Relationship Types) 3773

End of informative text.

22.7.2 Elements

The following elements define the contents of the Additional Characteristics schema:

22.7.2.1 [additionalCharacteristics \(Set of Additional Characteristics\)](#)

This element is the root element of the Additional Characteristics part and contains the list of additional characteristics for an Office Open XML document.

[*Example:* The following content in an Additional Characteristics part would specify that the producing spreadsheet application supports from 0 to 10,000 columns, and that column ranges should be interpreted accordingly:

```
<additionalCharacteristics>
  <characteristic name="numColumns" relation="le" val="10000"/>
  <characteristic name="numColumns" relation="ge" val="0"/>
</additionalCharacteristics>
```

end example]

[*Note:* The W3C XML Schema definition of this element’s content model ([CT AdditionalCharacteristics](#)) is located in §A.6.7. *end note*]

22.7.2.2 [characteristic \(Single Characteristic\)](#)

This element specifies a single characteristic. The type of characteristic is defined by the name attribute.

[*Example:* A producer can inform the consumer that the computations used to calculate the stored numbers in the formulas belong to a value space expressed by ranges of the binary mantissa and exponent. A consumer can optionally check those characteristics to determine whether, for example, the values should be recalculated. The XML for this would be:

```
<additionalCharacteristics>
  <characteristic name='precisionMantissa' relation='gt'
    val='-9007199254740992' />
  <characteristic name='precisionMantissa' relation='lt'
    val='9007199254740992' />
  <characteristic name='precisionExponent' relation='ge' val='-1075' />
  <characteristic name='precisionExponent' relation='le' val='970' />
</additionalCharacteristics>
```

end example]

Attributes	Description
name (Name of Characteristic)	Specifies the name of the characteristic. There are no constraints on the value of the name attribute, but each name shall be associated with a specific vocabulary via the vocabulary attribute. The values defined by ECMA-376 shall be associated with a null vocabulary value, and are as follows:

Attributes	Description	
	Name Value	Property Specified
	numColumns	Number of Columns supported by the spreadsheet producer.
	numRows	Number of Rows supported by the spreadsheet producer.
	functionVersion	Version of the function specification used
	precisionMantissa	Allowed values of the mantissa of numbers within spreadsheet cells/formulas when expressed in base 2.
	precisionExponent	Allowed values of the exponent of numbers within spreadsheet cells/formulas when expressed in base 2.
	numWorkbookColors	Number of Workbook colors
	numConditionalFormatConditions	Number of condition format conditions on a workbook cell
	nummaxSortLevels	Number of level of sorting on a range or table
	numAutoFilterItems	Number of items shown in the Auto-filter dropdown
	numDisplayCellChars	Number of characters that can display in a cell
	numPrintCellChars	Number of characters per cell that Excel can print
	numUniqueCellStyles	Number of unique cell styles in a workbook (combinations of all cell formatting)
	numFormulaLengthChars	Length of formulas in characters
	numFormulaNestingLevel	Number of levels of formula nesting
	numFunctionArguments	Number of arguments to a function
	numPivotTableRows	Number of rows in a pivot table
	numPivotTableColumns	Number of columns in a pivot table
	numUniquePivotFieldItems	Number of unique items in a pivot field
	numPivotTableMDXNameChars	Number of characters in a MDX name for a pivot table item
	numPivotTableRelationshipChars	String length for a relationship pivot table
	numPivotTableFieldLabelChars	Length of field labels in PivotTable including caption length limitations
	numPivotTableFields	Number of fields in a pivot table
	numSheetXRefArrayFormulas	The number of array formulas in a worksheet that can refer to another (given) worksheet

Attributes	Description
	The possible values for this attribute are defined by the W3C XML Schema string datatype.
relation (Relationship of Value to Name)	<p>Specifies how the contents of the value attribute should be interpreted in the context of this characteristic.</p> <p><i>[Example: The following would specify that the application supports from 0 to 10,000 columns, and that column ranges should be interpreted accordingly:</i></p> <pre> <additionalCharacteristics> <characteristic name="numColumns" relation="le" val="10000"/> <characteristic name="numColumns" relation="ge" val="0"/> </additionalCharacteristics> </pre> <p><i>end example]</i></p> <p>The possible values for this attribute are defined by the ST_Relation simple type (§22.7.3.1).</p>
val (Characteristic Value)	<p>Specifies the value of the characteristic.</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
vocabulary (Characteristic Grammar)	<p>Specifies a URI defining the characteristic grammar with which the name attribute value shall be interpreted.</p> <p>If this attribute is omitted, then the default grammar (as defined above) shall be used.</p> <p>The possible values for this attribute are defined by the W3C XML Schema anyURI datatype.</p>

[Note: The W3C XML Schema definition of this element's content model ([CT_Characteristic](#)) is located in §A.6.7.
end note]

22.7.3 Simple Types

This is the complete list of simple types dedicated to Additional Characteristics.

22.7.3.1 ST_Relation (Characteristic Relationship Types)

This simple type specifies the possible relationships between a characteristic's name and value attributes.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
eq (Equal To)	Equal to.
ge (Greater Than or Equal to)	Greater than or equal to.
gt (Greater Than)	Greater than.
le (Less Than or Equal To)	Less than or equal to.
lt (Less Than)	Less than.

[Note: The W3C XML Schema definition of this simple type’s content model ([ST_Relation](#)) is located in §A.6.7.
end note]

22.8 Office Document Relationships

Within an Office Open XML document, it is necessary to be able to explicitly reference one part within the package from another [*Example*: A PresentationML Slide needs to be able to explicitly reference each picture within it to know where each one is anchored. *end example*]

In order to ensure that all such explicit relationship references are easily identifiable within a document, all such relationships are included within attributes in this namespace. This namespace therefore only serves to define attributes used throughout Office Open XML to create explicit relationships, and a single simple type for such attributes.

22.8.1 Table of Contents

This subclause is informative.

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22.8.2.1 ST_RelationshipId (Explicit Relationship ID)	3774

End of informative text.

22.8.2 Simple Types

This is the complete list of simple types dedicated to Office Document Relationships.

22.8.2.1 ST_RelationshipId (Explicit Relationship ID)

This simple type specifies the relationship ID in a part’s relationship item which is the target of an explicit relationship from the parent XML element.

The kind of relationship which shall be the target of the relationship specified shall be determined based on the context of the parent XML element.

[*Example*: Consider the following markup in an Office Open XML document:

```
<... r:id="rId5" />
```

The id attribute is of type ST_RelationshipID, and therefore the relationship with ID rId5 must be the target of an explicit relationship from the source part, based on the context of the parent XML element. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

[*Note:* The W3C XML Schema definition of this simple type's content model (ST_RelationshipId) is located in §A.6.8. *end note*]

22.9 Shared Simple Types

The following simple types represent common value formats used throughout Office Open XML, and have been centralized in order to ensure their usage remains consistent.

22.9.1 Table of Contents

This subclause is informative.

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End of informative text.

22.9.2 Simple Types

This is the complete list of simple types dedicated to Shared Simple Types.

22.9.2.1 ST_CalendarType (Calendar Types)

This simple type specifies the possible types of calendars which can be used within the context of an Office Open XML document.

[*Example:* Consider the following structured document tag properties:

```
<w:sdtPr>
  <w:date w:fullDate="2006-01-01T06:30:00Z">
    <w:calendar w:val="gregorian"/>
  </w:date>
</w:sdtPr>
```

The calendar element specifies that the calendar type for a calendar which can be displayed in the document must be the Gregorian calendar format (gregorian). *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
gregorian (Gregorian)	Specifies that the Gregorian calendar, as defined in ISO 8601, shall be used. This calendar should be localized into the appropriate language.
gregorianArabic (Gregorian Arabic Calendar)	Specifies that the Gregorian calendar, as defined in ISO 8601, shall be used. The values for this calendar should be presented in Arabic.
gregorianMeFrench (Gregorian Middle East French Calendar)	Specifies that the Gregorian calendar, as defined in ISO 8601, shall be used. The values for this calendar should be presented in Middle East French.
gregorianUs (Gregorian English Calendar)	Specifies that the Gregorian calendar, as defined in ISO 8601, shall be used. The values for this calendar should be presented in English.
gregorianXlitEnglish (Gregorian Transliterated English)	Specifies that the Gregorian calendar, as defined in ISO 8601, shall be used. The values for this calendar should be the representation of the English strings in the corresponding Arabic characters (the Arabic transliteration of the English for the Gregorian calendar).

Enumeration Value	Description
gregorianXlitFrench (Gregorian Transliterated French)	Specifies that the Gregorian calendar, as defined in ISO 8601, shall be used. The values for this calendar should be the representation of the French strings in the corresponding Arabic characters (the Arabic transliteration of the French for the Gregorian calendar).
hebrew (Hebrew)	Specifies that the Hebrew lunar calendar, as described by the Gauss formula for Passover [Har'El, Zvi] and The Complete Restatement of Oral Law (Mishneh Torah), shall be used.
hijri (Hijri)	Specifies that the Hijri lunar calendar, as described by the Kingdom of Saudi Arabia, Ministry of Islamic Affairs, Endowments, Da'wah and Guidance, shall be used.
japan (Japanese Emperor Era)	Specifies that the Japanese Emperor Era calendar, as described by Japanese Industrial Standard JIS X 0301, shall be used.
korea (Korean Tangun Era)	Specifies that the Korean Tangun Era calendar, as described by Korean Law Enactment No. 4, shall be used.
none (No Calendar Type)	Specifies that no calendar should be used.
saka (Saka Era)	Specifies that the Saka Era calendar, as described by the Calendar Reform Committee of India, as part of the Indian Ephemeris and Nautical Almanac, shall be used.
taiwan (Taiwan)	Specifies that the Taiwanese calendar, as defined by the Chinese National Standard CNS 7648, shall be used.
thai (Thai)	Specifies that the Thai calendar, as defined by the Royal Decree of H.M. King Vajiravudh (Rama VI) in Royal Gazette B. E. 2456 (1913 A.D.) and by the decree of Prime Minister Phibunsongkhram (1941 A.D.) to start the year on the Gregorian January 1 and to map year zero to Gregorian year 543 B.C., shall be used.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_CalendarType](#)) is located in §A.6.9. *end note*]

22.9.2.2 [ST_ConformanceClass](#) (Document Conformance Class Value)

This simple type specifies the conformance class to which a particular Office Open XML document conforms.

[Example: Consider the following SpreadsheetML Workbook part markup:

```
<workbook ... conformance="transitional">
...
</workbook>
```

This SpreadsheetML document has a conformance attribute value of `transitional`, therefore it conforms to the SML Transitional conformance class. *end example*

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
strict (Office Open XML Strict)	Specifies that the document conforms to Office Open XML Strict.
transitional (Office Open XML Transitional)	Specifies that the document conforms to Office Open XML Transitional.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_ConformanceClass](#)) is located in §A.6.9. *end note*]

22.9.2.3 ST_FixedPercentage (Fixed Percentage Value with Sign)

This simple type specifies that its contents will contain a percentage measurement from -100% up to and including 100%, including a trailing percent sign (U+0025).

[Example: Consider the following WordprocessingML fragment:

```
<w:tcPr>
  <w:tcW w:type="pct" w:w="33.3%" />
</w:tcPr>
```

The value of the `w` attribute is the width of the associated table cell. *end example*

This simple type's contents are a restriction of the `ST_Percentage` datatype (§22.9.2.9).

This simple type also specifies the following restrictions:

- This simple type's contents shall match the following regular expression pattern: `-?((100)|([0-9][0-9]?))(\.[0-9][0-9]?)?%`.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_FixedPercentage](#)) is located in §A.6.9. *end note*]

22.9.2.4 ST_Guid (128-Bit GUID)

This simple type specifies that its values shall be a 128-bit globally unique identifier (GUID) value.

[*Example*: Consider the following WordprocessingML fragment for the properties of a single glossary document entry:

```
<w:docPartPr>
...
<w:guid w:val="{00000000-5BD2-4BC8-9F70-7020E1357FB2}" />
...
</w:docPartPr>
```

The guid element specifies that the unique identifier associated with the parent entry shall be {00000000-5BD2-4BC8-9F70-7020E1357FB2}. This value can be used as needed by an application, for example, to uniquely identify a part regardless of its name. *end example*]

This simple type's contents are a restriction of the W3C XML Schema token datatype.

This simple type also specifies the following restrictions:

- This simple type's contents shall match the following regular expression pattern: `\{[0-9A-F]{8}-[0-9A-F]{4}-[0-9A-F]{4}-[0-9A-F]{4}-[0-9A-F]{12}\}`.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_Guid](#)) is located in §A.6.9. *end note*]

22.9.2.5 ST_HexColorRGB (Hexadecimal Color Value)

This simple type specifies that its contents shall contain a color value in RRGGBB hexadecimal format, specified using six hexadecimal digits. Each of the red, green, and blue color values, from 0-255, is encoded as two hexadecimal digits.

[*Example*: Consider a color defined as follows:

```
Red:      122
Green:    23
Blue:     209
```

The resulting RRGGBB value would be 7A17D1, as each color is transformed into its hexadecimal equivalent. *end example*]

This simple type's contents are a restriction of the W3C XML Schema hexBinary datatype.

This simple type also specifies the following restrictions:

- This simple type's contents have a length of exactly 6 hexadecimal digit(s).

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_HexColorRGB](#)) is located in §A.6.9. *end note*]

22.9.2.6 ST_Lang (Language Reference)

This simple type specifies that its contents contains a language identifier as defined by RFC 4646/BCP 47.

The contents of this language are interpreted based on the context of the parent XML element.

[*Example*: Consider a language code defined as follows :

```
<w:lang w:val="en-CA" />
```

This language is therefore specified as English (en) and Canada (CA), resulting in use of the English (Canada) language setting. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_Lang](#)) is located in §A.6.9. *end note*]

22.9.2.7 ST_OnOff (On/Off Value)

This simple type specifies a set of values for any binary (true or false) property defined in a WordprocessingML document.

A value of 1 or true specifies that the property shall be turned on. This is the default value for this attribute, and is implied when the parent element is present, but this attribute is omitted.

A value of 0 or false specifies that the property shall be explicitly turned off.

This simple type's contents are a restriction of the W3C XML Schema boolean datatype.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_OnOff](#)) is located in §A.6.9. *end note*]

22.9.2.8 ST_Panose (Panose-1 Number)

This simple type specifies a number consisting of 20 hexadecimal digits which defines the Panose-1 font classification.

[*Example*: Consider the following information stored for a single font:

```
<w:font w:name="Times New Roman">
  <w:panose1 w:val="02020603050405020304" />
  ...
</w:font>
```

The panose1 element specifies its Panose-1 number via its val attribute value of 02020603050405020304. *end example*]

This simple type's contents are a restriction of the W3C XML Schema hexBinary datatype.

This simple type also specifies the following restrictions:

- This simple type's contents have a length of exactly 20 hexadecimal digit(s).

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_Panose](#)) is located in §A.6.9. *end note*]

22.9.2.9 ST_Percentage (Percentage Value with Sign)

This simple type specifies that its contents will contain a percentage measurement, with a trailing percent sign (U+0025).

[*Example:* Consider the following WordprocessingML fragment:

```
<w:tcPr>
  <w:tcW w:type="pct" w:w="33.3%" />
</w:pPr>
```

The value of the w attribute is the width of the associated table cell. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type also specifies the following restrictions:

- This simple type's contents shall match the following regular expression pattern: `-?[0-9]+(\.[0-9]+)?%`.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_Percentage](#)) is located in §A.6.9. *end note*]

22.9.2.10 ST_PositiveFixedPercentage (Positive Fixed Percentage Value with Sign)

This simple type specifies that its contents will contain a positive percentage measurement from 0% to 100% inclusive, including a trailing percent sign (U+0025).

[*Example:* Consider the following WordprocessingML fragment:

```
<w:tcPr>
  <w:tcW w:type="pct" w:w="33.3%" />
</w:pPr>
```

The value of the w attribute is the width of the associated table cell. *end example*]

This simple type's contents are a restriction of the ST_Percentage datatype (§22.9.2.9).

This simple type also specifies the following restrictions:

- This simple type's contents shall match the following regular expression pattern: `((100)|([0-9][0-9]?)(\.[0-9][0-9]?)?%`.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_PositiveFixedPercentage](#)) is located in §A.6.9. *end note*]

22.9.2.11 ST_PositivePercentage (Positive Percentage Value with Sign)

This simple type specifies that its contents will contain a positive percentage measurement, including a trailing percent sign (U+0025).

[*Example:* Consider the following WordprocessingML fragment:

```
<w:tcPr>
  <w:tcW w:type="pct" w:w="33.3%" />
</w:tcPr>
```

The value of the w attribute is the width of the associated table cell. *end example*]

This simple type's contents are a restriction of the ST_Percentage datatype (§22.9.2.9).

This simple type also specifies the following restrictions:

- This simple type's contents shall match the following regular expression pattern: `[0-9]+(\.[0-9]+)?%`.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_PositivePercentage](#)) is located in §A.6.9. *end note*]

22.9.2.12 ST_PositiveUniversalMeasure (Positive Universal Measurement)

This simple type specifies that its contents will contain a measurement expressed using one of common measure units. The content of this type is a positive decimal number immediately followed by a unit identifier. Unit identifiers are case sensitive and shall be in lowercase. Conforming applications are not required to preserve units of measure between loading and saving a particular document.

The same set of units of measure as in ST_UniversalMeasure type (§22.9.2.15) shall be supported.

This simple type's contents are a restriction of the ST_UniversalMeasure datatype (§22.9.2.15).

This simple type also specifies the following restrictions:

- This simple type's contents shall match the following regular expression pattern: `[0-9]+(\.[0-9]+)?(mm|cm|in|pt|pc|pi)`.

[*Note:* The W3C XML Schema definition of this simple type's content model ([ST_PositiveUniversalMeasure](#)) is located in §A.6.9. *end note*]

22.9.2.13 ST_String (String)

This simple type specifies that its contents contains a string.

This simple type's contents are a restriction of the W3C XML Schema string datatype.

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_String](#)) is located in §A.6.9. end note*]

22.9.2.14 [ST_TwipsMeasure \(Measurement in Twentieths of a Point\)](#)

This simple type specifies that its contents contain wither:

- A positive whole number, whose contents consist of a measurement in twentieths of a point (equivalent to 1/1440th of an inch), or
- A positive decimal number immediately following by a unit identifier.

The contents of this measurement are interpreted based on the context of the parent XML element.

[*Example: Consider an attribute value of 720 whose type is ST_TwipsMeasure. This attribute value specifies a size of one-half of an inch or 36 points (720 twentieths of a point = 36 points = 0.5 inches). end example*]

[*Example: Consider an attribute value of 12.7mm whose type is ST_HpsMeasure. This attribute value specifies a size of 0.0127 meter or one-half of an inch or 36 points. end example*]

This simple type is a union of the following types:

- The ST_PositiveUniversalMeasure simple type (§22.9.2.12).
- The ST_UnsignedDecimalNumber simple type (§22.9.2.16).

[*Note: The W3C XML Schema definition of this simple type's content model ([ST_TwipsMeasure](#)) is located in §A.6.9. end note*]

22.9.2.15 [ST_UniversalMeasure \(Universal Measurement\)](#)

This simple type specifies that its contents will contain measurement expressed using one of common measure units. The content of this type is a decimal number immediately followed by a unit identifier. Unit identifiers are case sensitive and shall be in lowercase. Conforming applications are not required to preserve units of measure between loading and saving a particular document.

The following table lists units of measure which are allowed together with their definition based on existing standard or expressed as a conversion from other unit of measure.

Unit Identifier	Definition
cm	As defined in ISO 31.
mm	As defined in ISO 31.
in	1 in = 2.54 cm (informative)
pt	1 pt = 1/72 in (informative)
pc	1 pc = 12 pt (informative)
pi	1 pi = 12 pt (informative)

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type also specifies the following restrictions:

- This simple type's contents shall match the following regular expression pattern: `-?[0-9]+(\.[0-9]+)?(mm|cm|in|pt|pc|pi)`.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_UniversalMeasure](#)) is located in §A.6.9. *end note*]

22.9.2.16 ST_UnsignedDecimalNumber (Unsigned Decimal Number Value)

This simple type specifies that its contents contain a positive whole decimal number, whose contents are interpreted based on the context of the parent XML element.

[*Example*: Consider the following WordprocessingML fragment:

```
<w:pPr>
  <w:divId w:val="1512645511" />
</w:pPr>
```

The value of the `val` attribute is the ID of the associated HTML `div`.

However, consider the following fragment:

```
<w:ilvl w:val="1">
  ...
</w:ilvl>
```

In this case, the decimal number in the `val` attribute is the ID of the associated numbering level. In each case, the decimal number value is interpreted in the context of the parent element. *end example*]

This simple type's contents are a restriction of the W3C XML Schema `unsignedLong` datatype.

[*Note*: The W3C XML Schema definition of this simple type's content model ([ST_UnsignedDecimalNumber](#)) is located in §A.6.9. *end note*]

22.9.2.17 ST_VerticalAlignRun (Vertical Positioning Location)

This simple type specifies possible values for the alignment of the contents of this run in relation to the default appearance of the run's text. This allows the text to be repositioned as subscript or superscript without altering the font size of the run properties.

[*Example*: Consider a run which must be positioning as superscript when displaying its contents. This requirement would be specified using the following WordprocessingML:

```
<w:rPr>
  <w:vertAlign w:val="superscript" />
</w:rPr>
```


The resulting run is positioned as superscript, therefore it is rendered in a smaller size above the default baseline location for the contents of the run. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
baseline (Regular Vertical Positioning)	Specifies that the text in the parent run shall be located at the baseline and presented in the same size as surrounding text.
subscript (Subscript)	Specifies that this text should be subscript. This setting shall lower the text in this run below the baseline and change it to a smaller size, if a smaller size is available.
superscript (Superscript)	Specifies that this text should be superscript. This setting shall raise the text in this run above the baseline and change it to a smaller size, if a smaller size is available.

[Note: The W3C XML Schema definition of this simple type's content model ([ST_VeriticalAlignRun](#)) is located in §A.6.9. *end note*]

22.9.2.18 ST_XAlign (Horizontal Alignment Location)

This simple type specifies the set of possible relative horizontal positions for the parent floating object. This relative position is specified relative to the horizontal anchor specified by the parent object.

[Example: Consider the following WordprocessingML fragment specifying a text frame:

```
<w:p>
  <w:pPr>
    <w:framePr w:w="2419" w:h="2189" w:hRule="atLeast" w:hSpace="187"
w:wrap="around" w:vAnchor="text" w:hAnchor="page" w:xAlign="left" w:y="73" />
  </w:pPr>
  <w:r>
    <w:t>Text Frame Content.</w:t>
  </w:r>
</w:p>
```

This text frame specifies by the presence of the xAlign attribute to align the frame on the left side of the anchor object, in this case, the page. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
center (Centered Horizontally)	Specifies that the parent object shall be centered with respect to the anchor settings. <i>[Example: Centered on the page horizontally. end example]</i>
inside (Inside)	Specifies that the parent object shall be inside of the anchor object. <i>[Example: Inside the text margin horizontally. end example]</i>
left (Left Aligned Horizontally)	Specifies that the parent object shall be left aligned with respect to the anchor settings. <i>[Example: Left aligned on the page horizontally. end example]</i>
outside (Outside)	Specifies that the parent object shall be outside of the anchor object. <i>[Example: Outside the text margin horizontally. end example]</i>
right (Right Aligned Horizontally)	Specifies that the parent object shall be right aligned with respect to the anchor settings. <i>[Example: Right aligned on the page horizontally. end example]</i>

[Note: The W3C XML Schema definition of this simple type’s content model ([ST_XAlign](#)) is located in §A.6.9. end note]

22.9.2.19 [ST_Xstring \(Escaped String\)](#)

String of characters with support for escaped invalid-XML characters.

For all characters which cannot be represented in XML as defined by the XML 1.0 specification, the characters are escaped using the Unicode numerical character representation escape character format `_xHHHH_`, where H represents a hexadecimal character in the character's value. *[Example: The Unicode character 8 is not permitted in an XML 1.0 document, so it must be escaped as `_x0008_`. end example]*

This simple type's contents are a restriction of the W3C XML Schema string datatype.

[Note: The W3C XML Schema definition of this simple type’s content model ([ST_Xstring](#)) is located in §A.6.9. end note]

22.9.2.20 ST_YAlign (Vertical Alignment Location)

This simple type specifies the set of possible relative vertical positions for the parent floating object. This relative position is specified relative to the vertical anchor specified by the parent object.

[*Example:* Consider the following WordprocessingML fragment specifying a text frame:

```
<w:p>
  <w:pPr>
    <w:framePr w:w="2419" w:h="2189" w:hRule="atLeast" w:hSpace="187"
w:wrap="around" w:vAnchor="margin" w:hAnchor="page" w:x="1643" w:y="73"
w:yAlign="center" />
  </w:pPr>
  <w:r>
    <w:t>Text Frame Content.</w:t>
  </w:r>
</w:p>
```

This text frame specifies by the presence of the yAlign attribute to vertically align the frame in the center of the anchor object, in this case, the margin. *end example*]

This simple type's contents are a restriction of the W3C XML Schema string datatype.

This simple type is restricted to the values listed in the following table:

Enumeration Value	Description
bottom (Bottom)	Specifies that the parent object shall be vertically aligned to the bottom edge of the anchor object. [<i>Example:</i> At the bottom of the current paragraph. <i>end example</i>]
center (Centered Vertically)	Specifies that the parent object shall be vertically centered with respect to the anchor object. Shall not be used with the baseJc element. [<i>Example:</i> Centered on the page vertically. <i>end example</i>]
inline (In line With Text)	Specifies that the parent object shall be vertically aligned in line with the surrounding text (i.e. shall not allow any text wrapping around it when positioned in the document. Shall not be used with the baseJc element.
inside (Inside Anchor Extents)	Specifies that the parent object shall be vertically aligned to the edge of the anchor object, and positioned inside that object. Shall not be used with the baseJc element.

Enumeration Value	Description
	<i>[Example: Inside the text margins vertically. end example]</i>
outside (Outside Anchor Extents)	<p>Specifies that the parent object shall be vertically aligned to the edge of the anchor object, and positioned outside that object. Shall not be used with the baseJc element.</p> <i>[Example: Outside the text margins vertically. end example]</i>
top (Top)	<p>Specifies that the parent object shall be vertically aligned to the top edge of the anchor object .</p> <i>[Example: At the top of the current paragraph. end example]</i>

[Note: The W3C XML Schema definition of this simple type’s content model ([ST_YAlign](#)) is located in §A.6.9. *end note*]

22.9.2.21 [ST_XmlName \(XML Name\)](#)

This simple type shall contain an XML non-colonized name (NCName).

[Example: Consider the following WordprocessingML fragment for the properties of a single custom XML element:

```
<w:customXmlPr>  
  <w:attr w:name="company" w:uri="http://schemas.openxmlformats.org/2006/example"  
  ... />  
</w: customXmlPr>
```

The attr element specifies that the NCName associated with the attribute name shall be company. *end example*]

This simple type's contents are a restriction of the W3C XML Schema NCName datatype.

23. Custom XML Schema References

This namespace defines the set of properties which define the location and properties associated with one or more custom XML schemas which have been stored within the contents of a Office Open XML document. Collectively, the set of schemas associated with a document's custom XML markup are referred to as that document's *schema library*. The schema library then stores the set of unique XML namespaces used within the document's custom XML markup, and allows applications to 'tag' these namespaces with appropriate metadata.

23.1 Table of Contents

This subclause is informative.

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End of informative text.

23.2 Elements

The following information describes the elements in this namespace:

23.2.1 schema (Custom XML Schema Reference)

This element specifies the properties associated with a single XML namespace, for which all known XML schemas shall be loaded in order to validate the custom XML markup stored within this document. These properties can be used appropriately to locate custom XML schema(s) for use with the document. ECMA-376 does not require any particular XML schema language.

[Note: Some examples of XML schema languages that might be used to implement Custom XML Mappings include:

- W3C XML Schema - <http://www.w3.org/XML/Schema>
- RELAX NG – ISO/IEC 19757-2
- Schematron – ISO/IEC 19757-3
- NVDL – ISO/IEC 19757-4

end note]

[Example: Consider a WordprocessingML document which contains custom XML markup in the <http://www.example.com> namespace. The following content would be displayed in the document's schema library data:

```

<sl:schemaLibrary>
  <sl:schema sl:uri="http://www.example.com" sl:schemaLocation="c:\example.xsd"
/>
</sl:schemaLibrary>

```

The schema element contains the properties for this one XML namespace: in this case, a namespace URI of `http://www.example.com` and a file location of `c:\example.xsd`. *end example*

[*Note:* This element is not intended to reintroduce transitional schema into the strict conformance class. *end note*]

Attributes	Description
manifestLocation (Supplementary XML File Location)	<p>Specifies the location of a supplementary XML file which can be downloaded and parsed when this document is loaded in order to provide additional application-defined capabilities. The contents of this file are application-defined.</p> <p>[<i>Example:</i> Consider a WordprocessingML document which contains custom XML markup in the <code>http://www.example.com</code> namespace, which is associated with a resource file located at <code>http://www.example.com/resource.xml</code>. The following content would be displayed in the document's schema library data:</p> <pre> <sl:schemaLibrary> <sl:schema sl:uri="http://www.example.com" sl:manifestLocation= "http://www.example.com/resource.xml" /> </sl:schemaLibrary> </pre> <p>The <code>manifestLocation</code> attribute contains <code>http://www.example.com/manifest.xml</code> which is the location of a resource file that can be downloaded for use when this namespace is used. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
schemaLanguage (Schema Language)	<p>Specifies the media type or the root namespace of the schema language.</p> <p>[<i>Example:</i></p> <pre> <sl:schema ... schemaLanguage="http://relaxng.org/ns/structure/1.0" /> </pre> <p><i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema token datatype.</p>
schemaLocation (Custom XML Schema Location)	<p>Specifies the location of the XML schema file which should be downloaded and parsed when this document is loaded.</p>

Attributes	Description
	<p>[<i>Example:</i> Consider a WordprocessingML document which contains custom XML markup in the <code>http://www.example.com</code> namespace, which is defined by an XML schema located at <code>c:\example.xsd</code>. The following content would be displayed in the document's schema library data:</p> <pre><sl:schemaLibrary> <sl:schema sl:uri="http://www.example.com" sl:schemaLocation="c:\example.xsd" /> </sl:schemaLibrary></pre> <p>The <code>schemaLocation</code> attribute contains <code>c:\example.xsd</code> which is the location of the XML schema file used when this namespace is used. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>
uri (Custom XML Schema Namespace)	<p>Specifies the target namespace for the XML Schema associated with this schema reference.</p> <p>[<i>Example:</i> Consider the following content for custom XML namespace data:</p> <pre>... <sl:schema w:uri="http://www.example.com/schema1" /> <sl:schema w:uri="http://www.example.com/schema2" /> ...</pre> <p>The <code>uri</code> attribute specifies the target namespace of each XML schema reference:</p> <ul style="list-style-type: none"> • <code>http://www.example.com/schema1</code> • <code>http://www.example.com/schema2</code> <p>Applications can then locate and utilize a schema for these namespaces using any means available. <i>end example</i>]</p> <p>The possible values for this attribute are defined by the W3C XML Schema string datatype.</p>

[*Note:* The W3C XML Schema definition of this element's content model ([CT_Schema](#)) is located in §A.7. *end note*]

23.2.2 schemaLibrary (Embedded Custom XML Schema Supplementary Data)

This element specifies the set of XML namespaces which have been associated with the contents of the custom XML markup within the current Office Open XML document. Each unique namespace which is referenced within the document can be referenced within this element by a single schema element, regardless of the number of constituent XML schemas which comprise that namespace.

[*Example:* Consider a WordprocessingML document which contains custom XML markup in two distinct namespaces: the `http://www.example.com` namespace and the `http://www.example2.com` namespace. If the first namespace is defined by a single XML schema, and the second is defined by five XML schemas (which are cross-referenced using the appropriate XML Schema syntax), the following content would be displayed in the document's schema library XML:

```
<sl:schemaLibrary>
  <sl:schema ... />
  <sl:schema ... />
</sl:schemaLibrary>
```

The schemaLibrary element contains only two schema elements even though there are six XML schemas in use, as there are only two distinct namespaces for which data is stored. *end example*]

[*Note:* The W3C XML Schema definition of this element's content model ([CT_SchemaLibrary](#)) is located in §A.7. *end note*]

Annex A.

(normative)

Schemas – W3C XML Schema

This Office Open XML specification includes a family of schemas defined using the W3C XML Schema 1.0 syntax. The normative definitions of these schemas follow below, and they also reside in an accompanying file named OfficeOpenXML-XMLSchema-Strict.zip, which is distributed in electronic form.

A.1 WordprocessingML

This schema is available in the file wml.xsd.

```

1 <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
2   xmlns:m="http://purl.oclc.org/ooxml/officeDocument/math"
3   xmlns:r="http://purl.oclc.org/ooxml/officeDocument/relationships"
4   xmlns:sl="http://purl.oclc.org/ooxml/schemaLibrary/main"
5   xmlns:wp="http://purl.oclc.org/ooxml/drawingml/wordprocessingDrawing"
6   xmlns="http://purl.oclc.org/ooxml/wordprocessingml/main"
7   xmlns:s="http://purl.oclc.org/ooxml/officeDocument/sharedTypes" elementFormDefault="qualified"
8   attributeFormDefault="qualified" blockDefault="#all"
9   targetNamespace="http://purl.oclc.org/ooxml/wordprocessingml/main">
10   <xsd:import namespace="http://purl.oclc.org/ooxml/drawingml/wordprocessingDrawing"
11     schemaLocation="dml-wordprocessingDrawing.xsd"/>
12   <xsd:import namespace="http://purl.oclc.org/ooxml/officeDocument/math" schemaLocation="shared-
13     math.xsd"/>
14   <xsd:import namespace="http://purl.oclc.org/ooxml/officeDocument/relationships"
15     schemaLocation="shared-relationshipReference.xsd"/>
16   <xsd:import namespace="http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
17     schemaLocation="shared-commonSimpleTypes.xsd"/>
18   <xsd:import namespace=" http://purl.oclc.org/ooxml/schemaLibrary/main " schemaLocation="shared-
19     customXmlSchemaProperties.xsd"/>
20   <xsd:import namespace="http://www.w3.org/XML/1998/namespace"/>
21   <xsd:complexType name="CT_Empty"/>
22   <xsd:complexType name="CT_OnOff">
23     <xsd:attribute name="val" type="s:ST_OnOff"/>
24   </xsd:complexType>
25   <xsd:simpleType name="ST_LongHexNumber">
26     <xsd:restriction base="xsd:hexBinary">
27       <xsd:length value="4"/>
28     </xsd:restriction>
29   </xsd:simpleType>
30   <xsd:complexType name="CT_LongHexNumber">
31     <xsd:attribute name="val" type="ST_LongHexNumber" use="required"/>
32   </xsd:complexType>
33   <xsd:simpleType name="ST_ShortHexNumber">

```

```

34     <xsd:restriction base="xsd:hexBinary">
35         <xsd:length value="2"/>
36     </xsd:restriction>
37 </xsd:simpleType>
38 <xsd:simpleType name="ST_UcharHexNumber">
39     <xsd:restriction base="xsd:hexBinary">
40         <xsd:length value="1"/>
41     </xsd:restriction>
42 </xsd:simpleType>
43 <xsd:complexType name="CT_Charset">
44     <xsd:attribute name="characterSet" type="s:ST_String" use="optional"/>
45 </xsd:complexType>
46 <xsd:simpleType name="ST_DecimalNumberOrPercent">
47     <xsd:union memberTypes="s:ST_Percentage"/>
48 </xsd:simpleType>
49 <xsd:simpleType name="ST_DecimalNumber">
50     <xsd:restriction base="xsd:integer"/>
51 </xsd:simpleType>
52 <xsd:complexType name="CT_DecimalNumber">
53     <xsd:attribute name="val" type="ST_DecimalNumber" use="required"/>
54 </xsd:complexType>
55 <xsd:complexType name="CT_UnsignedDecimalNumber">
56     <xsd:attribute name="val" type="s:ST_UnsignedDecimalNumber" use="required"/>
57 </xsd:complexType>
58 <xsd:complexType name="CT_DecimalNumberOrPrecent">
59     <xsd:attribute name="val" type="ST_DecimalNumberOrPercent" use="required"/>
60 </xsd:complexType>
61 <xsd:complexType name="CT_TwipsMeasure">
62     <xsd:attribute name="val" type="s:ST_TwipsMeasure" use="required"/>
63 </xsd:complexType>
64 <xsd:simpleType name="ST_SignedTwipsMeasure">
65     <xsd:union memberTypes="xsd:integer s:ST_UniversalMeasure"/>
66 </xsd:simpleType>
67 <xsd:complexType name="CT_SignedTwipsMeasure">
68     <xsd:attribute name="val" type="ST_SignedTwipsMeasure" use="required"/>
69 </xsd:complexType>
70 <xsd:simpleType name="ST_PixelsMeasure">
71     <xsd:restriction base="s:ST_UnsignedDecimalNumber"/>
72 </xsd:simpleType>
73 <xsd:complexType name="CT_PixelsMeasure">
74     <xsd:attribute name="val" type="ST_PixelsMeasure" use="required"/>
75 </xsd:complexType>
76 <xsd:simpleType name="ST_HpsMeasure">
77     <xsd:union memberTypes="s:ST_UnsignedDecimalNumber s:ST_PositiveUniversalMeasure"/>
78 </xsd:simpleType>
79 <xsd:complexType name="CT_HpsMeasure">
80     <xsd:attribute name="val" type="ST_HpsMeasure" use="required"/>
81 </xsd:complexType>
82 <xsd:simpleType name="ST_SignedHpsMeasure">
83     <xsd:union memberTypes="xsd:integer s:ST_UniversalMeasure"/>
84 </xsd:simpleType>
85 <xsd:complexType name="CT_SignedHpsMeasure">
86     <xsd:attribute name="val" type="ST_SignedHpsMeasure" use="required"/>

```

```

87 </xsd:complexType>
88 <xsd:simpleType name="ST_DateTime">
89   <xsd:restriction base="xsd:dateTime"/>
90 </xsd:simpleType>
91 <xsd:simpleType name="ST_MacroName">
92   <xsd:restriction base="xsd:string">
93     <xsd:maxLength value="33"/>
94   </xsd:restriction>
95 </xsd:simpleType>
96 <xsd:complexType name="CT_MacroName">
97   <xsd:attribute name="val" use="required" type="ST_MacroName"/>
98 </xsd:complexType>
99 <xsd:simpleType name="ST_EighthPointMeasure">
100   <xsd:restriction base="s:ST UnsignedDecimalNumber"/>
101 </xsd:simpleType>
102 <xsd:simpleType name="ST_PointMeasure">
103   <xsd:restriction base="s:ST UnsignedDecimalNumber"/>
104 </xsd:simpleType>
105 <xsd:complexType name="CT_String">
106   <xsd:attribute name="val" type="s:ST String" use="required"/>
107 </xsd:complexType>
108 <xsd:simpleType name="ST_TextScale">
109   <xsd:union memberTypes="ST_TextScalePercent"/>
110 </xsd:simpleType>
111 <xsd:simpleType name="ST_TextScalePercent">
112   <xsd:restriction base="xsd:string">
113     <xsd:pattern value="0*(600|([0-5]?[0-9]?[0-9]))%"/>
114   </xsd:restriction>
115 </xsd:simpleType>
116 <xsd:complexType name="CT_TextScale">
117   <xsd:attribute name="val" type="ST_TextScale"/>
118 </xsd:complexType>
119 <xsd:simpleType name="ST_HighlightColor">
120   <xsd:restriction base="xsd:string">
121     <xsd:enumeration value="black"/>
122     <xsd:enumeration value="blue"/>
123     <xsd:enumeration value="cyan"/>
124     <xsd:enumeration value="green"/>
125     <xsd:enumeration value="magenta"/>
126     <xsd:enumeration value="red"/>
127     <xsd:enumeration value="yellow"/>
128     <xsd:enumeration value="white"/>
129     <xsd:enumeration value="darkBlue"/>
130     <xsd:enumeration value="darkCyan"/>
131     <xsd:enumeration value="darkGreen"/>
132     <xsd:enumeration value="darkMagenta"/>
133     <xsd:enumeration value="darkRed"/>
134     <xsd:enumeration value="darkYellow"/>
135     <xsd:enumeration value="darkGray"/>
136     <xsd:enumeration value="lightGray"/>
137     <xsd:enumeration value="none"/>
138   </xsd:restriction>
139 </xsd:simpleType>

```

```

140 <xsd:complexType name="CT_Highlight">
141   <xsd:attribute name="val" type="ST_HighlightColor" use="required"/>
142 </xsd:complexType>
143 <xsd:simpleType name="ST_HexColorAuto">
144   <xsd:restriction base="xsd:string">
145     <xsd:enumeration value="auto"/>
146   </xsd:restriction>
147 </xsd:simpleType>
148 <xsd:simpleType name="ST_HexColor">
149   <xsd:union memberTypes="ST_HexColorAuto s:ST_HexColorRGB"/>
150 </xsd:simpleType>
151 <xsd:complexType name="CT_Color">
152   <xsd:attribute name="val" type="ST_HexColor" use="required"/>
153   <xsd:attribute name="themeColor" type="ST_ThemeColor" use="optional"/>
154   <xsd:attribute name="themeTint" type="ST_UcharHexNumber" use="optional"/>
155   <xsd:attribute name="themeShade" type="ST_UcharHexNumber" use="optional"/>
156 </xsd:complexType>
157 <xsd:complexType name="CT_Lang">
158   <xsd:attribute name="val" type="s:ST_Lang" use="required"/>
159 </xsd:complexType>
160 <xsd:complexType name="CT_Guid">
161   <xsd:attribute name="val" type="s:ST_Guid"/>
162 </xsd:complexType>
163 <xsd:simpleType name="ST_Underline">
164   <xsd:restriction base="xsd:string">
165     <xsd:enumeration value="single"/>
166     <xsd:enumeration value="words"/>
167     <xsd:enumeration value="double"/>
168     <xsd:enumeration value="thick"/>
169     <xsd:enumeration value="dotted"/>
170     <xsd:enumeration value="dottedHeavy"/>
171     <xsd:enumeration value="dash"/>
172     <xsd:enumeration value="dashedHeavy"/>
173     <xsd:enumeration value="dashLong"/>
174     <xsd:enumeration value="dashLongHeavy"/>
175     <xsd:enumeration value="dotDash"/>
176     <xsd:enumeration value="dashDotHeavy"/>
177     <xsd:enumeration value="dotDotDash"/>
178     <xsd:enumeration value="dashDotDotHeavy"/>
179     <xsd:enumeration value="wave"/>
180     <xsd:enumeration value="wavyHeavy"/>
181     <xsd:enumeration value="wavyDouble"/>
182     <xsd:enumeration value="none"/>
183   </xsd:restriction>
184 </xsd:simpleType>
185 <xsd:complexType name="CT_Underline">
186   <xsd:attribute name="val" type="ST_Underline" use="optional"/>
187   <xsd:attribute name="color" type="ST_HexColor" use="optional"/>
188   <xsd:attribute name="themeColor" type="ST_ThemeColor" use="optional"/>
189   <xsd:attribute name="themeTint" type="ST_UcharHexNumber" use="optional"/>
190   <xsd:attribute name="themeShade" type="ST_UcharHexNumber" use="optional"/>
191 </xsd:complexType>
192 <xsd:simpleType name="ST_TextEffect">

```

```

193     <xsd:restriction base="xsd:string">
194         <xsd:enumeration value="blinkBackground"/>
195         <xsd:enumeration value="lights"/>
196         <xsd:enumeration value="antsBlack"/>
197         <xsd:enumeration value="antsRed"/>
198         <xsd:enumeration value="shimmer"/>
199         <xsd:enumeration value="sparkle"/>
200         <xsd:enumeration value="none"/>
201     </xsd:restriction>
202 </xsd:simpleType>
203 <xsd:complexType name="CT_TextEffect">
204     <xsd:attribute name="val" type="ST_TextEffect" use="required"/>
205 </xsd:complexType>
206 <xsd:simpleType name="ST_Border">
207     <xsd:restriction base="xsd:string">
208         <xsd:enumeration value="nil"/>
209         <xsd:enumeration value="none"/>
210         <xsd:enumeration value="single"/>
211         <xsd:enumeration value="thick"/>
212         <xsd:enumeration value="double"/>
213         <xsd:enumeration value="dotted"/>
214         <xsd:enumeration value="dashed"/>
215         <xsd:enumeration value="dotDash"/>
216         <xsd:enumeration value="dotDotDash"/>
217         <xsd:enumeration value="triple"/>
218         <xsd:enumeration value="thinThickSmallGap"/>
219         <xsd:enumeration value="thickThinSmallGap"/>
220         <xsd:enumeration value="thinThickThinSmallGap"/>
221         <xsd:enumeration value="thinThickMediumGap"/>
222         <xsd:enumeration value="thickThinMediumGap"/>
223         <xsd:enumeration value="thinThickThinMediumGap"/>
224         <xsd:enumeration value="thinThickLargeGap"/>
225         <xsd:enumeration value="thickThinLargeGap"/>
226         <xsd:enumeration value="thinThickThinLargeGap"/>
227         <xsd:enumeration value="wave"/>
228         <xsd:enumeration value="doubleWave"/>
229         <xsd:enumeration value="dashSmallGap"/>
230         <xsd:enumeration value="dashDotStroked"/>
231         <xsd:enumeration value="threeDEmboss"/>
232         <xsd:enumeration value="threeDEngrave"/>
233         <xsd:enumeration value="outset"/>
234         <xsd:enumeration value="inset"/>
235         <xsd:enumeration value="apples"/>
236         <xsd:enumeration value="archedScallops"/>
237         <xsd:enumeration value="babyPacifier"/>
238         <xsd:enumeration value="babyRattle"/>
239         <xsd:enumeration value="balloons3Colors"/>
240         <xsd:enumeration value="balloonsHotAir"/>
241         <xsd:enumeration value="basicBlackDashes"/>
242         <xsd:enumeration value="basicBlackDots"/>
243         <xsd:enumeration value="basicBlackSquares"/>
244         <xsd:enumeration value="basicThinLines"/>
245         <xsd:enumeration value="basicWhiteDashes"/>

```

```

246      <xsd:enumeration value="basicWhiteDots"/>
247      <xsd:enumeration value="basicWhiteSquares"/>
248      <xsd:enumeration value="basicWideInline"/>
249      <xsd:enumeration value="basicWideMidline"/>
250      <xsd:enumeration value="basicWideOutline"/>
251      <xsd:enumeration value="bats"/>
252      <xsd:enumeration value="birds"/>
253      <xsd:enumeration value="birdsFlight"/>
254      <xsd:enumeration value="cabins"/>
255      <xsd:enumeration value="cakeSlice"/>
256      <xsd:enumeration value="candyCorn"/>
257      <xsd:enumeration value="celticKnotwork"/>
258      <xsd:enumeration value="certificateBanner"/>
259      <xsd:enumeration value="chainLink"/>
260      <xsd:enumeration value="champagneBottle"/>
261      <xsd:enumeration value="checkedBarBlack"/>
262      <xsd:enumeration value="checkedBarColor"/>
263      <xsd:enumeration value="checkered"/>
264      <xsd:enumeration value="christmasTree"/>
265      <xsd:enumeration value="circlesLines"/>
266      <xsd:enumeration value="circlesRectangles"/>
267      <xsd:enumeration value="classicalWave"/>
268      <xsd:enumeration value="clocks"/>
269      <xsd:enumeration value="compass"/>
270      <xsd:enumeration value="confetti"/>
271      <xsd:enumeration value="confettiGrays"/>
272      <xsd:enumeration value="confettiOutline"/>
273      <xsd:enumeration value="confettiStreamers"/>
274      <xsd:enumeration value="confettiWhite"/>
275      <xsd:enumeration value="cornerTriangles"/>
276      <xsd:enumeration value="couponCutoutDashes"/>
277      <xsd:enumeration value="couponCutoutDots"/>
278      <xsd:enumeration value="crazyMaze"/>
279      <xsd:enumeration value="creaturesButterfly"/>
280      <xsd:enumeration value="creaturesFish"/>
281      <xsd:enumeration value="creaturesInsects"/>
282      <xsd:enumeration value="creaturesLadyBug"/>
283      <xsd:enumeration value="crossStitch"/>
284      <xsd:enumeration value="cup"/>
285      <xsd:enumeration value="decoArch"/>
286      <xsd:enumeration value="decoArchColor"/>
287      <xsd:enumeration value="decoBlocks"/>
288      <xsd:enumeration value="diamondsGray"/>
289      <xsd:enumeration value="doubled"/>
290      <xsd:enumeration value="doubleDiamonds"/>
291      <xsd:enumeration value="earth1"/>
292      <xsd:enumeration value="earth2"/>
293      <xsd:enumeration value="earth3"/>
294      <xsd:enumeration value="eclipsingSquares1"/>
295      <xsd:enumeration value="eclipsingSquares2"/>
296      <xsd:enumeration value="eggsBlack"/>
297      <xsd:enumeration value="fans"/>
298      <xsd:enumeration value="film"/>

```

```

299     <xsd:enumeration value="firecrackers"/>
300     <xsd:enumeration value="flowersBlockPrint"/>
301     <xsd:enumeration value="flowersDaisies"/>
302     <xsd:enumeration value="flowersModern1"/>
303     <xsd:enumeration value="flowersModern2"/>
304     <xsd:enumeration value="flowersPansy"/>
305     <xsd:enumeration value="flowersRedRose"/>
306     <xsd:enumeration value="flowersRoses"/>
307     <xsd:enumeration value="flowersTeacup"/>
308     <xsd:enumeration value="flowersTiny"/>
309     <xsd:enumeration value="gems"/>
310     <xsd:enumeration value="gingerbreadMan"/>
311     <xsd:enumeration value="gradient"/>
312     <xsd:enumeration value="handmade1"/>
313     <xsd:enumeration value="handmade2"/>
314     <xsd:enumeration value="heartBalloon"/>
315     <xsd:enumeration value="heartGray"/>
316     <xsd:enumeration value="hearts"/>
317     <xsd:enumeration value="heebieJeebies"/>
318     <xsd:enumeration value="holly"/>
319     <xsd:enumeration value="houseFunky"/>
320     <xsd:enumeration value="hypnotic"/>
321     <xsd:enumeration value="iceCreamCones"/>
322     <xsd:enumeration value="lightBulb"/>
323     <xsd:enumeration value="lightning1"/>
324     <xsd:enumeration value="lightning2"/>
325     <xsd:enumeration value="mapPins"/>
326     <xsd:enumeration value="mapleLeaf"/>
327     <xsd:enumeration value="mapleMuffins"/>
328     <xsd:enumeration value="marquee"/>
329     <xsd:enumeration value="marqueeToothed"/>
330     <xsd:enumeration value="moons"/>
331     <xsd:enumeration value="mosaic"/>
332     <xsd:enumeration value="musicNotes"/>
333     <xsd:enumeration value="northwest"/>
334     <xsd:enumeration value="ovals"/>
335     <xsd:enumeration value="packages"/>
336     <xsd:enumeration value="palmsBlack"/>
337     <xsd:enumeration value="palmsColor"/>
338     <xsd:enumeration value="paperClips"/>
339     <xsd:enumeration value="papyrus"/>
340     <xsd:enumeration value="partyFavor"/>
341     <xsd:enumeration value="partyGlass"/>
342     <xsd:enumeration value="pencils"/>
343     <xsd:enumeration value="people"/>
344     <xsd:enumeration value="peopleWaving"/>
345     <xsd:enumeration value="peopleHats"/>
346     <xsd:enumeration value="poinsettias"/>
347     <xsd:enumeration value="postageStamp"/>
348     <xsd:enumeration value="pumpkin1"/>
349     <xsd:enumeration value="pushPinNote2"/>
350     <xsd:enumeration value="pushPinNote1"/>
351     <xsd:enumeration value="pyramids"/>

```

```

352     <xsd:enumeration value="pyramidsAbove"/>
353     <xsd:enumeration value="quadrants"/>
354     <xsd:enumeration value="rings"/>
355     <xsd:enumeration value="safari"/>
356     <xsd:enumeration value="sawtooth"/>
357     <xsd:enumeration value="sawtoothGray"/>
358     <xsd:enumeration value="scaredCat"/>
359     <xsd:enumeration value="seattle"/>
360     <xsd:enumeration value="shadowedSquares"/>
361     <xsd:enumeration value="sharksTeeth"/>
362     <xsd:enumeration value="shorebirdTracks"/>
363     <xsd:enumeration value="skyrocket"/>
364     <xsd:enumeration value="snowflakeFancy"/>
365     <xsd:enumeration value="snowflakes"/>
366     <xsd:enumeration value="sombbrero"/>
367     <xsd:enumeration value="southwest"/>
368     <xsd:enumeration value="stars"/>
369     <xsd:enumeration value="starsTop"/>
370     <xsd:enumeration value="stars3d"/>
371     <xsd:enumeration value="starsBlack"/>
372     <xsd:enumeration value="starsShadowed"/>
373     <xsd:enumeration value="sun"/>
374     <xsd:enumeration value="swirligig"/>
375     <xsd:enumeration value="tornPaper"/>
376     <xsd:enumeration value="tornPaperBlack"/>
377     <xsd:enumeration value="trees"/>
378     <xsd:enumeration value="triangleParty"/>
379     <xsd:enumeration value="triangles"/>
380     <xsd:enumeration value="triangle1"/>
381     <xsd:enumeration value="triangle2"/>
382     <xsd:enumeration value="triangleCircle1"/>
383     <xsd:enumeration value="triangleCircle2"/>
384     <xsd:enumeration value="shapes1"/>
385     <xsd:enumeration value="shapes2"/>
386     <xsd:enumeration value="twistedLines1"/>
387     <xsd:enumeration value="twistedLines2"/>
388     <xsd:enumeration value="vine"/>
389     <xsd:enumeration value="waveline"/>
390     <xsd:enumeration value="weavingAngles"/>
391     <xsd:enumeration value="weavingBraid"/>
392     <xsd:enumeration value="weavingRibbon"/>
393     <xsd:enumeration value="weavingStrips"/>
394     <xsd:enumeration value="whiteFlowers"/>
395     <xsd:enumeration value="woodwork"/>
396     <xsd:enumeration value="xIllusions"/>
397     <xsd:enumeration value="zanyTriangles"/>
398     <xsd:enumeration value="zigZag"/>
399     <xsd:enumeration value="zigZagStitch"/>
400     <xsd:enumeration value="custom"/>
401   </xsd:restriction>
402 </xsd:simpleType>
403 <xsd:complexType name="CT_Border">
404   <xsd:attribute name="val" type="ST_Border" use="required"/>

```



```

405     <xsd:attribute name="color" type="ST_HexColor" use="optional"/>
406     <xsd:attribute name="themeColor" type="ST_ThemeColor" use="optional"/>
407     <xsd:attribute name="themeTint" type="ST_UcharHexNumber" use="optional"/>
408     <xsd:attribute name="themeShade" type="ST_UcharHexNumber" use="optional"/>
409     <xsd:attribute name="sz" type="ST_EighthPointMeasure" use="optional"/>
410     <xsd:attribute name="space" type="ST_PointMeasure" use="optional"/>
411     <xsd:attribute name="shadow" type="s:ST_OnOff" use="optional"/>
412     <xsd:attribute name="frame" type="s:ST_OnOff" use="optional"/>
413 </xsd:complexType>
414 <xsd:simpleType name="ST_Shd">
415     <xsd:restriction base="xsd:string">
416         <xsd:enumeration value="nil"/>
417         <xsd:enumeration value="clear"/>
418         <xsd:enumeration value="solid"/>
419         <xsd:enumeration value="horzStripe"/>
420         <xsd:enumeration value="vertStripe"/>
421         <xsd:enumeration value="reverseDiagStripe"/>
422         <xsd:enumeration value="diagStripe"/>
423         <xsd:enumeration value="horzCross"/>
424         <xsd:enumeration value="diagCross"/>
425         <xsd:enumeration value="thinHorzStripe"/>
426         <xsd:enumeration value="thinVertStripe"/>
427         <xsd:enumeration value="thinReverseDiagStripe"/>
428         <xsd:enumeration value="thinDiagStripe"/>
429         <xsd:enumeration value="thinHorzCross"/>
430         <xsd:enumeration value="thinDiagCross"/>
431         <xsd:enumeration value="pct5"/>
432         <xsd:enumeration value="pct10"/>
433         <xsd:enumeration value="pct12"/>
434         <xsd:enumeration value="pct15"/>
435         <xsd:enumeration value="pct20"/>
436         <xsd:enumeration value="pct25"/>
437         <xsd:enumeration value="pct30"/>
438         <xsd:enumeration value="pct35"/>
439         <xsd:enumeration value="pct37"/>
440         <xsd:enumeration value="pct40"/>
441         <xsd:enumeration value="pct45"/>
442         <xsd:enumeration value="pct50"/>
443         <xsd:enumeration value="pct55"/>
444         <xsd:enumeration value="pct60"/>
445         <xsd:enumeration value="pct62"/>
446         <xsd:enumeration value="pct65"/>
447         <xsd:enumeration value="pct70"/>
448         <xsd:enumeration value="pct75"/>
449         <xsd:enumeration value="pct80"/>
450         <xsd:enumeration value="pct85"/>
451         <xsd:enumeration value="pct87"/>
452         <xsd:enumeration value="pct90"/>
453         <xsd:enumeration value="pct95"/>
454     </xsd:restriction>
455 </xsd:simpleType>
456 <xsd:complexType name="CT_Shd">
457     <xsd:attribute name="val" type="ST_Shd" use="required"/>

```

```

458     <xsd:attribute name="color" type="ST HexColor" use="optional"/>
459     <xsd:attribute name="themeColor" type="ST ThemeColor" use="optional"/>
460     <xsd:attribute name="themeTint" type="ST UcharHexNumber" use="optional"/>
461     <xsd:attribute name="themeShade" type="ST UcharHexNumber" use="optional"/>
462     <xsd:attribute name="fill" type="ST HexColor" use="optional"/>
463     <xsd:attribute name="themeFill" type="ST ThemeColor" use="optional"/>
464     <xsd:attribute name="themeFillTint" type="ST UcharHexNumber" use="optional"/>
465     <xsd:attribute name="themeFillShade" type="ST UcharHexNumber" use="optional"/>
466 </xsd:complexType>
467 <xsd:complexType name="CT_VerticalAlignRun">
468     <xsd:attribute name="val" type="s:ST VerticalAlignRun" use="required"/>
469 </xsd:complexType>
470 <xsd:complexType name="CT_FitText">
471     <xsd:attribute name="val" type="s:ST TwipsMeasure" use="required"/>
472     <xsd:attribute name="id" type="ST DecimalNumber" use="optional"/>
473 </xsd:complexType>
474 <xsd:simpleType name="ST_Em">
475     <xsd:restriction base="xsd:string">
476         <xsd:enumeration value="none"/>
477         <xsd:enumeration value="dot"/>
478         <xsd:enumeration value="comma"/>
479         <xsd:enumeration value="circle"/>
480         <xsd:enumeration value="underDot"/>
481     </xsd:restriction>
482 </xsd:simpleType>
483 <xsd:complexType name="CT_Em">
484     <xsd:attribute name="val" type="ST_Em" use="required"/>
485 </xsd:complexType>
486 <xsd:complexType name="CT_Language">
487     <xsd:attribute name="val" type="s:ST Lang" use="optional"/>
488     <xsd:attribute name="eastAsia" type="s:ST Lang" use="optional"/>
489     <xsd:attribute name="bidi" type="s:ST Lang" use="optional"/>
490 </xsd:complexType>
491 <xsd:simpleType name="ST_CombineBrackets">
492     <xsd:restriction base="xsd:string">
493         <xsd:enumeration value="none"/>
494         <xsd:enumeration value="round"/>
495         <xsd:enumeration value="square"/>
496         <xsd:enumeration value="angle"/>
497         <xsd:enumeration value="curly"/>
498     </xsd:restriction>
499 </xsd:simpleType>
500 <xsd:complexType name="CT_EastAsianLayout">
501     <xsd:attribute name="id" type="ST DecimalNumber" use="optional"/>
502     <xsd:attribute name="combine" type="s:ST OnOff" use="optional"/>
503     <xsd:attribute name="combineBrackets" type="ST_CombineBrackets" use="optional"/>
504     <xsd:attribute name="vert" type="s:ST OnOff" use="optional"/>
505     <xsd:attribute name="vertCompress" type="s:ST OnOff" use="optional"/>
506 </xsd:complexType>
507 <xsd:simpleType name="ST_HeightRule">
508     <xsd:restriction base="xsd:string">
509         <xsd:enumeration value="auto"/>
510         <xsd:enumeration value="exact"/>

```

```

511         <xsd:enumeration value="atLeast"/>
512     </xsd:restriction>
513 </xsd:simpleType>
514 <xsd:simpleType name="ST_Wrap">
515     <xsd:restriction base="xsd:string">
516         <xsd:enumeration value="auto"/>
517         <xsd:enumeration value="notBeside"/>
518         <xsd:enumeration value="around"/>
519         <xsd:enumeration value="tight"/>
520         <xsd:enumeration value="through"/>
521         <xsd:enumeration value="none"/>
522     </xsd:restriction>
523 </xsd:simpleType>
524 <xsd:simpleType name="ST_VAnchor">
525     <xsd:restriction base="xsd:string">
526         <xsd:enumeration value="text"/>
527         <xsd:enumeration value="margin"/>
528         <xsd:enumeration value="page"/>
529     </xsd:restriction>
530 </xsd:simpleType>
531 <xsd:simpleType name="ST_HAnchor">
532     <xsd:restriction base="xsd:string">
533         <xsd:enumeration value="text"/>
534         <xsd:enumeration value="margin"/>
535         <xsd:enumeration value="page"/>
536     </xsd:restriction>
537 </xsd:simpleType>
538 <xsd:simpleType name="ST_DropCap">
539     <xsd:restriction base="xsd:string">
540         <xsd:enumeration value="none"/>
541         <xsd:enumeration value="drop"/>
542         <xsd:enumeration value="margin"/>
543     </xsd:restriction>
544 </xsd:simpleType>
545 <xsd:complexType name="CT_FramePr">
546     <xsd:attribute name="dropCap" type="ST_DropCap" use="optional"/>
547     <xsd:attribute name="lines" type="ST_DecimalNumber" use="optional"/>
548     <xsd:attribute name="w" type="s:ST_TwipsMeasure" use="optional"/>
549     <xsd:attribute name="h" type="s:ST_TwipsMeasure" use="optional"/>
550     <xsd:attribute name="vSpace" type="s:ST_TwipsMeasure" use="optional"/>
551     <xsd:attribute name="hSpace" type="s:ST_TwipsMeasure" use="optional"/>
552     <xsd:attribute name="wrap" type="ST_Wrap" use="optional"/>
553     <xsd:attribute name="hAnchor" type="ST_HAnchor" use="optional"/>
554     <xsd:attribute name="vAnchor" type="ST_VAnchor" use="optional"/>
555     <xsd:attribute name="x" type="ST_SignedTwipsMeasure" use="optional"/>
556     <xsd:attribute name="xAlign" type="s:ST_XAlign" use="optional"/>
557     <xsd:attribute name="y" type="ST_SignedTwipsMeasure" use="optional"/>
558     <xsd:attribute name="yAlign" type="s:ST_YAlign" use="optional"/>
559     <xsd:attribute name="hRule" type="ST_HeightRule" use="optional"/>
560     <xsd:attribute name="anchorLock" type="s:ST_OnOff" use="optional"/>
561 </xsd:complexType>
562 <xsd:simpleType name="ST_TabJc">
563     <xsd:restriction base="xsd:string">

```

```

564         <xsd:enumeration value="clear"/>
565         <xsd:enumeration value="start"/>
566         <xsd:enumeration value="center"/>
567         <xsd:enumeration value="end"/>
568         <xsd:enumeration value="decimal"/>
569         <xsd:enumeration value="bar"/>
570         <xsd:enumeration value="num"/>
571     </xsd:restriction>
572 </xsd:simpleType>
573 <xsd:simpleType name="ST_TabTlc">
574     <xsd:restriction base="xsd:string">
575         <xsd:enumeration value="none"/>
576         <xsd:enumeration value="dot"/>
577         <xsd:enumeration value="hyphen"/>
578         <xsd:enumeration value="underscore"/>
579         <xsd:enumeration value="heavy"/>
580         <xsd:enumeration value="middleDot"/>
581     </xsd:restriction>
582 </xsd:simpleType>
583 <xsd:complexType name="CT_TabStop">
584     <xsd:attribute name="val" type="ST_TabJc" use="required"/>
585     <xsd:attribute name="leader" type="ST_TabTlc" use="optional"/>
586     <xsd:attribute name="pos" type="ST_SignedTwipsMeasure" use="required"/>
587 </xsd:complexType>
588 <xsd:simpleType name="ST_LineSpacingRule">
589     <xsd:restriction base="xsd:string">
590         <xsd:enumeration value="auto"/>
591         <xsd:enumeration value="exact"/>
592         <xsd:enumeration value="atLeast"/>
593     </xsd:restriction>
594 </xsd:simpleType>
595 <xsd:complexType name="CT_Spacing">
596     <xsd:attribute name="before" type="s:ST_TwipsMeasure" use="optional"/>
597     <xsd:attribute name="beforeLines" type="ST_DecimalNumber" use="optional"/>
598     <xsd:attribute name="beforeAutospacing" type="s:ST_OnOff" use="optional"/>
599     <xsd:attribute name="after" type="s:ST_TwipsMeasure" use="optional"/>
600     <xsd:attribute name="afterLines" type="ST_DecimalNumber" use="optional"/>
601     <xsd:attribute name="afterAutospacing" type="s:ST_OnOff" use="optional"/>
602     <xsd:attribute name="line" type="ST_SignedTwipsMeasure" use="optional"/>
603     <xsd:attribute name="lineRule" type="ST_LineSpacingRule" use="optional"/>
604 </xsd:complexType>
605 <xsd:complexType name="CT_Ind">
606     <xsd:attribute name="start" type="ST_SignedTwipsMeasure" use="optional"/>
607     <xsd:attribute name="startChars" type="ST_DecimalNumber" use="optional"/>
608     <xsd:attribute name="end" type="ST_SignedTwipsMeasure" use="optional"/>
609     <xsd:attribute name="endChars" type="ST_DecimalNumber" use="optional"/>
610     <xsd:attribute name="hanging" type="s:ST_TwipsMeasure" use="optional"/>
611     <xsd:attribute name="hangingChars" type="ST_DecimalNumber" use="optional"/>
612     <xsd:attribute name="firstLine" type="s:ST_TwipsMeasure" use="optional"/>
613     <xsd:attribute name="firstLineChars" type="ST_DecimalNumber" use="optional"/>
614 </xsd:complexType>
615 <xsd:simpleType name="ST_Jc">
616     <xsd:restriction base="xsd:string">

```

```

617         <xsd:enumeration value="start"/>
618         <xsd:enumeration value="center"/>
619         <xsd:enumeration value="end"/>
620         <xsd:enumeration value="both"/>
621         <xsd:enumeration value="mediumKashida"/>
622         <xsd:enumeration value="distribute"/>
623         <xsd:enumeration value="numTab"/>
624         <xsd:enumeration value="highKashida"/>
625         <xsd:enumeration value="lowKashida"/>
626         <xsd:enumeration value="thaiDistribute"/>
627     </xsd:restriction>
628 </xsd:simpleType>
629 <xsd:simpleType name="ST_JcTable">
630     <xsd:restriction base="xsd:string">
631         <xsd:enumeration value="center"/>
632         <xsd:enumeration value="end"/>
633         <xsd:enumeration value="start"/>
634     </xsd:restriction>
635 </xsd:simpleType>
636 <xsd:complexType name="CT_Jc">
637     <xsd:attribute name="val" type="ST_Jc" use="required"/>
638 </xsd:complexType>
639 <xsd:complexType name="CT_JcTable">
640     <xsd:attribute name="val" type="ST_JcTable" use="required"/>
641 </xsd:complexType>
642 <xsd:simpleType name="ST_View">
643     <xsd:restriction base="xsd:string">
644         <xsd:enumeration value="none"/>
645         <xsd:enumeration value="print"/>
646         <xsd:enumeration value="outline"/>
647         <xsd:enumeration value="masterPages"/>
648         <xsd:enumeration value="normal"/>
649         <xsd:enumeration value="web"/>
650     </xsd:restriction>
651 </xsd:simpleType>
652 <xsd:complexType name="CT_View">
653     <xsd:attribute name="val" type="ST_View" use="required"/>
654 </xsd:complexType>
655 <xsd:simpleType name="ST_Zoom">
656     <xsd:restriction base="xsd:string">
657         <xsd:enumeration value="none"/>
658         <xsd:enumeration value="fullPage"/>
659         <xsd:enumeration value="bestFit"/>
660         <xsd:enumeration value="textFit"/>
661     </xsd:restriction>
662 </xsd:simpleType>
663 <xsd:complexType name="CT_Zoom">
664     <xsd:attribute name="val" type="ST_Zoom" use="optional"/>
665     <xsd:attribute name="percent" type="ST_DecimalNumberOrPercent" use="required"/>
666 </xsd:complexType>
667 <xsd:complexType name="CT_WritingStyle">
668     <xsd:attribute name="lang" type="s:ST_Lang" use="required"/>
669     <xsd:attribute name="vendorID" type="s:ST_String" use="required"/>

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670     <xsd:attribute name="dllVersion" type="s:ST_String" use="required"/>
671     <xsd:attribute name="nlCheck" type="s:ST_OnOff" use="optional"/>
672     <xsd:attribute name="checkStyle" type="s:ST_OnOff" use="required"/>
673     <xsd:attribute name="appName" type="s:ST_String" use="required"/>
674 </xsd:complexType>
675 <xsd:simpleType name="ST_Proof">
676     <xsd:restriction base="xsd:string">
677         <xsd:enumeration value="clean"/>
678         <xsd:enumeration value="dirty"/>
679     </xsd:restriction>
680 </xsd:simpleType>
681 <xsd:complexType name="CT_Proof">
682     <xsd:attribute name="spelling" type="ST_Proof" use="optional"/>
683     <xsd:attribute name="grammar" type="ST_Proof" use="optional"/>
684 </xsd:complexType>
685 <xsd:simpleType name="ST_DocType">
686     <xsd:restriction base="xsd:string"/>
687 </xsd:simpleType>
688 <xsd:complexType name="CT_DocType">
689     <xsd:attribute name="val" type="ST_DocType" use="required"/>
690 </xsd:complexType>
691 <xsd:simpleType name="ST_DocProtect">
692     <xsd:restriction base="xsd:string">
693         <xsd:enumeration value="none"/>
694         <xsd:enumeration value="readOnly"/>
695         <xsd:enumeration value="comments"/>
696         <xsd:enumeration value="trackedChanges"/>
697         <xsd:enumeration value="forms"/>
698     </xsd:restriction>
699 </xsd:simpleType>
700 <xsd:attributeGroup name="AG_Password">
701     <xsd:attribute name="algorithmName" type="s:ST_String" use="optional"/>
702     <xsd:attribute name="hashValue" type="xsd:base64Binary" use="optional"/>
703     <xsd:attribute name="saltValue" type="xsd:base64Binary" use="optional"/>
704     <xsd:attribute name="spinCount" type="ST_DecimalNumber" use="optional"/>
705 </xsd:attributeGroup>
706 <xsd:complexType name="CT_DocProtect">
707     <xsd:attribute name="edit" type="ST_DocProtect" use="optional"/>
708     <xsd:attribute name="formatting" type="s:ST_OnOff" use="optional"/>
709     <xsd:attribute name="enforcement" type="s:ST_OnOff"/>
710     <xsd:attributeGroup ref="AG_Password"/>
711 </xsd:complexType>
712 <xsd:simpleType name="ST_MailMergeDocType">
713     <xsd:restriction base="xsd:string">
714         <xsd:enumeration value="catalog"/>
715         <xsd:enumeration value="envelopes"/>
716         <xsd:enumeration value="mailingLabels"/>
717         <xsd:enumeration value="formLetters"/>
718         <xsd:enumeration value="email"/>
719         <xsd:enumeration value="fax"/>
720     </xsd:restriction>
721 </xsd:simpleType>
722 <xsd:complexType name="CT_MailMergeDocType">

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723     <xsd:attribute name="val" type="ST MailMergeDocType" use="required"/>
724 </xsd:complexType>
725 <xsd:simpleType name="ST_MailMergeDataType">
726     <xsd:restriction base="xsd:string"/>
727 </xsd:simpleType>
728 <xsd:complexType name="CT_MailMergeDataType">
729     <xsd:attribute name="val" type="ST MailMergeDataType" use="required"/>
730 </xsd:complexType>
731 <xsd:simpleType name="ST_MailMergeDest">
732     <xsd:restriction base="xsd:string">
733         <xsd:enumeration value="newDocument"/>
734         <xsd:enumeration value="printer"/>
735         <xsd:enumeration value="email"/>
736         <xsd:enumeration value="fax"/>
737     </xsd:restriction>
738 </xsd:simpleType>
739 <xsd:complexType name="CT_MailMergeDest">
740     <xsd:attribute name="val" type="ST MailMergeDest" use="required"/>
741 </xsd:complexType>
742 <xsd:simpleType name="ST_MailMergeOdsoFMDFieldType">
743     <xsd:restriction base="xsd:string">
744         <xsd:enumeration value="null"/>
745         <xsd:enumeration value="dbColumn"/>
746     </xsd:restriction>
747 </xsd:simpleType>
748 <xsd:complexType name="CT_MailMergeOdsoFMDFieldType">
749     <xsd:attribute name="val" type="ST MailMergeOdsoFMDFieldType" use="required"/>
750 </xsd:complexType>
751 <xsd:complexType name="CT_TrackChangesView">
752     <xsd:attribute name="markup" type="s:ST OnOff" use="optional"/>
753     <xsd:attribute name="comments" type="s:ST OnOff" use="optional"/>
754     <xsd:attribute name="insDel" type="s:ST OnOff" use="optional"/>
755     <xsd:attribute name="formatting" type="s:ST OnOff" use="optional"/>
756     <xsd:attribute name="inkAnnotations" type="s:ST OnOff" use="optional"/>
757 </xsd:complexType>
758 <xsd:complexType name="CT_Kinsoku">
759     <xsd:attribute name="lang" type="s:ST Lang" use="required"/>
760     <xsd:attribute name="val" type="s:ST String" use="required"/>
761 </xsd:complexType>
762 <xsd:simpleType name="ST_TextDirection">
763     <xsd:restriction base="xsd:string">
764         <xsd:enumeration value="tb"/>
765         <xsd:enumeration value="rl"/>
766         <xsd:enumeration value="lr"/>
767         <xsd:enumeration value="tbV"/>
768         <xsd:enumeration value="rlV"/>
769         <xsd:enumeration value="lrV"/>
770     </xsd:restriction>
771 </xsd:simpleType>
772 <xsd:complexType name="CT_TextDirection">
773     <xsd:attribute name="val" type="ST TextDirection" use="required"/>
774 </xsd:complexType>
775 <xsd:simpleType name="ST_TextAlignment">

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776     <xsd:restriction base="xsd:string">
777         <xsd:enumeration value="top"/>
778         <xsd:enumeration value="center"/>
779         <xsd:enumeration value="baseline"/>
780         <xsd:enumeration value="bottom"/>
781         <xsd:enumeration value="auto"/>
782     </xsd:restriction>
783 </xsd:simpleType>
784 <xsd:complexType name="CT_TextAlignment">
785     <xsd:attribute name="val" type="ST_TextAlignment" use="required"/>
786 </xsd:complexType>
787 <xsd:simpleType name="ST_DisplacedByCustomXml">
788     <xsd:restriction base="xsd:string">
789         <xsd:enumeration value="next"/>
790         <xsd:enumeration value="prev"/>
791     </xsd:restriction>
792 </xsd:simpleType>
793 <xsd:simpleType name="ST_AnnotationVMerge">
794     <xsd:restriction base="xsd:string">
795         <xsd:enumeration value="cont"/>
796         <xsd:enumeration value="rest"/>
797     </xsd:restriction>
798 </xsd:simpleType>
799 <xsd:complexType name="CT_Markup">
800     <xsd:attribute name="id" type="ST_DecimalNumber" use="required"/>
801 </xsd:complexType>
802 <xsd:complexType name="CT_TrackChange">
803     <xsd:complexContent>
804         <xsd:extension base="CT_Markup">
805             <xsd:attribute name="author" type="s:ST_String" use="required"/>
806             <xsd:attribute name="date" type="ST_DateTime" use="optional"/>
807         </xsd:extension>
808     </xsd:complexContent>
809 </xsd:complexType>
810 <xsd:complexType name="CT_CellMergeTrackChange">
811     <xsd:complexContent>
812         <xsd:extension base="CT_TrackChange">
813             <xsd:attribute name="vMerge" type="ST_AnnotationVMerge" use="optional"/>
814             <xsd:attribute name="vMergeOrig" type="ST_AnnotationVMerge" use="optional"/>
815         </xsd:extension>
816     </xsd:complexContent>
817 </xsd:complexType>
818 <xsd:complexType name="CT_TrackChangeRange">
819     <xsd:complexContent>
820         <xsd:extension base="CT_TrackChange">
821             <xsd:attribute name="displacedByCustomXml" type="ST_DisplacedByCustomXml"
822                 use="optional"/>
823         </xsd:extension>
824     </xsd:complexContent>
825 </xsd:complexType>
826 <xsd:complexType name="CT_MarkupRange">
827     <xsd:complexContent>
828         <xsd:extension base="CT_Markup">

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829         <xsd:attribute name="displacedByCustomXml" type="ST_DisplacedByCustomXml"
830             use="optional"/>
831     </xsd:extension>
832 </xsd:complexContent>
833 </xsd:complexType>
834 <xsd:complexType name="CT_BookmarkRange">
835     <xsd:complexContent>
836         <xsd:extension base="CT_MarkupRange">
837             <xsd:attribute name="colFirst" type="ST_DecimalNumber" use="optional"/>
838             <xsd:attribute name="colLast" type="ST_DecimalNumber" use="optional"/>
839         </xsd:extension>
840     </xsd:complexContent>
841 </xsd:complexType>
842 <xsd:complexType name="CT_Bookmark">
843     <xsd:complexContent>
844         <xsd:extension base="CT_BookmarkRange">
845             <xsd:attribute name="name" type="s:ST_String" use="required"/>
846         </xsd:extension>
847     </xsd:complexContent>
848 </xsd:complexType>
849 <xsd:complexType name="CT_MoveBookmark">
850     <xsd:complexContent>
851         <xsd:extension base="CT_Bookmark">
852             <xsd:attribute name="author" type="s:ST_String" use="required"/>
853             <xsd:attribute name="date" type="ST_DateTime" use="required"/>
854         </xsd:extension>
855     </xsd:complexContent>
856 </xsd:complexType>
857 <xsd:complexType name="CT_Comment">
858     <xsd:complexContent>
859         <xsd:extension base="CT_TrackChange">
860             <xsd:sequence>
861                 <xsd:group ref="EG_BlockLevelElts" minOccurs="0" maxOccurs="unbounded"/>
862             </xsd:sequence>
863             <xsd:attribute name="initials" type="s:ST_String" use="optional"/>
864         </xsd:extension>
865     </xsd:complexContent>
866 </xsd:complexType>
867 <xsd:complexType name="CT_TblPrExChange">
868     <xsd:complexContent>
869         <xsd:extension base="CT_TrackChange">
870             <xsd:sequence>
871                 <xsd:element name="tblPrEx" type="CT_TblPrExBase" minOccurs="1"/>
872             </xsd:sequence>
873         </xsd:extension>
874     </xsd:complexContent>
875 </xsd:complexType>
876 <xsd:complexType name="CT_TcPrChange">
877     <xsd:complexContent>
878         <xsd:extension base="CT_TrackChange">
879             <xsd:sequence>
880                 <xsd:element name="tcPr" type="CT_TcPrInner" minOccurs="1"/>
881             </xsd:sequence>

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882         </xsd:extension>
883     </xsd:complexContent>
884 </xsd:complexType>
885 <xsd:complexType name="CT_TrPrChange">
886     <xsd:complexContent>
887         <xsd:extension base="CT_TrackChange">
888             <xsd:sequence>
889                 <xsd:element name="trPr" type="CT_TrPrBase" minOccurs="1"/>
890             </xsd:sequence>
891         </xsd:extension>
892     </xsd:complexContent>
893 </xsd:complexType>
894 <xsd:complexType name="CT_TblGridChange">
895     <xsd:complexContent>
896         <xsd:extension base="CT_Markup">
897             <xsd:sequence>
898                 <xsd:element name="tblGrid" type="CT_TblGridBase"/>
899             </xsd:sequence>
900         </xsd:extension>
901     </xsd:complexContent>
902 </xsd:complexType>
903 <xsd:complexType name="CT_TblPrChange">
904     <xsd:complexContent>
905         <xsd:extension base="CT_TrackChange">
906             <xsd:sequence>
907                 <xsd:element name="tblPr" type="CT_TblPrBase"/>
908             </xsd:sequence>
909         </xsd:extension>
910     </xsd:complexContent>
911 </xsd:complexType>
912 <xsd:complexType name="CT_SectPrChange">
913     <xsd:complexContent>
914         <xsd:extension base="CT_TrackChange">
915             <xsd:sequence>
916                 <xsd:element name="sectPr" type="CT_SectPrBase" minOccurs="0"/>
917             </xsd:sequence>
918         </xsd:extension>
919     </xsd:complexContent>
920 </xsd:complexType>
921 <xsd:complexType name="CT_PPrChange">
922     <xsd:complexContent>
923         <xsd:extension base="CT_TrackChange">
924             <xsd:sequence>
925                 <xsd:element name="pPr" type="CT_PPrBase" minOccurs="1"/>
926             </xsd:sequence>
927         </xsd:extension>
928     </xsd:complexContent>
929 </xsd:complexType>
930 <xsd:complexType name="CT_RPrChange">
931     <xsd:complexContent>
932         <xsd:extension base="CT_TrackChange">
933             <xsd:sequence>
934                 <xsd:element name="rPr" type="CT_RPrOriginal" minOccurs="1"/>

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935         </xsd:sequence>
936     </xsd:extension>
937 </xsd:complexContent>
938 </xsd:complexType>
939 <xsd:complexType name="CT_ParaRPrChange">
940     <xsd:complexContent>
941         <xsd:extension base="CT_TrackChange">
942             <xsd:sequence>
943                 <xsd:element name="rPr" type="CT_ParaRPrOriginal" minOccurs="1"/>
944             </xsd:sequence>
945         </xsd:extension>
946     </xsd:complexContent>
947 </xsd:complexType>
948 <xsd:complexType name="CT_RunTrackChange">
949     <xsd:complexContent>
950         <xsd:extension base="CT_TrackChange">
951             <xsd:choice minOccurs="0" maxOccurs="unbounded">
952                 <xsd:group ref="EG_ContentRunContent"/>
953                 <xsd:group ref="m:EG_OMathMathElements"/>
954             </xsd:choice>
955         </xsd:extension>
956     </xsd:complexContent>
957 </xsd:complexType>
958 <xsd:group name="EG_PContentMath">
959     <xsd:choice>
960         <xsd:group ref="EG_PContentBase" minOccurs="0" maxOccurs="unbounded" />
961         <xsd:group ref="EG_ContentRunContentBase" minOccurs="0"
962             maxOccurs="unbounded" />
963     </xsd:choice>
964 </xsd:group>
965 <xsd:group name="EG_PContentBase">
966     <xsd:choice>
967         <xsd:element name="customXml" type="CT_CustomXmlRun"/>
968         <xsd:element name="fldSimple" type="CT_SimpleField" minOccurs="0"
969             maxOccurs="unbounded"/>
970         <xsd:element name="hyperlink" type="CT_Hyperlink"/>
971     </xsd:choice>
972 </xsd:group>
973 <xsd:group name="EG_ContentRunContentBase">
974     <xsd:choice>
975         <xsd:element name="smartTag" type="CT_SmartTagRun"/>
976         <xsd:element name="sdt" type="CT_SdtRun"/>
977         <xsd:group ref="EG_RunLevelElts" minOccurs="0" maxOccurs="unbounded" />
978     </xsd:choice>
979 </xsd:group>
980 <xsd:group name="EG_CellMarkupElements">
981     <xsd:choice>
982         <xsd:element name="cellIns" type="CT_TrackChange" minOccurs="0"/>
983         <xsd:element name="cellDel" type="CT_TrackChange" minOccurs="0"/>
984         <xsd:element name="cellMerge" type="CT_CellMergeTrackChange" minOccurs="0"/>
985     </xsd:choice>
986 </xsd:group>
987 <xsd:group name="EG_RangeMarkupElements">

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988     <xsd:choice>
989         <xsd:element name="bookmarkStart" type="CT_Bookmark"/>
990         <xsd:element name="bookmarkEnd" type="CT_MarkupRange"/>
991         <xsd:element name="moveFromRangeStart" type="CT_MoveBookmark"/>
992         <xsd:element name="moveFromRangeEnd" type="CT_MarkupRange"/>
993         <xsd:element name="moveToRangeStart" type="CT_MoveBookmark"/>
994         <xsd:element name="moveToRangeEnd" type="CT_MarkupRange"/>
995         <xsd:element name="commentRangeStart" type="CT_MarkupRange"/>
996         <xsd:element name="commentRangeEnd" type="CT_MarkupRange"/>
997         <xsd:element name="customXmlInsRangeStart" type="CT_TrackChange"/>
998         <xsd:element name="customXmlInsRangeEnd" type="CT_Markup"/>
999         <xsd:element name="customXmlDelRangeStart" type="CT_TrackChange"/>
1000        <xsd:element name="customXmlDelRangeEnd" type="CT_Markup"/>
1001        <xsd:element name="customXmlMoveFromRangeStart" type="CT_TrackChange"/>
1002        <xsd:element name="customXmlMoveFromRangeEnd" type="CT_Markup"/>
1003        <xsd:element name="customXmlMoveToRangeStart" type="CT_TrackChange"/>
1004        <xsd:element name="customXmlMoveToRangeEnd" type="CT_Markup"/>
1005    </xsd:choice>
1006</xsd:group>
1007<xsd:complexType name="CT_NumPr">
1008    <xsd:sequence>
1009        <xsd:element name="ilvl" type="CT_DecimalNumber" minOccurs="0"/>
1010        <xsd:element name="numId" type="CT_DecimalNumber" minOccurs="0"/>
1011        <xsd:element name="ins" type="CT_TrackChange" minOccurs="0"/>
1012    </xsd:sequence>
1013</xsd:complexType>
1014<xsd:complexType name="CT_PBdr">
1015    <xsd:sequence>
1016        <xsd:element name="top" type="CT_Border" minOccurs="0"/>
1017        <xsd:element name="left" type="CT_Border" minOccurs="0"/>
1018        <xsd:element name="bottom" type="CT_Border" minOccurs="0"/>
1019        <xsd:element name="right" type="CT_Border" minOccurs="0"/>
1020        <xsd:element name="between" type="CT_Border" minOccurs="0"/>
1021        <xsd:element name="bar" type="CT_Border" minOccurs="0"/>
1022    </xsd:sequence>
1023</xsd:complexType>
1024<xsd:complexType name="CT_Tabs">
1025    <xsd:sequence>
1026        <xsd:element name="tab" type="CT_TabStop" minOccurs="1" maxOccurs="unbounded"/>
1027    </xsd:sequence>
1028</xsd:complexType>
1029<xsd:simpleType name="ST_TextboxTightWrap">
1030    <xsd:restriction base="xsd:string">
1031        <xsd:enumeration value="none"/>
1032        <xsd:enumeration value="allLines"/>
1033        <xsd:enumeration value="firstAndLastLine"/>
1034        <xsd:enumeration value="firstLineOnly"/>
1035        <xsd:enumeration value="lastLineOnly"/>
1036    </xsd:restriction>
1037</xsd:simpleType>
1038<xsd:complexType name="CT_TextboxTightWrap">
1039    <xsd:attribute name="val" type="ST_TextboxTightWrap" use="required"/>
1040</xsd:complexType>

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1041 <xsd:complexType name="CT_PPr">
1042   <xsd:complexContent>
1043     <xsd:extension base="CT_PPrBase">
1044       <xsd:sequence>
1045         <xsd:element name="rPr" type="CT_ParaRPr" minOccurs="0"/>
1046         <xsd:element name="sectPr" type="CT_SectPr" minOccurs="0"/>
1047         <xsd:element name="pPrChange" type="CT_PPrChange" minOccurs="0"/>
1048       </xsd:sequence>
1049     </xsd:extension>
1050   </xsd:complexContent>
1051 </xsd:complexType>
1052 <xsd:complexType name="CT_PPrBase">
1053   <xsd:sequence>
1054     <xsd:element name="pStyle" type="CT_String" minOccurs="0"/>
1055     <xsd:element name="keepNext" type="CT_OnOff" minOccurs="0"/>
1056     <xsd:element name="keepLines" type="CT_OnOff" minOccurs="0"/>
1057     <xsd:element name="pageBreakBefore" type="CT_OnOff" minOccurs="0"/>
1058     <xsd:element name="framePr" type="CT_FramePr" minOccurs="0"/>
1059     <xsd:element name="widowControl" type="CT_OnOff" minOccurs="0"/>
1060     <xsd:element name="numPr" type="CT_NumPr" minOccurs="0"/>
1061     <xsd:element name="suppressLineNumbers" type="CT_OnOff" minOccurs="0"/>
1062     <xsd:element name="pBdr" type="CT_PBdr" minOccurs="0"/>
1063     <xsd:element name="shd" type="CT_Shdt" minOccurs="0"/>
1064     <xsd:element name="tabs" type="CT_Tabs" minOccurs="0"/>
1065     <xsd:element name="suppressAutoHyphens" type="CT_OnOff" minOccurs="0"/>
1066     <xsd:element name="kinsoku" type="CT_OnOff" minOccurs="0"/>
1067     <xsd:element name="wordWrap" type="CT_OnOff" minOccurs="0"/>
1068     <xsd:element name="overflowPunct" type="CT_OnOff" minOccurs="0"/>
1069     <xsd:element name="topLinePunct" type="CT_OnOff" minOccurs="0"/>
1070     <xsd:element name="autoSpaceDE" type="CT_OnOff" minOccurs="0"/>
1071     <xsd:element name="autoSpaceDN" type="CT_OnOff" minOccurs="0"/>
1072     <xsd:element name="bidi" type="CT_OnOff" minOccurs="0"/>
1073     <xsd:element name="adjustRightInd" type="CT_OnOff" minOccurs="0"/>
1074     <xsd:element name="snapToGrid" type="CT_OnOff" minOccurs="0"/>
1075     <xsd:element name="spacing" type="CT_Spacing" minOccurs="0"/>
1076     <xsd:element name="ind" type="CT_Ind" minOccurs="0"/>
1077     <xsd:element name="contextualSpacing" type="CT_OnOff" minOccurs="0"/>
1078     <xsd:element name="mirrorIndents" type="CT_OnOff" minOccurs="0"/>
1079     <xsd:element name="suppressOverlap" type="CT_OnOff" minOccurs="0"/>
1080     <xsd:element name="jc" type="CT_Jc" minOccurs="0"/>
1081     <xsd:element name="textDirection" type="CT_TextDirection" minOccurs="0"/>
1082     <xsd:element name="textAlignment" type="CT_TextAlignment" minOccurs="0"/>
1083     <xsd:element name="textboxTightWrap" type="CT_TextboxTightWrap" minOccurs="0"/>
1084     <xsd:element name="outlineLvl" type="CT_DecimalNumber" minOccurs="0"/>
1085     <xsd:element name="divId" type="CT_DecimalNumber" minOccurs="0"/>
1086     <xsd:element name="cnfStyle" type="CT_Cnf" minOccurs="0" maxOccurs="1"/>
1087   </xsd:sequence>
1088 </xsd:complexType>
1089 <xsd:complexType name="CT_PPrGeneral">
1090   <xsd:complexContent>
1091     <xsd:extension base="CT_PPrBase">
1092       <xsd:sequence>
1093         <xsd:element name="pPrChange" type="CT_PPrChange" minOccurs="0"/>

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1094         </xsd:sequence>
1095     </xsd:extension>
1096 </xsd:complexContent>
1097 </xsd:complexType>
1098 <xsd:complexType name="CT_Control">
1099     <xsd:attribute name="name" type="s:ST_String" use="optional"/>
1100     <xsd:attribute name="shapeid" type="s:ST_String" use="optional"/>
1101     <xsd:attribute ref="r:id" use="optional"/>
1102 </xsd:complexType>
1103 <xsd:complexType name="CT_Background">
1104     <xsd:sequence>
1105         <xsd:element name="drawing" type="CT_Drawing" minOccurs="0"/>
1106     </xsd:sequence>
1107     <xsd:attribute name="color" type="ST_HexColor" use="optional"/>
1108     <xsd:attribute name="themeColor" type="ST_ThemeColor" use="optional"/>
1109     <xsd:attribute name="themeTint" type="ST_UcharHexNumber" use="optional"/>
1110     <xsd:attribute name="themeShade" type="ST_UcharHexNumber" use="optional"/>
1111 </xsd:complexType>
1112 <xsd:complexType name="CT_Rel">
1113     <xsd:attribute ref="r:id" use="required"/>
1114 </xsd:complexType>
1115 <xsd:complexType name="CT_Object">
1116     <xsd:sequence>
1117         <xsd:element name="drawing" type="CT_Drawing" minOccurs="0"/>
1118         <xsd:choice minOccurs="0">
1119             <xsd:element name="control" type="CT_Control"/>
1120             <xsd:element name="objectLink" type="CT_ObjectLink"/>
1121             <xsd:element name="objectEmbed" type="CT_ObjectEmbed"/>
1122             <xsd:element name="movie" type="CT_Rel"/>
1123         </xsd:choice>
1124     </xsd:sequence>
1125     <xsd:attribute name="dxaOrig" type="s:ST_TwipsMeasure" use="optional"/>
1126     <xsd:attribute name="dyaOrig" type="s:ST_TwipsMeasure" use="optional"/>
1127 </xsd:complexType>
1128 <xsd:complexType name="CT_ObjectEmbed">
1129     <xsd:attribute name="drawAspect" type="ST_ObjectDrawAspect" use="optional"/>
1130     <xsd:attribute ref="r:id" use="required"/>
1131     <xsd:attribute name="progId" type="s:ST_String" use="optional"/>
1132     <xsd:attribute name="shapeId" type="s:ST_String" use="optional"/>
1133     <xsd:attribute name="fieldCodes" type="s:ST_String" use="optional"/>
1134 </xsd:complexType>
1135 <xsd:simpleType name="ST_ObjectDrawAspect">
1136     <xsd:restriction base="xsd:string">
1137         <xsd:enumeration value="content"/>
1138         <xsd:enumeration value="icon"/>
1139     </xsd:restriction>
1140 </xsd:simpleType>
1141 <xsd:complexType name="CT_ObjectLink">
1142     <xsd:complexContent>
1143         <xsd:extension base="CT_ObjectEmbed">
1144             <xsd:attribute name="updateMode" type="ST_ObjectUpdateMode" use="required"/>
1145             <xsd:attribute name="lockedField" type="s:ST_OnOff" use="optional"/>
1146         </xsd:extension>

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1147     </xsd:complexContent>
1148 </xsd:complexType>
1149 <xsd:simpleType name="ST_ObjectUpdateMode">
1150     <xsd:restriction base="xsd:string">
1151         <xsd:enumeration value="always"/>
1152         <xsd:enumeration value="onCall"/>
1153     </xsd:restriction>
1154 </xsd:simpleType>
1155 <xsd:complexType name="CT_Drawing">
1156     <xsd:choice minOccurs="1" maxOccurs="unbounded">
1157         <xsd:element ref="wp:anchor" minOccurs="0"/>
1158         <xsd:element ref="wp:inline" minOccurs="0"/>
1159     </xsd:choice>
1160 </xsd:complexType>
1161 <xsd:complexType name="CT_SimpleField">
1162     <xsd:sequence>
1163         <xsd:group ref="EG_PContent" minOccurs="0" maxOccurs="unbounded"/>
1164     </xsd:sequence>
1165     <xsd:attribute name="instr" type="s:ST_String" use="required"/>
1166     <xsd:attribute name="fldLock" type="s:ST_OnOff"/>
1167     <xsd:attribute name="dirty" type="s:ST_OnOff"/>
1168 </xsd:complexType>
1169 <xsd:simpleType name="ST_FldCharType">
1170     <xsd:restriction base="xsd:string">
1171         <xsd:enumeration value="begin"/>
1172         <xsd:enumeration value="separate"/>
1173         <xsd:enumeration value="end"/>
1174     </xsd:restriction>
1175 </xsd:simpleType>
1176 <xsd:simpleType name="ST_InfoTextType">
1177     <xsd:restriction base="xsd:string">
1178         <xsd:enumeration value="text"/>
1179         <xsd:enumeration value="autoText"/>
1180     </xsd:restriction>
1181 </xsd:simpleType>
1182 <xsd:simpleType name="ST_FFHelpTextVal">
1183     <xsd:restriction base="xsd:string">
1184         <xsd:maxLength value="256"/>
1185     </xsd:restriction>
1186 </xsd:simpleType>
1187 <xsd:simpleType name="ST_FFStatusTextVal">
1188     <xsd:restriction base="xsd:string">
1189         <xsd:maxLength value="140"/>
1190     </xsd:restriction>
1191 </xsd:simpleType>
1192 <xsd:simpleType name="ST_FFName">
1193     <xsd:restriction base="xsd:string">
1194         <xsd:maxLength value="65"/>
1195     </xsd:restriction>
1196 </xsd:simpleType>
1197 <xsd:simpleType name="ST_FFTextType">
1198     <xsd:restriction base="xsd:string">
1199         <xsd:enumeration value="regular"/>

```

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1200     <xsd:enumeration value="number"/>
1201     <xsd:enumeration value="date"/>
1202     <xsd:enumeration value="currentTime"/>
1203     <xsd:enumeration value="currentDate"/>
1204     <xsd:enumeration value="calculated"/>
1205   </xsd:restriction>
1206 </xsd:simpleType>
1207 <xsd:complexType name="CT_FFTextType">
1208   <xsd:attribute name="val" type="ST_FFTextType" use="required"/>
1209 </xsd:complexType>
1210 <xsd:complexType name="CT_FFName">
1211   <xsd:attribute name="val" type="ST_FFName"/>
1212 </xsd:complexType>
1213 <xsd:complexType name="CT_FldChar">
1214   <xsd:choice>
1215     <xsd:element name="ffData" type="CT_FFData" minOccurs="0" maxOccurs="1"/>
1216   </xsd:choice>
1217   <xsd:attribute name="fldCharType" type="ST_FldCharType" use="required"/>
1218   <xsd:attribute name="fldLock" type="s:ST_OnOff"/>
1219   <xsd:attribute name="dirty" type="s:ST_OnOff"/>
1220 </xsd:complexType>
1221 <xsd:complexType name="CT_Hyperlink">
1222   <xsd:group ref="EG_PContent" minOccurs="0" maxOccurs="unbounded"/>
1223   <xsd:attribute name="tgtFrame" type="s:ST_String" use="optional"/>
1224   <xsd:attribute name="tooltip" type="s:ST_String" use="optional"/>
1225   <xsd:attribute name="docLocation" type="s:ST_String" use="optional"/>
1226   <xsd:attribute name="history" type="s:ST_OnOff" use="optional"/>
1227   <xsd:attribute name="anchor" type="s:ST_String" use="optional"/>
1228   <xsd:attribute ref="r:id"/>
1229 </xsd:complexType>
1230 <xsd:complexType name="CT_FFData">
1231   <xsd:choice maxOccurs="unbounded">
1232     <xsd:element name="name" type="CT_FFName"/>
1233     <xsd:element name="label" type="CT_DecimalNumber" minOccurs="0"/>
1234     <xsd:element name="tabIndex" type="CT_UnsignedDecimalNumber" minOccurs="0"/>
1235     <xsd:element name="enabled" type="CT_OnOff"/>
1236     <xsd:element name="calcOnExit" type="CT_OnOff"/>
1237     <xsd:element name="entryMacro" type="CT_MacroName" minOccurs="0" maxOccurs="1"/>
1238     <xsd:element name="exitMacro" type="CT_MacroName" minOccurs="0" maxOccurs="1"/>
1239     <xsd:element name="helpText" type="CT_FFHelpText" minOccurs="0" maxOccurs="1"/>
1240     <xsd:element name="statusText" type="CT_FFStatusText" minOccurs="0" maxOccurs="1"/>
1241   <xsd:choice>
1242     <xsd:element name="checkBox" type="CT_FFCheckBox"/>
1243     <xsd:element name="ddList" type="CT_FFDDLList"/>
1244     <xsd:element name="textInput" type="CT_FFTextInput"/>
1245   </xsd:choice>
1246 </xsd:choice>
1247 </xsd:complexType>
1248 <xsd:complexType name="CT_FFHelpText">
1249   <xsd:attribute name="type" type="ST_InfoTextType"/>
1250   <xsd:attribute name="val" type="ST_FFHelpTextVal"/>
1251 </xsd:complexType>
1252 <xsd:complexType name="CT_FFStatusText">

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1253     <xsd:attribute name="type" type="ST_InfoTextType"/>
1254     <xsd:attribute name="val" type="ST_FFStatusTextVal"/>
1255 </xsd:complexType>
1256 <xsd:complexType name="CT_FFCheckBox">
1257     <xsd:sequence>
1258         <xsd:choice>
1259             <xsd:element name="size" type="CT_HpsMeasure"/>
1260             <xsd:element name="sizeAuto" type="CT_OnOff"/>
1261         </xsd:choice>
1262         <xsd:element name="default" type="CT_OnOff" minOccurs="0"/>
1263         <xsd:element name="checked" type="CT_OnOff" minOccurs="0"/>
1264     </xsd:sequence>
1265 </xsd:complexType>
1266 <xsd:complexType name="CT_FFDDLList">
1267     <xsd:sequence>
1268         <xsd:element name="result" type="CT_DecimalNumber" minOccurs="0"/>
1269         <xsd:element name="default" type="CT_DecimalNumber" minOccurs="0"/>
1270         <xsd:element name="listEntry" type="CT_String" minOccurs="0" maxOccurs="unbounded"/>
1271     </xsd:sequence>
1272 </xsd:complexType>
1273 <xsd:complexType name="CT_FFTextInput">
1274     <xsd:sequence>
1275         <xsd:element name="type" type="CT_FFTextType" minOccurs="0"/>
1276         <xsd:element name="default" type="CT_String" minOccurs="0"/>
1277         <xsd:element name="maxLength" type="CT_DecimalNumber" minOccurs="0"/>
1278         <xsd:element name="format" type="CT_String" minOccurs="0"/>
1279     </xsd:sequence>
1280 </xsd:complexType>
1281 <xsd:simpleType name="ST_SectionMark">
1282     <xsd:restriction base="xsd:string">
1283         <xsd:enumeration value="nextPage"/>
1284         <xsd:enumeration value="nextColumn"/>
1285         <xsd:enumeration value="continuous"/>
1286         <xsd:enumeration value="evenPage"/>
1287         <xsd:enumeration value="oddPage"/>
1288     </xsd:restriction>
1289 </xsd:simpleType>
1290 <xsd:complexType name="CT_SectType">
1291     <xsd:attribute name="val" type="ST_SectionMark"/>
1292 </xsd:complexType>
1293 <xsd:complexType name="CT_PaperSource">
1294     <xsd:attribute name="first" type="ST_DecimalNumber"/>
1295     <xsd:attribute name="other" type="ST_DecimalNumber"/>
1296 </xsd:complexType>
1297 <xsd:simpleType name="ST_NumberFormat">
1298     <xsd:restriction base="xsd:string">
1299         <xsd:enumeration value="decimal"/>
1300         <xsd:enumeration value="upperRoman"/>
1301         <xsd:enumeration value="lowerRoman"/>
1302         <xsd:enumeration value="upperLetter"/>
1303         <xsd:enumeration value="lowerLetter"/>
1304         <xsd:enumeration value="ordinal"/>
1305         <xsd:enumeration value="cardinalText"/>

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1306     <xsd:enumeration value="ordinalText"/>
1307     <xsd:enumeration value="hex"/>
1308     <xsd:enumeration value="chicago"/>
1309     <xsd:enumeration value="ideographDigital"/>
1310     <xsd:enumeration value="japaneseCounting"/>
1311     <xsd:enumeration value="aiueo"/>
1312     <xsd:enumeration value="iroha"/>
1313     <xsd:enumeration value="decimalFullWidth"/>
1314     <xsd:enumeration value="decimalHalfWidth"/>
1315     <xsd:enumeration value="japaneseLegal"/>
1316     <xsd:enumeration value="japaneseDigitalTenThousand"/>
1317     <xsd:enumeration value="decimalEnclosedCircle"/>
1318     <xsd:enumeration value="decimalFullWidth2"/>
1319     <xsd:enumeration value="aiueoFullWidth"/>
1320     <xsd:enumeration value="irohaFullWidth"/>
1321     <xsd:enumeration value="decimalZero"/>
1322     <xsd:enumeration value="bullet"/>
1323     <xsd:enumeration value="ganada"/>
1324     <xsd:enumeration value="chosung"/>
1325     <xsd:enumeration value="decimalEnclosedFullstop"/>
1326     <xsd:enumeration value="decimalEnclosedParen"/>
1327     <xsd:enumeration value="decimalEnclosedCircleChinese"/>
1328     <xsd:enumeration value="ideographEnclosedCircle"/>
1329     <xsd:enumeration value="ideographTraditional"/>
1330     <xsd:enumeration value="ideographZodiac"/>
1331     <xsd:enumeration value="ideographZodiacTraditional"/>
1332     <xsd:enumeration value="taiwaneseCounting"/>
1333     <xsd:enumeration value="ideographLegalTraditional"/>
1334     <xsd:enumeration value="taiwaneseCountingThousand"/>
1335     <xsd:enumeration value="taiwaneseDigital"/>
1336     <xsd:enumeration value="chineseCounting"/>
1337     <xsd:enumeration value="chineseLegalSimplified"/>
1338     <xsd:enumeration value="chineseCountingThousand"/>
1339     <xsd:enumeration value="koreanDigital"/>
1340     <xsd:enumeration value="koreanCounting"/>
1341     <xsd:enumeration value="koreanLegal"/>
1342     <xsd:enumeration value="koreanDigital2"/>
1343     <xsd:enumeration value="vietnameseCounting"/>
1344     <xsd:enumeration value="russianLower"/>
1345     <xsd:enumeration value="russianUpper"/>
1346     <xsd:enumeration value="none"/>
1347     <xsd:enumeration value="numberInDash"/>
1348     <xsd:enumeration value="hebrew1"/>
1349     <xsd:enumeration value="hebrew2"/>
1350     <xsd:enumeration value="arabicAlpha"/>
1351     <xsd:enumeration value="arabicAbjad"/>
1352     <xsd:enumeration value="hindiVowels"/>
1353     <xsd:enumeration value="hindiConsonants"/>
1354     <xsd:enumeration value="hindiNumbers"/>
1355     <xsd:enumeration value="hindiCounting"/>
1356     <xsd:enumeration value="thaiLetters"/>
1357     <xsd:enumeration value="thaiNumbers"/>
1358     <xsd:enumeration value="thaiCounting"/>

```

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1359         <xsd:enumeration value="bahtText"/>
1360         <xsd:enumeration value="dollarText"/>
1361         <xsd:enumeration value="custom"/>
1362     </xsd:restriction>
1363 </xsd:simpleType>
1364 <xsd:simpleType name="ST_PageOrientation">
1365     <xsd:restriction base="xsd:string">
1366         <xsd:enumeration value="portrait"/>
1367         <xsd:enumeration value="landscape"/>
1368     </xsd:restriction>
1369 </xsd:simpleType>
1370 <xsd:complexType name="CT_PageSz">
1371     <xsd:attribute name="w" type="s:ST_TwipsMeasure"/>
1372     <xsd:attribute name="h" type="s:ST_TwipsMeasure"/>
1373     <xsd:attribute name="orient" type="ST_PageOrientation" use="optional"/>
1374     <xsd:attribute name="code" type="ST_DecimalNumber" use="optional"/>
1375 </xsd:complexType>
1376 <xsd:complexType name="CT_PageMar">
1377     <xsd:attribute name="top" type="ST_SignedTwipsMeasure" use="required"/>
1378     <xsd:attribute name="right" type="s:ST_TwipsMeasure" use="required"/>
1379     <xsd:attribute name="bottom" type="ST_SignedTwipsMeasure" use="required"/>
1380     <xsd:attribute name="left" type="s:ST_TwipsMeasure" use="required"/>
1381     <xsd:attribute name="header" type="s:ST_TwipsMeasure" use="required"/>
1382     <xsd:attribute name="footer" type="s:ST_TwipsMeasure" use="required"/>
1383     <xsd:attribute name="gutter" type="s:ST_TwipsMeasure" use="required"/>
1384 </xsd:complexType>
1385 <xsd:simpleType name="ST_PageBorderZOrder">
1386     <xsd:restriction base="xsd:string">
1387         <xsd:enumeration value="front"/>
1388         <xsd:enumeration value="back"/>
1389     </xsd:restriction>
1390 </xsd:simpleType>
1391 <xsd:simpleType name="ST_PageBorderDisplay">
1392     <xsd:restriction base="xsd:string">
1393         <xsd:enumeration value="allPages"/>
1394         <xsd:enumeration value="firstPage"/>
1395         <xsd:enumeration value="notFirstPage"/>
1396     </xsd:restriction>
1397 </xsd:simpleType>
1398 <xsd:simpleType name="ST_PageBorderOffset">
1399     <xsd:restriction base="xsd:string">
1400         <xsd:enumeration value="page"/>
1401         <xsd:enumeration value="text"/>
1402     </xsd:restriction>
1403 </xsd:simpleType>
1404 <xsd:complexType name="CT_PageBorders">
1405     <xsd:sequence>
1406         <xsd:element name="top" type="CT_TopPageBorder" minOccurs="0"/>
1407         <xsd:element name="left" type="CT_PageBorder" minOccurs="0"/>
1408         <xsd:element name="bottom" type="CT_BottomPageBorder" minOccurs="0"/>
1409         <xsd:element name="right" type="CT_PageBorder" minOccurs="0"/>
1410     </xsd:sequence>
1411     <xsd:attribute name="zOrder" type="ST_PageBorderZOrder" use="optional"/>

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1412     <xsd:attribute name="display" type="ST PageBorderDisplay" use="optional"/>
1413     <xsd:attribute name="offsetFrom" type="ST PageBorderOffset" use="optional"/>
1414 </xsd:complexType>
1415 <xsd:complexType name="CT_PageBorder">
1416     <xsd:complexContent>
1417         <xsd:extension base="CT_Border">
1418             <xsd:attribute ref="r:id" use="optional"/>
1419         </xsd:extension>
1420     </xsd:complexContent>
1421 </xsd:complexType>
1422 <xsd:complexType name="CT_BottomPageBorder">
1423     <xsd:complexContent>
1424         <xsd:extension base="CT_PageBorder">
1425             <xsd:attribute ref="r:bottomLeft" use="optional"/>
1426             <xsd:attribute ref="r:bottomRight" use="optional"/>
1427         </xsd:extension>
1428     </xsd:complexContent>
1429 </xsd:complexType>
1430 <xsd:complexType name="CT_TopPageBorder">
1431     <xsd:complexContent>
1432         <xsd:extension base="CT_PageBorder">
1433             <xsd:attribute ref="r:topLeft" use="optional"/>
1434             <xsd:attribute ref="r:topRight" use="optional"/>
1435         </xsd:extension>
1436     </xsd:complexContent>
1437 </xsd:complexType>
1438 <xsd:simpleType name="ST_ChapterSep">
1439     <xsd:restriction base="xsd:string">
1440         <xsd:enumeration value="hyphen"/>
1441         <xsd:enumeration value="period"/>
1442         <xsd:enumeration value="colon"/>
1443         <xsd:enumeration value="emDash"/>
1444         <xsd:enumeration value="enDash"/>
1445     </xsd:restriction>
1446 </xsd:simpleType>
1447 <xsd:simpleType name="ST_LineNumberRestart">
1448     <xsd:restriction base="xsd:string">
1449         <xsd:enumeration value="newPage"/>
1450         <xsd:enumeration value="newSection"/>
1451         <xsd:enumeration value="continuous"/>
1452     </xsd:restriction>
1453 </xsd:simpleType>
1454 <xsd:complexType name="CT_LineNumber">
1455     <xsd:attribute name="countBy" type="ST_DecimalNumber" use="optional"/>
1456     <xsd:attribute name="start" type="ST_DecimalNumber" use="optional"/>
1457     <xsd:attribute name="distance" type="s:ST_TwipsMeasure" use="optional"/>
1458     <xsd:attribute name="restart" type="ST_LineNumberRestart" use="optional"/>
1459 </xsd:complexType>
1460 <xsd:complexType name="CT_PageNumber">
1461     <xsd:attribute name="fmt" type="ST_NumberFormat" use="optional"/>
1462     <xsd:attribute name="start" type="ST_DecimalNumber" use="optional"/>
1463     <xsd:attribute name="chapStyle" type="ST_DecimalNumber" use="optional"/>
1464     <xsd:attribute name="chapSep" type="ST_ChapterSep" use="optional"/>

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1465 </xsd:complexType>
1466 <xsd:complexType name="CT_Column">
1467   <xsd:attribute name="w" type="s:ST_TwipsMeasure" use="optional"/>
1468   <xsd:attribute name="space" type="s:ST_TwipsMeasure" use="optional"/>
1469 </xsd:complexType>
1470 <xsd:complexType name="CT_Columns">
1471   <xsd:sequence minOccurs="0">
1472     <xsd:element name="col" type="CT_Column" maxOccurs="45"/>
1473   </xsd:sequence>
1474   <xsd:attribute name="equalWidth" type="s:ST_OnOff" use="optional"/>
1475   <xsd:attribute name="space" type="s:ST_TwipsMeasure" use="optional"/>
1476   <xsd:attribute name="num" type="ST_DecimalNumber" use="optional"/>
1477   <xsd:attribute name="sep" type="s:ST_OnOff" use="optional"/>
1478 </xsd:complexType>
1479 <xsd:simpleType name="ST_VerticalJc">
1480   <xsd:restriction base="xsd:string">
1481     <xsd:enumeration value="top"/>
1482     <xsd:enumeration value="center"/>
1483     <xsd:enumeration value="both"/>
1484     <xsd:enumeration value="bottom"/>
1485   </xsd:restriction>
1486 </xsd:simpleType>
1487 <xsd:complexType name="CT_VerticalJc">
1488   <xsd:attribute name="val" type="ST_VerticalJc" use="required"/>
1489 </xsd:complexType>
1490 <xsd:simpleType name="ST_DocGrid">
1491   <xsd:restriction base="xsd:string">
1492     <xsd:enumeration value="default"/>
1493     <xsd:enumeration value="lines"/>
1494     <xsd:enumeration value="linesAndChars"/>
1495     <xsd:enumeration value="snapToChars"/>
1496   </xsd:restriction>
1497 </xsd:simpleType>
1498 <xsd:complexType name="CT_DocGrid">
1499   <xsd:attribute name="type" type="ST_DocGrid"/>
1500   <xsd:attribute name="linePitch" type="ST_DecimalNumber"/>
1501   <xsd:attribute name="charSpace" type="ST_DecimalNumber"/>
1502 </xsd:complexType>
1503 <xsd:simpleType name="ST_HdrFtr">
1504   <xsd:restriction base="xsd:string">
1505     <xsd:enumeration value="even"/>
1506     <xsd:enumeration value="default"/>
1507     <xsd:enumeration value="first"/>
1508   </xsd:restriction>
1509 </xsd:simpleType>
1510 <xsd:simpleType name="ST_FtnEdn">
1511   <xsd:restriction base="xsd:string">
1512     <xsd:enumeration value="normal"/>
1513     <xsd:enumeration value="separator"/>
1514     <xsd:enumeration value="continuationSeparator"/>
1515     <xsd:enumeration value="continuationNotice"/>
1516   </xsd:restriction>
1517 </xsd:simpleType>

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1518 <xsd:complexType name="CT_HdrFtrRef">
1519   <xsd:complexContent>
1520     <xsd:extension base="CT_Rel">
1521       <xsd:attribute name="type" type="ST_HdrFtr" use="required"/>
1522     </xsd:extension>
1523   </xsd:complexContent>
1524 </xsd:complexType>
1525 <xsd:group name="EG_HdrFtrReferences">
1526   <xsd:choice>
1527     <xsd:element name="headerReference" type="CT_HdrFtrRef" minOccurs="0"/>
1528     <xsd:element name="footerReference" type="CT_HdrFtrRef" minOccurs="0"/>
1529   </xsd:choice>
1530 </xsd:group>
1531 <xsd:complexType name="CT_HdrFtr">
1532   <xsd:group ref="EG_BlockLevelElts" minOccurs="1" maxOccurs="unbounded"/>
1533 </xsd:complexType>
1534 <xsd:group name="EG_SectPrContents">
1535   <xsd:sequence>
1536     <xsd:element name="footnotePr" type="CT_FtnProps" minOccurs="0"/>
1537     <xsd:element name="endnotePr" type="CT_EdnProps" minOccurs="0"/>
1538     <xsd:element name="type" type="CT_SectType" minOccurs="0"/>
1539     <xsd:element name="pgSz" type="CT_PageSz" minOccurs="0"/>
1540     <xsd:element name="pgMar" type="CT_PageMar" minOccurs="0"/>
1541     <xsd:element name="paperSrc" type="CT_PaperSource" minOccurs="0"/>
1542     <xsd:element name="pgBorders" type="CT_PageBorders" minOccurs="0"/>
1543     <xsd:element name="lnNumType" type="CT_LineNumber" minOccurs="0"/>
1544     <xsd:element name="pgNumType" type="CT_PageNumber" minOccurs="0"/>
1545     <xsd:element name="cols" type="CT_Columns" minOccurs="0"/>
1546     <xsd:element name="formProt" type="CT_OnOff" minOccurs="0"/>
1547     <xsd:element name="vAlign" type="CT_VerticalJc" minOccurs="0"/>
1548     <xsd:element name="noEndnote" type="CT_OnOff" minOccurs="0"/>
1549     <xsd:element name="titlePg" type="CT_OnOff" minOccurs="0"/>
1550     <xsd:element name="textDirection" type="CT_TextDirection" minOccurs="0"/>
1551     <xsd:element name="bidi" type="CT_OnOff" minOccurs="0"/>
1552     <xsd:element name="rtlGutter" type="CT_OnOff" minOccurs="0"/>
1553     <xsd:element name="docGrid" type="CT_DocGrid" minOccurs="0"/>
1554     <xsd:element name="printerSettings" type="CT_Rel" minOccurs="0"/>
1555   </xsd:sequence>
1556 </xsd:group>
1557 <xsd:attributeGroup name="AG_SectPrAttributes">
1558   <xsd:attribute name="rsidRPr" type="ST_LongHexNumber"/>
1559   <xsd:attribute name="rsidDel" type="ST_LongHexNumber"/>
1560   <xsd:attribute name="rsidR" type="ST_LongHexNumber"/>
1561   <xsd:attribute name="rsidSect" type="ST_LongHexNumber"/>
1562 </xsd:attributeGroup>
1563 <xsd:complexType name="CT_SectPrBase">
1564   <xsd:sequence>
1565     <xsd:group ref="EG_SectPrContents" minOccurs="0"/>
1566   </xsd:sequence>
1567   <xsd:attributeGroup ref="AG_SectPrAttributes"/>
1568 </xsd:complexType>
1569 <xsd:complexType name="CT_SectPr">
1570   <xsd:sequence>

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1571     <xsd:group ref="EG_HdrFtrReferences" minOccurs="0" maxOccurs="6"/>
1572     <xsd:group ref="EG_SectPrContents" minOccurs="0"/>
1573     <xsd:element name="sectPrChange" type="CT_SectPrChange" minOccurs="0"/>
1574 </xsd:sequence>
1575 <xsd:attributeGroup ref="AG_SectPrAttributes" />
1576 </xsd:complexType>
1577 <xsd:simpleType name="ST_BrType">
1578     <xsd:restriction base="xsd:string">
1579         <xsd:enumeration value="page"/>
1580         <xsd:enumeration value="column"/>
1581         <xsd:enumeration value="textWrapping"/>
1582     </xsd:restriction>
1583 </xsd:simpleType>
1584 <xsd:simpleType name="ST_BrClear">
1585     <xsd:restriction base="xsd:string">
1586         <xsd:enumeration value="none"/>
1587         <xsd:enumeration value="left"/>
1588         <xsd:enumeration value="right"/>
1589         <xsd:enumeration value="all"/>
1590     </xsd:restriction>
1591 </xsd:simpleType>
1592 <xsd:complexType name="CT_Br">
1593     <xsd:attribute name="type" type="ST_BrType" use="optional"/>
1594     <xsd:attribute name="clear" type="ST_BrClear" use="optional"/>
1595 </xsd:complexType>
1596 <xsd:simpleType name="ST_PTabAlignment">
1597     <xsd:restriction base="xsd:string">
1598         <xsd:enumeration value="left"/>
1599         <xsd:enumeration value="center"/>
1600         <xsd:enumeration value="right"/>
1601     </xsd:restriction>
1602 </xsd:simpleType>
1603 <xsd:simpleType name="ST_PTabRelativeTo">
1604     <xsd:restriction base="xsd:string">
1605         <xsd:enumeration value="margin"/>
1606         <xsd:enumeration value="indent"/>
1607     </xsd:restriction>
1608 </xsd:simpleType>
1609 <xsd:simpleType name="ST_PTabLeader">
1610     <xsd:restriction base="xsd:string">
1611         <xsd:enumeration value="none"/>
1612         <xsd:enumeration value="dot"/>
1613         <xsd:enumeration value="hyphen"/>
1614         <xsd:enumeration value="underscore"/>
1615         <xsd:enumeration value="middleDot"/>
1616     </xsd:restriction>
1617 </xsd:simpleType>
1618 <xsd:complexType name="CT_PTab">
1619     <xsd:attribute name="alignment" type="ST_PTabAlignment" use="required"/>
1620     <xsd:attribute name="relativeTo" type="ST_PTabRelativeTo" use="required"/>
1621     <xsd:attribute name="leader" type="ST_PTabLeader" use="required"/>
1622 </xsd:complexType>
1623 <xsd:complexType name="CT_Sym">

```

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1624     <xsd:attribute name="font" type="s:ST_String"/>
1625     <xsd:attribute name="char" type="ST_ShortHexNumber"/>
1626 </xsd:complexType>
1627 <xsd:simpleType name="ST_ProofErr">
1628     <xsd:restriction base="xsd:string">
1629         <xsd:enumeration value="spellStart"/>
1630         <xsd:enumeration value="spellEnd"/>
1631         <xsd:enumeration value="gramStart"/>
1632         <xsd:enumeration value="gramEnd"/>
1633     </xsd:restriction>
1634 </xsd:simpleType>
1635 <xsd:complexType name="CT_ProofErr">
1636     <xsd:attribute name="type" type="ST_ProofErr" use="required"/>
1637 </xsd:complexType>
1638 <xsd:simpleType name="ST_EdGrp">
1639     <xsd:restriction base="xsd:string">
1640         <xsd:enumeration value="none"/>
1641         <xsd:enumeration value="everyone"/>
1642         <xsd:enumeration value="administrators"/>
1643         <xsd:enumeration value="contributors"/>
1644         <xsd:enumeration value="editors"/>
1645         <xsd:enumeration value="owners"/>
1646         <xsd:enumeration value="current"/>
1647     </xsd:restriction>
1648 </xsd:simpleType>
1649 <xsd:complexType name="CT_Perm">
1650     <xsd:attribute name="id" type="s:ST_String" use="required"/>
1651     <xsd:attribute name="displacedByCustomXml" type="ST_DisplacedByCustomXml" use="optional"/>
1652 </xsd:complexType>
1653 <xsd:complexType name="CT_PermStart">
1654     <xsd:complexContent>
1655         <xsd:extension base="CT_Perm">
1656             <xsd:attribute name="edGrp" type="ST_EdGrp" use="optional"/>
1657             <xsd:attribute name="ed" type="s:ST_String" use="optional"/>
1658             <xsd:attribute name="colFirst" type="ST_DecimalNumber" use="optional"/>
1659             <xsd:attribute name="colLast" type="ST_DecimalNumber" use="optional"/>
1660         </xsd:extension>
1661     </xsd:complexContent>
1662 </xsd:complexType>
1663 <xsd:complexType name="CT_Text">
1664     <xsd:simpleContent>
1665         <xsd:extension base="s:ST_String">
1666             <xsd:attribute ref="xml:space" use="optional"/>
1667         </xsd:extension>
1668     </xsd:simpleContent>
1669 </xsd:complexType>
1670 <xsd:group name="EG_RunInnerContent">
1671     <xsd:choice>
1672         <xsd:element name="br" type="CT_Br"/>
1673         <xsd:element name="t" type="CT_Text"/>
1674         <xsd:element name="contentPart" type="CT_Rel"/>
1675         <xsd:element name="delText" type="CT_Text"/>
1676         <xsd:element name="instrText" type="CT_Text"/>

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1677     <xsd:element name="delInstrText" type="CT_Text"/>
1678     <xsd:element name="noBreakHyphen" type="CT_Empty"/>
1679     <xsd:element name="softHyphen" type="CT_Empty" minOccurs="0"/>
1680     <xsd:element name="dayShort" type="CT_Empty" minOccurs="0"/>
1681     <xsd:element name="monthShort" type="CT_Empty" minOccurs="0"/>
1682     <xsd:element name="yearShort" type="CT_Empty" minOccurs="0"/>
1683     <xsd:element name="dayLong" type="CT_Empty" minOccurs="0"/>
1684     <xsd:element name="monthLong" type="CT_Empty" minOccurs="0"/>
1685     <xsd:element name="yearLong" type="CT_Empty" minOccurs="0"/>
1686     <xsd:element name="annotationRef" type="CT_Empty" minOccurs="0"/>
1687     <xsd:element name="footnoteRef" type="CT_Empty" minOccurs="0"/>
1688     <xsd:element name="endnoteRef" type="CT_Empty" minOccurs="0"/>
1689     <xsd:element name="separator" type="CT_Empty" minOccurs="0"/>
1690     <xsd:element name="continuationSeparator" type="CT_Empty" minOccurs="0"/>
1691     <xsd:element name="sym" type="CT_Sym" minOccurs="0"/>
1692     <xsd:element name="pgNum" type="CT_Empty" minOccurs="0"/>
1693     <xsd:element name="cr" type="CT_Empty" minOccurs="0"/>
1694     <xsd:element name="tab" type="CT_Empty" minOccurs="0"/>
1695     <xsd:element name="object" type="CT_Object"/>
1696     <xsd:element name="fldChar" type="CT_FldChar"/>
1697     <xsd:element name="ruby" type="CT_Ruby"/>
1698     <xsd:element name="footnoteReference" type="CT_FtnEdnRef"/>
1699     <xsd:element name="endnoteReference" type="CT_FtnEdnRef"/>
1700     <xsd:element name="commentReference" type="CT_Markup"/>
1701     <xsd:element name="drawing" type="CT_Drawing"/>
1702     <xsd:element name="ptab" type="CT_PTab" minOccurs="0"/>
1703     <xsd:element name="lastRenderedPageBreak" type="CT_Empty" minOccurs="0" maxOccurs="1"/>
1704 </xsd:choice>
1705 </xsd:group>
1706 <xsd:complexType name="CT_R">
1707     <xsd:sequence>
1708         <xsd:group ref="EG_RPr" minOccurs="0"/>
1709         <xsd:group ref="EG_RunInnerContent" minOccurs="0" maxOccurs="unbounded"/>
1710     </xsd:sequence>
1711     <xsd:attribute name="rsidRPr" type="ST_LongHexNumber"/>
1712     <xsd:attribute name="rsidDel" type="ST_LongHexNumber"/>
1713     <xsd:attribute name="rsidR" type="ST_LongHexNumber"/>
1714 </xsd:complexType>
1715 <xsd:simpleType name="ST_Hint">
1716     <xsd:restriction base="xsd:string">
1717         <xsd:enumeration value="default"/>
1718         <xsd:enumeration value="eastAsia"/>
1719         <xsd:enumeration value="cs"/>
1720     </xsd:restriction>
1721 </xsd:simpleType>
1722 <xsd:simpleType name="ST_Theme">
1723     <xsd:restriction base="xsd:string">
1724         <xsd:enumeration value="majorEastAsia"/>
1725         <xsd:enumeration value="majorBidi"/>
1726         <xsd:enumeration value="majorAscii"/>
1727         <xsd:enumeration value="majorHAnsi"/>
1728         <xsd:enumeration value="minorEastAsia"/>
1729         <xsd:enumeration value="minorBidi"/>

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1730     <xsd:enumeration value="minorAscii"/>
1731     <xsd:enumeration value="minorHAnsi"/>
1732 </xsd:restriction>
1733 </xsd:simpleType>
1734 <xsd:complexType name="CT_Fonts">
1735     <xsd:attribute name="hint" type="ST Hint"/>
1736     <xsd:attribute name="ascii" type="s:ST String"/>
1737     <xsd:attribute name="hAnsi" type="s:ST String"/>
1738     <xsd:attribute name="eastAsia" type="s:ST String"/>
1739     <xsd:attribute name="cs" type="s:ST String"/>
1740     <xsd:attribute name="asciiTheme" type="ST Theme"/>
1741     <xsd:attribute name="hAnsiTheme" type="ST Theme"/>
1742     <xsd:attribute name="eastAsiaTheme" type="ST Theme"/>
1743     <xsd:attribute name="cstheme" type="ST Theme"/>
1744 </xsd:complexType>
1745 <xsd:group name="EG_RPrBase">
1746     <xsd:choice>
1747         <xsd:element name="rStyle" type="CT String"/>
1748         <xsd:element name="rFonts" type="CT_Fonts"/>
1749         <xsd:element name="b" type="CT OnOff"/>
1750         <xsd:element name="bCs" type="CT OnOff"/>
1751         <xsd:element name="i" type="CT OnOff"/>
1752         <xsd:element name="iCs" type="CT OnOff"/>
1753         <xsd:element name="caps" type="CT OnOff"/>
1754         <xsd:element name="smallCaps" type="CT OnOff"/>
1755         <xsd:element name="strike" type="CT OnOff"/>
1756         <xsd:element name="dstrike" type="CT OnOff"/>
1757         <xsd:element name="outline" type="CT OnOff"/>
1758         <xsd:element name="shadow" type="CT OnOff"/>
1759         <xsd:element name="emboss" type="CT OnOff"/>
1760         <xsd:element name="imprint" type="CT OnOff"/>
1761         <xsd:element name="noProof" type="CT OnOff"/>
1762         <xsd:element name="snapToGrid" type="CT OnOff"/>
1763         <xsd:element name="vanish" type="CT OnOff"/>
1764         <xsd:element name="webHidden" type="CT OnOff"/>
1765         <xsd:element name="color" type="CT Color"/>
1766         <xsd:element name="spacing" type="CT SignedTwipsMeasure"/>
1767         <xsd:element name="w" type="CT TextScale"/>
1768         <xsd:element name="kern" type="CT HpsMeasure"/>
1769         <xsd:element name="position" type="CT SignedHpsMeasure"/>
1770         <xsd:element name="sz" type="CT HpsMeasure"/>
1771         <xsd:element name="szCs" type="CT HpsMeasure"/>
1772         <xsd:element name="highlight" type="CT Highlight"/>
1773         <xsd:element name="u" type="CT Underline"/>
1774         <xsd:element name="effect" type="CT TextEffect"/>
1775         <xsd:element name="bdr" type="CT Border"/>
1776         <xsd:element name="shd" type="CT Shd"/>
1777         <xsd:element name="fitText" type="CT FitText"/>
1778         <xsd:element name="vertAlign" type="CT VerticalAlignRun"/>
1779         <xsd:element name="rtl" type="CT OnOff"/>
1780         <xsd:element name="cs" type="CT OnOff"/>
1781         <xsd:element name="em" type="CT Em"/>
1782         <xsd:element name="lang" type="CT Language"/>

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1783     <xsd:element name="eastAsianLayout" type="CT_EastAsianLayout"/>
1784     <xsd:element name="specVanish" type="CT_OnOff"/>
1785     <xsd:element name="oMath" type="CT_OnOff"/>
1786   </xsd:choice>
1787 </xsd:group>
1788 <xsd:group name="EG_RPrContent">
1789   <xsd:sequence>
1790     <xsd:group ref="EG_RPrBase" minOccurs="0" maxOccurs="unbounded"/>
1791     <xsd:element name="rPrChange" type="CT_RPrChange" minOccurs="0"/>
1792   </xsd:sequence>
1793 </xsd:group>
1794 <xsd:complexType name="CT_RPr">
1795   <xsd:sequence>
1796     <xsd:group ref="EG_RPrContent" minOccurs="0"/>
1797   </xsd:sequence>
1798 </xsd:complexType>
1799 <xsd:group name="EG_RPr">
1800   <xsd:sequence>
1801     <xsd:element name="rPr" type="CT_RPr" minOccurs="0"/>
1802   </xsd:sequence>
1803 </xsd:group>
1804 <xsd:group name="EG_RPrMath">
1805   <xsd:choice>
1806     <xsd:group ref="EG_RPr"/>
1807     <xsd:element name="ins" type="CT_MathCtrlIns"/>
1808     <xsd:element name="del" type="CT_MathCtrlDel"/>
1809   </xsd:choice>
1810 </xsd:group>
1811 <xsd:complexType name="CT_MathCtrlIns">
1812   <xsd:complexContent>
1813     <xsd:extension base="CT_TrackChange">
1814       <xsd:choice minOccurs="0">
1815         <xsd:element name="del" type="CT_RPrChange" minOccurs="1"/>
1816         <xsd:element name="rPr" type="CT_RPr" minOccurs="1"/>
1817       </xsd:choice>
1818     </xsd:extension>
1819   </xsd:complexContent>
1820 </xsd:complexType>
1821 <xsd:complexType name="CT_MathCtrlDel">
1822   <xsd:complexContent>
1823     <xsd:extension base="CT_TrackChange">
1824       <xsd:choice minOccurs="0">
1825         <xsd:element name="rPr" type="CT_RPr" minOccurs="1"/>
1826       </xsd:choice>
1827     </xsd:extension>
1828   </xsd:complexContent>
1829 </xsd:complexType>
1830 <xsd:complexType name="CT_RPrOriginal">
1831   <xsd:sequence>
1832     <xsd:group ref="EG_RPrBase" minOccurs="0" maxOccurs="unbounded"/>
1833   </xsd:sequence>
1834 </xsd:complexType>
1835 <xsd:complexType name="CT_ParaRPrOriginal">

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1836     <xsd:sequence>
1837         <xsd:group ref="EG_ParaRPrTrackChanges" minOccurs="0"/>
1838         <xsd:group ref="EG_RPrBase" minOccurs="0" maxOccurs="unbounded"/>
1839     </xsd:sequence>
1840 </xsd:complexType>
1841 <xsd:complexType name="CT_ParaRPr">
1842     <xsd:sequence>
1843         <xsd:group ref="EG_ParaRPrTrackChanges" minOccurs="0"/>
1844         <xsd:group ref="EG_RPrBase" minOccurs="0" maxOccurs="unbounded"/>
1845         <xsd:element name="rPrChange" type="CT_ParaRPrChange" minOccurs="0"/>
1846     </xsd:sequence>
1847 </xsd:complexType>
1848 <xsd:group name="EG_ParaRPrTrackChanges">
1849     <xsd:sequence>
1850         <xsd:element name="ins" type="CT_TrackChange" minOccurs="0"/>
1851         <xsd:element name="del" type="CT_TrackChange" minOccurs="0"/>
1852         <xsd:element name="moveFrom" type="CT_TrackChange" minOccurs="0"/>
1853         <xsd:element name="moveTo" type="CT_TrackChange" minOccurs="0"/>
1854     </xsd:sequence>
1855 </xsd:group>
1856 <xsd:complexType name="CT_AltChunk">
1857     <xsd:sequence>
1858         <xsd:element name="altChunkPr" type="CT_AltChunkPr" minOccurs="0" maxOccurs="1"/>
1859     </xsd:sequence>
1860     <xsd:attribute ref="r:id" use="optional"/>
1861 </xsd:complexType>
1862 <xsd:complexType name="CT_AltChunkPr">
1863     <xsd:sequence>
1864         <xsd:element name="matchSrc" type="CT_OnOff" minOccurs="0" maxOccurs="1"/>
1865     </xsd:sequence>
1866 </xsd:complexType>
1867 <xsd:simpleType name="ST_RubyAlign">
1868     <xsd:restriction base="xsd:string">
1869         <xsd:enumeration value="center"/>
1870         <xsd:enumeration value="distributeLetter"/>
1871         <xsd:enumeration value="distributeSpace"/>
1872         <xsd:enumeration value="left"/>
1873         <xsd:enumeration value="right"/>
1874         <xsd:enumeration value="rightVertical"/>
1875     </xsd:restriction>
1876 </xsd:simpleType>
1877 <xsd:complexType name="CT_RubyAlign">
1878     <xsd:attribute name="val" type="ST_RubyAlign" use="required"/>
1879 </xsd:complexType>
1880 <xsd:complexType name="CT_RubyPr">
1881     <xsd:sequence>
1882         <xsd:element name="rubyAlign" type="CT_RubyAlign"/>
1883         <xsd:element name="hps" type="CT_HpsMeasure"/>
1884         <xsd:element name="hpsRaise" type="CT_HpsMeasure"/>
1885         <xsd:element name="hpsBaseText" type="CT_HpsMeasure"/>
1886         <xsd:element name="lid" type="CT_Lang"/>
1887         <xsd:element name="dirty" type="CT_OnOff" minOccurs="0"/>
1888     </xsd:sequence>

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1889 </xsd:complexType>
1890 <xsd:group name="EG_RubyContent">
1891   <xsd:choice>
1892     <xsd:element name="r" type="CT_R"/>
1893     <xsd:group ref="EG_RunLevelElts" minOccurs="0" maxOccurs="unbounded"/>
1894   </xsd:choice>
1895 </xsd:group>
1896 <xsd:complexType name="CT_RubyContent">
1897   <xsd:group ref="EG_RubyContent" minOccurs="0" maxOccurs="unbounded"/>
1898 </xsd:complexType>
1899 <xsd:complexType name="CT_Ruby">
1900   <xsd:sequence>
1901     <xsd:element name="rubyPr" type="CT_RubyPr"/>
1902     <xsd:element name="rt" type="CT_RubyContent"/>
1903     <xsd:element name="rubyBase" type="CT_RubyContent"/>
1904   </xsd:sequence>
1905 </xsd:complexType>
1906 <xsd:simpleType name="ST_Lock">
1907   <xsd:restriction base="xsd:string">
1908     <xsd:enumeration value="sdtLocked"/>
1909     <xsd:enumeration value="contentLocked"/>
1910     <xsd:enumeration value="unlocked"/>
1911     <xsd:enumeration value="sdtContentLocked"/>
1912   </xsd:restriction>
1913 </xsd:simpleType>
1914 <xsd:complexType name="CT_Lock">
1915   <xsd:attribute name="val" type="ST_Lock"/>
1916 </xsd:complexType>
1917 <xsd:complexType name="CT_SdtListItem">
1918   <xsd:attribute name="displayText" type="s:ST_String"/>
1919   <xsd:attribute name="value" type="s:ST_String"/>
1920 </xsd:complexType>
1921 <xsd:simpleType name="ST_SdtDateMappingType">
1922   <xsd:restriction base="xsd:string">
1923     <xsd:enumeration value="text"/>
1924     <xsd:enumeration value="date"/>
1925     <xsd:enumeration value="dateTime"/>
1926   </xsd:restriction>
1927 </xsd:simpleType>
1928 <xsd:complexType name="CT_SdtDateMappingType">
1929   <xsd:attribute name="val" type="ST_SdtDateMappingType"/>
1930 </xsd:complexType>
1931 <xsd:complexType name="CT_CalendarType">
1932   <xsd:attribute name="val" type="s:ST_CalendarType"/>
1933 </xsd:complexType>
1934 <xsd:complexType name="CT_SdtDate">
1935   <xsd:sequence>
1936     <xsd:element name="dateFormat" type="CT_String" minOccurs="0"/>
1937     <xsd:element name="lid" type="CT_Lang" minOccurs="0"/>
1938     <xsd:element name="storeMappedDataAs" type="CT_SdtDateMappingType" minOccurs="0"/>
1939     <xsd:element name="calendar" type="CT_CalendarType" minOccurs="0"/>
1940   </xsd:sequence>
1941   <xsd:attribute name="fullDate" type="ST_DateTime" use="optional"/>

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1942 </xsd:complexType>
1943 <xsd:complexType name="CT_SdtComboBox">
1944   <xsd:sequence>
1945     <xsd:element name="listItem" type="CT_SdtListItem" minOccurs="0" maxOccurs="unbounded"/>
1946   </xsd:sequence>
1947   <xsd:attribute name="lastValue" type="s:ST String" use="optional"/>
1948 </xsd:complexType>
1949 <xsd:complexType name="CT_SdtDocPart">
1950   <xsd:sequence>
1951     <xsd:element name="docPartGallery" type="CT String" minOccurs="0"/>
1952     <xsd:element name="docPartCategory" type="CT String" minOccurs="0"/>
1953     <xsd:element name="docPartUnique" type="CT OnOff" minOccurs="0"/>
1954   </xsd:sequence>
1955 </xsd:complexType>
1956 <xsd:complexType name="CT_SdtDropDownList">
1957   <xsd:sequence>
1958     <xsd:element name="listItem" type="CT_SdtListItem" minOccurs="0" maxOccurs="unbounded"/>
1959   </xsd:sequence>
1960   <xsd:attribute name="lastValue" type="s:ST String" use="optional"/>
1961 </xsd:complexType>
1962 <xsd:complexType name="CT_Placeholder">
1963   <xsd:sequence>
1964     <xsd:element name="docPart" type="CT String"/>
1965   </xsd:sequence>
1966 </xsd:complexType>
1967 <xsd:complexType name="CT_SdtText">
1968   <xsd:attribute name="multiline" type="s:ST OnOff"/>
1969 </xsd:complexType>
1970 <xsd:complexType name="CT_DataBinding">
1971   <xsd:attribute name="prefixMappings" type="s:ST String"/>
1972   <xsd:attribute name="xpath" type="s:ST String" use="required"/>
1973   <xsd:attribute name="storeItemID" type="s:ST String" use="required"/>
1974 </xsd:complexType>
1975 <xsd:complexType name="CT_SdtPr">
1976   <xsd:sequence>
1977     <xsd:element name="rPr" type="CT RPr" minOccurs="0"/>
1978     <xsd:element name="alias" type="CT String" minOccurs="0"/>
1979     <xsd:element name="tag" type="CT String" minOccurs="0"/>
1980     <xsd:element name="id" type="CT DecimalNumber" minOccurs="0"/>
1981     <xsd:element name="lock" type="CT Lock" minOccurs="0"/>
1982     <xsd:element name="placeholder" type="CT Placeholder" minOccurs="0"/>
1983     <xsd:element name="temporary" type="CT OnOff" minOccurs="0"/>
1984     <xsd:element name="showingPlcHdr" type="CT OnOff" minOccurs="0"/>
1985     <xsd:element name="dataBinding" type="CT DataBinding" minOccurs="0"/>
1986     <xsd:element name="label" type="CT DecimalNumber" minOccurs="0"/>
1987     <xsd:element name="tabIndex" type="CT UnsignedDecimalNumber" minOccurs="0"/>
1988     <xsd:choice minOccurs="0" maxOccurs="1">
1989       <xsd:element name="equation" type="CT Empty"/>
1990       <xsd:element name="comboBox" type="CT_SdtComboBox"/>
1991       <xsd:element name="date" type="CT_SdtDate"/>
1992       <xsd:element name="docPartObj" type="CT_SdtDocPart"/>
1993       <xsd:element name="docPartList" type="CT_SdtDocPart"/>
1994       <xsd:element name="dropDownList" type="CT_SdtDropDownList"/>

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1995         <xsd:element name="picture" type="CT_Empty"/>
1996         <xsd:element name="richText" type="CT_Empty"/>
1997         <xsd:element name="text" type="CT_SdtText"/>
1998         <xsd:element name="citation" type="CT_Empty"/>
1999         <xsd:element name="group" type="CT_Empty"/>
2000         <xsd:element name="bibliography" type="CT_Empty"/>
2001     </xsd:choice>
2002 </xsd:sequence>
2003 </xsd:complexType>
2004 <xsd:complexType name="CT_SdtEndPr">
2005     <xsd:choice maxOccurs="unbounded">
2006         <xsd:element name="rPr" type="CT_RPr" minOccurs="0"/>
2007     </xsd:choice>
2008 </xsd:complexType>
2009 <xsd:group name="EG_ContentRunContent">
2010     <xsd:choice>
2011         <xsd:element name="customXml" type="CT_CustomXmlRun"/>
2012         <xsd:element name="smartTag" type="CT_SmartTagRun"/>
2013         <xsd:element name="sdt" type="CT_SdtRun"/>
2014         <xsd:element name="dir" type="CT_DirContentRun"/>
2015         <xsd:element name="bdo" type="CT_BdoContentRun"/>
2016         <xsd:element name="r" type="CT_R"/>
2017         <xsd:group ref="EG_RunLevelElts" minOccurs="0" maxOccurs="unbounded"/>
2018     </xsd:choice>
2019 </xsd:group>
2020 <xsd:complexType name="CT_DirContentRun">
2021     <xsd:group ref="EG_PContent" minOccurs="0" maxOccurs="unbounded"/>
2022     <xsd:attribute name="val" type="ST_Direction" use="optional"/>
2023 </xsd:complexType>
2024 <xsd:complexType name="CT_BdoContentRun">
2025     <xsd:group ref="EG_PContent" minOccurs="0" maxOccurs="unbounded"/>
2026     <xsd:attribute name="val" type="ST_Direction" use="optional"/>
2027 </xsd:complexType>
2028 <xsd:simpleType name="ST_Direction">
2029     <xsd:restriction base="xsd:string">
2030         <xsd:enumeration value="ltr"/>
2031         <xsd:enumeration value="rtl"/>
2032     </xsd:restriction>
2033 </xsd:simpleType>
2034 <xsd:complexType name="CT_SdtContentRun">
2035     <xsd:group ref="EG_PContent" minOccurs="0" maxOccurs="unbounded"/>
2036 </xsd:complexType>
2037 <xsd:group name="EG_ContentBlockContent">
2038     <xsd:choice>
2039         <xsd:element name="customXml" type="CT_CustomXmlBlock"/>
2040         <xsd:element name="sdt" type="CT_SdtBlock"/>
2041         <xsd:element name="p" type="CT_P" minOccurs="0" maxOccurs="unbounded"/>
2042         <xsd:element name="tbl" type="CT_Tbl" minOccurs="0" maxOccurs="unbounded"/>
2043         <xsd:group ref="EG_RunLevelElts" minOccurs="0" maxOccurs="unbounded"/>
2044     </xsd:choice>
2045 </xsd:group>
2046 <xsd:complexType name="CT_SdtContentBlock">
2047     <xsd:group ref="EG_ContentBlockContent" minOccurs="0" maxOccurs="unbounded"/>

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2048 </xsd:complexType>
2049 <xsd:group name="EG_ContentRowContent">
2050   <xsd:choice>
2051     <xsd:element name="tr" type="CT_Row" minOccurs="0" maxOccurs="unbounded"/>
2052     <xsd:element name="customXml" type="CT_CustomXmlRow"/>
2053     <xsd:element name="sdt" type="CT_SdtRow"/>
2054     <xsd:group ref="EG_RunLevelElts" minOccurs="0" maxOccurs="unbounded"/>
2055   </xsd:choice>
2056 </xsd:group>
2057 <xsd:complexType name="CT_SdtContentRow">
2058   <xsd:group ref="EG_ContentRowContent" minOccurs="0" maxOccurs="unbounded"/>
2059 </xsd:complexType>
2060 <xsd:group name="EG_ContentCellContent">
2061   <xsd:choice>
2062     <xsd:element name="tc" type="CT_Tc" minOccurs="0" maxOccurs="unbounded"/>
2063     <xsd:element name="customXml" type="CT_CustomXmlCell"/>
2064     <xsd:element name="sdt" type="CT_SdtCell"/>
2065     <xsd:group ref="EG_RunLevelElts" minOccurs="0" maxOccurs="unbounded"/>
2066   </xsd:choice>
2067 </xsd:group>
2068 <xsd:complexType name="CT_SdtContentCell">
2069   <xsd:group ref="EG_ContentCellContent" minOccurs="0" maxOccurs="unbounded"/>
2070 </xsd:complexType>
2071 <xsd:complexType name="CT_SdtBlock">
2072   <xsd:sequence>
2073     <xsd:element name="sdtPr" type="CT_SdtPr" minOccurs="0" maxOccurs="1"/>
2074     <xsd:element name="sdtEndPr" type="CT_SdtEndPr" minOccurs="0" maxOccurs="1"/>
2075     <xsd:element name="sdtContent" type="CT_SdtContentBlock" minOccurs="0" maxOccurs="1"/>
2076   </xsd:sequence>
2077 </xsd:complexType>
2078 <xsd:complexType name="CT_SdtRun">
2079   <xsd:sequence>
2080     <xsd:element name="sdtPr" type="CT_SdtPr" minOccurs="0" maxOccurs="1"/>
2081     <xsd:element name="sdtEndPr" type="CT_SdtEndPr" minOccurs="0" maxOccurs="1"/>
2082     <xsd:element name="sdtContent" type="CT_SdtContentRun" minOccurs="0" maxOccurs="1"/>
2083   </xsd:sequence>
2084 </xsd:complexType>
2085 <xsd:complexType name="CT_SdtCell">
2086   <xsd:sequence>
2087     <xsd:element name="sdtPr" type="CT_SdtPr" minOccurs="0" maxOccurs="1"/>
2088     <xsd:element name="sdtEndPr" type="CT_SdtEndPr" minOccurs="0" maxOccurs="1"/>
2089     <xsd:element name="sdtContent" type="CT_SdtContentCell" minOccurs="0" maxOccurs="1"/>
2090   </xsd:sequence>
2091 </xsd:complexType>
2092 <xsd:complexType name="CT_SdtRow">
2093   <xsd:sequence>
2094     <xsd:element name="sdtPr" type="CT_SdtPr" minOccurs="0" maxOccurs="1"/>
2095     <xsd:element name="sdtEndPr" type="CT_SdtEndPr" minOccurs="0" maxOccurs="1"/>
2096     <xsd:element name="sdtContent" type="CT_SdtContentRow" minOccurs="0" maxOccurs="1"/>
2097   </xsd:sequence>
2098 </xsd:complexType>
2099 <xsd:complexType name="CT_Attr">
2100   <xsd:attribute name="uri" type="s:ST_String"/>

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2101     <xsd:attribute name="name" type="s:ST_String" use="required"/>
2102     <xsd:attribute name="val" type="s:ST_String" use="required"/>
2103 </xsd:complexType>
2104 <xsd:complexType name="CT_CustomXmlRun">
2105     <xsd:sequence>
2106         <xsd:element name="customXmlPr" type="CT_CustomXmlPr" minOccurs="0" maxOccurs="1"/>
2107         <xsd:group ref="EG_PContent" minOccurs="0" maxOccurs="unbounded"/>
2108     </xsd:sequence>
2109     <xsd:attribute name="uri" type="s:ST_String"/>
2110     <xsd:attribute name="element" type="s:ST_XmlName" use="required"/>
2111 </xsd:complexType>
2112 <xsd:complexType name="CT_SmartTagRun">
2113     <xsd:sequence>
2114         <xsd:element name="smartTagPr" type="CT_SmartTagPr" minOccurs="0" maxOccurs="1"/>
2115         <xsd:group ref="EG_PContent" minOccurs="0" maxOccurs="unbounded"/>
2116     </xsd:sequence>
2117     <xsd:attribute name="uri" type="s:ST_String"/>
2118     <xsd:attribute name="element" type="s:ST_XmlName" use="required"/>
2119 </xsd:complexType>
2120 <xsd:complexType name="CT_CustomXmlBlock">
2121     <xsd:sequence>
2122         <xsd:element name="customXmlPr" type="CT_CustomXmlPr" minOccurs="0" maxOccurs="1"/>
2123         <xsd:group ref="EG_ContentBlockContent" minOccurs="0" maxOccurs="unbounded"/>
2124     </xsd:sequence>
2125     <xsd:attribute name="uri" type="s:ST_String"/>
2126     <xsd:attribute name="element" type="s:ST_XmlName" use="required"/>
2127 </xsd:complexType>
2128 <xsd:complexType name="CT_CustomXmlPr">
2129     <xsd:sequence>
2130         <xsd:element name="placeholder" type="CT_String" minOccurs="0"/>
2131         <xsd:element name="attr" type="CT_Attr" minOccurs="0" maxOccurs="unbounded"/>
2132     </xsd:sequence>
2133 </xsd:complexType>
2134 <xsd:complexType name="CT_CustomXmlRow">
2135     <xsd:sequence>
2136         <xsd:element name="customXmlPr" type="CT_CustomXmlPr" minOccurs="0" maxOccurs="1"/>
2137         <xsd:group ref="EG_ContentRowContent" minOccurs="0" maxOccurs="unbounded"/>
2138     </xsd:sequence>
2139     <xsd:attribute name="uri" type="s:ST_String"/>
2140     <xsd:attribute name="element" type="s:ST_XmlName" use="required"/>
2141 </xsd:complexType>
2142 <xsd:complexType name="CT_CustomXmlCell">
2143     <xsd:sequence>
2144         <xsd:element name="customXmlPr" type="CT_CustomXmlPr" minOccurs="0" maxOccurs="1"/>
2145         <xsd:group ref="EG_ContentCellContent" minOccurs="0" maxOccurs="unbounded"/>
2146     </xsd:sequence>
2147     <xsd:attribute name="uri" type="s:ST_String"/>
2148     <xsd:attribute name="element" type="s:ST_XmlName" use="required"/>
2149 </xsd:complexType>
2150 <xsd:complexType name="CT_SmartTagPr">
2151     <xsd:sequence>
2152         <xsd:element name="attr" type="CT_Attr" minOccurs="0" maxOccurs="unbounded"/>
2153     </xsd:sequence>

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2154 </xsd:complexType>
2155 <xsd:group name="EG_PContent">
2156   <xsd:choice>
2157     <xsd:group ref="EG_ContentRunContent" minOccurs="0" maxOccurs="unbounded"/>
2158     <xsd:element name="fldSimple" type="CT_SimpleField" minOccurs="0" maxOccurs="unbounded"/>
2159     <xsd:element name="hyperlink" type="CT_Hyperlink"/>
2160     <xsd:element name="subDoc" type="CT_Rel"/>
2161   </xsd:choice>
2162 </xsd:group>
2163 <xsd:complexType name="CT_P">
2164   <xsd:sequence>
2165     <xsd:element name="pPr" type="CT_PPr" minOccurs="0"/>
2166     <xsd:group ref="EG_PContent" minOccurs="0" maxOccurs="unbounded"/>
2167   </xsd:sequence>
2168   <xsd:attribute name="rsidRPr" type="ST_LongHexNumber"/>
2169   <xsd:attribute name="rsidR" type="ST_LongHexNumber"/>
2170   <xsd:attribute name="rsidDel" type="ST_LongHexNumber"/>
2171   <xsd:attribute name="rsidP" type="ST_LongHexNumber"/>
2172   <xsd:attribute name="rsidRDefault" type="ST_LongHexNumber"/>
2173 </xsd:complexType>
2174 <xsd:simpleType name="ST_TblWidth">
2175   <xsd:restriction base="xsd:string">
2176     <xsd:enumeration value="nil"/>
2177     <xsd:enumeration value="pct"/>
2178     <xsd:enumeration value="dxa"/>
2179     <xsd:enumeration value="auto"/>
2180   </xsd:restriction>
2181 </xsd:simpleType>
2182 <xsd:complexType name="CT_Height">
2183   <xsd:attribute name="val" type="s:ST_TwipsMeasure"/>
2184   <xsd:attribute name="hRule" type="ST_HeightRule"/>
2185 </xsd:complexType>
2186 <xsd:simpleType name="ST_MeasurementOrPercent">
2187   <xsd:union memberTypes="ST_DecimalNumberOrPercent s:ST_UniversalMeasure"/>
2188 </xsd:simpleType>
2189 <xsd:complexType name="CT_TblWidth">
2190   <xsd:attribute name="w" type="ST_MeasurementOrPercent"/>
2191   <xsd:attribute name="type" type="ST_TblWidth"/>
2192 </xsd:complexType>
2193 <xsd:complexType name="CT_TblGridCol">
2194   <xsd:attribute name="w" type="s:ST_TwipsMeasure"/>
2195 </xsd:complexType>
2196 <xsd:complexType name="CT_TblGridBase">
2197   <xsd:sequence>
2198     <xsd:element name="gridCol" type="CT_TblGridCol" minOccurs="0" maxOccurs="unbounded"/>
2199   </xsd:sequence>
2200 </xsd:complexType>
2201 <xsd:complexType name="CT_TblGrid">
2202   <xsd:complexContent>
2203     <xsd:extension base="CT_TblGridBase">
2204       <xsd:sequence>
2205         <xsd:element name="tblGridChange" type="CT_TblGridChange" minOccurs="0"/>
2206       </xsd:sequence>

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2207         </xsd:extension>
2208     </xsd:complexContent>
2209 </xsd:complexType>
2210 <xsd:complexType name="CT_TcBorders">
2211     <xsd:sequence>
2212         <xsd:element name="top" type="CT_Border" minOccurs="0"/>
2213         <xsd:element name="start" type="CT_Border" minOccurs="0"/>
2214         <xsd:element name="bottom" type="CT_Border" minOccurs="0"/>
2215         <xsd:element name="end" type="CT_Border" minOccurs="0"/>
2216         <xsd:element name="insideH" type="CT_Border" minOccurs="0"/>
2217         <xsd:element name="insideV" type="CT_Border" minOccurs="0"/>
2218         <xsd:element name="tl2br" type="CT_Border" minOccurs="0"/>
2219         <xsd:element name="tr2bl" type="CT_Border" minOccurs="0"/>
2220     </xsd:sequence>
2221 </xsd:complexType>
2222 <xsd:complexType name="CT_TcMar">
2223     <xsd:sequence>
2224         <xsd:element name="top" type="CT_TblWidth" minOccurs="0" maxOccurs="1"/>
2225         <xsd:element name="start" type="CT_TblWidth" minOccurs="0" maxOccurs="1"/>
2226         <xsd:element name="bottom" type="CT_TblWidth" minOccurs="0" maxOccurs="1"/>
2227         <xsd:element name="end" type="CT_TblWidth" minOccurs="0" maxOccurs="1"/>
2228     </xsd:sequence>
2229 </xsd:complexType>
2230 <xsd:simpleType name="ST_Merge">
2231     <xsd:restriction base="xsd:string">
2232         <xsd:enumeration value="continue"/>
2233         <xsd:enumeration value="restart"/>
2234     </xsd:restriction>
2235 </xsd:simpleType>
2236 <xsd:complexType name="CT_VMerge">
2237     <xsd:attribute name="val" type="ST_Merge"/>
2238 </xsd:complexType>
2239 <xsd:complexType name="CT_TcPrBase">
2240     <xsd:sequence>
2241         <xsd:element name="cnfStyle" type="CT_Cnf" minOccurs="0" maxOccurs="1"/>
2242         <xsd:element name="tcW" type="CT_TblWidth" minOccurs="0" maxOccurs="1"/>
2243         <xsd:element name="gridSpan" type="CT_DecimalNumber" minOccurs="0"/>
2244         <xsd:element name="vMerge" type="CT_VMerge" minOccurs="0"/>
2245         <xsd:element name="tcBorders" type="CT_TcBorders" minOccurs="0" maxOccurs="1"/>
2246         <xsd:element name="shd" type="CT_Shdt" minOccurs="0"/>
2247         <xsd:element name="noWrap" type="CT_OnOff" minOccurs="0"/>
2248         <xsd:element name="tcMar" type="CT_TcMar" minOccurs="0" maxOccurs="1"/>
2249         <xsd:element name="textDirection" type="CT_TextDirection" minOccurs="0" maxOccurs="1"/>
2250         <xsd:element name="tcFitText" type="CT_OnOff" minOccurs="0" maxOccurs="1"/>
2251         <xsd:element name="vAlign" type="CT_VerticalJc" minOccurs="0"/>
2252         <xsd:element name="hideMark" type="CT_OnOff" minOccurs="0"/>
2253         <xsd:element name="headers" type="CT_Headers" minOccurs="0"/>
2254     </xsd:sequence>
2255 </xsd:complexType>
2256 <xsd:complexType name="CT_TcPr">
2257     <xsd:complexContent>
2258         <xsd:extension base="CT_TcPrInner">
2259             <xsd:sequence>

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2260         <xsd:element name="tcPrChange" type="CT_TcPrChange" minOccurs="0"/>
2261     </xsd:sequence>
2262 </xsd:extension>
2263 </xsd:complexContent>
2264 </xsd:complexType>
2265 <xsd:complexType name="CT_TcPrInner">
2266     <xsd:complexContent>
2267         <xsd:extension base="CT_TcPrBase">
2268             <xsd:sequence>
2269                 <xsd:group ref="EG_CellMarkupElements" minOccurs="0" maxOccurs="1"/>
2270             </xsd:sequence>
2271         </xsd:extension>
2272     </xsd:complexContent>
2273 </xsd:complexType>
2274 <xsd:complexType name="CT_Tc">
2275     <xsd:sequence>
2276         <xsd:element name="tcPr" type="CT_TcPr" minOccurs="0" maxOccurs="1"/>
2277         <xsd:group ref="EG_BlockLevelElts" minOccurs="1" maxOccurs="unbounded"/>
2278     </xsd:sequence>
2279     <xsd:attribute name="id" type="s:ST_String" use="optional"/>
2280 </xsd:complexType>
2281 <xsd:complexType name="CT_Cnf">
2282     <xsd:attribute name="firstRow" type="s:ST_OnOff"/>
2283     <xsd:attribute name="lastRow" type="s:ST_OnOff"/>
2284     <xsd:attribute name="firstColumn" type="s:ST_OnOff"/>
2285     <xsd:attribute name="lastColumn" type="s:ST_OnOff"/>
2286     <xsd:attribute name="oddVBand" type="s:ST_OnOff"/>
2287     <xsd:attribute name="evenVBand" type="s:ST_OnOff"/>
2288     <xsd:attribute name="oddHBand" type="s:ST_OnOff"/>
2289     <xsd:attribute name="evenHBand" type="s:ST_OnOff"/>
2290     <xsd:attribute name="firstRowFirstColumn" type="s:ST_OnOff"/>
2291     <xsd:attribute name="firstRowLastColumn" type="s:ST_OnOff"/>
2292     <xsd:attribute name="lastRowFirstColumn" type="s:ST_OnOff"/>
2293     <xsd:attribute name="lastRowLastColumn" type="s:ST_OnOff"/>
2294 </xsd:complexType>
2295 <xsd:complexType name="CT_Headers">
2296     <xsd:sequence minOccurs="0" maxOccurs="unbounded">
2297         <xsd:element name="header" type="CT_String"/>
2298     </xsd:sequence>
2299 </xsd:complexType>
2300 <xsd:complexType name="CT_TrPrBase">
2301     <xsd:choice maxOccurs="unbounded">
2302         <xsd:element name="cnfStyle" type="CT_Cnf" minOccurs="0" maxOccurs="1"/>
2303         <xsd:element name="divId" type="CT_DecimalNumber" minOccurs="0"/>
2304         <xsd:element name="gridBefore" type="CT_DecimalNumber" minOccurs="0"/>
2305         <xsd:element name="gridAfter" type="CT_DecimalNumber" minOccurs="0"/>
2306         <xsd:element name="wBefore" type="CT_TblWidth" minOccurs="0" maxOccurs="1"/>
2307         <xsd:element name="wAfter" type="CT_TblWidth" minOccurs="0" maxOccurs="1"/>
2308         <xsd:element name="cantSplit" type="CT_OnOff" minOccurs="0"/>
2309         <xsd:element name="trHeight" type="CT_Height" minOccurs="0"/>
2310         <xsd:element name="tblHeader" type="CT_OnOff" minOccurs="0"/>
2311         <xsd:element name="tblCellSpacing" type="CT_TblWidth" minOccurs="0" maxOccurs="1"/>
2312         <xsd:element name="jc" type="CT_JcTable" minOccurs="0" maxOccurs="1"/>

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2313         <xsd:element name="hidden" type="CT_OnOff" minOccurs="0"/>
2314     </xsd:choice>
2315 </xsd:complexType>
2316 <xsd:complexType name="CT_TrPr">
2317     <xsd:complexContent>
2318         <xsd:extension base="CT_TrPrBase">
2319             <xsd:sequence>
2320                 <xsd:element name="ins" type="CT_TrackChange" minOccurs="0"/>
2321                 <xsd:element name="del" type="CT_TrackChange" minOccurs="0"/>
2322                 <xsd:element name="trPrChange" type="CT_TrPrChange" minOccurs="0"/>
2323             </xsd:sequence>
2324         </xsd:extension>
2325     </xsd:complexContent>
2326 </xsd:complexType>
2327 <xsd:complexType name="CT_Row">
2328     <xsd:sequence>
2329         <xsd:element name="tblPrEx" type="CT_TblPrEx" minOccurs="0" maxOccurs="1"/>
2330         <xsd:element name="trPr" type="CT_TrPr" minOccurs="0" maxOccurs="1"/>
2331         <xsd:group ref="EG_ContentCellContent" minOccurs="0" maxOccurs="unbounded"/>
2332     </xsd:sequence>
2333     <xsd:attribute name="rsidRPr" type="ST_LongHexNumber"/>
2334     <xsd:attribute name="rsidR" type="ST_LongHexNumber"/>
2335     <xsd:attribute name="rsidDel" type="ST_LongHexNumber"/>
2336     <xsd:attribute name="rsidTr" type="ST_LongHexNumber"/>
2337 </xsd:complexType>
2338 <xsd:simpleType name="ST_TblLayoutType">
2339     <xsd:restriction base="xsd:string">
2340         <xsd:enumeration value="fixed"/>
2341         <xsd:enumeration value="autofit"/>
2342     </xsd:restriction>
2343 </xsd:simpleType>
2344 <xsd:complexType name="CT_TblLayoutType">
2345     <xsd:attribute name="type" type="ST_TblLayoutType"/>
2346 </xsd:complexType>
2347 <xsd:simpleType name="ST_TblOverlap">
2348     <xsd:restriction base="xsd:string">
2349         <xsd:enumeration value="never"/>
2350         <xsd:enumeration value="overlap"/>
2351     </xsd:restriction>
2352 </xsd:simpleType>
2353 <xsd:complexType name="CT_TblOverlap">
2354     <xsd:attribute name="val" type="ST_TblOverlap" use="required"/>
2355 </xsd:complexType>
2356 <xsd:complexType name="CT_TblPPr">
2357     <xsd:attribute name="leftFromText" type="s:ST_TwipsMeasure"/>
2358     <xsd:attribute name="rightFromText" type="s:ST_TwipsMeasure"/>
2359     <xsd:attribute name="topFromText" type="s:ST_TwipsMeasure"/>
2360     <xsd:attribute name="bottomFromText" type="s:ST_TwipsMeasure"/>
2361     <xsd:attribute name="vertAnchor" type="ST_VAnchor"/>
2362     <xsd:attribute name="horzAnchor" type="ST_HAnchor"/>
2363     <xsd:attribute name="tblpXSpec" type="s:ST_XAlign"/>
2364     <xsd:attribute name="tblpX" type="ST_SignedTwipsMeasure"/>
2365     <xsd:attribute name="tblpYSpec" type="s:ST_YAlign"/>

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2366     <xsd:attribute name="tblpY" type="ST SignedTwipsMeasure"/>
2367 </xsd:complexType>
2368 <xsd:complexType name="CT_TblCellMar">
2369     <xsd:sequence>
2370         <xsd:element name="top" type="CT TblWidth" minOccurs="0" maxOccurs="1"/>
2371         <xsd:element name="start" type="CT TblWidth" minOccurs="0" maxOccurs="1"/>
2372         <xsd:element name="bottom" type="CT TblWidth" minOccurs="0" maxOccurs="1"/>
2373         <xsd:element name="end" type="CT TblWidth" minOccurs="0" maxOccurs="1"/>
2374     </xsd:sequence>
2375 </xsd:complexType>
2376 <xsd:complexType name="CT_TblBorders">
2377     <xsd:sequence>
2378         <xsd:element name="top" type="CT Border" minOccurs="0"/>
2379         <xsd:element name="start" type="CT Border" minOccurs="0"/>
2380         <xsd:element name="bottom" type="CT Border" minOccurs="0"/>
2381         <xsd:element name="end" type="CT Border" minOccurs="0"/>
2382         <xsd:element name="insideH" type="CT Border" minOccurs="0"/>
2383         <xsd:element name="insideV" type="CT Border" minOccurs="0"/>
2384     </xsd:sequence>
2385 </xsd:complexType>
2386 <xsd:complexType name="CT_TblPrBase">
2387     <xsd:sequence>
2388         <xsd:element name="tblStyle" type="CT String" minOccurs="0"/>
2389         <xsd:element name="tblpPr" type="CT TblPPr" minOccurs="0" maxOccurs="1"/>
2390         <xsd:element name="tblOverlap" type="CT TblOverlap" minOccurs="0" maxOccurs="1"/>
2391         <xsd:element name="bidiVisual" type="CT OnOff" minOccurs="0" maxOccurs="1"/>
2392         <xsd:element name="tblStyleRowBandSize" type="CT DecimalNumber" minOccurs="0"
2393             maxOccurs="1"/>
2394         <xsd:element name="tblStyleColBandSize" type="CT DecimalNumber" minOccurs="0"
2395             maxOccurs="1"/>
2396         <xsd:element name="tblW" type="CT TblWidth" minOccurs="0" maxOccurs="1"/>
2397         <xsd:element name="jc" type="CT JcTable" minOccurs="0" maxOccurs="1"/>
2398         <xsd:element name="tblCellSpacing" type="CT TblWidth" minOccurs="0" maxOccurs="1"/>
2399         <xsd:element name="tblInd" type="CT TblWidth" minOccurs="0" maxOccurs="1"/>
2400         <xsd:element name="tblBorders" type="CT TblBorders" minOccurs="0" maxOccurs="1"/>
2401         <xsd:element name="shd" type="CT Shd" minOccurs="0" maxOccurs="1"/>
2402         <xsd:element name="tblLayout" type="CT TblLayoutType" minOccurs="0" maxOccurs="1"/>
2403         <xsd:element name="tblCellMar" type="CT TblCellMar" minOccurs="0" maxOccurs="1"/>
2404         <xsd:element name="tblLook" type="CT TblLook" minOccurs="0" maxOccurs="1"/>
2405         <xsd:element name="tblCaption" type="CT String" minOccurs="0" maxOccurs="1"/>
2406         <xsd:element name="tblDescription" type="CT String" minOccurs="0" maxOccurs="1"/>
2407     </xsd:sequence>
2408 </xsd:complexType>
2409 <xsd:complexType name="CT_TblPr">
2410     <xsd:complexContent>
2411         <xsd:extension base="CT_TblPrBase">
2412             <xsd:sequence>
2413                 <xsd:element name="tblPrChange" type="CT TblPrChange" minOccurs="0"/>
2414             </xsd:sequence>
2415         </xsd:extension>
2416     </xsd:complexContent>
2417 </xsd:complexType>
2418 <xsd:complexType name="CT_TblPrExBase">

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2419     <xsd:sequence>
2420       <xsd:element name="tblW" type="CT_TblWidth" minOccurs="0" maxOccurs="1"/>
2421       <xsd:element name="jc" type="CT_JcTable" minOccurs="0" maxOccurs="1"/>
2422       <xsd:element name="tblCellSpacing" type="CT_TblWidth" minOccurs="0" maxOccurs="1"/>
2423       <xsd:element name="tblInd" type="CT_TblWidth" minOccurs="0" maxOccurs="1"/>
2424       <xsd:element name="tblBorders" type="CT_TblBorders" minOccurs="0" maxOccurs="1"/>
2425       <xsd:element name="shd" type="CT_Shdt" minOccurs="0" maxOccurs="1"/>
2426       <xsd:element name="tblLayout" type="CT_TblLayoutType" minOccurs="0" maxOccurs="1"/>
2427       <xsd:element name="tblCellMar" type="CT_TblCellMar" minOccurs="0" maxOccurs="1"/>
2428       <xsd:element name="tblLook" type="CT_TblLook" minOccurs="0" maxOccurs="1"/>
2429     </xsd:sequence>
2430   </xsd:complexType>
2431   <xsd:complexType name="CT_TblPrEx">
2432     <xsd:complexContent>
2433       <xsd:extension base="CT_TblPrExBase">
2434         <xsd:sequence>
2435           <xsd:element name="tblPrExChange" type="CT_TblPrExChange" minOccurs="0"/>
2436         </xsd:sequence>
2437       </xsd:extension>
2438     </xsd:complexContent>
2439   </xsd:complexType>
2440   <xsd:complexType name="CT_Tbl">
2441     <xsd:sequence>
2442       <xsd:group ref="EG_RangeMarkupElements" minOccurs="0" maxOccurs="unbounded"/>
2443       <xsd:element name="tblPr" type="CT_TblPr"/>
2444       <xsd:element name="tblGrid" type="CT_TblGrid"/>
2445       <xsd:group ref="EG_ContentRowContent" minOccurs="0" maxOccurs="unbounded"/>
2446     </xsd:sequence>
2447   </xsd:complexType>
2448   <xsd:complexType name="CT_TblLook">
2449     <xsd:attribute name="firstRow" type="s:ST_OnOff"/>
2450     <xsd:attribute name="lastRow" type="s:ST_OnOff"/>
2451     <xsd:attribute name="firstColumn" type="s:ST_OnOff"/>
2452     <xsd:attribute name="lastColumn" type="s:ST_OnOff"/>
2453     <xsd:attribute name="noHBand" type="s:ST_OnOff"/>
2454     <xsd:attribute name="noVBand" type="s:ST_OnOff"/>
2455   </xsd:complexType>
2456   <xsd:simpleType name="ST_FtnPos">
2457     <xsd:restriction base="xsd:string">
2458       <xsd:enumeration value="pageBottom"/>
2459       <xsd:enumeration value="beneathText"/>
2460       <xsd:enumeration value="sectEnd"/>
2461       <xsd:enumeration value="docEnd"/>
2462     </xsd:restriction>
2463   </xsd:simpleType>
2464   <xsd:complexType name="CT_FtnPos">
2465     <xsd:attribute name="val" type="ST_FtnPos" use="required"/>
2466   </xsd:complexType>
2467   <xsd:simpleType name="ST_EdnPos">
2468     <xsd:restriction base="xsd:string">
2469       <xsd:enumeration value="sectEnd"/>
2470       <xsd:enumeration value="docEnd"/>
2471     </xsd:restriction>

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2472 </xsd:simpleType>
2473 <xsd:complexType name="CT_EdnPos">
2474   <xsd:attribute name="val" type="ST_EdnPos" use="required"/>
2475 </xsd:complexType>
2476 <xsd:complexType name="CT_NumFmt">
2477   <xsd:attribute name="val" type="ST_NumberFormat" use="required"/>
2478   <xsd:attribute name="format" type="s:ST_String" use="optional"/>
2479 </xsd:complexType>
2480 <xsd:simpleType name="ST_RestartNumber">
2481   <xsd:restriction base="xsd:string">
2482     <xsd:enumeration value="continuous"/>
2483     <xsd:enumeration value="eachSect"/>
2484     <xsd:enumeration value="eachPage"/>
2485   </xsd:restriction>
2486 </xsd:simpleType>
2487 <xsd:complexType name="CT_NumRestart">
2488   <xsd:attribute name="val" type="ST_RestartNumber" use="required"/>
2489 </xsd:complexType>
2490 <xsd:complexType name="CT_FtnEdnRef">
2491   <xsd:attribute name="customMarkFollows" type="s:ST_OnOff" use="optional"/>
2492   <xsd:attribute name="id" use="required" type="ST_DecimalNumber"/>
2493 </xsd:complexType>
2494 <xsd:complexType name="CT_FtnEdnSepRef">
2495   <xsd:attribute name="id" type="ST_DecimalNumber" use="required"/>
2496 </xsd:complexType>
2497 <xsd:complexType name="CT_FtnEdn">
2498   <xsd:sequence>
2499     <xsd:group ref="EG_BlockLevelElts" minOccurs="1" maxOccurs="unbounded"/>
2500   </xsd:sequence>
2501   <xsd:attribute name="type" type="ST_FtnEdn" use="optional"/>
2502   <xsd:attribute name="id" type="ST_DecimalNumber" use="required"/>
2503 </xsd:complexType>
2504 <xsd:group name="EG_FtnEdnNumProps">
2505   <xsd:sequence>
2506     <xsd:element name="numStart" type="CT_DecimalNumber" minOccurs="0"/>
2507     <xsd:element name="numRestart" type="CT_NumRestart" minOccurs="0"/>
2508   </xsd:sequence>
2509 </xsd:group>
2510 <xsd:complexType name="CT_FtnProps">
2511   <xsd:sequence>
2512     <xsd:element name="pos" type="CT_FtnPos" minOccurs="0"/>
2513     <xsd:element name="numFmt" type="CT_NumFmt" minOccurs="0"/>
2514     <xsd:group ref="EG_FtnEdnNumProps" minOccurs="0"/>
2515   </xsd:sequence>
2516 </xsd:complexType>
2517 <xsd:complexType name="CT_EdnProps">
2518   <xsd:sequence>
2519     <xsd:element name="pos" type="CT_EdnPos" minOccurs="0"/>
2520     <xsd:element name="numFmt" type="CT_NumFmt" minOccurs="0"/>
2521     <xsd:group ref="EG_FtnEdnNumProps" minOccurs="0"/>
2522   </xsd:sequence>
2523 </xsd:complexType>
2524 <xsd:complexType name="CT_FtnDocProps">

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2525     <xsd:complexContent>
2526         <xsd:extension base="CT_FtnProps">
2527             <xsd:sequence>
2528                 <xsd:element name="footnote" type="CT_FtnEdnSepRef" minOccurs="0" maxOccurs="3"/>
2529             </xsd:sequence>
2530         </xsd:extension>
2531     </xsd:complexContent>
2532 </xsd:complexType>
2533 <xsd:complexType name="CT_EdnDocProps">
2534     <xsd:complexContent>
2535         <xsd:extension base="CT_EdnProps">
2536             <xsd:sequence>
2537                 <xsd:element name="endnote" type="CT_FtnEdnSepRef" minOccurs="0" maxOccurs="3"/>
2538             </xsd:sequence>
2539         </xsd:extension>
2540     </xsd:complexContent>
2541 </xsd:complexType>
2542 <xsd:complexType name="CT_RecipientData">
2543     <xsd:sequence>
2544         <xsd:element name="active" type="CT_OnOff" minOccurs="0"/>
2545         <xsd:element name="column" type="CT_DecimalNumber" minOccurs="1"/>
2546         <xsd:element name="uniqueTag" type="CT_Base64Binary" minOccurs="1"/>
2547     </xsd:sequence>
2548 </xsd:complexType>
2549 <xsd:complexType name="CT_Base64Binary">
2550     <xsd:attribute name="val" type="xsd:base64Binary" use="required">
2551     </xsd:attribute>
2552 </xsd:complexType>
2553 <xsd:complexType name="CT_Recipients">
2554     <xsd:sequence>
2555         <xsd:element name="recipientData" type="CT_RecipientData" minOccurs="1"
2556             maxOccurs="unbounded"/>
2557     </xsd:sequence>
2558 </xsd:complexType>
2559 <xsd:element name="recipients" type="CT_Recipients"/>
2560 <xsd:complexType name="CT_OdsoFieldMapData">
2561     <xsd:sequence>
2562         <xsd:element name="type" type="CT_MailMergeOdsoFMDFieldType" minOccurs="0"/>
2563         <xsd:element name="name" type="CT_String" minOccurs="0"/>
2564         <xsd:element name="mappedName" type="CT_String" minOccurs="0"/>
2565         <xsd:element name="column" type="CT_DecimalNumber" minOccurs="0"/>
2566         <xsd:element name="lid" type="CT_Lang" minOccurs="0"/>
2567         <xsd:element name="dynamicAddress" type="CT_OnOff" minOccurs="0"/>
2568     </xsd:sequence>
2569 </xsd:complexType>
2570 <xsd:simpleType name="ST_MailMergeSourceType">
2571     <xsd:restriction base="xsd:string">
2572         <xsd:enumeration value="database"/>
2573         <xsd:enumeration value="addressBook"/>
2574         <xsd:enumeration value="document1"/>
2575         <xsd:enumeration value="document2"/>
2576         <xsd:enumeration value="text"/>
2577         <xsd:enumeration value="email"/>

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2578         <xsd:enumeration value="native"/>
2579         <xsd:enumeration value="legacy"/>
2580         <xsd:enumeration value="master"/>
2581     </xsd:restriction>
2582 </xsd:simpleType>
2583 <xsd:complexType name="CT_MailMergeSourceType">
2584     <xsd:attribute name="val" use="required" type="ST_MailMergeSourceType"/>
2585 </xsd:complexType>
2586 <xsd:complexType name="CT_Odso">
2587     <xsd:sequence>
2588         <xsd:element name="udl" type="CT_String" minOccurs="0"/>
2589         <xsd:element name="table" type="CT_String" minOccurs="0"/>
2590         <xsd:element name="src" type="CT_Rel" minOccurs="0"/>
2591         <xsd:element name="colDelim" type="CT_DecimalNumber" minOccurs="0"/>
2592         <xsd:element name="type" type="CT_MailMergeSourceType" minOccurs="0"/>
2593         <xsd:element name="fHdr" type="CT_OnOff" minOccurs="0"/>
2594         <xsd:element name="fieldMapData" type="CT_OdsoFieldMapData" minOccurs="0"
2595             maxOccurs="unbounded"/>
2596         <xsd:element name="recipientData" type="CT_Rel" minOccurs="0" maxOccurs="unbounded"/>
2597     </xsd:sequence>
2598 </xsd:complexType>
2599 <xsd:complexType name="CT_MailMerge">
2600     <xsd:sequence>
2601         <xsd:element name="mainDocumentType" type="CT_MailMergeDocType" minOccurs="1"/>
2602         <xsd:element name="linkToQuery" type="CT_OnOff" minOccurs="0"/>
2603         <xsd:element name="dataType" type="CT_MailMergeDataType" minOccurs="1"/>
2604         <xsd:element name="connectString" type="CT_String" minOccurs="0"/>
2605         <xsd:element name="query" type="CT_String" minOccurs="0"/>
2606         <xsd:element name="dataSource" type="CT_Rel" minOccurs="0"/>
2607         <xsd:element name="headerSource" type="CT_Rel" minOccurs="0"/>
2608         <xsd:element name="doNotSuppressBlankLines" type="CT_OnOff" minOccurs="0"/>
2609         <xsd:element name="destination" type="CT_MailMergeDest" minOccurs="0"/>
2610         <xsd:element name="addressFieldName" type="CT_String" minOccurs="0"/>
2611         <xsd:element name="mailSubject" type="CT_String" minOccurs="0"/>
2612         <xsd:element name="mailAsAttachment" type="CT_OnOff" minOccurs="0"/>
2613         <xsd:element name="viewMergedData" type="CT_OnOff" minOccurs="0"/>
2614         <xsd:element name="activeRecord" type="CT_DecimalNumber" minOccurs="0"/>
2615         <xsd:element name="checkErrors" type="CT_DecimalNumber" minOccurs="0"/>
2616         <xsd:element name="odso" type="CT_Odso" minOccurs="0"/>
2617     </xsd:sequence>
2618 </xsd:complexType>
2619 <xsd:simpleType name="ST_TargetScreenSz">
2620     <xsd:restriction base="xsd:string">
2621         <xsd:enumeration value="544x376"/>
2622         <xsd:enumeration value="640x480"/>
2623         <xsd:enumeration value="720x512"/>
2624         <xsd:enumeration value="800x600"/>
2625         <xsd:enumeration value="1024x768"/>
2626         <xsd:enumeration value="1152x882"/>
2627         <xsd:enumeration value="1152x900"/>
2628         <xsd:enumeration value="1280x1024"/>
2629         <xsd:enumeration value="1600x1200"/>
2630         <xsd:enumeration value="1800x1440"/>

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2631         <xsd:enumeration value="1920x1200"/>
2632     </xsd:restriction>
2633 </xsd:simpleType>
2634 <xsd:complexType name="CT_TargetScreenSz">
2635     <xsd:attribute name="val" type="ST_TargetScreenSz" use="required"/>
2636 </xsd:complexType>
2637 <xsd:complexType name="CT_Compat">
2638     <xsd:sequence>
2639         <xsd:element name="spaceForUL" type="CT_OnOff" minOccurs="0"/>
2640         <xsd:element name="balanceSingleByteDoubleByteWidth" type="CT_OnOff" minOccurs="0"/>
2641         <xsd:element name="doNotLeaveBackslashAlone" type="CT_OnOff" minOccurs="0"/>
2642         <xsd:element name="ulTrailSpace" type="CT_OnOff" minOccurs="0"/>
2643         <xsd:element name="doNotExpandShiftReturn" type="CT_OnOff" minOccurs="0"/>
2644         <xsd:element name="adjustLineHeightInTable" type="CT_OnOff" minOccurs="0"/>
2645         <xsd:element name="applyBreakingRules" type="CT_OnOff" minOccurs="0"/>
2646         <xsd:element name="compatSetting" type="CT_CompatSetting" minOccurs="0"
2647             maxOccurs="unbounded"/>
2648     </xsd:sequence>
2649 </xsd:complexType>
2650 <xsd:complexType name="CT_CompatSetting">
2651     <xsd:attribute name="name" type="s:ST_String"/>
2652     <xsd:attribute name="uri" type="s:ST_String"/>
2653     <xsd:attribute name="val" type="s:ST_String"/>
2654 </xsd:complexType>
2655 <xsd:complexType name="CT_DocVar">
2656     <xsd:attribute name="name" type="s:ST_String" use="required"/>
2657     <xsd:attribute name="val" type="s:ST_String" use="required"/>
2658 </xsd:complexType>
2659 <xsd:complexType name="CT_DocVars">
2660     <xsd:sequence>
2661         <xsd:element name="docVar" type="CT_DocVar" minOccurs="0" maxOccurs="unbounded"/>
2662     </xsd:sequence>
2663 </xsd:complexType>
2664 <xsd:complexType name="CT_DocRsids">
2665     <xsd:sequence>
2666         <xsd:element name="rsidRoot" type="CT_LongHexNumber" minOccurs="0" maxOccurs="1"/>
2667         <xsd:element name="rsid" type="CT_LongHexNumber" minOccurs="0" maxOccurs="unbounded"/>
2668     </xsd:sequence>
2669 </xsd:complexType>
2670 <xsd:simpleType name="ST_CharacterSpacing">
2671     <xsd:restriction base="xsd:string">
2672         <xsd:enumeration value="doNotCompress"/>
2673         <xsd:enumeration value="compressPunctuation"/>
2674         <xsd:enumeration value="compressPunctuationAndJapaneseKana"/>
2675     </xsd:restriction>
2676 </xsd:simpleType>
2677 <xsd:complexType name="CT_CharacterSpacing">
2678     <xsd:attribute name="val" type="ST_CharacterSpacing" use="required"/>
2679 </xsd:complexType>
2680 <xsd:complexType name="CT_SaveThroughXslt">
2681     <xsd:attribute ref="r:id" use="optional"/>
2682     <xsd:attribute name="solutionID" type="s:ST_String" use="optional"/>
2683 </xsd:complexType>

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2684 <xsd:complexType name="CT_RPrDefault">
2685   <xsd:sequence>
2686     <xsd:element name="rPr" type="CT_RPr" minOccurs="0"/>
2687   </xsd:sequence>
2688 </xsd:complexType>
2689 <xsd:complexType name="CT_PPrDefault">
2690   <xsd:sequence>
2691     <xsd:element name="pPr" type="CT_PPrGeneral" minOccurs="0"/>
2692   </xsd:sequence>
2693 </xsd:complexType>
2694 <xsd:complexType name="CT_DocDefaults">
2695   <xsd:sequence>
2696     <xsd:element name="rPrDefault" type="CT_RPrDefault" minOccurs="0"/>
2697     <xsd:element name="pPrDefault" type="CT_PPrDefault" minOccurs="0"/>
2698   </xsd:sequence>
2699 </xsd:complexType>
2700 <xsd:simpleType name="ST_WmlColorSchemeIndex">
2701   <xsd:restriction base="xsd:string">
2702     <xsd:enumeration value="dark1"/>
2703     <xsd:enumeration value="light1"/>
2704     <xsd:enumeration value="dark2"/>
2705     <xsd:enumeration value="light2"/>
2706     <xsd:enumeration value="accent1"/>
2707     <xsd:enumeration value="accent2"/>
2708     <xsd:enumeration value="accent3"/>
2709     <xsd:enumeration value="accent4"/>
2710     <xsd:enumeration value="accent5"/>
2711     <xsd:enumeration value="accent6"/>
2712     <xsd:enumeration value="hyperlink"/>
2713     <xsd:enumeration value="followedHyperlink"/>
2714   </xsd:restriction>
2715 </xsd:simpleType>
2716 <xsd:complexType name="CT_ColorSchemeMapping">
2717   <xsd:attribute name="bg1" type="ST_WmlColorSchemeIndex"/>
2718   <xsd:attribute name="t1" type="ST_WmlColorSchemeIndex"/>
2719   <xsd:attribute name="bg2" type="ST_WmlColorSchemeIndex"/>
2720   <xsd:attribute name="t2" type="ST_WmlColorSchemeIndex"/>
2721   <xsd:attribute name="accent1" type="ST_WmlColorSchemeIndex"/>
2722   <xsd:attribute name="accent2" type="ST_WmlColorSchemeIndex"/>
2723   <xsd:attribute name="accent3" type="ST_WmlColorSchemeIndex"/>
2724   <xsd:attribute name="accent4" type="ST_WmlColorSchemeIndex"/>
2725   <xsd:attribute name="accent5" type="ST_WmlColorSchemeIndex"/>
2726   <xsd:attribute name="accent6" type="ST_WmlColorSchemeIndex"/>
2727   <xsd:attribute name="hyperlink" type="ST_WmlColorSchemeIndex"/>
2728   <xsd:attribute name="followedHyperlink" type="ST_WmlColorSchemeIndex"/>
2729 </xsd:complexType>
2730 <xsd:complexType name="CT_ReadingModeInkLockDown">
2731   <xsd:attribute name="actualPg" type="s:ST_OnOff" use="required"/>
2732   <xsd:attribute name="w" type="ST_PixelsMeasure" use="required"/>
2733   <xsd:attribute name="h" type="ST_PixelsMeasure" use="required"/>
2734   <xsd:attribute name="fontSz" type="ST_DecimalNumberOrPercent" use="required"/>
2735 </xsd:complexType>
2736 <xsd:complexType name="CT_WriteProtection">

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2737     <xsd:attribute name="recommended" type="s:ST OnOff" use="optional"/>
2738     <xsd:attributeGroup ref="AG Password"/>
2739 </xsd:complexType>
2740 <xsd:complexType name="CT_Settings">
2741     <xsd:sequence>
2742         <xsd:element name="writeProtection" type="CT WriteProtection" minOccurs="0"/>
2743         <xsd:element name="view" type="CT View" minOccurs="0"/>
2744         <xsd:element name="zoom" type="CT Zoom" minOccurs="0"/>
2745         <xsd:element name="removePersonalInformation" type="CT OnOff" minOccurs="0"/>
2746         <xsd:element name="removeDateAndTime" type="CT OnOff" minOccurs="0"/>
2747         <xsd:element name="doNotDisplayPageBoundaries" type="CT OnOff" minOccurs="0"/>
2748         <xsd:element name="displayBackgroundShape" type="CT OnOff" minOccurs="0"/>
2749         <xsd:element name="printPostScriptOverText" type="CT OnOff" minOccurs="0"/>
2750         <xsd:element name="printFractionalCharacterWidth" type="CT OnOff" minOccurs="0"/>
2751         <xsd:element name="printFormsData" type="CT OnOff" minOccurs="0"/>
2752         <xsd:element name="embedTrueTypeFonts" type="CT OnOff" minOccurs="0"/>
2753         <xsd:element name="embedSystemFonts" type="CT OnOff" minOccurs="0"/>
2754         <xsd:element name="saveSubsetFonts" type="CT OnOff" minOccurs="0"/>
2755         <xsd:element name="saveFormsData" type="CT OnOff" minOccurs="0"/>
2756         <xsd:element name="mirrorMargins" type="CT OnOff" minOccurs="0"/>
2757         <xsd:element name="alignBordersAndEdges" type="CT OnOff" minOccurs="0"/>
2758         <xsd:element name="bordersDoNotSurroundHeader" type="CT OnOff" minOccurs="0"/>
2759         <xsd:element name="bordersDoNotSurroundFooter" type="CT OnOff" minOccurs="0"/>
2760         <xsd:element name="gutterAtTop" type="CT OnOff" minOccurs="0"/>
2761         <xsd:element name="hideSpellingErrors" type="CT OnOff" minOccurs="0"/>
2762         <xsd:element name="hideGrammaticalErrors" type="CT OnOff" minOccurs="0"/>
2763         <xsd:element name="activeWritingStyle" type="CT WritingStyle" minOccurs="0"
2764             maxOccurs="unbounded"/>
2765         <xsd:element name="proofState" type="CT Proof" minOccurs="0"/>
2766         <xsd:element name="formsDesign" type="CT OnOff" minOccurs="0"/>
2767         <xsd:element name="attachedTemplate" type="CT Rel" minOccurs="0"/>
2768         <xsd:element name="linkStyles" type="CT OnOff" minOccurs="0"/>
2769         <xsd:element name="stylePaneFormatFilter" type="CT StylePaneFilter" minOccurs="0"/>
2770         <xsd:element name="stylePaneSortMethod" type="CT StyleSort" minOccurs="0"/>
2771         <xsd:element name="documentType" type="CT DocType" minOccurs="0"/>
2772         <xsd:element name="mailMerge" type="CT MailMerge" minOccurs="0"/>
2773         <xsd:element name="revisionView" type="CT TrackChangesView" minOccurs="0"/>
2774         <xsd:element name="trackRevisions" type="CT OnOff" minOccurs="0"/>
2775         <xsd:element name="doNotTrackMoves" type="CT OnOff" minOccurs="0"/>
2776         <xsd:element name="doNotTrackFormatting" type="CT OnOff" minOccurs="0"/>
2777         <xsd:element name="documentProtection" type="CT DocProtect" minOccurs="0"/>
2778         <xsd:element name="autoFormatOverride" type="CT OnOff" minOccurs="0"/>
2779         <xsd:element name="styleLockTheme" type="CT OnOff" minOccurs="0"/>
2780         <xsd:element name="styleLockQFSet" type="CT OnOff" minOccurs="0"/>
2781         <xsd:element name="defaultTabStop" type="CT TwipsMeasure" minOccurs="0"/>
2782         <xsd:element name="autoHyphenation" type="CT OnOff" minOccurs="0"/>
2783         <xsd:element name="consecutiveHyphenLimit" type="CT DecimalNumber" minOccurs="0"/>
2784         <xsd:element name="hyphenationZone" type="CT TwipsMeasure" minOccurs="0"/>
2785         <xsd:element name="doNotHyphenateCaps" type="CT OnOff" minOccurs="0"/>
2786         <xsd:element name="showEnvelope" type="CT OnOff" minOccurs="0"/>
2787         <xsd:element name="summaryLength" type="CT DecimalNumberOrPrecent" minOccurs="0"/>
2788         <xsd:element name="clickAndTypeStyle" type="CT String" minOccurs="0"/>
2789         <xsd:element name="defaultTableStyle" type="CT String" minOccurs="0"/>

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2790 <xsd:element name="evenAndOddHeaders" type="CT OnOff" minOccurs="0"/>
2791 <xsd:element name="bookFoldRevPrinting" type="CT OnOff" minOccurs="0"/>
2792 <xsd:element name="bookFoldPrinting" type="CT OnOff" minOccurs="0"/>
2793 <xsd:element name="bookFoldPrintingSheets" type="CT DecimalNumber" minOccurs="0"/>
2794 <xsd:element name="drawingGridHorizontalSpacing" type="CT TwipsMeasure" minOccurs="0"/>
2795 <xsd:element name="drawingGridVerticalSpacing" type="CT TwipsMeasure" minOccurs="0"/>
2796 <xsd:element name="displayHorizontalDrawingGridEvery" type="CT DecimalNumber"
2797     minOccurs="0"/>
2798 <xsd:element name="displayVerticalDrawingGridEvery" type="CT DecimalNumber"
2799     minOccurs="0"/>
2800 <xsd:element name="doNotUseMarginsForDrawingGridOrigin" type="CT OnOff" minOccurs="0"/>
2801 <xsd:element name="drawingGridHorizontalOrigin" type="CT TwipsMeasure" minOccurs="0"/>
2802 <xsd:element name="drawingGridVerticalOrigin" type="CT TwipsMeasure" minOccurs="0"/>
2803 <xsd:element name="doNotShadeFormData" type="CT OnOff" minOccurs="0"/>
2804 <xsd:element name="noPunctuationKerning" type="CT OnOff" minOccurs="0"/>
2805 <xsd:element name="characterSpacingControl" type="CT CharacterSpacing" minOccurs="0"/>
2806 <xsd:element name="printTwoOnOne" type="CT OnOff" minOccurs="0"/>
2807 <xsd:element name="strictFirstAndLastChars" type="CT OnOff" minOccurs="0"/>
2808 <xsd:element name="noLineBreaksAfter" type="CT Kinsoku" minOccurs="0"/>
2809 <xsd:element name="noLineBreaksBefore" type="CT Kinsoku" minOccurs="0"/>
2810 <xsd:element name="savePreviewPicture" type="CT OnOff" minOccurs="0"/>
2811 <xsd:element name="doNotValidateAgainstSchema" type="CT OnOff" minOccurs="0"/>
2812 <xsd:element name="saveInvalidXml" type="CT OnOff" minOccurs="0"/>
2813 <xsd:element name="ignoreMixedContent" type="CT OnOff" minOccurs="0"/>
2814 <xsd:element name="alwaysShowPlaceholderText" type="CT OnOff" minOccurs="0"/>
2815 <xsd:element name="doNotDemarcateInvalidXml" type="CT OnOff" minOccurs="0"/>
2816 <xsd:element name="saveXmlDataOnly" type="CT OnOff" minOccurs="0"/>
2817 <xsd:element name="useXSLTWhenSaving" type="CT OnOff" minOccurs="0"/>
2818 <xsd:element name="saveThroughXslt" type="CT SaveThroughXslt" minOccurs="0"/>
2819 <xsd:element name="showXMLTags" type="CT OnOff" minOccurs="0"/>
2820 <xsd:element name="alwaysMergeEmptyNamespace" type="CT OnOff" minOccurs="0"/>
2821 <xsd:element name="updateFields" type="CT OnOff" minOccurs="0"/>
2822 <xsd:element name="footnotePr" type="CT FtnDocProps" minOccurs="0"/>
2823 <xsd:element name="endnotePr" type="CT EdnDocProps" minOccurs="0"/>
2824 <xsd:element name="compat" type="CT Compat" minOccurs="0"/>
2825 <xsd:element name="docVars" type="CT DocVars" minOccurs="0"/>
2826 <xsd:element name="rsids" type="CT DocRsids" minOccurs="0"/>
2827 <xsd:element ref="m:mathPr" minOccurs="0" maxOccurs="1"/>
2828 <xsd:element name="attachedSchema" type="CT String" minOccurs="0" maxOccurs="unbounded"/>
2829 <xsd:element name="themeFontLang" type="CT Language" minOccurs="0" maxOccurs="1"/>
2830 <xsd:element name="clrSchemeMapping" type="CT ColorSchemeMapping" minOccurs="0"/>
2831 <xsd:element name="doNotIncludeSubdocsInStats" type="CT OnOff" minOccurs="0"/>
2832 <xsd:element name="doNotAutoCompressPictures" type="CT OnOff" minOccurs="0"/>
2833 <xsd:element name="forceUpgrade" type="CT Empty" minOccurs="0" maxOccurs="1"/>
2834 <xsd:element name="captions" type="CT Captions" minOccurs="0" maxOccurs="1"/>
2835 <xsd:element name="readModeInkLockDown" type="CT ReadingModeInkLockDown" minOccurs="0"/>
2836 <xsd:element name="smartTagType" type="CT SmartTagType" minOccurs="0"
2837     maxOccurs="unbounded"/>
2838 <xsd:element ref="sl:schemaLibrary" minOccurs="0" maxOccurs="1"/>
2839 <xsd:element name="doNotEmbedSmartTags" type="CT OnOff" minOccurs="0"/>
2840 <xsd:element name="decimalSymbol" type="CT String" minOccurs="0" maxOccurs="1"/>
2841 <xsd:element name="listSeparator" type="CT String" minOccurs="0" maxOccurs="1"/>
2842 </xsd:sequence>

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2843 </xsd:complexType>
2844 <xsd:complexType name="CT_StyleSort">
2845   <xsd:attribute name="val" type="ST_StyleSort" use="required"/>
2846 </xsd:complexType>
2847 <xsd:complexType name="CT_StylePaneFilter">
2848   <xsd:attribute name="allStyles" type="s:ST_OnOff"/>
2849   <xsd:attribute name="customStyles" type="s:ST_OnOff"/>
2850   <xsd:attribute name="latentStyles" type="s:ST_OnOff"/>
2851   <xsd:attribute name="stylesInUse" type="s:ST_OnOff"/>
2852   <xsd:attribute name="headingStyles" type="s:ST_OnOff"/>
2853   <xsd:attribute name="numberingStyles" type="s:ST_OnOff"/>
2854   <xsd:attribute name="tableStyles" type="s:ST_OnOff"/>
2855   <xsd:attribute name="directFormattingOnRuns" type="s:ST_OnOff"/>
2856   <xsd:attribute name="directFormattingOnParagraphs" type="s:ST_OnOff"/>
2857   <xsd:attribute name="directFormattingOnNumbering" type="s:ST_OnOff"/>
2858   <xsd:attribute name="directFormattingOnTables" type="s:ST_OnOff"/>
2859   <xsd:attribute name="clearFormatting" type="s:ST_OnOff"/>
2860   <xsd:attribute name="top3HeadingStyles" type="s:ST_OnOff"/>
2861   <xsd:attribute name="visibleStyles" type="s:ST_OnOff"/>
2862   <xsd:attribute name="alternateStyleNames" type="s:ST_OnOff"/>
2863 </xsd:complexType>
2864 <xsd:simpleType name="ST_StyleSort">
2865   <xsd:restriction base="xsd:string">
2866     <xsd:enumeration value="name"/>
2867     <xsd:enumeration value="priority"/>
2868     <xsd:enumeration value="default"/>
2869     <xsd:enumeration value="font"/>
2870     <xsd:enumeration value="basedOn"/>
2871     <xsd:enumeration value="type"/>
2872   </xsd:restriction>
2873 </xsd:simpleType>
2874 <xsd:complexType name="CT_WebSettings">
2875   <xsd:sequence>
2876     <xsd:element name="frameset" type="CT_Frameset" minOccurs="0"/>
2877     <xsd:element name="divs" type="CT_Divs" minOccurs="0"/>
2878     <xsd:element name="encoding" type="CT_String" minOccurs="0"/>
2879     <xsd:element name="optimizeForBrowser" type="CT_OptimizeForBrowser" minOccurs="0"/>
2880     <xsd:element name="allowPNG" type="CT_OnOff" minOccurs="0"/>
2881     <xsd:element name="doNotRelyOnCSS" type="CT_OnOff" minOccurs="0"/>
2882     <xsd:element name="doNotSaveAsSingleFile" type="CT_OnOff" minOccurs="0"/>
2883     <xsd:element name="doNotOrganizeInFolder" type="CT_OnOff" minOccurs="0"/>
2884     <xsd:element name="doNotUseLongFileNames" type="CT_OnOff" minOccurs="0"/>
2885     <xsd:element name="pixelsPerInch" type="CT_DecimalNumber" minOccurs="0"/>
2886     <xsd:element name="targetScreenSz" type="CT_TargetScreenSz" minOccurs="0"/>
2887     <xsd:element name="saveSmartTagsAsXml" type="CT_OnOff" minOccurs="0"/>
2888   </xsd:sequence>
2889 </xsd:complexType>
2890 <xsd:simpleType name="ST_FrameScrollbar">
2891   <xsd:restriction base="xsd:string">
2892     <xsd:enumeration value="on"/>
2893     <xsd:enumeration value="off"/>
2894     <xsd:enumeration value="auto"/>
2895   </xsd:restriction>

```

```

2896 </xsd:simpleType>
2897 <xsd:complexType name="CT_FrameScrollbar">
2898   <xsd:attribute name="val" type="ST_FrameScrollbar" use="required"/>
2899 </xsd:complexType>
2900 <xsd:complexType name="CT_OptimizeForBrowser">
2901   <xsd:complexContent>
2902     <xsd:extension base="CT_OnOff">
2903       <xsd:attribute name="target" type="s:ST_String" use="optional"/>
2904     </xsd:extension>
2905   </xsd:complexContent>
2906 </xsd:complexType>
2907 <xsd:complexType name="CT_Frame">
2908   <xsd:sequence>
2909     <xsd:element name="sz" type="CT_String" minOccurs="0"/>
2910     <xsd:element name="name" type="CT_String" minOccurs="0"/>
2911     <xsd:element name="title" type="CT_String" minOccurs="0"/>
2912     <xsd:element name="longDesc" type="CT_Rel" minOccurs="0"/>
2913     <xsd:element name="sourceFileName" type="CT_Rel" minOccurs="0"/>
2914     <xsd:element name="marW" type="CT_PixelsMeasure" minOccurs="0"/>
2915     <xsd:element name="marH" type="CT_PixelsMeasure" minOccurs="0"/>
2916     <xsd:element name="scrollbar" type="CT_FrameScrollbar" minOccurs="0"/>
2917     <xsd:element name="noResizeAllowed" type="CT_OnOff" minOccurs="0"/>
2918     <xsd:element name="linkedToFile" type="CT_OnOff" minOccurs="0"/>
2919   </xsd:sequence>
2920 </xsd:complexType>
2921 <xsd:simpleType name="ST_FrameLayout">
2922   <xsd:restriction base="xsd:string">
2923     <xsd:enumeration value="rows"/>
2924     <xsd:enumeration value="cols"/>
2925     <xsd:enumeration value="none"/>
2926   </xsd:restriction>
2927 </xsd:simpleType>
2928 <xsd:complexType name="CT_FrameLayout">
2929   <xsd:attribute name="val" type="ST_FrameLayout" use="required"/>
2930 </xsd:complexType>
2931 <xsd:complexType name="CT_FramesetSplitbar">
2932   <xsd:sequence>
2933     <xsd:element name="w" type="CT_TwipsMeasure" minOccurs="0"/>
2934     <xsd:element name="color" type="CT_Color" minOccurs="0"/>
2935     <xsd:element name="noBorder" type="CT_OnOff" minOccurs="0"/>
2936     <xsd:element name="flatBorders" type="CT_OnOff" minOccurs="0"/>
2937   </xsd:sequence>
2938 </xsd:complexType>
2939 <xsd:complexType name="CT_Frameset">
2940   <xsd:sequence>
2941     <xsd:element name="sz" type="CT_String" minOccurs="0"/>
2942     <xsd:element name="framesetSplitbar" type="CT_FramesetSplitbar" minOccurs="0"/>
2943     <xsd:element name="frameLayout" type="CT_FrameLayout" minOccurs="0"/>
2944     <xsd:element name="title" type="CT_String" minOccurs="0"/>
2945     <xsd:choice minOccurs="0" maxOccurs="unbounded">
2946       <xsd:element name="frameset" type="CT_Frameset" minOccurs="0" maxOccurs="unbounded"/>
2947       <xsd:element name="frame" type="CT_Frame" minOccurs="0" maxOccurs="unbounded"/>
2948     </xsd:choice>

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2949     </xsd:sequence>
2950 </xsd:complexType>
2951 <xsd:complexType name="CT_NumPicBullet">
2952     <xsd:choice>
2953         <xsd:element name="drawing" type="CT_Drawing"/>
2954     </xsd:choice>
2955     <xsd:attribute name="numPicBulletId" type="ST_DecimalNumber" use="required"/>
2956 </xsd:complexType>
2957 <xsd:simpleType name="ST_LevelSuffix">
2958     <xsd:restriction base="xsd:string">
2959         <xsd:enumeration value="tab"/>
2960         <xsd:enumeration value="space"/>
2961         <xsd:enumeration value="nothing"/>
2962     </xsd:restriction>
2963 </xsd:simpleType>
2964 <xsd:complexType name="CT_LevelSuffix">
2965     <xsd:attribute name="val" type="ST_LevelSuffix" use="required"/>
2966 </xsd:complexType>
2967 <xsd:complexType name="CT_LevelText">
2968     <xsd:attribute name="val" type="s:ST_String" use="optional"/>
2969     <xsd:attribute name="null" type="s:ST_OnOff" use="optional"/>
2970 </xsd:complexType>
2971 <xsd:complexType name="CT_Lvl">
2972     <xsd:sequence>
2973         <xsd:element name="start" type="CT_DecimalNumber" minOccurs="0"/>
2974         <xsd:element name="numFmt" type="CT_NumFmt" minOccurs="0"/>
2975         <xsd:element name="lvlRestart" type="CT_DecimalNumber" minOccurs="0"/>
2976         <xsd:element name="pStyle" type="CT_String" minOccurs="0"/>
2977         <xsd:element name="isLgl" type="CT_OnOff" minOccurs="0"/>
2978         <xsd:element name="suff" type="CT_LevelSuffix" minOccurs="0"/>
2979         <xsd:element name="lvlText" type="CT_LevelText" minOccurs="0"/>
2980         <xsd:element name="lvlPicBulletId" type="CT_DecimalNumber" minOccurs="0"/>
2981         <xsd:element name="lvlJc" type="CT_Jc" minOccurs="0"/>
2982         <xsd:element name="pPr" type="CT_PPrGeneral" minOccurs="0"/>
2983         <xsd:element name="rPr" type="CT_RPr" minOccurs="0"/>
2984     </xsd:sequence>
2985     <xsd:attribute name="ilvl" type="ST_DecimalNumber" use="required"/>
2986     <xsd:attribute name="tplc" type="ST_LongHexNumber" use="optional"/>
2987     <xsd:attribute name="tentative" type="s:ST_OnOff" use="optional"/>
2988 </xsd:complexType>
2989 <xsd:simpleType name="ST_MultiLevelType">
2990     <xsd:restriction base="xsd:string">
2991         <xsd:enumeration value="singleLevel"/>
2992         <xsd:enumeration value="multilevel"/>
2993         <xsd:enumeration value="hybridMultilevel"/>
2994     </xsd:restriction>
2995 </xsd:simpleType>
2996 <xsd:complexType name="CT_MultiLevelType">
2997     <xsd:attribute name="val" type="ST_MultiLevelType" use="required"/>
2998 </xsd:complexType>
2999 <xsd:complexType name="CT_AbstractNum">
3000     <xsd:sequence>
3001         <xsd:element name="nsid" type="CT_LongHexNumber" minOccurs="0"/>

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3002     <xsd:element name="multiLevelType" type="CT_MultiLevelType" minOccurs="0"/>
3003     <xsd:element name="tmpl" type="CT_LongHexNumber" minOccurs="0"/>
3004     <xsd:element name="name" type="CT_String" minOccurs="0"/>
3005     <xsd:element name="styleLink" type="CT_String" minOccurs="0"/>
3006     <xsd:element name="numStyleLink" type="CT_String" minOccurs="0"/>
3007     <xsd:element name="lvl" type="CT_Lvl" minOccurs="0" maxOccurs="9"/>
3008   </xsd:sequence>
3009   <xsd:attribute name="abstractNumId" type="ST_DecimalNumber" use="required"/>
3010 </xsd:complexType>
3011 <xsd:complexType name="CT_NumLvl">
3012   <xsd:sequence>
3013     <xsd:element name="startOverride" type="CT_DecimalNumber" minOccurs="0"/>
3014     <xsd:element name="lvl" type="CT_Lvl" minOccurs="0" maxOccurs="1"/>
3015   </xsd:sequence>
3016   <xsd:attribute name="ilvl" type="ST_DecimalNumber" use="required"/>
3017 </xsd:complexType>
3018 <xsd:complexType name="CT_Num">
3019   <xsd:sequence>
3020     <xsd:element name="abstractNumId" type="CT_DecimalNumber" minOccurs="1"/>
3021     <xsd:element name="lvlOverride" type="CT_NumLvl" minOccurs="0" maxOccurs="9"/>
3022   </xsd:sequence>
3023   <xsd:attribute name="numId" type="ST_DecimalNumber" use="required"/>
3024 </xsd:complexType>
3025 <xsd:complexType name="CT_Numbering">
3026   <xsd:sequence>
3027     <xsd:element name="numPicBullet" type="CT_NumPicBullet" minOccurs="0"
3028       maxOccurs="unbounded"/>
3029     <xsd:element name="abstractNum" type="CT_AbstractNum" minOccurs="0"
3030       maxOccurs="unbounded"/>
3031     <xsd:element name="num" type="CT_Num" minOccurs="0" maxOccurs="unbounded"/>
3032     <xsd:element name="numIdMacAtCleanup" type="CT_DecimalNumber" minOccurs="0"/>
3033   </xsd:sequence>
3034 </xsd:complexType>
3035 <xsd:simpleType name="ST_TblStyleOverrideType">
3036   <xsd:restriction base="xsd:string">
3037     <xsd:enumeration value="wholeTable"/>
3038     <xsd:enumeration value="firstRow"/>
3039     <xsd:enumeration value="lastRow"/>
3040     <xsd:enumeration value="firstCol"/>
3041     <xsd:enumeration value="lastCol"/>
3042     <xsd:enumeration value="band1Vert"/>
3043     <xsd:enumeration value="band2Vert"/>
3044     <xsd:enumeration value="band1Horz"/>
3045     <xsd:enumeration value="band2Horz"/>
3046     <xsd:enumeration value="neCell"/>
3047     <xsd:enumeration value="nwCell"/>
3048     <xsd:enumeration value="seCell"/>
3049     <xsd:enumeration value="swCell"/>
3050   </xsd:restriction>
3051 </xsd:simpleType>
3052 <xsd:complexType name="CT_TblStylePr">
3053   <xsd:sequence>
3054     <xsd:element name="pPr" type="CT_PPrGeneral" minOccurs="0"/>

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3055     <xsd:element name="rPr" type="CT_RPr" minOccurs="0"/>
3056     <xsd:element name="tblPr" type="CT_TblPrBase" minOccurs="0"/>
3057     <xsd:element name="trPr" type="CT_TrPr" minOccurs="0" maxOccurs="1"/>
3058     <xsd:element name="tcPr" type="CT_TcPr" minOccurs="0" maxOccurs="1"/>
3059   </xsd:sequence>
3060   <xsd:attribute name="type" type="ST_TblStyleOverrideType" use="required"/>
3061 </xsd:complexType>
3062 <xsd:simpleType name="ST_StyleType">
3063   <xsd:restriction base="xsd:string">
3064     <xsd:enumeration value="paragraph"/>
3065     <xsd:enumeration value="character"/>
3066     <xsd:enumeration value="table"/>
3067     <xsd:enumeration value="numbering"/>
3068   </xsd:restriction>
3069 </xsd:simpleType>
3070 <xsd:complexType name="CT_Style">
3071   <xsd:sequence>
3072     <xsd:element name="name" type="CT_String" minOccurs="0" maxOccurs="1"/>
3073     <xsd:element name="aliases" type="CT_String" minOccurs="0"/>
3074     <xsd:element name="basedOn" type="CT_String" minOccurs="0"/>
3075     <xsd:element name="next" type="CT_String" minOccurs="0"/>
3076     <xsd:element name="link" type="CT_String" minOccurs="0"/>
3077     <xsd:element name="autoRedefine" type="CT_OnOff" minOccurs="0"/>
3078     <xsd:element name="hidden" type="CT_OnOff" minOccurs="0"/>
3079     <xsd:element name="uiPriority" type="CT_DecimalNumber" minOccurs="0"/>
3080     <xsd:element name="semiHidden" type="CT_OnOff" minOccurs="0"/>
3081     <xsd:element name="unhideWhenUsed" type="CT_OnOff" minOccurs="0"/>
3082     <xsd:element name="qFormat" type="CT_OnOff" minOccurs="0"/>
3083     <xsd:element name="locked" type="CT_OnOff" minOccurs="0"/>
3084     <xsd:element name="personal" type="CT_OnOff" minOccurs="0"/>
3085     <xsd:element name="personalCompose" type="CT_OnOff" minOccurs="0"/>
3086     <xsd:element name="personalReply" type="CT_OnOff" minOccurs="0"/>
3087     <xsd:element name="rsid" type="CT_LongHexNumber" minOccurs="0"/>
3088     <xsd:element name="pPr" type="CT_PPrGeneral" minOccurs="0" maxOccurs="1"/>
3089     <xsd:element name="rPr" type="CT_RPr" minOccurs="0" maxOccurs="1"/>
3090     <xsd:element name="tblPr" type="CT_TblPrBase" minOccurs="0" maxOccurs="1"/>
3091     <xsd:element name="trPr" type="CT_TrPr" minOccurs="0" maxOccurs="1"/>
3092     <xsd:element name="tcPr" type="CT_TcPr" minOccurs="0" maxOccurs="1"/>
3093     <xsd:element name="tblStylePr" type="CT_TblStylePr" minOccurs="0" maxOccurs="unbounded"/>
3094   </xsd:sequence>
3095   <xsd:attribute name="type" type="ST_StyleType" use="optional"/>
3096   <xsd:attribute name="styleId" type="s:ST_String" use="optional"/>
3097   <xsd:attribute name="default" type="s:ST_OnOff" use="optional"/>
3098   <xsd:attribute name="customStyle" type="s:ST_OnOff" use="optional"/>
3099 </xsd:complexType>
3100 <xsd:complexType name="CT_LsdException">
3101   <xsd:attribute name="name" type="s:ST_String" use="required"/>
3102   <xsd:attribute name="locked" type="s:ST_OnOff"/>
3103   <xsd:attribute name="uiPriority" type="ST_DecimalNumber"/>
3104   <xsd:attribute name="semiHidden" type="s:ST_OnOff"/>
3105   <xsd:attribute name="unhideWhenUsed" type="s:ST_OnOff"/>
3106   <xsd:attribute name="qFormat" type="s:ST_OnOff"/>
3107 </xsd:complexType>

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3108 <xsd:complexType name="CT_LatentStyles">
3109   <xsd:sequence>
3110     <xsd:element name="lsdException" type="CT_LsdException" minOccurs="0"
3111       maxOccurs="unbounded"/>
3112   </xsd:sequence>
3113   <xsd:attribute name="defLockedState" type="s:ST_OnOff"/>
3114   <xsd:attribute name="defUIPriority" type="ST_DecimalNumber"/>
3115   <xsd:attribute name="defSemiHidden" type="s:ST_OnOff"/>
3116   <xsd:attribute name="defUnhideWhenUsed" type="s:ST_OnOff"/>
3117   <xsd:attribute name="defQFormat" type="s:ST_OnOff"/>
3118   <xsd:attribute name="count" type="ST_DecimalNumber"/>
3119 </xsd:complexType>
3120 <xsd:complexType name="CT_Styles">
3121   <xsd:sequence>
3122     <xsd:element name="docDefaults" type="CT_DocDefaults" minOccurs="0"/>
3123     <xsd:element name="latentStyles" type="CT_LatentStyles" minOccurs="0" maxOccurs="1"/>
3124     <xsd:element name="style" type="CT_Style" minOccurs="0" maxOccurs="unbounded"/>
3125   </xsd:sequence>
3126 </xsd:complexType>
3127 <xsd:complexType name="CT_Panose">
3128   <xsd:attribute name="val" type="s:ST_Panose" use="required"/>
3129 </xsd:complexType>
3130 <xsd:simpleType name="ST_FontFamily">
3131   <xsd:restriction base="xsd:string">
3132     <xsd:enumeration value="decorative"/>
3133     <xsd:enumeration value="modern"/>
3134     <xsd:enumeration value="roman"/>
3135     <xsd:enumeration value="script"/>
3136     <xsd:enumeration value="swiss"/>
3137     <xsd:enumeration value="auto"/>
3138   </xsd:restriction>
3139 </xsd:simpleType>
3140 <xsd:complexType name="CT_FontFamily">
3141   <xsd:attribute name="val" type="ST_FontFamily" use="required"/>
3142 </xsd:complexType>
3143 <xsd:simpleType name="ST_Pitch">
3144   <xsd:restriction base="xsd:string">
3145     <xsd:enumeration value="fixed"/>
3146     <xsd:enumeration value="variable"/>
3147     <xsd:enumeration value="default"/>
3148   </xsd:restriction>
3149 </xsd:simpleType>
3150 <xsd:complexType name="CT_Pitch">
3151   <xsd:attribute name="val" type="ST_Pitch" use="required"/>
3152 </xsd:complexType>
3153 <xsd:complexType name="CT_FontSig">
3154   <xsd:attribute name="usb0" use="required" type="ST_LongHexNumber"/>
3155   <xsd:attribute name="usb1" use="required" type="ST_LongHexNumber"/>
3156   <xsd:attribute name="usb2" use="required" type="ST_LongHexNumber"/>
3157   <xsd:attribute name="usb3" use="required" type="ST_LongHexNumber"/>
3158   <xsd:attribute name="csb0" use="required" type="ST_LongHexNumber"/>
3159   <xsd:attribute name="csb1" use="required" type="ST_LongHexNumber"/>
3160 </xsd:complexType>

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3161 <xsd:complexType name="CT_FontRel">
3162   <xsd:complexContent>
3163     <xsd:extension base="CT_Rel">
3164       <xsd:attribute name="fontKey" type="s:ST_Guid"/>
3165       <xsd:attribute name="subsetting" type="s:ST_OnOff"/>
3166     </xsd:extension>
3167   </xsd:complexContent>
3168 </xsd:complexType>
3169 <xsd:complexType name="CT_Font">
3170   <xsd:sequence>
3171     <xsd:element name="altName" type="CT_String" minOccurs="0" maxOccurs="1"/>
3172     <xsd:element name="panose1" type="CT_Panose" minOccurs="0" maxOccurs="1"/>
3173     <xsd:element name="charset" type="CT_Charset" minOccurs="0" maxOccurs="1"/>
3174     <xsd:element name="family" type="CT_FontFamily" minOccurs="0" maxOccurs="1"/>
3175     <xsd:element name="notTrueType" type="CT_OnOff" minOccurs="0" maxOccurs="1"/>
3176     <xsd:element name="pitch" type="CT_Pitch" minOccurs="0" maxOccurs="1"/>
3177     <xsd:element name="sig" type="CT_FontSig" minOccurs="0" maxOccurs="1"/>
3178     <xsd:element name="embedRegular" type="CT_FontRel" minOccurs="0" maxOccurs="1"/>
3179     <xsd:element name="embedBold" type="CT_FontRel" minOccurs="0" maxOccurs="1"/>
3180     <xsd:element name="embedItalic" type="CT_FontRel" minOccurs="0" maxOccurs="1"/>
3181     <xsd:element name="embedBoldItalic" type="CT_FontRel" minOccurs="0" maxOccurs="1"/>
3182   </xsd:sequence>
3183   <xsd:attribute name="name" type="s:ST_String" use="required"/>
3184 </xsd:complexType>
3185 <xsd:complexType name="CT_FontsList">
3186   <xsd:sequence>
3187     <xsd:element name="font" type="CT_Font" minOccurs="0" maxOccurs="unbounded"/>
3188   </xsd:sequence>
3189 </xsd:complexType>
3190 <xsd:complexType name="CT_DivBdr">
3191   <xsd:sequence>
3192     <xsd:element name="top" type="CT_Border" minOccurs="0"/>
3193     <xsd:element name="left" type="CT_Border" minOccurs="0"/>
3194     <xsd:element name="bottom" type="CT_Border" minOccurs="0"/>
3195     <xsd:element name="right" type="CT_Border" minOccurs="0"/>
3196   </xsd:sequence>
3197 </xsd:complexType>
3198 <xsd:complexType name="CT_Div">
3199   <xsd:sequence>
3200     <xsd:element name="blockQuote" type="CT_OnOff" minOccurs="0"/>
3201     <xsd:element name="bodyDiv" type="CT_OnOff" minOccurs="0"/>
3202     <xsd:element name="marLeft" type="CT_SignedTwipsMeasure"/>
3203     <xsd:element name="marRight" type="CT_SignedTwipsMeasure"/>
3204     <xsd:element name="marTop" type="CT_SignedTwipsMeasure"/>
3205     <xsd:element name="marBottom" type="CT_SignedTwipsMeasure"/>
3206     <xsd:element name="divBdr" type="CT_DivBdr" minOccurs="0"/>
3207     <xsd:element name="divsChild" type="CT_Divs" minOccurs="0" maxOccurs="unbounded"/>
3208   </xsd:sequence>
3209   <xsd:attribute name="id" type="ST_DecimalNumber" use="required"/>
3210 </xsd:complexType>
3211 <xsd:complexType name="CT_Divs">
3212   <xsd:sequence minOccurs="1" maxOccurs="unbounded">
3213     <xsd:element name="div" type="CT_Div"/>

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3214     </xsd:sequence>
3215 </xsd:complexType>
3216 <xsd:group name="EG_MathContent">
3217     <xsd:choice>
3218         <xsd:element ref="m:oMathPara"/>
3219         <xsd:element ref="m:oMath"/>
3220     </xsd:choice>
3221 </xsd:group>
3222 <xsd:group name="EG_BlockLevelChunkElts">
3223     <xsd:choice>
3224         <xsd:group ref="EG_ContentBlockContent" minOccurs="0" maxOccurs="unbounded"/>
3225     </xsd:choice>
3226 </xsd:group>
3227 <xsd:group name="EG_BlockLevelElts">
3228     <xsd:choice>
3229         <xsd:group ref="EG_BlockLevelChunkElts" minOccurs="0" maxOccurs="unbounded"/>
3230         <xsd:element name="altChunk" type="CT_AltChunk" minOccurs="0" maxOccurs="unbounded"/>
3231     </xsd:choice>
3232 </xsd:group>
3233 <xsd:group name="EG_RunLevelElts">
3234     <xsd:choice>
3235         <xsd:element name="proofErr" minOccurs="0" type="CT_ProofErr"/>
3236         <xsd:element name="permStart" minOccurs="0" type="CT_PermStart"/>
3237         <xsd:element name="permEnd" minOccurs="0" type="CT_Perm"/>
3238         <xsd:group ref="EG_RangeMarkupElements" minOccurs="0" maxOccurs="unbounded"/>
3239         <xsd:element name="ins" type="CT_RunTrackChange" minOccurs="0"/>
3240         <xsd:element name="del" type="CT_RunTrackChange" minOccurs="0"/>
3241         <xsd:element name="moveFrom" type="CT_RunTrackChange"/>
3242         <xsd:element name="moveTo" type="CT_RunTrackChange"/>
3243         <xsd:group ref="EG_MathContent" minOccurs="0" maxOccurs="unbounded"/>
3244     </xsd:choice>
3245 </xsd:group>
3246 <xsd:complexType name="CT_Body">
3247     <xsd:sequence>
3248         <xsd:group ref="EG_BlockLevelElts" minOccurs="0" maxOccurs="unbounded"/>
3249         <xsd:element name="sectPr" minOccurs="0" maxOccurs="1" type="CT_SectPr"/>
3250     </xsd:sequence>
3251 </xsd:complexType>
3252 <xsd:complexType name="CT_Comments">
3253     <xsd:sequence>
3254         <xsd:element name="comment" type="CT_Comment" minOccurs="0" maxOccurs="unbounded"/>
3255     </xsd:sequence>
3256 </xsd:complexType>
3257 <xsd:element name="comments" type="CT_Comments"/>
3258 <xsd:complexType name="CT_Footnotes">
3259     <xsd:sequence maxOccurs="unbounded">
3260         <xsd:element name="footnote" type="CT_FtnEdn" minOccurs="0"/>
3261     </xsd:sequence>
3262 </xsd:complexType>
3263 <xsd:element name="footnotes" type="CT_Footnotes"/>
3264 <xsd:complexType name="CT_Endnotes">
3265     <xsd:sequence maxOccurs="unbounded">
3266         <xsd:element name="endnote" type="CT_FtnEdn" minOccurs="0"/>

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3267     </xsd:sequence>
3268 </xsd:complexType>
3269 <xsd:element name="endnotes" type="CT_Endnotes"/>
3270 <xsd:element name="hdr" type="CT_HdrFtr"/>
3271 <xsd:element name="ftr" type="CT_HdrFtr"/>
3272 <xsd:complexType name="CT_SmartTagType">
3273     <xsd:attribute name="namespaceuri" type="s:ST_String"/>
3274     <xsd:attribute name="name" type="s:ST_String"/>
3275     <xsd:attribute name="url" type="s:ST_String"/>
3276 </xsd:complexType>
3277 <xsd:simpleType name="ST_ThemeColor">
3278     <xsd:restriction base="xsd:string">
3279         <xsd:enumeration value="dark1"/>
3280         <xsd:enumeration value="light1"/>
3281         <xsd:enumeration value="dark2"/>
3282         <xsd:enumeration value="light2"/>
3283         <xsd:enumeration value="accent1"/>
3284         <xsd:enumeration value="accent2"/>
3285         <xsd:enumeration value="accent3"/>
3286         <xsd:enumeration value="accent4"/>
3287         <xsd:enumeration value="accent5"/>
3288         <xsd:enumeration value="accent6"/>
3289         <xsd:enumeration value="hyperlink"/>
3290         <xsd:enumeration value="followedHyperlink"/>
3291         <xsd:enumeration value="none"/>
3292         <xsd:enumeration value="background1"/>
3293         <xsd:enumeration value="text1"/>
3294         <xsd:enumeration value="background2"/>
3295         <xsd:enumeration value="text2"/>
3296     </xsd:restriction>
3297 </xsd:simpleType>
3298 <xsd:simpleType name="ST_DocPartBehavior">
3299     <xsd:restriction base="xsd:string">
3300         <xsd:enumeration value="content"/>
3301         <xsd:enumeration value="p"/>
3302         <xsd:enumeration value="pg"/>
3303     </xsd:restriction>
3304 </xsd:simpleType>
3305 <xsd:complexType name="CT_DocPartBehavior">
3306     <xsd:attribute name="val" use="required" type="ST_DocPartBehavior"/>
3307 </xsd:complexType>
3308 <xsd:complexType name="CT_DocPartBehaviors">
3309     <xsd:choice>
3310         <xsd:element name="behavior" type="CT_DocPartBehavior" maxOccurs="unbounded"/>
3311     </xsd:choice>
3312 </xsd:complexType>
3313 <xsd:simpleType name="ST_DocPartType">
3314     <xsd:restriction base="xsd:string">
3315         <xsd:enumeration value="none"/>
3316         <xsd:enumeration value="normal"/>
3317         <xsd:enumeration value="autoExp"/>
3318         <xsd:enumeration value="toolbar"/>
3319         <xsd:enumeration value="speller"/>

```

```

3320         <xsd:enumeration value="formFld"/>
3321         <xsd:enumeration value="bbPlcHdr"/>
3322     </xsd:restriction>
3323 </xsd:simpleType>
3324 <xsd:complexType name="CT_DocPartType">
3325     <xsd:attribute name="val" use="required" type="ST_DocPartType"/>
3326 </xsd:complexType>
3327 <xsd:complexType name="CT_DocPartTypes">
3328     <xsd:choice>
3329         <xsd:element name="type" type="CT_DocPartType" maxOccurs="unbounded"/>
3330     </xsd:choice>
3331     <xsd:attribute name="all" type="s:ST_OnOff" use="optional"/>
3332 </xsd:complexType>
3333 <xsd:simpleType name="ST_DocPartGallery">
3334     <xsd:restriction base="xsd:string">
3335         <xsd:enumeration value="placeholder"/>
3336         <xsd:enumeration value="any"/>
3337         <xsd:enumeration value="default"/>
3338         <xsd:enumeration value="docParts"/>
3339         <xsd:enumeration value="coverPg"/>
3340         <xsd:enumeration value="eq"/>
3341         <xsd:enumeration value="ftrs"/>
3342         <xsd:enumeration value="hdrs"/>
3343         <xsd:enumeration value="pgNum"/>
3344         <xsd:enumeration value="tbls"/>
3345         <xsd:enumeration value="watermarks"/>
3346         <xsd:enumeration value="autoTxt"/>
3347         <xsd:enumeration value="txtBox"/>
3348         <xsd:enumeration value="pgNumT"/>
3349         <xsd:enumeration value="pgNumB"/>
3350         <xsd:enumeration value="pgNumMargins"/>
3351         <xsd:enumeration value="tblOfContents"/>
3352         <xsd:enumeration value="bib"/>
3353         <xsd:enumeration value="custQuickParts"/>
3354         <xsd:enumeration value="custCoverPg"/>
3355         <xsd:enumeration value="custEq"/>
3356         <xsd:enumeration value="custFtrs"/>
3357         <xsd:enumeration value="custHdrs"/>
3358         <xsd:enumeration value="custPgNum"/>
3359         <xsd:enumeration value="custTbls"/>
3360         <xsd:enumeration value="custWatermarks"/>
3361         <xsd:enumeration value="custAutoTxt"/>
3362         <xsd:enumeration value="custTxtBox"/>
3363         <xsd:enumeration value="custPgNumT"/>
3364         <xsd:enumeration value="custPgNumB"/>
3365         <xsd:enumeration value="custPgNumMargins"/>
3366         <xsd:enumeration value="custTblOfContents"/>
3367         <xsd:enumeration value="custBib"/>
3368         <xsd:enumeration value="custom1"/>
3369         <xsd:enumeration value="custom2"/>
3370         <xsd:enumeration value="custom3"/>
3371         <xsd:enumeration value="custom4"/>
3372         <xsd:enumeration value="custom5"/>

```



```

3373     </xsd:restriction>
3374 </xsd:simpleType>
3375 <xsd:complexType name="CT_DocPartGallery">
3376     <xsd:attribute name="val" type="ST_DocPartGallery" use="required"/>
3377 </xsd:complexType>
3378 <xsd:complexType name="CT_DocPartCategory">
3379     <xsd:sequence>
3380         <xsd:element name="name" type="CT_String" minOccurs="1" maxOccurs="1"/>
3381         <xsd:element name="gallery" type="CT_DocPartGallery" minOccurs="1" maxOccurs="1"/>
3382     </xsd:sequence>
3383 </xsd:complexType>
3384 <xsd:complexType name="CT_DocPartName">
3385     <xsd:attribute name="val" type="s:ST_String" use="required"/>
3386     <xsd:attribute name="decorated" type="s:ST_OnOff" use="optional"/>
3387 </xsd:complexType>
3388 <xsd:complexType name="CT_DocPartPr">
3389     <xsd:all>
3390         <xsd:element name="name" type="CT_DocPartName" minOccurs="1"/>
3391         <xsd:element name="style" type="CT_String" minOccurs="0"/>
3392         <xsd:element name="category" type="CT_DocPartCategory" minOccurs="0"/>
3393         <xsd:element name="types" type="CT_DocPartTypes" minOccurs="0"/>
3394         <xsd:element name="behaviors" type="CT_DocPartBehaviors"
3395             minOccurs="0"/>
3396         <xsd:element name="description" type="CT_String" minOccurs="0"/>
3397         <xsd:element name="guid" type="CT_Guid" minOccurs="0"/>
3398     </xsd:all>
3399 </xsd:complexType>
3400 <xsd:complexType name="CT_DocPart">
3401     <xsd:sequence>
3402         <xsd:element name="docPartPr" type="CT_DocPartPr" minOccurs="0"/>
3403         <xsd:element name="docPartBody" type="CT_Body" minOccurs="0"/>
3404     </xsd:sequence>
3405 </xsd:complexType>
3406 <xsd:complexType name="CT_DocParts">
3407     <xsd:choice>
3408         <xsd:element name="docPart" type="CT_DocPart" minOccurs="1" maxOccurs="unbounded"/>
3409     </xsd:choice>
3410 </xsd:complexType>
3411 <xsd:element name="settings" type="CT_Settings"/>
3412 <xsd:element name="webSettings" type="CT_WebSettings"/>
3413 <xsd:element name="fonts" type="CT_FontsList"/>
3414 <xsd:element name="numbering" type="CT_Numbering"/>
3415 <xsd:element name="styles" type="CT_Styles"/>
3416 <xsd:simpleType name="ST_CaptionPos">
3417     <xsd:restriction base="xsd:string">
3418         <xsd:enumeration value="above"/>
3419         <xsd:enumeration value="below"/>
3420         <xsd:enumeration value="left"/>
3421         <xsd:enumeration value="right"/>
3422     </xsd:restriction>
3423 </xsd:simpleType>
3424 <xsd:complexType name="CT_Caption">
3425     <xsd:attribute name="name" type="s:ST_String" use="required"/>

```

```

3426     <xsd:attribute name="pos" type="ST_CaptionPos" use="optional"/>
3427     <xsd:attribute name="chapNum" type="s:ST_OnOff" use="optional"/>
3428     <xsd:attribute name="heading" type="ST_DecimalNumber" use="optional"/>
3429     <xsd:attribute name="noLabel" type="s:ST_OnOff" use="optional"/>
3430     <xsd:attribute name="numFmt" type="ST_NumberFormat" use="optional"/>
3431     <xsd:attribute name="sep" type="ST_ChapterSep" use="optional"/>
3432 </xsd:complexType>
3433 <xsd:complexType name="CT_AutoCaption">
3434     <xsd:attribute name="name" type="s:ST_String" use="required"/>
3435     <xsd:attribute name="caption" type="s:ST_String" use="required"/>
3436 </xsd:complexType>
3437 <xsd:complexType name="CT_AutoCaptions">
3438     <xsd:sequence>
3439         <xsd:element name="autoCaption" type="CT_AutoCaption" minOccurs="1"
3440             maxOccurs="unbounded"/>
3441     </xsd:sequence>
3442 </xsd:complexType>
3443 <xsd:complexType name="CT_Captions">
3444     <xsd:sequence>
3445         <xsd:element name="caption" type="CT_Caption" minOccurs="1" maxOccurs="unbounded"/>
3446         <xsd:element name="autoCaptions" type="CT_AutoCaptions" minOccurs="0" maxOccurs="1"/>
3447     </xsd:sequence>
3448 </xsd:complexType>
3449 <xsd:complexType name="CT_DocumentBase">
3450     <xsd:sequence>
3451         <xsd:element name="background" type="CT_Background" minOccurs="0"/>
3452     </xsd:sequence>
3453 </xsd:complexType>
3454 <xsd:complexType name="CT_Document">
3455     <xsd:complexContent>
3456         <xsd:extension base="CT_DocumentBase">
3457             <xsd:sequence>
3458                 <xsd:element name="body" type="CT_Body" minOccurs="0" maxOccurs="1"/>
3459             </xsd:sequence>
3460             <xsd:attribute name="conformance" type="s:ST_ConformanceClass"/>
3461         </xsd:extension>
3462     </xsd:complexContent>
3463 </xsd:complexType>
3464 <xsd:complexType name="CT_GlossaryDocument">
3465     <xsd:complexContent>
3466         <xsd:extension base="CT_DocumentBase">
3467             <xsd:sequence>
3468                 <xsd:element name="docParts" type="CT_DocParts" minOccurs="0"/>
3469             </xsd:sequence>
3470         </xsd:extension>
3471     </xsd:complexContent>
3472 </xsd:complexType>
3473 <xsd:element name="document" type="CT_Document"/>
3474 <xsd:element name="glossaryDocument" type="CT_GlossaryDocument"/>
3475 </xsd:schema>

```

A.2 SpreadsheetML

This schema is available in the file `sml.xsd`.

```

1 <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
2   xmlns=http://purl.oclc.org/ooxml/spreadsheetml/main"
3   xmlns:r="http://purl.oclc.org/ooxml/officeDocument/relationships"
4   xmlns:xdr="http://purl.oclc.org/ooxml/drawingml/spreadsheetDrawing"
5   xmlns:s="http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
6   targetNamespace="http://purl.oclc.org/ooxml/spreadsheetml/main" elementFormDefault="qualified">
7   <xsd:import namespace="http://purl.oclc.org/ooxml/officeDocument/relationships"
8     schemaLocation="shared-relationshipReference.xsd"/>
9   <xsd:import namespace="http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
10     schemaLocation="shared-commonSimpleTypes.xsd"/>
11   <xsd:import namespace="http://purl.oclc.org/ooxml/drawingml/spreadsheetDrawing"
12     schemaLocation="dml-spreadsheetDrawing.xsd"/>
13   <xsd:complexType name="CT_AutoFilter">
14     <xsd:sequence>
15       <xsd:element name="filterColumn" minOccurs="0" maxOccurs="unbounded"
16         type="CT_FilterColumn"/>
17       <xsd:element name="sortState" minOccurs="0" maxOccurs="1" type="CT_SortState"/>
18       <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
19     </xsd:sequence>
20     <xsd:attribute name="ref" type="ST_Ref"/>
21   </xsd:complexType>
22   <xsd:complexType name="CT_FilterColumn">
23     <xsd:choice minOccurs="0" maxOccurs="1">
24       <xsd:element name="filters" type="CT_Filters" minOccurs="0" maxOccurs="1"/>
25       <xsd:element name="top10" type="CT_Top10" minOccurs="0" maxOccurs="1"/>
26       <xsd:element name="customFilters" type="CT_CustomFilters" minOccurs="0" maxOccurs="1"/>
27       <xsd:element name="dynamicFilter" type="CT_DynamicFilter" minOccurs="0" maxOccurs="1"/>
28       <xsd:element name="colorFilter" type="CT_ColorFilter" minOccurs="0" maxOccurs="1"/>
29       <xsd:element name="iconFilter" minOccurs="0" maxOccurs="1" type="CT_IconFilter"/>
30       <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
31     </xsd:choice>
32     <xsd:attribute name="colId" type="xsd:unsignedInt" use="required"/>
33     <xsd:attribute name="hiddenButton" type="xsd:boolean" use="optional" default="false"/>
34     <xsd:attribute name="showButton" type="xsd:boolean" use="optional" default="true"/>
35   </xsd:complexType>
36   <xsd:complexType name="CT_Filters">
37     <xsd:sequence>
38       <xsd:element name="filter" type="CT_Filter" minOccurs="0" maxOccurs="unbounded"/>
39       <xsd:element name="dateGroupItem" type="CT_DateGroupItem" minOccurs="0"
40         maxOccurs="unbounded"/>
41     </xsd:sequence>
42     <xsd:attribute name="blank" type="xsd:boolean" use="optional" default="false"/>
43     <xsd:attribute name="calendarType" type="s:ST_CalendarType" use="optional" default="none"/>
44   </xsd:complexType>
45   <xsd:complexType name="CT_Filter">
46     <xsd:attribute name="val" type="s:ST_Xstring"/>
47   </xsd:complexType>
48   <xsd:complexType name="CT_CustomFilters">
49     <xsd:sequence>

```

```

50     <xsd:element name="customFilter" type="CT_CustomFilter" minOccurs="1" maxOccurs="2"/>
51   </xsd:sequence>
52   <xsd:attribute name="and" type="xsd:boolean" use="optional" default="false"/>
53 </xsd:complexType>
54 <xsd:complexType name="CT_CustomFilter">
55   <xsd:attribute name="operator" type="ST_FilterOperator" default="equal" use="optional"/>
56   <xsd:attribute name="val" type="s:ST_Xstring"/>
57 </xsd:complexType>
58 <xsd:complexType name="CT_Top10">
59   <xsd:attribute name="top" type="xsd:boolean" use="optional" default="true"/>
60   <xsd:attribute name="percent" type="xsd:boolean" use="optional" default="false"/>
61   <xsd:attribute name="val" type="xsd:double" use="required"/>
62   <xsd:attribute name="filterVal" type="xsd:double" use="optional"/>
63 </xsd:complexType>
64 <xsd:complexType name="CT_ColorFilter">
65   <xsd:attribute name="dxId" type="ST_DxfId" use="optional"/>
66   <xsd:attribute name="cellColor" type="xsd:boolean" use="optional" default="true"/>
67 </xsd:complexType>
68 <xsd:complexType name="CT_IconFilter">
69   <xsd:attribute name="iconSet" type="ST_IconSetType" use="required"/>
70   <xsd:attribute name="iconId" type="xsd:unsignedInt" use="optional"/>
71 </xsd:complexType>
72 <xsd:simpleType name="ST_FilterOperator">
73   <xsd:restriction base="xsd:string">
74     <xsd:enumeration value="equal"/>
75     <xsd:enumeration value="lessThan"/>
76     <xsd:enumeration value="lessThanOrEqual"/>
77     <xsd:enumeration value="notEqual"/>
78     <xsd:enumeration value="greaterThanOrEqual"/>
79     <xsd:enumeration value="greaterThan"/>
80   </xsd:restriction>
81 </xsd:simpleType>
82 <xsd:complexType name="CT_DynamicFilter">
83   <xsd:attribute name="type" type="ST_DynamicFilterType" use="required"/>
84   <xsd:attribute name="val" type="xsd:double" use="optional"/>
85   <xsd:attribute name="valIso" type="xsd:dateTime" use="optional"/>
86   <xsd:attribute name="maxValIso" type="xsd:dateTime" use="optional"/>
87 </xsd:complexType>
88 <xsd:simpleType name="ST_DynamicFilterType">
89   <xsd:restriction base="xsd:string">
90     <xsd:enumeration value="null"/>
91     <xsd:enumeration value="aboveAverage"/>
92     <xsd:enumeration value="belowAverage"/>
93     <xsd:enumeration value="tomorrow"/>
94     <xsd:enumeration value="today"/>
95     <xsd:enumeration value="yesterday"/>
96     <xsd:enumeration value="nextWeek"/>
97     <xsd:enumeration value="thisWeek"/>
98     <xsd:enumeration value="lastWeek"/>
99     <xsd:enumeration value="nextMonth"/>
100    <xsd:enumeration value="thisMonth"/>
101    <xsd:enumeration value="lastMonth"/>
102    <xsd:enumeration value="nextQuarter"/>

```

```

103     <xsd:enumeration value="thisQuarter"/>
104     <xsd:enumeration value="lastQuarter"/>
105     <xsd:enumeration value="nextYear"/>
106     <xsd:enumeration value="thisYear"/>
107     <xsd:enumeration value="lastYear"/>
108     <xsd:enumeration value="yearToDate"/>
109     <xsd:enumeration value="Q1"/>
110     <xsd:enumeration value="Q2"/>
111     <xsd:enumeration value="Q3"/>
112     <xsd:enumeration value="Q4"/>
113     <xsd:enumeration value="M1"/>
114     <xsd:enumeration value="M2"/>
115     <xsd:enumeration value="M3"/>
116     <xsd:enumeration value="M4"/>
117     <xsd:enumeration value="M5"/>
118     <xsd:enumeration value="M6"/>
119     <xsd:enumeration value="M7"/>
120     <xsd:enumeration value="M8"/>
121     <xsd:enumeration value="M9"/>
122     <xsd:enumeration value="M10"/>
123     <xsd:enumeration value="M11"/>
124     <xsd:enumeration value="M12"/>
125 </xsd:restriction>
126 </xsd:simpleType>
127 <xsd:simpleType name="ST_IconSetType">
128     <xsd:restriction base="xsd:string">
129         <xsd:enumeration value="3Arrows"/>
130         <xsd:enumeration value="3ArrowsGray"/>
131         <xsd:enumeration value="3Flags"/>
132         <xsd:enumeration value="3TrafficLights1"/>
133         <xsd:enumeration value="3TrafficLights2"/>
134         <xsd:enumeration value="3Signs"/>
135         <xsd:enumeration value="3Symbols"/>
136         <xsd:enumeration value="3Symbols2"/>
137         <xsd:enumeration value="4Arrows"/>
138         <xsd:enumeration value="4ArrowsGray"/>
139         <xsd:enumeration value="4RedToBlack"/>
140         <xsd:enumeration value="4Rating"/>
141         <xsd:enumeration value="4TrafficLights"/>
142         <xsd:enumeration value="5Arrows"/>
143         <xsd:enumeration value="5ArrowsGray"/>
144         <xsd:enumeration value="5Rating"/>
145         <xsd:enumeration value="5Quarters"/>
146     </xsd:restriction>
147 </xsd:simpleType>
148 <xsd:complexType name="CT_SortState">
149     <xsd:sequence>
150         <xsd:element name="sortCondition" minOccurs="0" maxOccurs="64" type="CT_SortCondition"/>
151         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
152     </xsd:sequence>
153     <xsd:attribute name="columnSort" type="xsd:boolean" use="optional" default="false"/>
154     <xsd:attribute name="caseSensitive" type="xsd:boolean" use="optional" default="false"/>
155     <xsd:attribute name="sortMethod" type="ST_SortMethod" use="optional" default="none"/>

```

```

156     <xsd:attribute name="ref" type="ST_Ref" use="required"/>
157 </xsd:complexType>
158 <xsd:complexType name="CT_SortCondition">
159     <xsd:attribute name="descending" type="xsd:boolean" use="optional" default="false"/>
160     <xsd:attribute name="sortBy" type="ST_SortBy" use="optional" default="value"/>
161     <xsd:attribute name="ref" type="ST_Ref" use="required"/>
162     <xsd:attribute name="customList" type="s:ST_Xstring" use="optional"/>
163     <xsd:attribute name="dxfId" type="ST_DxfId" use="optional"/>
164     <xsd:attribute name="iconSet" type="ST_IconSetType" use="optional" default="3Arrows"/>
165     <xsd:attribute name="iconId" type="xsd:unsignedInt" use="optional"/>
166 </xsd:complexType>
167 <xsd:simpleType name="ST_SortBy">
168     <xsd:restriction base="xsd:string">
169         <xsd:enumeration value="value"/>
170         <xsd:enumeration value="cellColor"/>
171         <xsd:enumeration value="fontColor"/>
172         <xsd:enumeration value="icon"/>
173     </xsd:restriction>
174 </xsd:simpleType>
175 <xsd:simpleType name="ST_SortMethod">
176     <xsd:restriction base="xsd:string">
177         <xsd:enumeration value="stroke"/>
178         <xsd:enumeration value="pinYin"/>
179         <xsd:enumeration value="none"/>
180     </xsd:restriction>
181 </xsd:simpleType>
182 <xsd:complexType name="CT_DateGroupItem">
183     <xsd:attribute name="year" type="xsd:unsignedShort" use="required"/>
184     <xsd:attribute name="month" type="xsd:unsignedShort" use="optional"/>
185     <xsd:attribute name="day" type="xsd:unsignedShort" use="optional"/>
186     <xsd:attribute name="hour" type="xsd:unsignedShort" use="optional"/>
187     <xsd:attribute name="minute" type="xsd:unsignedShort" use="optional"/>
188     <xsd:attribute name="second" type="xsd:unsignedShort" use="optional"/>
189     <xsd:attribute name="dateTimeGrouping" type="ST_DateTimeGrouping" use="required"/>
190 </xsd:complexType>
191 <xsd:simpleType name="ST_DateTimeGrouping">
192     <xsd:restriction base="xsd:string">
193         <xsd:enumeration value="year"/>
194         <xsd:enumeration value="month"/>
195         <xsd:enumeration value="day"/>
196         <xsd:enumeration value="hour"/>
197         <xsd:enumeration value="minute"/>
198         <xsd:enumeration value="second"/>
199     </xsd:restriction>
200 </xsd:simpleType>
201 <xsd:simpleType name="ST_CellRef">
202     <xsd:restriction base="xsd:string"/>
203 </xsd:simpleType>
204 <xsd:simpleType name="ST_Ref">
205     <xsd:restriction base="xsd:string"/>
206 </xsd:simpleType>
207 <xsd:simpleType name="ST_RefA">
208     <xsd:restriction base="xsd:string"/>

```

```

209 </xsd:simpleType>
210 <xsd:simpleType name="ST_Sqref">
211   <xsd:list itemType="ST_Ref"/>
212 </xsd:simpleType>
213 <xsd:simpleType name="ST_Formula">
214   <xsd:restriction base="s:ST_Xstring"/>
215 </xsd:simpleType>
216 <xsd:simpleType name="ST_UnsignedIntHex">
217   <xsd:restriction base="xsd:hexBinary">
218     <xsd:length value="4"/>
219   </xsd:restriction>
220 </xsd:simpleType>
221 <xsd:complexType name="CT_XStringElement">
222   <xsd:attribute name="v" type="s:ST_Xstring" use="required"/>
223 </xsd:complexType>
224 <xsd:complexType name="CT_Extension">
225   <xsd:sequence>
226     <xsd:any processContents="lax"/>
227   </xsd:sequence>
228   <xsd:attribute name="uri" type="xsd:token"/>
229 </xsd:complexType>
230 <xsd:complexType name="CT_ObjectAnchor">
231   <xsd:sequence>
232     <xsd:element ref="xdr:from" minOccurs="1" maxOccurs="1"/>
233     <xsd:element ref="xdr:to" minOccurs="1" maxOccurs="1"/>
234   </xsd:sequence>
235   <xsd:attribute name="moveWithCells" type="xsd:boolean" use="optional" default="false"/>
236   <xsd:attribute name="sizeWithCells" type="xsd:boolean" use="optional" default="false"/>
237 </xsd:complexType>
238 <xsd:group name="EG_ExtensionList">
239   <xsd:sequence>
240     <xsd:element name="ext" type="CT_Extension" minOccurs="0" maxOccurs="unbounded"/>
241   </xsd:sequence>
242 </xsd:group>
243 <xsd:complexType name="CT_ExtensionList">
244   <xsd:sequence>
245     <xsd:group ref="EG_ExtensionList" minOccurs="0"/>
246   </xsd:sequence>
247 </xsd:complexType>
248 <xsd:element name="calcChain" type="CT_CalcChain"/>
249 <xsd:complexType name="CT_CalcChain">
250   <xsd:sequence>
251     <xsd:element name="c" type="CT_CalcCell" minOccurs="1" maxOccurs="unbounded"/>
252     <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
253   </xsd:sequence>
254 </xsd:complexType>
255 <xsd:complexType name="CT_CalcCell">
256   <xsd:attribute name="r" type="ST_CellRef" use="required"/>
257   <xsd:attribute name="i" type="xsd:int" use="optional" default="0"/>
258   <xsd:attribute name="s" type="xsd:boolean" use="optional" default="false"/>
259   <xsd:attribute name="l" type="xsd:boolean" use="optional" default="false"/>
260   <xsd:attribute name="t" type="xsd:boolean" use="optional" default="false"/>
261   <xsd:attribute name="a" type="xsd:boolean" use="optional" default="false"/>

```

```

262 </xsd:complexType>
263 <xsd:element name="comments" type="CT_Comments"/>
264 <xsd:complexType name="CT_Comments">
265   <xsd:sequence>
266     <xsd:element name="authors" type="CT_Authors" minOccurs="1" maxOccurs="1"/>
267     <xsd:element name="commentList" type="CT_CommentList" minOccurs="1" maxOccurs="1"/>
268     <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
269   </xsd:sequence>
270 </xsd:complexType>
271 <xsd:complexType name="CT_Authors">
272   <xsd:sequence>
273     <xsd:element name="author" type="s:ST_Xstring" minOccurs="0" maxOccurs="unbounded"/>
274   </xsd:sequence>
275 </xsd:complexType>
276 <xsd:complexType name="CT_CommentList">
277   <xsd:sequence>
278     <xsd:element name="comment" type="CT_Comment" minOccurs="0" maxOccurs="unbounded"/>
279   </xsd:sequence>
280 </xsd:complexType>
281 <xsd:complexType name="CT_Comment">
282   <xsd:sequence>
283     <xsd:element name="text" type="CT_Rst" minOccurs="1" maxOccurs="1"/>
284     <xsd:element name="commentPr" type="CT_CommentPr" minOccurs="0" maxOccurs="1"/>
285   </xsd:sequence>
286   <xsd:attribute name="ref" type="ST_Ref" use="required"/>
287   <xsd:attribute name="authorId" type="xsd:unsignedInt" use="required"/>
288   <xsd:attribute name="guid" type="s:ST_Guid" use="optional"/>
289   <xsd:attribute name="shapeId" type="xsd:unsignedInt" use="optional"/>
290 </xsd:complexType>
291 <xsd:complexType name="CT_CommentPr">
292   <xsd:sequence>
293     <xsd:element name="anchor" type="CT_ObjectAnchor" minOccurs="1" maxOccurs="1"/>
294   </xsd:sequence>
295   <xsd:attribute name="locked" type="xsd:boolean" use="optional" default="true"/>
296   <xsd:attribute name="defaultSize" type="xsd:boolean" use="optional" default="true"/>
297   <xsd:attribute name="print" type="xsd:boolean" use="optional" default="true"/>
298   <xsd:attribute name="disabled" type="xsd:boolean" use="optional" default="false"/>
299   <xsd:attribute name="autoFill" type="xsd:boolean" use="optional" default="true"/>
300   <xsd:attribute name="autoLine" type="xsd:boolean" use="optional" default="true"/>
301   <xsd:attribute name="altText" type="s:ST_Xstring" use="optional"/>
302   <xsd:attribute name="textHAlign" type="ST_TextHAlign" use="optional" default="left"/>
303   <xsd:attribute name="textVAlign" type="ST_TextVAlign" use="optional" default="top"/>
304   <xsd:attribute name="lockText" type="xsd:boolean" use="optional" default="true"/>
305   <xsd:attribute name="justLastX" type="xsd:boolean" use="optional" default="false"/>
306   <xsd:attribute name="autoScale" type="xsd:boolean" use="optional" default="false"/>
307 </xsd:complexType>
308 <xsd:simpleType name="ST_TextHAlign">
309   <xsd:restriction base="xsd:string">
310     <xsd:enumeration value="left"/>
311     <xsd:enumeration value="center"/>
312     <xsd:enumeration value="right"/>
313     <xsd:enumeration value="justify"/>
314     <xsd:enumeration value="distributed"/>

```



```

315     </xsd:restriction>
316 </xsd:simpleType>
317 <xsd:simpleType name="ST_TextVAlign">
318     <xsd:restriction base="xsd:string">
319         <xsd:enumeration value="top"/>
320         <xsd:enumeration value="center"/>
321         <xsd:enumeration value="bottom"/>
322         <xsd:enumeration value="justify"/>
323         <xsd:enumeration value="distributed"/>
324     </xsd:restriction>
325 </xsd:simpleType>
326 <xsd:element name="MapInfo" type="CT_MapInfo"/>
327 <xsd:complexType name="CT_MapInfo">
328     <xsd:sequence>
329         <xsd:element name="Schema" type="CT_Schema" minOccurs="1" maxOccurs="unbounded"/>
330         <xsd:element name="Map" type="CT_Map" minOccurs="1" maxOccurs="unbounded"/>
331     </xsd:sequence>
332     <xsd:attribute name="SelectionNamespaces" type="xsd:string" use="required"/>
333 </xsd:complexType>
334 <xsd:complexType name="CT_Schema" mixed="true">
335     <xsd:sequence>
336         <xsd:any/>
337     </xsd:sequence>
338     <xsd:attribute name="ID" type="xsd:string" use="required"/>
339     <xsd:attribute name="SchemaRef" type="xsd:string" use="optional"/>
340     <xsd:attribute name="Namespace" type="xsd:string" use="optional"/>
341     <xsd:attribute name="SchemaLanguage" type="xsd:token" use="optional"/>
342 </xsd:complexType>
343 <xsd:complexType name="CT_Map">
344     <xsd:sequence>
345         <xsd:element name="DataBinding" type="CT_DataBinding" minOccurs="0" maxOccurs="1"/>
346     </xsd:sequence>
347     <xsd:attribute name="ID" type="xsd:unsignedInt" use="required"/>
348     <xsd:attribute name="Name" type="xsd:string" use="required"/>
349     <xsd:attribute name="RootElement" type="xsd:string" use="required"/>
350     <xsd:attribute name="SchemaID" type="xsd:string" use="required"/>
351     <xsd:attribute name="ShowImportExportValidationErrors" type="xsd:boolean" use="required"/>
352     <xsd:attribute name="AutoFit" type="xsd:boolean" use="required"/>
353     <xsd:attribute name="Append" type="xsd:boolean" use="required"/>
354     <xsd:attribute name="PreserveSortAFLayout" type="xsd:boolean" use="required"/>
355     <xsd:attribute name="PreserveFormat" type="xsd:boolean" use="required"/>
356 </xsd:complexType>
357 <xsd:complexType name="CT_DataBinding">
358     <xsd:sequence>
359         <xsd:any/>
360     </xsd:sequence>
361     <xsd:attribute name="DataBindingName" type="xsd:string" use="optional"/>
362     <xsd:attribute name="FileBinding" type="xsd:boolean" use="optional"/>
363     <xsd:attribute name="ConnectionID" type="xsd:unsignedInt" use="optional"/>
364     <xsd:attribute name="FileBindingName" type="xsd:string" use="optional"/>
365     <xsd:attribute name="DataBindingLoadMode" type="xsd:unsignedInt" use="required"/>
366 </xsd:complexType>
367 <xsd:element name="connections" type="CT_Connections"/>

```

```

368 <xsd:complexType name="CT_Connections">
369   <xsd:sequence>
370     <xsd:element name="connection" minOccurs="1" maxOccurs="unbounded" type="CT_Connection"/>
371   </xsd:sequence>
372 </xsd:complexType>
373 <xsd:complexType name="CT_Connection">
374   <xsd:sequence>
375     <xsd:element name="dbPr" minOccurs="0" maxOccurs="1" type="CT_DbPr"/>
376     <xsd:element name="olapPr" minOccurs="0" maxOccurs="1" type="CT_OlapPr"/>
377     <xsd:element name="webPr" minOccurs="0" maxOccurs="1" type="CT_WebPr"/>
378     <xsd:element name="textPr" minOccurs="0" maxOccurs="1" type="CT_TextPr"/>
379     <xsd:element name="parameters" minOccurs="0" maxOccurs="1" type="CT_Parameters"/>
380     <xsd:element name="extLst" minOccurs="0" maxOccurs="1" type="CT_ExtensionList"/>
381   </xsd:sequence>
382   <xsd:attribute name="id" use="required" type="xsd:unsignedInt"/>
383   <xsd:attribute name="sourceFile" use="optional" type="s:ST_Xstring"/>
384   <xsd:attribute name="odcFile" use="optional" type="s:ST_Xstring"/>
385   <xsd:attribute name="keepAlive" use="optional" type="xsd:boolean" default="false"/>
386   <xsd:attribute name="interval" use="optional" type="xsd:unsignedInt" default="0"/>
387   <xsd:attribute name="name" use="optional" type="s:ST_Xstring"/>
388   <xsd:attribute name="description" use="optional" type="s:ST_Xstring"/>
389   <xsd:attribute name="type" use="optional" type="xsd:unsignedInt"/>
390   <xsd:attribute name="reconnectionMethod" use="optional" type="xsd:unsignedInt" default="1"/>
391   <xsd:attribute name="refreshedVersion" use="required" type="xsd:unsignedByte"/>
392   <xsd:attribute name="minRefreshableVersion" use="optional" type="xsd:unsignedByte"
393     default="0"/>
394   <xsd:attribute name="savePassword" use="optional" type="xsd:boolean" default="false"/>
395   <xsd:attribute name="new" use="optional" type="xsd:boolean" default="false"/>
396   <xsd:attribute name="deleted" use="optional" type="xsd:boolean" default="false"/>
397   <xsd:attribute name="onlyUseConnectionFile" use="optional" type="xsd:boolean"
398     default="false"/>
399   <xsd:attribute name="background" use="optional" type="xsd:boolean" default="false"/>
400   <xsd:attribute name="refreshOnLoad" use="optional" type="xsd:boolean" default="false"/>
401   <xsd:attribute name="saveData" use="optional" type="xsd:boolean" default="false"/>
402   <xsd:attribute name="credentials" use="optional" type="ST_CredMethod" default="integrated"/>
403   <xsd:attribute name="singleSignOnId" use="optional" type="s:ST_Xstring"/>
404 </xsd:complexType>
405 <xsd:simpleType name="ST_CredMethod">
406   <xsd:restriction base="xsd:string">
407     <xsd:enumeration value="integrated"/>
408     <xsd:enumeration value="none"/>
409     <xsd:enumeration value="stored"/>
410     <xsd:enumeration value="prompt"/>
411   </xsd:restriction>
412 </xsd:simpleType>
413 <xsd:complexType name="CT_DbPr">
414   <xsd:attribute name="connection" use="required" type="s:ST_Xstring"/>
415   <xsd:attribute name="command" use="optional" type="s:ST_Xstring"/>
416   <xsd:attribute name="serverCommand" use="optional" type="s:ST_Xstring"/>
417   <xsd:attribute name="commandType" use="optional" type="xsd:unsignedInt" default="2"/>
418 </xsd:complexType>
419 <xsd:complexType name="CT_OlapPr">
420   <xsd:attribute name="local" use="optional" type="xsd:boolean" default="false"/>

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421     <xsd:attribute name="localConnection" use="optional" type="s:ST_Xstring"/>
422     <xsd:attribute name="localRefresh" use="optional" type="xsd:boolean" default="true"/>
423     <xsd:attribute name="sendLocale" use="optional" type="xsd:boolean" default="false"/>
424     <xsd:attribute name="rowDrillCount" use="optional" type="xsd:unsignedInt"/>
425     <xsd:attribute name="serverFill" use="optional" type="xsd:boolean" default="true"/>
426     <xsd:attribute name="serverNumberFormat" use="optional" type="xsd:boolean" default="true"/>
427     <xsd:attribute name="serverFont" use="optional" type="xsd:boolean" default="true"/>
428     <xsd:attribute name="serverFontColor" use="optional" type="xsd:boolean" default="true"/>
429 </xsd:complexType>
430 <xsd:complexType name="CT_WebPr">
431     <xsd:sequence>
432         <xsd:element name="tables" minOccurs="0" maxOccurs="1" type="CT_Tables"/>
433     </xsd:sequence>
434     <xsd:attribute name="xml" use="optional" type="xsd:boolean" default="false"/>
435     <xsd:attribute name="sourceData" use="optional" type="xsd:boolean" default="false"/>
436     <xsd:attribute name="parsePre" use="optional" type="xsd:boolean" default="false"/>
437     <xsd:attribute name="consecutive" use="optional" type="xsd:boolean" default="false"/>
438     <xsd:attribute name="firstRow" use="optional" type="xsd:boolean" default="false"/>
439     <xsd:attribute name="xl97" use="optional" type="xsd:boolean" default="false"/>
440     <xsd:attribute name="textDates" use="optional" type="xsd:boolean" default="false"/>
441     <xsd:attribute name="xl2000" use="optional" type="xsd:boolean" default="false"/>
442     <xsd:attribute name="url" use="optional" type="s:ST_Xstring"/>
443     <xsd:attribute name="post" use="optional" type="s:ST_Xstring"/>
444     <xsd:attribute name="htmlTables" use="optional" type="xsd:boolean" default="false"/>
445     <xsd:attribute name="htmlFormat" use="optional" type="ST_HtmlFmt" default="none"/>
446     <xsd:attribute name="editPage" use="optional" type="s:ST_Xstring"/>
447 </xsd:complexType>
448 <xsd:simpleType name="ST_HtmlFmt">
449     <xsd:restriction base="xsd:string">
450         <xsd:enumeration value="none"/>
451         <xsd:enumeration value="rtf"/>
452         <xsd:enumeration value="all"/>
453     </xsd:restriction>
454 </xsd:simpleType>
455 <xsd:complexType name="CT_Parameters">
456     <xsd:sequence>
457         <xsd:element name="parameter" minOccurs="1" maxOccurs="unbounded" type="CT_Parameter"/>
458     </xsd:sequence>
459     <xsd:attribute name="count" use="optional" type="xsd:unsignedInt"/>
460 </xsd:complexType>
461 <xsd:complexType name="CT_Parameter">
462     <xsd:attribute name="name" use="optional" type="s:ST_Xstring"/>
463     <xsd:attribute name="sqlType" use="optional" type="xsd:int" default="0"/>
464     <xsd:attribute name="parameterType" use="optional" type="ST_ParameterType" default="prompt"/>
465     <xsd:attribute name="refreshOnChange" use="optional" type="xsd:boolean" default="false"/>
466     <xsd:attribute name="prompt" use="optional" type="s:ST_Xstring"/>
467     <xsd:attribute name="boolean" use="optional" type="xsd:boolean"/>
468     <xsd:attribute name="double" use="optional" type="xsd:double"/>
469     <xsd:attribute name="integer" use="optional" type="xsd:int"/>
470     <xsd:attribute name="string" use="optional" type="s:ST_Xstring"/>
471     <xsd:attribute name="cell" use="optional" type="s:ST_Xstring"/>
472 </xsd:complexType>
473 <xsd:simpleType name="ST_ParameterType">

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474     <xsd:restriction base="xsd:string">
475         <xsd:enumeration value="prompt"/>
476         <xsd:enumeration value="value"/>
477         <xsd:enumeration value="cell"/>
478     </xsd:restriction>
479 </xsd:simpleType>
480 <xsd:complexType name="CT_Tables">
481     <xsd:choice minOccurs="1" maxOccurs="unbounded">
482         <xsd:element name="m" type="CT_TableMissing"/>
483         <xsd:element name="s" type="CT_XStringElement"/>
484         <xsd:element name="x" type="CT_Index"/>
485     </xsd:choice>
486     <xsd:attribute name="count" use="optional" type="xsd:unsignedInt"/>
487 </xsd:complexType>
488 <xsd:complexType name="CT_TableMissing"/>
489 <xsd:complexType name="CT_TextPr">
490     <xsd:sequence>
491         <xsd:element name="textFields" minOccurs="0" maxOccurs="1" type="CT_TextFields"/>
492     </xsd:sequence>
493     <xsd:attribute name="prompt" use="optional" type="xsd:boolean" default="true"/>
494     <xsd:attribute name="fileType" use="optional" type="ST_FileType" default="win"/>
495     <xsd:attribute name="characterSet" use="optional" type="xsd:string"/>
496     <xsd:attribute name="firstRow" use="optional" type="xsd:unsignedInt" default="1"/>
497     <xsd:attribute name="sourceFile" use="optional" type="s:ST_Xstring" default=""/>
498     <xsd:attribute name="delimited" use="optional" type="xsd:boolean" default="true"/>
499     <xsd:attribute name="decimal" use="optional" type="s:ST_Xstring" default="."/>
500     <xsd:attribute name="thousands" use="optional" type="s:ST_Xstring" default=","/>
501     <xsd:attribute name="tab" use="optional" type="xsd:boolean" default="true"/>
502     <xsd:attribute name="space" use="optional" type="xsd:boolean" default="false"/>
503     <xsd:attribute name="comma" use="optional" type="xsd:boolean" default="false"/>
504     <xsd:attribute name="semicolon" use="optional" type="xsd:boolean" default="false"/>
505     <xsd:attribute name="consecutive" use="optional" type="xsd:boolean" default="false"/>
506     <xsd:attribute name="qualifier" use="optional" type="ST_Qualifier" default="doubleQuote"/>
507     <xsd:attribute name="delimiter" use="optional" type="s:ST_Xstring"/>
508 </xsd:complexType>
509 <xsd:simpleType name="ST_FileType">
510     <xsd:restriction base="xsd:string">
511         <xsd:enumeration value="mac"/>
512         <xsd:enumeration value="win"/>
513         <xsd:enumeration value="dos"/>
514         <xsd:enumeration value="lin"/>
515         <xsd:enumeration value="other"/>
516     </xsd:restriction>
517 </xsd:simpleType>
518 <xsd:simpleType name="ST_Qualifier">
519     <xsd:restriction base="xsd:string">
520         <xsd:enumeration value="doubleQuote"/>
521         <xsd:enumeration value="singleQuote"/>
522         <xsd:enumeration value="none"/>
523     </xsd:restriction>
524 </xsd:simpleType>
525 <xsd:complexType name="CT_TextFields">
526     <xsd:sequence>

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527     <xsd:element name="textField" minOccurs="1" maxOccurs="unbounded" type="CT_TextField"/>
528   </xsd:sequence>
529   <xsd:attribute name="count" use="optional" type="xsd:unsignedInt" default="1"/>
530 </xsd:complexType>
531 <xsd:complexType name="CT_TextField">
532   <xsd:attribute name="type" use="optional" type="ST_ExternalConnectionType" default="general"/>
533   <xsd:attribute name="position" use="optional" type="xsd:unsignedInt" default="0"/>
534 </xsd:complexType>
535 <xsd:simpleType name="ST_ExternalConnectionType">
536   <xsd:restriction base="xsd:string">
537     <xsd:enumeration value="general"/>
538     <xsd:enumeration value="text"/>
539     <xsd:enumeration value="MDY"/>
540     <xsd:enumeration value="DMY"/>
541     <xsd:enumeration value="YMD"/>
542     <xsd:enumeration value="MYD"/>
543     <xsd:enumeration value="DYM"/>
544     <xsd:enumeration value="YDM"/>
545     <xsd:enumeration value="skip"/>
546     <xsd:enumeration value="EMD"/>
547   </xsd:restriction>
548 </xsd:simpleType>
549 <xsd:element name="pivotCacheDefinition" type="CT_PivotCacheDefinition"/>
550 <xsd:element name="pivotCacheRecords" type="CT_PivotCacheRecords"/>
551 <xsd:element name="pivotTableDefinition" type="CT_pivotTableDefinition"/>
552 <xsd:complexType name="CT_PivotCacheDefinition">
553   <xsd:sequence>
554     <xsd:element name="cacheSource" type="CT_CacheSource" minOccurs="1" maxOccurs="1"/>
555     <xsd:element name="cacheFields" type="CT_CacheFields" minOccurs="1" maxOccurs="1"/>
556     <xsd:element name="cacheHierarchies" minOccurs="0" type="CT_CacheHierarchies"/>
557     <xsd:element name="kpis" minOccurs="0" type="CT_PCDKPIs"/>
558     <xsd:element name="tupleCache" minOccurs="0" type="CT_TupleCache"/>
559     <xsd:element name="calculatedItems" minOccurs="0" type="CT_CalculatedItems"/>
560     <xsd:element name="calculatedMembers" type="CT_CalculatedMembers" minOccurs="0"/>
561     <xsd:element name="dimensions" type="CT_Dimensions" minOccurs="0"/>
562     <xsd:element name="measureGroups" type="CT_MeasureGroups" minOccurs="0"/>
563     <xsd:element name="maps" type="CT_MeasureDimensionMaps" minOccurs="0"/>
564     <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
565   </xsd:sequence>
566   <xsd:attribute ref="r:id" use="optional"/>
567   <xsd:attribute name="invalid" type="xsd:boolean" use="optional" default="false"/>
568   <xsd:attribute name="saveData" type="xsd:boolean" use="optional" default="true"/>
569   <xsd:attribute name="refreshOnLoad" type="xsd:boolean" use="optional" default="false"/>
570   <xsd:attribute name="optimizeMemory" type="xsd:boolean" use="optional" default="false"/>
571   <xsd:attribute name="enableRefresh" type="xsd:boolean" use="optional" default="true"/>
572   <xsd:attribute name="refreshedBy" type="s:ST_Xstring" use="optional"/>
573   <xsd:attribute name="refreshedDateIso" type="xsd:dateTime" use="optional"/>
574   <xsd:attribute name="backgroundQuery" type="xsd:boolean" default="false"/>
575   <xsd:attribute name="missingItemsLimit" type="xsd:unsignedInt" use="optional"/>
576   <xsd:attribute name="createdVersion" type="xsd:unsignedByte" use="optional" default="0"/>
577   <xsd:attribute name="refreshedVersion" type="xsd:unsignedByte" use="optional" default="0"/>
578   <xsd:attribute name="minRefreshableVersion" type="xsd:unsignedByte" use="optional"
579     default="0"/>

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580     <xsd:attribute name="recordCount" type="xsd:unsignedInt" use="optional"/>
581     <xsd:attribute name="upgradeOnRefresh" type="xsd:boolean" use="optional" default="false"/>
582     <xsd:attribute name="tupleCache" type="xsd:boolean" use="optional" default="false"/>
583     <xsd:attribute name="supportSubquery" type="xsd:boolean" use="optional" default="false"/>
584     <xsd:attribute name="supportAdvancedDrill" type="xsd:boolean" use="optional" default="false"/>
585 </xsd:complexType>
586 <xsd:complexType name="CT_CacheFields">
587     <xsd:sequence>
588         <xsd:element name="cacheField" type="CT_CacheField" minOccurs="0" maxOccurs="unbounded"/>
589     </xsd:sequence>
590     <xsd:attribute name="count" type="xsd:unsignedInt"/>
591 </xsd:complexType>
592 <xsd:complexType name="CT_CacheField">
593     <xsd:sequence>
594         <xsd:element name="sharedItems" type="CT_SharedItems" minOccurs="0" maxOccurs="1"/>
595         <xsd:element name="fieldGroup" minOccurs="0" type="CT_FieldGroup"/>
596         <xsd:element name="mpMap" minOccurs="0" maxOccurs="unbounded" type="CT_X"/>
597         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
598     </xsd:sequence>
599     <xsd:attribute name="name" type="s:ST_Xstring" use="required"/>
600     <xsd:attribute name="caption" type="s:ST_Xstring" use="optional"/>
601     <xsd:attribute name="propertyName" type="s:ST_Xstring" use="optional"/>
602     <xsd:attribute name="serverField" type="xsd:boolean" use="optional" default="false"/>
603     <xsd:attribute name="uniqueList" type="xsd:boolean" use="optional" default="true"/>
604     <xsd:attribute name="numFmtId" type="ST_NumFmtId" use="optional"/>
605     <xsd:attribute name="formula" type="s:ST_Xstring" use="optional"/>
606     <xsd:attribute name="sqlType" type="xsd:int" use="optional" default="0"/>
607     <xsd:attribute name="hierarchy" type="xsd:int" use="optional" default="0"/>
608     <xsd:attribute name="level" type="xsd:unsignedInt" use="optional" default="0"/>
609     <xsd:attribute name="databaseField" type="xsd:boolean" default="true"/>
610     <xsd:attribute name="mappingCount" type="xsd:unsignedInt" use="optional"/>
611     <xsd:attribute name="memberPropertyField" type="xsd:boolean" use="optional" default="false"/>
612 </xsd:complexType>
613 <xsd:complexType name="CT_CacheSource">
614     <xsd:choice minOccurs="0" maxOccurs="1">
615         <xsd:element name="worksheetSource" type="CT_WorksheetSource" minOccurs="1"
616             maxOccurs="1"/>
617         <xsd:element name="consolidation" type="CT_Consolidation" minOccurs="1" maxOccurs="1"/>
618         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0"/>
619     </xsd:choice>
620     <xsd:attribute name="type" type="ST_SourceType" use="required"/>
621     <xsd:attribute name="connectionId" type="xsd:unsignedInt" default="0" use="optional"/>
622 </xsd:complexType>
623 <xsd:simpleType name="ST_SourceType">
624     <xsd:restriction base="xsd:string">
625         <xsd:enumeration value="worksheet"/>
626         <xsd:enumeration value="external"/>
627         <xsd:enumeration value="consolidation"/>
628         <xsd:enumeration value="scenario"/>
629     </xsd:restriction>
630 </xsd:simpleType>
631 <xsd:complexType name="CT_WorksheetSource">
632     <xsd:attribute name="ref" type="ST_Ref" use="optional"/>

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633     <xsd:attribute name="name" type="s:ST Xstring" use="optional"/>
634     <xsd:attribute name="sheet" type="s:ST Xstring" use="optional"/>
635     <xsd:attribute ref="r:id" use="optional"/>
636 </xsd:complexType>
637 <xsd:complexType name="CT_Consolidation">
638     <xsd:sequence>
639         <xsd:element name="pages" type="CT Pages" minOccurs="0" maxOccurs="1"/>
640         <xsd:element name="rangeSets" type="CT RangeSets" minOccurs="1" maxOccurs="1"/>
641     </xsd:sequence>
642     <xsd:attribute name="autoPage" type="xsd:boolean" default="true" use="optional"/>
643 </xsd:complexType>
644 <xsd:complexType name="CT_Pages">
645     <xsd:sequence>
646         <xsd:element name="page" type="CT PCDSCPage" minOccurs="1" maxOccurs="4"/>
647     </xsd:sequence>
648     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
649 </xsd:complexType>
650 <xsd:complexType name="CT_PCDSCPage">
651     <xsd:sequence>
652         <xsd:element name="pageItem" type="CT PageItem" minOccurs="0" maxOccurs="unbounded"/>
653     </xsd:sequence>
654     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
655 </xsd:complexType>
656 <xsd:complexType name="CT_PageItem">
657     <xsd:attribute name="name" type="s:ST Xstring" use="required"/>
658 </xsd:complexType>
659 <xsd:complexType name="CT_RangeSets">
660     <xsd:sequence>
661         <xsd:element name="rangeSet" type="CT RangeSet" minOccurs="1" maxOccurs="unbounded"/>
662     </xsd:sequence>
663     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
664 </xsd:complexType>
665 <xsd:complexType name="CT_RangeSet">
666     <xsd:attribute name="i1" type="xsd:unsignedInt" use="optional"/>
667     <xsd:attribute name="i2" type="xsd:unsignedInt" use="optional"/>
668     <xsd:attribute name="i3" type="xsd:unsignedInt" use="optional"/>
669     <xsd:attribute name="i4" type="xsd:unsignedInt" use="optional"/>
670     <xsd:attribute name="ref" type="ST Ref" use="optional"/>
671     <xsd:attribute name="name" type="s:ST Xstring" use="optional"/>
672     <xsd:attribute name="sheet" type="s:ST Xstring" use="optional"/>
673     <xsd:attribute ref="r:id" use="optional"/>
674 </xsd:complexType>
675 <xsd:complexType name="CT_SharedItems">
676     <xsd:choice minOccurs="0" maxOccurs="unbounded">
677         <xsd:element name="m" type="CT Missing" minOccurs="1" maxOccurs="1"/>
678         <xsd:element name="n" type="CT Number" minOccurs="1" maxOccurs="1"/>
679         <xsd:element name="b" type="CT Boolean" minOccurs="1" maxOccurs="1"/>
680         <xsd:element name="e" type="CT Error" minOccurs="1" maxOccurs="1"/>
681         <xsd:element name="s" type="CT String" minOccurs="1" maxOccurs="1"/>
682         <xsd:element name="d" type="CT DateTime" minOccurs="1" maxOccurs="1"/>
683     </xsd:choice>
684     <xsd:attribute name="containsSemiMixedTypes" type="xsd:boolean" use="optional"
685         default="true"/>

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686 <xsd:attribute name="containsNonDate" type="xsd:boolean" use="optional" default="true"/>
687 <xsd:attribute name="containsDate" type="xsd:boolean" use="optional" default="false"/>
688 <xsd:attribute name="containsString" type="xsd:boolean" use="optional" default="true"/>
689 <xsd:attribute name="containsBlank" type="xsd:boolean" use="optional" default="false"/>
690 <xsd:attribute name="containsMixedTypes" type="xsd:boolean" use="optional" default="false"/>
691 <xsd:attribute name="containsNumber" type="xsd:boolean" use="optional" default="false"/>
692 <xsd:attribute name="containsInteger" type="xsd:boolean" use="optional" default="false"/>
693 <xsd:attribute name="minValue" type="xsd:double" use="optional"/>
694 <xsd:attribute name="maxValue" type="xsd:double" use="optional"/>
695 <xsd:attribute name="minDate" type="xsd:dateTime" use="optional"/>
696 <xsd:attribute name="maxDate" type="xsd:dateTime" use="optional"/>
697 <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
698 <xsd:attribute name="longText" type="xsd:boolean" use="optional" default="false"/>
699 </xsd:complexType>
700 <xsd:complexType name="CT_Missing">
701   <xsd:sequence>
702     <xsd:element name="tpls" minOccurs="0" maxOccurs="unbounded" type="CT_Tuples"/>
703     <xsd:element name="x" minOccurs="0" maxOccurs="unbounded" type="CT_X"/>
704   </xsd:sequence>
705   <xsd:attribute name="u" type="xsd:boolean"/>
706   <xsd:attribute name="f" type="xsd:boolean"/>
707   <xsd:attribute name="c" type="s:ST_Xstring"/>
708   <xsd:attribute name="cp" type="xsd:unsignedInt"/>
709   <xsd:attribute name="in" type="xsd:unsignedInt" use="optional"/>
710   <xsd:attribute name="bc" type="ST_UnsignedIntHex" use="optional"/>
711   <xsd:attribute name="fc" type="ST_UnsignedIntHex" use="optional"/>
712   <xsd:attribute name="i" type="xsd:boolean" use="optional" default="false"/>
713   <xsd:attribute name="un" type="xsd:boolean" use="optional" default="false"/>
714   <xsd:attribute name="st" type="xsd:boolean" use="optional" default="false"/>
715   <xsd:attribute name="b" type="xsd:boolean" use="optional" default="false"/>
716 </xsd:complexType>
717 <xsd:complexType name="CT_Number">
718   <xsd:sequence>
719     <xsd:element name="tpls" minOccurs="0" maxOccurs="unbounded" type="CT_Tuples"/>
720     <xsd:element name="x" minOccurs="0" maxOccurs="unbounded" type="CT_X"/>
721   </xsd:sequence>
722   <xsd:attribute name="v" use="required" type="xsd:double"/>
723   <xsd:attribute name="u" type="xsd:boolean"/>
724   <xsd:attribute name="f" type="xsd:boolean"/>
725   <xsd:attribute name="c" type="s:ST_Xstring"/>
726   <xsd:attribute name="cp" type="xsd:unsignedInt"/>
727   <xsd:attribute name="in" type="xsd:unsignedInt" use="optional"/>
728   <xsd:attribute name="bc" type="ST_UnsignedIntHex" use="optional"/>
729   <xsd:attribute name="fc" type="ST_UnsignedIntHex" use="optional"/>
730   <xsd:attribute name="i" type="xsd:boolean" use="optional" default="false"/>
731   <xsd:attribute name="un" type="xsd:boolean" use="optional" default="false"/>
732   <xsd:attribute name="st" type="xsd:boolean" use="optional" default="false"/>
733   <xsd:attribute name="b" type="xsd:boolean" use="optional" default="false"/>
734 </xsd:complexType>
735 <xsd:complexType name="CT_Boolean">
736   <xsd:sequence>
737     <xsd:element name="x" minOccurs="0" maxOccurs="unbounded" type="CT_X"/>
738   </xsd:sequence>

```



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739     <xsd:attribute name="v" use="required" type="xsd:boolean"/>
740     <xsd:attribute name="u" type="xsd:boolean"/>
741     <xsd:attribute name="f" type="xsd:boolean"/>
742     <xsd:attribute name="c" type="s:ST Xstring"/>
743     <xsd:attribute name="cp" type="xsd:unsignedInt"/>
744 </xsd:complexType>
745 <xsd:complexType name="CT_Error">
746     <xsd:sequence>
747         <xsd:element name="tpls" minOccurs="0" type="CT_Tuples"/>
748         <xsd:element name="x" minOccurs="0" maxOccurs="unbounded" type="CT_X"/>
749     </xsd:sequence>
750     <xsd:attribute name="v" use="required" type="s:ST Xstring"/>
751     <xsd:attribute name="u" type="xsd:boolean"/>
752     <xsd:attribute name="f" type="xsd:boolean"/>
753     <xsd:attribute name="c" type="s:ST Xstring"/>
754     <xsd:attribute name="cp" type="xsd:unsignedInt"/>
755     <xsd:attribute name="in" type="xsd:unsignedInt" use="optional"/>
756     <xsd:attribute name="bc" type="ST UnsignedIntHex" use="optional"/>
757     <xsd:attribute name="fc" type="ST UnsignedIntHex" use="optional"/>
758     <xsd:attribute name="i" type="xsd:boolean" use="optional" default="false"/>
759     <xsd:attribute name="un" type="xsd:boolean" use="optional" default="false"/>
760     <xsd:attribute name="st" type="xsd:boolean" use="optional" default="false"/>
761     <xsd:attribute name="b" type="xsd:boolean" use="optional" default="false"/>
762 </xsd:complexType>
763 <xsd:complexType name="CT_String">
764     <xsd:sequence>
765         <xsd:element name="tpls" minOccurs="0" maxOccurs="unbounded" type="CT_Tuples"/>
766         <xsd:element name="x" minOccurs="0" maxOccurs="unbounded" type="CT_X"/>
767     </xsd:sequence>
768     <xsd:attribute name="v" use="required" type="s:ST Xstring"/>
769     <xsd:attribute name="u" type="xsd:boolean"/>
770     <xsd:attribute name="f" type="xsd:boolean"/>
771     <xsd:attribute name="c" type="s:ST Xstring"/>
772     <xsd:attribute name="cp" type="xsd:unsignedInt"/>
773     <xsd:attribute name="in" type="xsd:unsignedInt" use="optional"/>
774     <xsd:attribute name="bc" type="ST UnsignedIntHex" use="optional"/>
775     <xsd:attribute name="fc" type="ST UnsignedIntHex" use="optional"/>
776     <xsd:attribute name="i" type="xsd:boolean" use="optional" default="false"/>
777     <xsd:attribute name="un" type="xsd:boolean" use="optional" default="false"/>
778     <xsd:attribute name="st" type="xsd:boolean" use="optional" default="false"/>
779     <xsd:attribute name="b" type="xsd:boolean" use="optional" default="false"/>
780 </xsd:complexType>
781 <xsd:complexType name="CT_DateTime">
782     <xsd:sequence>
783         <xsd:element name="x" minOccurs="0" maxOccurs="unbounded" type="CT_X"/>
784     </xsd:sequence>
785     <xsd:attribute name="v" use="required" type="xsd:dateTime"/>
786     <xsd:attribute name="u" type="xsd:boolean"/>
787     <xsd:attribute name="f" type="xsd:boolean"/>
788     <xsd:attribute name="c" type="s:ST Xstring"/>
789     <xsd:attribute name="cp" type="xsd:unsignedInt"/>
790 </xsd:complexType>
791 <xsd:complexType name="CT_FieldGroup">

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792     <xsd:sequence>
793         <xsd:element name="rangePr" minOccurs="0" type="CT_RangePr"/>
794         <xsd:element name="discretePr" minOccurs="0" type="CT_DiscretePr"/>
795         <xsd:element name="groupItems" minOccurs="0" type="CT_GroupItems"/>
796     </xsd:sequence>
797     <xsd:attribute name="par" type="xsd:unsignedInt" use="optional"/>
798     <xsd:attribute name="base" type="xsd:unsignedInt" use="optional"/>
799 </xsd:complexType>
800 <xsd:complexType name="CT_RangePr">
801     <xsd:attribute name="autoStart" type="xsd:boolean" default="true"/>
802     <xsd:attribute name="autoEnd" type="xsd:boolean" default="true"/>
803     <xsd:attribute name="groupBy" type="ST_GroupBy" default="range"/>
804     <xsd:attribute name="startNum" type="xsd:double"/>
805     <xsd:attribute name="endNum" type="xsd:double"/>
806     <xsd:attribute name="startDate" type="xsd:dateTime"/>
807     <xsd:attribute name="endDate" type="xsd:dateTime"/>
808     <xsd:attribute name="groupInterval" type="xsd:double" default="1"/>
809 </xsd:complexType>
810 <xsd:simpleType name="ST_GroupBy">
811     <xsd:restriction base="xsd:string">
812         <xsd:enumeration value="range"/>
813         <xsd:enumeration value="seconds"/>
814         <xsd:enumeration value="minutes"/>
815         <xsd:enumeration value="hours"/>
816         <xsd:enumeration value="days"/>
817         <xsd:enumeration value="months"/>
818         <xsd:enumeration value="quarters"/>
819         <xsd:enumeration value="years"/>
820     </xsd:restriction>
821 </xsd:simpleType>
822 <xsd:complexType name="CT_DiscretePr">
823     <xsd:sequence>
824         <xsd:element name="x" maxOccurs="unbounded" type="CT_Index"/>
825     </xsd:sequence>
826     <xsd:attribute name="count" type="xsd:unsignedInt"/>
827 </xsd:complexType>
828 <xsd:complexType name="CT_GroupItems">
829     <xsd:choice maxOccurs="unbounded">
830         <xsd:element name="m" type="CT_Missing"/>
831         <xsd:element name="n" type="CT_Number"/>
832         <xsd:element name="b" type="CT_Boolean"/>
833         <xsd:element name="e" type="CT_Error"/>
834         <xsd:element name="s" type="CT_String"/>
835         <xsd:element name="d" type="CT_DateTime"/>
836     </xsd:choice>
837     <xsd:attribute name="count" type="xsd:unsignedInt"/>
838 </xsd:complexType>
839 <xsd:complexType name="CT_PivotCacheRecords">
840     <xsd:sequence>
841         <xsd:element name="r" minOccurs="0" maxOccurs="unbounded" type="CT_Record"/>
842         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
843     </xsd:sequence>
844     <xsd:attribute name="count" type="xsd:unsignedInt"/>

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845 </xsd:complexType>
846 <xsd:complexType name="CT_Record">
847   <xsd:choice maxOccurs="unbounded">
848     <xsd:element name="m" type="CT_Missing"/>
849     <xsd:element name="n" type="CT_Number"/>
850     <xsd:element name="b" type="CT_Boolean"/>
851     <xsd:element name="e" type="CT_Error"/>
852     <xsd:element name="s" type="CT_String"/>
853     <xsd:element name="d" type="CT_DateTime"/>
854     <xsd:element name="x" type="CT_Index"/>
855   </xsd:choice>
856 </xsd:complexType>
857 <xsd:complexType name="CT_PCDKPIs">
858   <xsd:sequence>
859     <xsd:element name="kpi" minOccurs="0" maxOccurs="unbounded" type="CT_PCDKPI"/>
860   </xsd:sequence>
861   <xsd:attribute name="count" type="xsd:unsignedInt"/>
862 </xsd:complexType>
863 <xsd:complexType name="CT_PCDKPI">
864   <xsd:attribute name="uniqueName" use="required" type="s:ST_Xstring"/>
865   <xsd:attribute name="caption" use="optional" type="s:ST_Xstring"/>
866   <xsd:attribute name="displayFolder" type="s:ST_Xstring"/>
867   <xsd:attribute name="measureGroup" type="s:ST_Xstring"/>
868   <xsd:attribute name="parent" type="s:ST_Xstring"/>
869   <xsd:attribute name="value" use="required" type="s:ST_Xstring"/>
870   <xsd:attribute name="goal" type="s:ST_Xstring"/>
871   <xsd:attribute name="status" type="s:ST_Xstring"/>
872   <xsd:attribute name="trend" type="s:ST_Xstring"/>
873   <xsd:attribute name="weight" type="s:ST_Xstring"/>
874   <xsd:attribute name="time" type="s:ST_Xstring"/>
875 </xsd:complexType>
876 <xsd:complexType name="CT_CacheHierarchies">
877   <xsd:sequence>
878     <xsd:element name="cacheHierarchy" minOccurs="0" maxOccurs="unbounded"
879       type="CT_CacheHierarchy"/>
880   </xsd:sequence>
881   <xsd:attribute name="count" type="xsd:unsignedInt"/>
882 </xsd:complexType>
883 <xsd:complexType name="CT_CacheHierarchy">
884   <xsd:sequence>
885     <xsd:element name="fieldsUsage" minOccurs="0" type="CT_FieldsUsage"/>
886     <xsd:element name="groupLevels" minOccurs="0" type="CT_GroupLevels"/>
887     <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
888   </xsd:sequence>
889   <xsd:attribute name="uniqueName" use="required" type="s:ST_Xstring"/>
890   <xsd:attribute name="caption" use="optional" type="s:ST_Xstring"/>
891   <xsd:attribute name="measure" type="xsd:boolean" default="false"/>
892   <xsd:attribute name="set" type="xsd:boolean" default="false"/>
893   <xsd:attribute name="parentSet" type="xsd:unsignedInt" use="optional"/>
894   <xsd:attribute name="iconSet" type="xsd:int" default="0"/>
895   <xsd:attribute name="attribute" type="xsd:boolean" default="false"/>
896   <xsd:attribute name="time" type="xsd:boolean" default="false"/>
897   <xsd:attribute name="keyAttribute" type="xsd:boolean" default="false"/>

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898     <xsd:attribute name="defaultMemberUniqueName" type="s:ST Xstring"/>
899     <xsd:attribute name="allUniqueName" type="s:ST Xstring"/>
900     <xsd:attribute name="allCaption" type="s:ST Xstring"/>
901     <xsd:attribute name="dimensionUniqueName" type="s:ST Xstring"/>
902     <xsd:attribute name="displayFolder" type="s:ST Xstring"/>
903     <xsd:attribute name="measureGroup" type="s:ST Xstring"/>
904     <xsd:attribute name="measures" type="xsd:boolean" default="false"/>
905     <xsd:attribute name="count" use="required" type="xsd:unsignedInt"/>
906     <xsd:attribute name="oneField" type="xsd:boolean" default="false"/>
907     <xsd:attribute name="memberValueDatatype" use="optional" type="xsd:unsignedShort"/>
908     <xsd:attribute name="unbalanced" use="optional" type="xsd:boolean"/>
909     <xsd:attribute name="unbalancedGroup" use="optional" type="xsd:boolean"/>
910     <xsd:attribute name="hidden" type="xsd:boolean" default="false"/>
911 </xsd:complexType>
912 <xsd:complexType name="CT_FieldsUsage">
913     <xsd:sequence>
914         <xsd:element name="fieldUsage" minOccurs="0" maxOccurs="unbounded" type="CT_FieldUsage"/>
915     </xsd:sequence>
916     <xsd:attribute name="count" type="xsd:unsignedInt"/>
917 </xsd:complexType>
918 <xsd:complexType name="CT_FieldUsage">
919     <xsd:attribute name="x" use="required" type="xsd:int"/>
920 </xsd:complexType>
921 <xsd:complexType name="CT_GroupLevels">
922     <xsd:sequence>
923         <xsd:element name="groupLevel" maxOccurs="unbounded" type="CT_GroupLevel"/>
924     </xsd:sequence>
925     <xsd:attribute name="count" type="xsd:unsignedInt"/>
926 </xsd:complexType>
927 <xsd:complexType name="CT_GroupLevel">
928     <xsd:sequence>
929         <xsd:element name="groups" minOccurs="0" type="CT_Groups"/>
930         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
931     </xsd:sequence>
932     <xsd:attribute name="uniqueName" use="required" type="s:ST Xstring"/>
933     <xsd:attribute name="caption" use="required" type="s:ST Xstring"/>
934     <xsd:attribute name="user" type="xsd:boolean" default="false"/>
935     <xsd:attribute name="customRollUp" type="xsd:boolean" default="false"/>
936 </xsd:complexType>
937 <xsd:complexType name="CT_Groups">
938     <xsd:sequence>
939         <xsd:element name="group" maxOccurs="unbounded" type="CT_LevelGroup"/>
940     </xsd:sequence>
941     <xsd:attribute name="count" type="xsd:unsignedInt"/>
942 </xsd:complexType>
943 <xsd:complexType name="CT_LevelGroup">
944     <xsd:sequence>
945         <xsd:element name="groupMembers" type="CT_GroupMembers"/>
946     </xsd:sequence>
947     <xsd:attribute name="name" use="required" type="s:ST Xstring"/>
948     <xsd:attribute name="uniqueName" use="required" type="s:ST Xstring"/>
949     <xsd:attribute name="caption" use="required" type="s:ST Xstring"/>
950     <xsd:attribute name="uniqueParent" type="s:ST Xstring"/>

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951     <xsd:attribute name="id" type="xsd:int"/>
952 </xsd:complexType>
953 <xsd:complexType name="CT_GroupMembers">
954     <xsd:sequence>
955         <xsd:element name="groupMember" maxOccurs="unbounded" type="CT_GroupMember"/>
956     </xsd:sequence>
957     <xsd:attribute name="count" type="xsd:unsignedInt"/>
958 </xsd:complexType>
959 <xsd:complexType name="CT_GroupMember">
960     <xsd:attribute name="uniqueName" use="required" type="s:ST_Xstring"/>
961     <xsd:attribute name="group" type="xsd:boolean" default="false"/>
962 </xsd:complexType>
963 <xsd:complexType name="CT_TupleCache">
964     <xsd:sequence>
965         <xsd:element name="entries" minOccurs="0" type="CT_PCSDTCEntries"/>
966         <xsd:element name="sets" minOccurs="0" type="CT_Sets"/>
967         <xsd:element name="queryCache" minOccurs="0" type="CT_QueryCache"/>
968         <xsd:element name="serverFormats" minOccurs="0" maxOccurs="1" type="CT_ServerFormats"/>
969         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
970     </xsd:sequence>
971 </xsd:complexType>
972 <xsd:complexType name="CT_ServerFormat">
973     <xsd:attribute name="culture" use="optional" type="s:ST_Xstring"/>
974     <xsd:attribute name="format" use="optional" type="s:ST_Xstring"/>
975 </xsd:complexType>
976 <xsd:complexType name="CT_ServerFormats">
977     <xsd:sequence>
978         <xsd:element name="serverFormat" type="CT_ServerFormat" minOccurs="0"
979             maxOccurs="unbounded"/>
980     </xsd:sequence>
981     <xsd:attribute name="count" type="xsd:unsignedInt"/>
982 </xsd:complexType>
983 <xsd:complexType name="CT_PCSDTCEntries">
984     <xsd:choice maxOccurs="unbounded">
985         <xsd:element name="m" type="CT_Missing"/>
986         <xsd:element name="n" type="CT_Number"/>
987         <xsd:element name="e" type="CT_Error"/>
988         <xsd:element name="s" type="CT_String"/>
989     </xsd:choice>
990     <xsd:attribute name="count" type="xsd:unsignedInt"/>
991 </xsd:complexType>
992 <xsd:complexType name="CT_Tuples">
993     <xsd:sequence>
994         <xsd:element name="tpl" type="CT_Tuple" minOccurs="1" maxOccurs="unbounded"/>
995     </xsd:sequence>
996     <xsd:attribute name="c" type="xsd:unsignedInt" use="optional"/>
997 </xsd:complexType>
998 <xsd:complexType name="CT_Tuple">
999     <xsd:attribute name="fld" type="xsd:unsignedInt"/>
1000     <xsd:attribute name="hier" type="xsd:unsignedInt"/>
1001     <xsd:attribute name="item" type="xsd:unsignedInt" use="required"/>
1002 </xsd:complexType>
1003 <xsd:complexType name="CT_Sets">

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1004     <xsd:sequence>
1005         <xsd:element name="set" maxOccurs="unbounded" type="CT_Set"/>
1006     </xsd:sequence>
1007     <xsd:attribute name="count" type="xsd:unsignedInt"/>
1008 </xsd:complexType>
1009 <xsd:complexType name="CT_Set">
1010     <xsd:sequence>
1011         <xsd:element name="tpls" minOccurs="0" maxOccurs="unbounded" type="CT_Tuples"/>
1012         <xsd:element name="sortByTuple" minOccurs="0" type="CT_Tuples"/>
1013     </xsd:sequence>
1014     <xsd:attribute name="count" type="xsd:unsignedInt"/>
1015     <xsd:attribute name="maxRank" use="required" type="xsd:int"/>
1016     <xsd:attribute name="setDefinition" use="required" type="s:ST_Xstring"/>
1017     <xsd:attribute name="sortType" type="ST_SortType" default="none"/>
1018     <xsd:attribute name="queryFailed" type="xsd:boolean" default="false"/>
1019 </xsd:complexType>
1020 <xsd:simpleType name="ST_SortType">
1021     <xsd:restriction base="xsd:string">
1022         <xsd:enumeration value="none"/>
1023         <xsd:enumeration value="ascending"/>
1024         <xsd:enumeration value="descending"/>
1025         <xsd:enumeration value="ascendingAlpha"/>
1026         <xsd:enumeration value="descendingAlpha"/>
1027         <xsd:enumeration value="ascendingNatural"/>
1028         <xsd:enumeration value="descendingNatural"/>
1029     </xsd:restriction>
1030 </xsd:simpleType>
1031 <xsd:complexType name="CT_QueryCache">
1032     <xsd:sequence>
1033         <xsd:element name="query" maxOccurs="unbounded" type="CT_Query"/>
1034     </xsd:sequence>
1035     <xsd:attribute name="count" type="xsd:unsignedInt"/>
1036 </xsd:complexType>
1037 <xsd:complexType name="CT_Query">
1038     <xsd:sequence>
1039         <xsd:element name="tpls" minOccurs="0" type="CT_Tuples"/>
1040     </xsd:sequence>
1041     <xsd:attribute name="mdx" use="required" type="s:ST_Xstring"/>
1042 </xsd:complexType>
1043 <xsd:complexType name="CT_CalculatedItems">
1044     <xsd:sequence>
1045         <xsd:element name="calculatedItem" maxOccurs="unbounded" type="CT_CalculatedItem"/>
1046     </xsd:sequence>
1047     <xsd:attribute name="count" type="xsd:unsignedInt"/>
1048 </xsd:complexType>
1049 <xsd:complexType name="CT_CalculatedItem">
1050     <xsd:sequence>
1051         <xsd:element name="pivotArea" type="CT_PivotArea"/>
1052         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
1053     </xsd:sequence>
1054     <xsd:attribute name="field" type="xsd:unsignedInt" use="optional"/>
1055     <xsd:attribute name="formula" type="s:ST_Xstring"/>
1056 </xsd:complexType>

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1057 <xsd:complexType name="CT_CalculatedMembers">
1058   <xsd:sequence>
1059     <xsd:element name="calculatedMember" maxOccurs="unbounded" type="CT_CalculatedMember"/>
1060   </xsd:sequence>
1061   <xsd:attribute name="count" type="xsd:unsignedInt"/>
1062 </xsd:complexType>
1063 <xsd:complexType name="CT_CalculatedMember">
1064   <xsd:sequence minOccurs="0">
1065     <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
1066   </xsd:sequence>
1067   <xsd:attribute name="name" use="required" type="s:ST_Xstring"/>
1068   <xsd:attribute name="mdx" use="required" type="s:ST_Xstring"/>
1069   <xsd:attribute name="memberName" type="s:ST_Xstring"/>
1070   <xsd:attribute name="hierarchy" type="s:ST_Xstring"/>
1071   <xsd:attribute name="parent" type="s:ST_Xstring"/>
1072   <xsd:attribute name="solveOrder" type="xsd:int" default="0"/>
1073   <xsd:attribute name="set" type="xsd:boolean" default="false"/>
1074 </xsd:complexType>
1075 <xsd:complexType name="CT_pivotTableDefinition">
1076   <xsd:sequence>
1077     <xsd:element name="location" type="CT_Location"/>
1078     <xsd:element name="pivotFields" type="CT_PivotFields" minOccurs="0"/>
1079     <xsd:element name="rowFields" type="CT_RowFields" minOccurs="0"/>
1080     <xsd:element name="rowItems" type="CT_rowItems" minOccurs="0"/>
1081     <xsd:element name="colFields" type="CT_ColFields" minOccurs="0"/>
1082     <xsd:element name="colItems" type="CT_colItems" minOccurs="0"/>
1083     <xsd:element name="pageFields" type="CT_PageFields" minOccurs="0"/>
1084     <xsd:element name="dataFields" type="CT_DataFields" minOccurs="0"/>
1085     <xsd:element name="formats" type="CT_Formats" minOccurs="0"/>
1086     <xsd:element name="conditionalFormats" type="CT_ConditionalFormats" minOccurs="0"/>
1087     <xsd:element name="chartFormats" type="CT_ChartFormats" minOccurs="0"/>
1088     <xsd:element name="pivotHierarchies" type="CT_PivotHierarchies" minOccurs="0"/>
1089     <xsd:element name="pivotTableStyleInfo" minOccurs="0" maxOccurs="1"
1090       type="CT_PivotTableStyle"/>
1091     <xsd:element name="filters" minOccurs="0" maxOccurs="1" type="CT_PivotFilters"/>
1092     <xsd:element name="rowHierarchiesUsage" type="CT_RowHierarchiesUsage" minOccurs="0"
1093       maxOccurs="1"/>
1094     <xsd:element name="colHierarchiesUsage" type="CT_ColHierarchiesUsage" minOccurs="0"
1095       maxOccurs="1"/>
1096     <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
1097   </xsd:sequence>
1098   <xsd:attribute name="name" use="required" type="s:ST_Xstring"/>
1099   <xsd:attribute name="cacheId" use="required" type="xsd:unsignedInt"/>
1100   <xsd:attribute name="dataOnRows" type="xsd:boolean" default="false"/>
1101   <xsd:attribute name="dataPosition" type="xsd:unsignedInt" use="optional"/>
1102   <xsd:attributeGroup ref="AG_AutoFormat"/>
1103   <xsd:attribute name="dataCaption" use="required" type="s:ST_Xstring"/>
1104   <xsd:attribute name="grandTotalCaption" type="s:ST_Xstring"/>
1105   <xsd:attribute name="errorCaption" type="s:ST_Xstring"/>
1106   <xsd:attribute name="showError" type="xsd:boolean" default="false"/>
1107   <xsd:attribute name="missingCaption" type="s:ST_Xstring"/>
1108   <xsd:attribute name="showMissing" type="xsd:boolean" default="true"/>
1109   <xsd:attribute name="pageStyle" type="s:ST_Xstring"/>

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1110 <xsd:attribute name="pivotTableStyle" type="s:ST Xstring"/>
1111 <xsd:attribute name="vacatedStyle" type="s:ST Xstring"/>
1112 <xsd:attribute name="tag" type="s:ST Xstring"/>
1113 <xsd:attribute name="updatedVersion" type="xsd:unsignedByte" default="0"/>
1114 <xsd:attribute name="minRefreshableVersion" type="xsd:unsignedByte" default="0"/>
1115 <xsd:attribute name="asteriskTotals" type="xsd:boolean" default="false"/>
1116 <xsd:attribute name="showItems" type="xsd:boolean" default="true"/>
1117 <xsd:attribute name="editData" type="xsd:boolean" default="false"/>
1118 <xsd:attribute name="disableFieldList" type="xsd:boolean" default="false"/>
1119 <xsd:attribute name="showCalcMbrs" type="xsd:boolean" default="true"/>
1120 <xsd:attribute name="visualTotals" type="xsd:boolean" default="true"/>
1121 <xsd:attribute name="showMultipleLabel" type="xsd:boolean" default="true"/>
1122 <xsd:attribute name="showDataDropDown" type="xsd:boolean" default="true"/>
1123 <xsd:attribute name="showDrill" type="xsd:boolean" default="true"/>
1124 <xsd:attribute name="printDrill" type="xsd:boolean" default="false"/>
1125 <xsd:attribute name="showMemberPropertyTips" type="xsd:boolean" default="true"/>
1126 <xsd:attribute name="showDataTips" type="xsd:boolean" default="true"/>
1127 <xsd:attribute name="enableWizard" type="xsd:boolean" default="true"/>
1128 <xsd:attribute name="enableDrill" type="xsd:boolean" default="true"/>
1129 <xsd:attribute name="enableFieldProperties" type="xsd:boolean" default="true"/>
1130 <xsd:attribute name="preserveFormatting" type="xsd:boolean" default="true"/>
1131 <xsd:attribute name="useAutoFormatting" type="xsd:boolean" default="false"/>
1132 <xsd:attribute name="pageWrap" type="xsd:unsignedInt" default="0"/>
1133 <xsd:attribute name="pageOverThenDown" type="xsd:boolean" default="false"/>
1134 <xsd:attribute name="subtotalHiddenItems" type="xsd:boolean" default="false"/>
1135 <xsd:attribute name="rowGrandTotals" type="xsd:boolean" default="true"/>
1136 <xsd:attribute name="colGrandTotals" type="xsd:boolean" default="true"/>
1137 <xsd:attribute name="fieldPrintTitles" type="xsd:boolean" default="false"/>
1138 <xsd:attribute name="itemPrintTitles" type="xsd:boolean" default="false"/>
1139 <xsd:attribute name="mergeItem" type="xsd:boolean" default="false"/>
1140 <xsd:attribute name="showDropZones" type="xsd:boolean" default="true"/>
1141 <xsd:attribute name="createdVersion" type="xsd:unsignedByte" default="0"/>
1142 <xsd:attribute name="indent" type="xsd:unsignedInt" default="1"/>
1143 <xsd:attribute name="showEmptyRow" type="xsd:boolean" default="false"/>
1144 <xsd:attribute name="showEmptyCol" type="xsd:boolean" default="false"/>
1145 <xsd:attribute name="showHeaders" type="xsd:boolean" default="true"/>
1146 <xsd:attribute name="compact" type="xsd:boolean" default="true"/>
1147 <xsd:attribute name="outline" type="xsd:boolean" default="false"/>
1148 <xsd:attribute name="outlineData" type="xsd:boolean" default="false"/>
1149 <xsd:attribute name="compactData" type="xsd:boolean" default="true"/>
1150 <xsd:attribute name="published" type="xsd:boolean" default="false"/>
1151 <xsd:attribute name="gridDropZones" type="xsd:boolean" default="false"/>
1152 <xsd:attribute name="immersive" type="xsd:boolean" default="true"/>
1153 <xsd:attribute name="multipleFieldFilters" type="xsd:boolean" default="true"/>
1154 <xsd:attribute name="chartFormat" type="xsd:unsignedInt" default="0"/>
1155 <xsd:attribute name="rowHeaderCaption" type="s:ST Xstring"/>
1156 <xsd:attribute name="colHeaderCaption" type="s:ST Xstring"/>
1157 <xsd:attribute name="fieldListSortAscending" type="xsd:boolean" default="false"/>
1158 <xsd:attribute name="mdxSubqueries" type="xsd:boolean" default="false"/>
1159 <xsd:attribute name="customListSort" type="xsd:boolean" use="optional" default="true"/>
1160 </xsd:complexType>
1161 <xsd:complexType name="CT_Location">
1162 <xsd:attribute name="ref" use="required" type="ST_Ref"/>

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1163     <xsd:attribute name="firstHeaderRow" use="required" type="xsd:unsignedInt"/>
1164     <xsd:attribute name="firstDataRow" use="required" type="xsd:unsignedInt"/>
1165     <xsd:attribute name="firstDataCol" use="required" type="xsd:unsignedInt"/>
1166     <xsd:attribute name="rowPageCount" type="xsd:unsignedInt" default="0"/>
1167     <xsd:attribute name="colPageCount" type="xsd:unsignedInt" default="0"/>
1168 </xsd:complexType>
1169 <xsd:complexType name="CT_PivotFields">
1170     <xsd:sequence>
1171         <xsd:element name="pivotField" maxOccurs="unbounded" type="CT_PivotField"/>
1172     </xsd:sequence>
1173     <xsd:attribute name="count" type="xsd:unsignedInt"/>
1174 </xsd:complexType>
1175 <xsd:complexType name="CT_PivotField">
1176     <xsd:sequence>
1177         <xsd:element name="items" minOccurs="0" type="CT_Items"/>
1178         <xsd:element name="autoSortScope" minOccurs="0" type="CT_AutoSortScope"/>
1179         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
1180     </xsd:sequence>
1181     <xsd:attribute name="name" type="s:ST_Xstring"/>
1182     <xsd:attribute name="axis" use="optional" type="ST_Axis"/>
1183     <xsd:attribute name="dataField" type="xsd:boolean" default="false"/>
1184     <xsd:attribute name="subtotalCaption" type="s:ST_Xstring"/>
1185     <xsd:attribute name="showDropDowns" type="xsd:boolean" default="true"/>
1186     <xsd:attribute name="hiddenLevel" type="xsd:boolean" default="false"/>
1187     <xsd:attribute name="uniqueMemberProperty" type="s:ST_Xstring"/>
1188     <xsd:attribute name="compact" type="xsd:boolean" default="true"/>
1189     <xsd:attribute name="allDrilled" type="xsd:boolean" default="false"/>
1190     <xsd:attribute name="numFmtId" type="ST_NumFmtId" use="optional"/>
1191     <xsd:attribute name="outline" type="xsd:boolean" default="true"/>
1192     <xsd:attribute name="subtotalTop" type="xsd:boolean" default="true"/>
1193     <xsd:attribute name="dragToRow" type="xsd:boolean" default="true"/>
1194     <xsd:attribute name="dragToCol" type="xsd:boolean" default="true"/>
1195     <xsd:attribute name="multipleItemSelectionAllowed" type="xsd:boolean" default="false"/>
1196     <xsd:attribute name="dragToPage" type="xsd:boolean" default="true"/>
1197     <xsd:attribute name="dragToData" type="xsd:boolean" default="true"/>
1198     <xsd:attribute name="dragOff" type="xsd:boolean" default="true"/>
1199     <xsd:attribute name="showAll" type="xsd:boolean" default="true"/>
1200     <xsd:attribute name="insertBlankRow" type="xsd:boolean" default="false"/>
1201     <xsd:attribute name="serverField" type="xsd:boolean" default="false"/>
1202     <xsd:attribute name="insertPageBreak" type="xsd:boolean" default="false"/>
1203     <xsd:attribute name="autoShow" type="xsd:boolean" default="false"/>
1204     <xsd:attribute name="topAutoShow" type="xsd:boolean" default="true"/>
1205     <xsd:attribute name="hideNewItems" type="xsd:boolean" default="false"/>
1206     <xsd:attribute name="measureFilter" type="xsd:boolean" default="false"/>
1207     <xsd:attribute name="includeNewItemsInFilter" type="xsd:boolean" default="false"/>
1208     <xsd:attribute name="itemPageCount" type="xsd:unsignedInt" default="10"/>
1209     <xsd:attribute name="sortType" type="ST_FieldSortType" default="manual"/>
1210     <xsd:attribute name="dataSourceSort" type="xsd:boolean" use="optional"/>
1211     <xsd:attribute name="nonAutoSortDefault" type="xsd:boolean" default="false"/>
1212     <xsd:attribute name="rankBy" type="xsd:unsignedInt" use="optional"/>
1213     <xsd:attribute name="defaultSubtotal" type="xsd:boolean" default="true"/>
1214     <xsd:attribute name="sumSubtotal" type="xsd:boolean" default="false"/>
1215     <xsd:attribute name="countASubtotal" type="xsd:boolean" default="false"/>

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1216     <xsd:attribute name="avgSubtotal" type="xsd:boolean" default="false"/>
1217     <xsd:attribute name="maxSubtotal" type="xsd:boolean" default="false"/>
1218     <xsd:attribute name="minSubtotal" type="xsd:boolean" default="false"/>
1219     <xsd:attribute name="productSubtotal" type="xsd:boolean" default="false"/>
1220     <xsd:attribute name="countSubtotal" type="xsd:boolean" default="false"/>
1221     <xsd:attribute name="stdDevSubtotal" type="xsd:boolean" default="false"/>
1222     <xsd:attribute name="stdDevPSubtotal" type="xsd:boolean" default="false"/>
1223     <xsd:attribute name="varSubtotal" type="xsd:boolean" default="false"/>
1224     <xsd:attribute name="varPSubtotal" type="xsd:boolean" default="false"/>
1225     <xsd:attribute name="showPropCell" type="xsd:boolean" use="optional" default="false"/>
1226     <xsd:attribute name="showPropTip" type="xsd:boolean" use="optional" default="false"/>
1227     <xsd:attribute name="showPropAsCaption" type="xsd:boolean" use="optional" default="false"/>
1228     <xsd:attribute name="defaultAttributeDrillState" type="xsd:boolean" use="optional"
1229         default="false"/>
1230 </xsd:complexType>
1231 <xsd:complexType name="CT_AutoSortScope">
1232     <xsd:sequence>
1233         <xsd:element name="pivotArea" type="CT_PivotArea"/>
1234     </xsd:sequence>
1235 </xsd:complexType>
1236 <xsd:complexType name="CT_Items">
1237     <xsd:sequence>
1238         <xsd:element name="item" maxOccurs="unbounded" type="CT_Item"/>
1239     </xsd:sequence>
1240     <xsd:attribute name="count" type="xsd:unsignedInt"/>
1241 </xsd:complexType>
1242 <xsd:complexType name="CT_Item">
1243     <xsd:attribute name="n" type="s:ST_Xstring"/>
1244     <xsd:attribute name="t" type="ST_ItemType" default="data"/>
1245     <xsd:attribute name="h" type="xsd:boolean" default="false"/>
1246     <xsd:attribute name="s" type="xsd:boolean" default="false"/>
1247     <xsd:attribute name="sd" type="xsd:boolean" default="true"/>
1248     <xsd:attribute name="f" type="xsd:boolean" default="false"/>
1249     <xsd:attribute name="m" type="xsd:boolean" default="false"/>
1250     <xsd:attribute name="c" type="xsd:boolean" default="false"/>
1251     <xsd:attribute name="x" type="xsd:unsignedInt" use="optional"/>
1252     <xsd:attribute name="d" type="xsd:boolean" default="false"/>
1253     <xsd:attribute name="e" type="xsd:boolean" default="true"/>
1254 </xsd:complexType>
1255 <xsd:complexType name="CT_PageFields">
1256     <xsd:sequence>
1257         <xsd:element name="pageField" maxOccurs="unbounded" type="CT_PageField"/>
1258     </xsd:sequence>
1259     <xsd:attribute name="count" type="xsd:unsignedInt"/>
1260 </xsd:complexType>
1261 <xsd:complexType name="CT_PageField">
1262     <xsd:sequence minOccurs="0">
1263         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
1264     </xsd:sequence>
1265     <xsd:attribute name="fld" use="required" type="xsd:int"/>
1266     <xsd:attribute name="item" use="optional" type="xsd:unsignedInt"/>
1267     <xsd:attribute name="hier" type="xsd:int"/>
1268     <xsd:attribute name="name" type="s:ST_Xstring"/>

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1269     <xsd:attribute name="cap" type="s:ST_Xstring"/>
1270 </xsd:complexType>
1271 <xsd:complexType name="CT_DataFields">
1272     <xsd:sequence>
1273         <xsd:element name="dataField" maxOccurs="unbounded" type="CT_DataField"/>
1274     </xsd:sequence>
1275     <xsd:attribute name="count" type="xsd:unsignedInt"/>
1276 </xsd:complexType>
1277 <xsd:complexType name="CT_DataField">
1278     <xsd:sequence>
1279         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
1280     </xsd:sequence>
1281     <xsd:attribute name="name" use="optional" type="s:ST_Xstring"/>
1282     <xsd:attribute name="fld" type="xsd:unsignedInt" use="required"/>
1283     <xsd:attribute name="subtotal" type="ST_DataConsolidateFunction" default="sum"/>
1284     <xsd:attribute name="showDataAs" type="ST_ShowDataAs" default="normal"/>
1285     <xsd:attribute name="baseField" type="xsd:int" default="-1"/>
1286     <xsd:attribute name="baseItem" type="xsd:unsignedInt" default="1048832"/>
1287     <xsd:attribute name="numFmtId" type="ST_NumFmtId" use="optional"/>
1288 </xsd:complexType>
1289 <xsd:complexType name="CT_rowItems">
1290     <xsd:sequence>
1291         <xsd:element name="i" maxOccurs="unbounded" type="CT_I"/>
1292     </xsd:sequence>
1293     <xsd:attribute name="count" type="xsd:unsignedInt"/>
1294 </xsd:complexType>
1295 <xsd:complexType name="CT_colItems">
1296     <xsd:sequence>
1297         <xsd:element name="i" maxOccurs="unbounded" type="CT_I"/>
1298     </xsd:sequence>
1299     <xsd:attribute name="count" type="xsd:unsignedInt"/>
1300 </xsd:complexType>
1301 <xsd:complexType name="CT_I">
1302     <xsd:sequence>
1303         <xsd:element name="x" minOccurs="0" maxOccurs="unbounded" type="CT_X"/>
1304     </xsd:sequence>
1305     <xsd:attribute name="t" type="ST_ItemType" default="data"/>
1306     <xsd:attribute name="r" type="xsd:unsignedInt" default="0"/>
1307     <xsd:attribute name="i" type="xsd:unsignedInt" default="0"/>
1308 </xsd:complexType>
1309 <xsd:complexType name="CT_X">
1310     <xsd:attribute name="v" type="xsd:int" default="0"/>
1311 </xsd:complexType>
1312 <xsd:complexType name="CT_RowFields">
1313     <xsd:sequence>
1314         <xsd:element name="field" maxOccurs="unbounded" type="CT_Field"/>
1315     </xsd:sequence>
1316     <xsd:attribute name="count" type="xsd:unsignedInt" default="0"/>
1317 </xsd:complexType>
1318 <xsd:complexType name="CT_ColFields">
1319     <xsd:sequence>
1320         <xsd:element name="field" maxOccurs="unbounded" type="CT_Field"/>
1321     </xsd:sequence>

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1322     <xsd:attribute name="count" type="xsd:unsignedInt" default="0"/>
1323 </xsd:complexType>
1324 <xsd:complexType name="CT_Field">
1325     <xsd:attribute name="x" type="xsd:int" use="required"/>
1326 </xsd:complexType>
1327 <xsd:complexType name="CT_Formats">
1328     <xsd:sequence>
1329         <xsd:element name="format" maxOccurs="unbounded" type="CT_Format"/>
1330     </xsd:sequence>
1331     <xsd:attribute name="count" type="xsd:unsignedInt" default="0"/>
1332 </xsd:complexType>
1333 <xsd:complexType name="CT_Format">
1334     <xsd:sequence>
1335         <xsd:element name="pivotArea" type="CT_PivotArea"/>
1336         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
1337     </xsd:sequence>
1338     <xsd:attribute name="action" type="ST_FormatAction" default="formatting"/>
1339     <xsd:attribute name="dxfId" type="ST_DxfId" use="optional"/>
1340 </xsd:complexType>
1341 <xsd:complexType name="CT_ConditionalFormats">
1342     <xsd:sequence>
1343         <xsd:element name="conditionalFormat" maxOccurs="unbounded" type="CT_ConditionalFormat"/>
1344     </xsd:sequence>
1345     <xsd:attribute name="count" type="xsd:unsignedInt" default="0"/>
1346 </xsd:complexType>
1347 <xsd:complexType name="CT_ConditionalFormat">
1348     <xsd:sequence>
1349         <xsd:element name="pivotAreas" type="CT_PivotAreas"/>
1350         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
1351     </xsd:sequence>
1352     <xsd:attribute name="scope" type="ST_Scope" default="selection"/>
1353     <xsd:attribute name="type" type="ST_Type" default="none"/>
1354     <xsd:attribute name="priority" use="required" type="xsd:unsignedInt"/>
1355 </xsd:complexType>
1356 <xsd:complexType name="CT_PivotAreas">
1357     <xsd:sequence>
1358         <xsd:element name="pivotArea" minOccurs="0" maxOccurs="unbounded" type="CT_PivotArea"/>
1359     </xsd:sequence>
1360     <xsd:attribute name="count" type="xsd:unsignedInt"/>
1361 </xsd:complexType>
1362 <xsd:simpleType name="ST_Scope">
1363     <xsd:restriction base="xsd:string">
1364         <xsd:enumeration value="selection"/>
1365         <xsd:enumeration value="data"/>
1366         <xsd:enumeration value="field"/>
1367     </xsd:restriction>
1368 </xsd:simpleType>
1369 <xsd:simpleType name="ST_Type">
1370     <xsd:restriction base="xsd:string">
1371         <xsd:enumeration value="none"/>
1372         <xsd:enumeration value="all"/>
1373         <xsd:enumeration value="row"/>
1374         <xsd:enumeration value="column"/>

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1375     </xsd:restriction>
1376 </xsd:simpleType>
1377 <xsd:complexType name="CT_ChartFormats">
1378     <xsd:sequence>
1379         <xsd:element name="chartFormat" maxOccurs="unbounded" type="CT_ChartFormat"/>
1380     </xsd:sequence>
1381     <xsd:attribute name="count" type="xsd:unsignedInt" default="0"/>
1382 </xsd:complexType>
1383 <xsd:complexType name="CT_ChartFormat">
1384     <xsd:sequence>
1385         <xsd:element name="pivotArea" type="CT_PivotArea"/>
1386     </xsd:sequence>
1387     <xsd:attribute name="chart" use="required" type="xsd:unsignedInt"/>
1388     <xsd:attribute name="format" use="required" type="xsd:unsignedInt"/>
1389     <xsd:attribute name="series" type="xsd:boolean" default="false"/>
1390 </xsd:complexType>
1391 <xsd:complexType name="CT_PivotHierarchies">
1392     <xsd:sequence>
1393         <xsd:element name="pivotHierarchy" maxOccurs="unbounded" type="CT_PivotHierarchy"/>
1394     </xsd:sequence>
1395     <xsd:attribute name="count" type="xsd:unsignedInt"/>
1396 </xsd:complexType>
1397 <xsd:complexType name="CT_PivotHierarchy">
1398     <xsd:sequence>
1399         <xsd:element name="mps" minOccurs="0" type="CT_MemberProperties"/>
1400         <xsd:element name="members" minOccurs="0" maxOccurs="unbounded" type="CT_Members"/>
1401         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
1402     </xsd:sequence>
1403     <xsd:attribute name="outline" type="xsd:boolean" default="false"/>
1404     <xsd:attribute name="multipleItemSelectionAllowed" type="xsd:boolean" default="false"/>
1405     <xsd:attribute name="subtotalTop" type="xsd:boolean" default="false"/>
1406     <xsd:attribute name="showInFieldList" type="xsd:boolean" default="true"/>
1407     <xsd:attribute name="dragToRow" type="xsd:boolean" default="true"/>
1408     <xsd:attribute name="dragToCol" type="xsd:boolean" default="true"/>
1409     <xsd:attribute name="dragToPage" type="xsd:boolean" default="true"/>
1410     <xsd:attribute name="dragToData" type="xsd:boolean" default="false"/>
1411     <xsd:attribute name="dragOff" type="xsd:boolean" default="true"/>
1412     <xsd:attribute name="includeNewItemInFilter" type="xsd:boolean" default="false"/>
1413     <xsd:attribute name="caption" type="s:ST_Xstring" use="optional"/>
1414 </xsd:complexType>
1415 <xsd:complexType name="CT_RowHierarchiesUsage">
1416     <xsd:sequence>
1417         <xsd:element name="rowHierarchyUsage" minOccurs="1" maxOccurs="unbounded"
1418             type="CT_HierarchyUsage"/>
1419     </xsd:sequence>
1420     <xsd:attribute name="count" type="xsd:unsignedInt"/>
1421 </xsd:complexType>
1422 <xsd:complexType name="CT_ColHierarchiesUsage">
1423     <xsd:sequence>
1424         <xsd:element name="colHierarchyUsage" minOccurs="1" maxOccurs="unbounded"
1425             type="CT_HierarchyUsage"/>
1426     </xsd:sequence>
1427     <xsd:attribute name="count" type="xsd:unsignedInt"/>

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1428 </xsd:complexType>
1429 <xsd:complexType name="CT_HierarchyUsage">
1430   <xsd:attribute name="hierarchyUsage" type="xsd:int" use="required"/>
1431 </xsd:complexType>
1432 <xsd:complexType name="CT_MemberProperties">
1433   <xsd:sequence>
1434     <xsd:element name="mp" maxOccurs="unbounded" type="CT_MemberProperty"/>
1435   </xsd:sequence>
1436   <xsd:attribute name="count" type="xsd:unsignedInt"/>
1437 </xsd:complexType>
1438 <xsd:complexType name="CT_MemberProperty">
1439   <xsd:attribute name="name" type="s:ST Xstring" use="optional"/>
1440   <xsd:attribute name="showCell" type="xsd:boolean" use="optional" default="false"/>
1441   <xsd:attribute name="showTip" type="xsd:boolean" use="optional" default="false"/>
1442   <xsd:attribute name="showAsCaption" type="xsd:boolean" use="optional" default="false"/>
1443   <xsd:attribute name="nameLen" type="xsd:unsignedInt" use="optional"/>
1444   <xsd:attribute name="pPos" type="xsd:unsignedInt" use="optional"/>
1445   <xsd:attribute name="pLen" type="xsd:unsignedInt" use="optional"/>
1446   <xsd:attribute name="level" type="xsd:unsignedInt" use="optional"/>
1447   <xsd:attribute name="field" use="required" type="xsd:unsignedInt"/>
1448 </xsd:complexType>
1449 <xsd:complexType name="CT_Members">
1450   <xsd:sequence>
1451     <xsd:element name="member" maxOccurs="unbounded" type="CT_Member"/>
1452   </xsd:sequence>
1453   <xsd:attribute name="count" type="xsd:unsignedInt"/>
1454   <xsd:attribute name="level" use="optional" type="xsd:unsignedInt"/>
1455 </xsd:complexType>
1456 <xsd:complexType name="CT_Member">
1457   <xsd:attribute name="name" use="required" type="s:ST Xstring"/>
1458 </xsd:complexType>
1459 <xsd:complexType name="CT_Dimensions">
1460   <xsd:sequence>
1461     <xsd:element name="dimension" minOccurs="0" maxOccurs="unbounded"
1462       type="CT_PivotDimension"/>
1463   </xsd:sequence>
1464   <xsd:attribute name="count" type="xsd:unsignedInt"/>
1465 </xsd:complexType>
1466 <xsd:complexType name="CT_PivotDimension">
1467   <xsd:attribute name="measure" type="xsd:boolean" default="false"/>
1468   <xsd:attribute name="name" use="required" type="s:ST Xstring"/>
1469   <xsd:attribute name="uniqueName" use="required" type="s:ST Xstring"/>
1470   <xsd:attribute name="caption" use="required" type="s:ST Xstring"/>
1471 </xsd:complexType>
1472 <xsd:complexType name="CT_MeasureGroups">
1473   <xsd:sequence>
1474     <xsd:element name="measureGroup" minOccurs="0" maxOccurs="unbounded"
1475       type="CT_MeasureGroup"/>
1476   </xsd:sequence>
1477   <xsd:attribute name="count" type="xsd:unsignedInt"/>
1478 </xsd:complexType>
1479 <xsd:complexType name="CT_MeasureDimensionMaps">
1480   <xsd:sequence>

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1481     <xsd:element name="map" minOccurs="0" maxOccurs="unbounded"
1482         type="CT_MeasureDimensionMap"/>
1483     </xsd:sequence>
1484     <xsd:attribute name="count" type="xsd:unsignedInt"/>
1485 </xsd:complexType>
1486 <xsd:complexType name="CT_MeasureGroup">
1487     <xsd:attribute name="name" use="required" type="s:ST_Xstring"/>
1488     <xsd:attribute name="caption" use="required" type="s:ST_Xstring"/>
1489 </xsd:complexType>
1490 <xsd:complexType name="CT_MeasureDimensionMap">
1491     <xsd:attribute name="measureGroup" use="optional" type="xsd:unsignedInt"/>
1492     <xsd:attribute name="dimension" use="optional" type="xsd:unsignedInt"/>
1493 </xsd:complexType>
1494 <xsd:complexType name="CT_PivotTableStyle">
1495     <xsd:attribute name="name" type="xsd:string"/>
1496     <xsd:attribute name="showRowHeaders" type="xsd:boolean"/>
1497     <xsd:attribute name="showColHeaders" type="xsd:boolean"/>
1498     <xsd:attribute name="showRowStripes" type="xsd:boolean"/>
1499     <xsd:attribute name="showColStripes" type="xsd:boolean"/>
1500     <xsd:attribute name="showLastColumn" type="xsd:boolean" use="optional"/>
1501 </xsd:complexType>
1502 <xsd:complexType name="CT_PivotFilters">
1503     <xsd:sequence>
1504         <xsd:element name="filter" minOccurs="0" maxOccurs="unbounded" type="CT_PivotFilter"/>
1505     </xsd:sequence>
1506     <xsd:attribute name="count" type="xsd:unsignedInt" default="0"/>
1507 </xsd:complexType>
1508 <xsd:complexType name="CT_PivotFilter">
1509     <xsd:sequence>
1510         <xsd:element name="autoFilter" minOccurs="1" maxOccurs="1" type="CT_AutoFilter"/>
1511         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
1512     </xsd:sequence>
1513     <xsd:attribute name="fld" use="required" type="xsd:unsignedInt"/>
1514     <xsd:attribute name="mpFld" type="xsd:unsignedInt" use="optional"/>
1515     <xsd:attribute name="type" use="required" type="ST_PivotFilterType"/>
1516     <xsd:attribute name="evalOrder" use="optional" type="xsd:int" default="0"/>
1517     <xsd:attribute name="id" use="required" type="xsd:unsignedInt"/>
1518     <xsd:attribute name="iMeasureHier" use="optional" type="xsd:unsignedInt"/>
1519     <xsd:attribute name="iMeasureFld" use="optional" type="xsd:unsignedInt"/>
1520     <xsd:attribute name="name" type="s:ST_Xstring"/>
1521     <xsd:attribute name="description" type="s:ST_Xstring"/>
1522     <xsd:attribute name="stringValue1" type="s:ST_Xstring"/>
1523     <xsd:attribute name="stringValue2" type="s:ST_Xstring"/>
1524 </xsd:complexType>
1525 <xsd:simpleType name="ST_ShowDataAs">
1526     <xsd:restriction base="xsd:string">
1527         <xsd:enumeration value="normal"/>
1528         <xsd:enumeration value="difference"/>
1529         <xsd:enumeration value="percent"/>
1530         <xsd:enumeration value="percentDiff"/>
1531         <xsd:enumeration value="runTotal"/>
1532         <xsd:enumeration value="percentOfRow"/>
1533         <xsd:enumeration value="percentOfCol"/>

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1534         <xsd:enumeration value="percentOfTotal"/>
1535         <xsd:enumeration value="index"/>
1536     </xsd:restriction>
1537 </xsd:simpleType>
1538 <xsd:simpleType name="ST_ItemType">
1539     <xsd:restriction base="xsd:string">
1540         <xsd:enumeration value="data"/>
1541         <xsd:enumeration value="default"/>
1542         <xsd:enumeration value="sum"/>
1543         <xsd:enumeration value="countA"/>
1544         <xsd:enumeration value="avg"/>
1545         <xsd:enumeration value="max"/>
1546         <xsd:enumeration value="min"/>
1547         <xsd:enumeration value="product"/>
1548         <xsd:enumeration value="count"/>
1549         <xsd:enumeration value="stdDev"/>
1550         <xsd:enumeration value="stdDevP"/>
1551         <xsd:enumeration value="var"/>
1552         <xsd:enumeration value="varP"/>
1553         <xsd:enumeration value="grand"/>
1554         <xsd:enumeration value="blank"/>
1555     </xsd:restriction>
1556 </xsd:simpleType>
1557 <xsd:simpleType name="ST_FormatAction">
1558     <xsd:restriction base="xsd:string">
1559         <xsd:enumeration value="blank"/>
1560         <xsd:enumeration value="formatting"/>
1561         <xsd:enumeration value="drill"/>
1562         <xsd:enumeration value="formula"/>
1563     </xsd:restriction>
1564 </xsd:simpleType>
1565 <xsd:simpleType name="ST_FieldSortType">
1566     <xsd:restriction base="xsd:string">
1567         <xsd:enumeration value="manual"/>
1568         <xsd:enumeration value="ascending"/>
1569         <xsd:enumeration value="descending"/>
1570     </xsd:restriction>
1571 </xsd:simpleType>
1572 <xsd:simpleType name="ST_PivotFilterType">
1573     <xsd:restriction base="xsd:string">
1574         <xsd:enumeration value="unknown"/>
1575         <xsd:enumeration value="count"/>
1576         <xsd:enumeration value="percent"/>
1577         <xsd:enumeration value="sum"/>
1578         <xsd:enumeration value="captionEqual"/>
1579         <xsd:enumeration value="captionNotEqual"/>
1580         <xsd:enumeration value="captionBeginsWith"/>
1581         <xsd:enumeration value="captionNotBeginsWith"/>
1582         <xsd:enumeration value="captionEndsWith"/>
1583         <xsd:enumeration value="captionNotEndsWith"/>
1584         <xsd:enumeration value="captionContains"/>
1585         <xsd:enumeration value="captionNotContains"/>
1586         <xsd:enumeration value="captionGreaterThan"/>

```



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1587 <xsd:enumeration value="captionGreaterThanOrEqual"/>
1588 <xsd:enumeration value="captionLessThan"/>
1589 <xsd:enumeration value="captionLessThanOrEqual"/>
1590 <xsd:enumeration value="captionBetween"/>
1591 <xsd:enumeration value="captionNotBetween"/>
1592 <xsd:enumeration value="valueEqual"/>
1593 <xsd:enumeration value="valueNotEqual"/>
1594 <xsd:enumeration value="valueGreaterThan"/>
1595 <xsd:enumeration value="valueGreaterThanOrEqual"/>
1596 <xsd:enumeration value="valueLessThan"/>
1597 <xsd:enumeration value="valueLessThanOrEqual"/>
1598 <xsd:enumeration value="valueBetween"/>
1599 <xsd:enumeration value="valueNotBetween"/>
1600 <xsd:enumeration value="dateEqual"/>
1601 <xsd:enumeration value="dateNotEqual"/>
1602 <xsd:enumeration value="dateOlderThan"/>
1603 <xsd:enumeration value="dateOlderThanOrEqual"/>
1604 <xsd:enumeration value="dateNewerThan"/>
1605 <xsd:enumeration value="dateNewerThanOrEqual"/>
1606 <xsd:enumeration value="dateBetween"/>
1607 <xsd:enumeration value="dateNotBetween"/>
1608 <xsd:enumeration value="tomorrow"/>
1609 <xsd:enumeration value="today"/>
1610 <xsd:enumeration value="yesterday"/>
1611 <xsd:enumeration value="nextWeek"/>
1612 <xsd:enumeration value="thisWeek"/>
1613 <xsd:enumeration value="lastWeek"/>
1614 <xsd:enumeration value="nextMonth"/>
1615 <xsd:enumeration value="thisMonth"/>
1616 <xsd:enumeration value="lastMonth"/>
1617 <xsd:enumeration value="nextQuarter"/>
1618 <xsd:enumeration value="thisQuarter"/>
1619 <xsd:enumeration value="lastQuarter"/>
1620 <xsd:enumeration value="nextYear"/>
1621 <xsd:enumeration value="thisYear"/>
1622 <xsd:enumeration value="lastYear"/>
1623 <xsd:enumeration value="yearToDate"/>
1624 <xsd:enumeration value="Q1"/>
1625 <xsd:enumeration value="Q2"/>
1626 <xsd:enumeration value="Q3"/>
1627 <xsd:enumeration value="Q4"/>
1628 <xsd:enumeration value="M1"/>
1629 <xsd:enumeration value="M2"/>
1630 <xsd:enumeration value="M3"/>
1631 <xsd:enumeration value="M4"/>
1632 <xsd:enumeration value="M5"/>
1633 <xsd:enumeration value="M6"/>
1634 <xsd:enumeration value="M7"/>
1635 <xsd:enumeration value="M8"/>
1636 <xsd:enumeration value="M9"/>
1637 <xsd:enumeration value="M10"/>
1638 <xsd:enumeration value="M11"/>
1639 <xsd:enumeration value="M12"/>

```

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1640     </xsd:restriction>
1641 </xsd:simpleType>
1642 <xsd:complexType name="CT_PivotArea">
1643     <xsd:sequence>
1644         <xsd:element name="references" minOccurs="0" type="CT_PivotAreaReferences"/>
1645         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
1646     </xsd:sequence>
1647     <xsd:attribute name="field" use="optional" type="xsd:int"/>
1648     <xsd:attribute name="type" type="ST_PivotAreaType" default="normal"/>
1649     <xsd:attribute name="dataOnly" type="xsd:boolean" default="true"/>
1650     <xsd:attribute name="labelOnly" type="xsd:boolean" default="false"/>
1651     <xsd:attribute name="grandRow" type="xsd:boolean" default="false"/>
1652     <xsd:attribute name="grandCol" type="xsd:boolean" default="false"/>
1653     <xsd:attribute name="cacheIndex" type="xsd:boolean" default="false"/>
1654     <xsd:attribute name="outline" type="xsd:boolean" default="true"/>
1655     <xsd:attribute name="offset" type="ST_Ref"/>
1656     <xsd:attribute name="collapsedLevelsAreSubtotals" type="xsd:boolean" default="false"/>
1657     <xsd:attribute name="axis" type="ST_Axis" use="optional"/>
1658     <xsd:attribute name="fieldPosition" type="xsd:unsignedInt" use="optional"/>
1659 </xsd:complexType>
1660 <xsd:simpleType name="ST_PivotAreaType">
1661     <xsd:restriction base="xsd:string">
1662         <xsd:enumeration value="none"/>
1663         <xsd:enumeration value="normal"/>
1664         <xsd:enumeration value="data"/>
1665         <xsd:enumeration value="all"/>
1666         <xsd:enumeration value="origin"/>
1667         <xsd:enumeration value="button"/>
1668         <xsd:enumeration value="topEnd"/>
1669     </xsd:restriction>
1670 </xsd:simpleType>
1671 <xsd:complexType name="CT_PivotAreaReferences">
1672     <xsd:sequence>
1673         <xsd:element name="reference" maxOccurs="unbounded" type="CT_PivotAreaReference"/>
1674     </xsd:sequence>
1675     <xsd:attribute name="count" type="xsd:unsignedInt"/>
1676 </xsd:complexType>
1677 <xsd:complexType name="CT_PivotAreaReference">
1678     <xsd:sequence>
1679         <xsd:element name="x" minOccurs="0" maxOccurs="unbounded" type="CT_Index"/>
1680         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
1681     </xsd:sequence>
1682     <xsd:attribute name="field" use="optional" type="xsd:unsignedInt"/>
1683     <xsd:attribute name="count" type="xsd:unsignedInt"/>
1684     <xsd:attribute name="selected" type="xsd:boolean" default="true"/>
1685     <xsd:attribute name="byPosition" type="xsd:boolean" default="false"/>
1686     <xsd:attribute name="relative" type="xsd:boolean" default="false"/>
1687     <xsd:attribute name="defaultSubtotal" type="xsd:boolean" default="false"/>
1688     <xsd:attribute name="sumSubtotal" type="xsd:boolean" default="false"/>
1689     <xsd:attribute name="countASubtotal" type="xsd:boolean" default="false"/>
1690     <xsd:attribute name="avgSubtotal" type="xsd:boolean" default="false"/>
1691     <xsd:attribute name="maxSubtotal" type="xsd:boolean" default="false"/>
1692     <xsd:attribute name="minSubtotal" type="xsd:boolean" default="false"/>

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1693     <xsd:attribute name="productSubtotal" type="xsd:boolean" default="false"/>
1694     <xsd:attribute name="countSubtotal" type="xsd:boolean" default="false"/>
1695     <xsd:attribute name="stdDevSubtotal" type="xsd:boolean" default="false"/>
1696     <xsd:attribute name="stdDevPSubtotal" type="xsd:boolean" default="false"/>
1697     <xsd:attribute name="varSubtotal" type="xsd:boolean" default="false"/>
1698     <xsd:attribute name="varPSubtotal" type="xsd:boolean" default="false"/>
1699 </xsd:complexType>
1700 <xsd:complexType name="CT_Index">
1701     <xsd:attribute name="v" use="required" type="xsd:unsignedInt"/>
1702 </xsd:complexType>
1703 <xsd:simpleType name="ST_Axis">
1704     <xsd:restriction base="xsd:string">
1705         <xsd:enumeration value="axisRow"/>
1706         <xsd:enumeration value="axisCol"/>
1707         <xsd:enumeration value="axisPage"/>
1708         <xsd:enumeration value="axisValues"/>
1709     </xsd:restriction>
1710 </xsd:simpleType>
1711 <xsd:element name="queryTable" type="CT_QueryTable"/>
1712 <xsd:complexType name="CT_QueryTable">
1713     <xsd:sequence>
1714         <xsd:element name="queryTableRefresh" type="CT_QueryTableRefresh" minOccurs="0"
1715             maxOccurs="1"/>
1716         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1717     </xsd:sequence>
1718     <xsd:attribute name="name" type="s:ST_Xstring" use="required"/>
1719     <xsd:attribute name="headers" type="xsd:boolean" use="optional" default="true"/>
1720     <xsd:attribute name="rowNumbers" type="xsd:boolean" use="optional" default="false"/>
1721     <xsd:attribute name="disableRefresh" type="xsd:boolean" use="optional" default="false"/>
1722     <xsd:attribute name="backgroundRefresh" type="xsd:boolean" use="optional" default="true"/>
1723     <xsd:attribute name="firstBackgroundRefresh" type="xsd:boolean" use="optional"
1724         default="false"/>
1725     <xsd:attribute name="refreshOnLoad" type="xsd:boolean" use="optional" default="false"/>
1726     <xsd:attribute name="growShrinkType" type="ST_GrowShrinkType" use="optional"
1727         default="insertDelete"/>
1728     <xsd:attribute name="fillFormulas" type="xsd:boolean" use="optional" default="false"/>
1729     <xsd:attribute name="removeDataOnSave" type="xsd:boolean" use="optional" default="false"/>
1730     <xsd:attribute name="disableEdit" type="xsd:boolean" use="optional" default="false"/>
1731     <xsd:attribute name="preserveFormatting" type="xsd:boolean" use="optional" default="true"/>
1732     <xsd:attribute name="adjustColumnWidth" type="xsd:boolean" use="optional" default="true"/>
1733     <xsd:attribute name="intermediate" type="xsd:boolean" use="optional" default="false"/>
1734     <xsd:attribute name="connectionId" type="xsd:unsignedInt" use="required"/>
1735     <xsd:attributeGroup ref="AG_AutoFormat"/>
1736 </xsd:complexType>
1737 <xsd:complexType name="CT_QueryTableRefresh">
1738     <xsd:sequence>
1739         <xsd:element name="queryTableFields" type="CT_QueryTableFields" minOccurs="1"
1740             maxOccurs="1"/>
1741         <xsd:element name="queryTableDeletedFields" type="CT_QueryTableDeletedFields"
1742             minOccurs="0" maxOccurs="1"/>
1743         <xsd:element name="sortState" minOccurs="0" maxOccurs="1" type="CT_SortState"/>
1744         <xsd:element name="extLst" minOccurs="0" maxOccurs="1" type="CT_ExtensionList"/>
1745     </xsd:sequence>

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1746     <xsd:attribute name="preserveSortFilterLayout" type="xsd:boolean" use="optional"
1747       default="true"/>
1748     <xsd:attribute name="fieldIdWrapped" type="xsd:boolean" use="optional" default="false"/>
1749     <xsd:attribute name="headersInLastRefresh" type="xsd:boolean" use="optional" default="true"/>
1750     <xsd:attribute name="minimumVersion" type="xsd:unsignedByte" use="optional" default="0"/>
1751     <xsd:attribute name="nextId" type="xsd:unsignedInt" use="optional" default="1"/>
1752     <xsd:attribute name="unboundColumnsLeft" type="xsd:unsignedInt" use="optional" default="0"/>
1753     <xsd:attribute name="unboundColumnsRight" type="xsd:unsignedInt" use="optional" default="0"/>
1754   </xsd:complexType>
1755   <xsd:complexType name="CT_QueryTableDeletedFields">
1756     <xsd:sequence>
1757       <xsd:element name="deletedField" type="CT_DeletedField" minOccurs="1"
1758         maxOccurs="unbounded"/>
1759     </xsd:sequence>
1760     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
1761   </xsd:complexType>
1762   <xsd:complexType name="CT_DeletedField">
1763     <xsd:attribute name="name" type="s:ST_Xstring" use="required"/>
1764   </xsd:complexType>
1765   <xsd:complexType name="CT_QueryTableFields">
1766     <xsd:sequence>
1767       <xsd:element name="queryTableField" type="CT_QueryTableField" minOccurs="0"
1768         maxOccurs="unbounded"/>
1769     </xsd:sequence>
1770     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional" default="0"/>
1771   </xsd:complexType>
1772   <xsd:complexType name="CT_QueryTableField">
1773     <xsd:sequence minOccurs="0">
1774       <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1775     </xsd:sequence>
1776     <xsd:attribute name="id" type="xsd:unsignedInt" use="required"/>
1777     <xsd:attribute name="name" type="s:ST_Xstring" use="optional"/>
1778     <xsd:attribute name="dataBound" type="xsd:boolean" use="optional" default="true"/>
1779     <xsd:attribute name="rowNumbers" type="xsd:boolean" use="optional" default="false"/>
1780     <xsd:attribute name="fillFormulas" type="xsd:boolean" use="optional" default="false"/>
1781     <xsd:attribute name="clipped" type="xsd:boolean" use="optional" default="false"/>
1782     <xsd:attribute name="tableColumnId" type="xsd:unsignedInt" default="0"/>
1783   </xsd:complexType>
1784   <xsd:simpleType name="ST_GrowShrinkType">
1785     <xsd:restriction base="xsd:string">
1786       <xsd:enumeration value="insertDelete"/>
1787       <xsd:enumeration value="insertClear"/>
1788       <xsd:enumeration value="overwriteClear"/>
1789     </xsd:restriction>
1790   </xsd:simpleType>
1791   <xsd:element name="sst" type="CT_Sst"/>
1792   <xsd:complexType name="CT_Sst">
1793     <xsd:sequence>
1794       <xsd:element name="si" type="CT_Rst" minOccurs="0" maxOccurs="unbounded"/>
1795       <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
1796     </xsd:sequence>
1797     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
1798     <xsd:attribute name="uniqueCount" type="xsd:unsignedInt" use="optional"/>

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1799 </xsd:complexType>
1800 <xsd:simpleType name="ST_PhoneticType">
1801   <xsd:restriction base="xsd:string">
1802     <xsd:enumeration value="halfwidthKatakana"/>
1803     <xsd:enumeration value="fullwidthKatakana"/>
1804     <xsd:enumeration value="Hiragana"/>
1805     <xsd:enumeration value="noConversion"/>
1806   </xsd:restriction>
1807 </xsd:simpleType>
1808 <xsd:simpleType name="ST_PhoneticAlignment">
1809   <xsd:restriction base="xsd:string">
1810     <xsd:enumeration value="noControl"/>
1811     <xsd:enumeration value="left"/>
1812     <xsd:enumeration value="center"/>
1813     <xsd:enumeration value="distributed"/>
1814   </xsd:restriction>
1815 </xsd:simpleType>
1816 <xsd:complexType name="CT_PhoneticRun">
1817   <xsd:sequence>
1818     <xsd:element name="t" type="s:ST_Xstring" minOccurs="1" maxOccurs="1"/>
1819   </xsd:sequence>
1820   <xsd:attribute name="sb" type="xsd:unsignedInt" use="required"/>
1821   <xsd:attribute name="eb" type="xsd:unsignedInt" use="required"/>
1822 </xsd:complexType>
1823 <xsd:complexType name="CT_RElt">
1824   <xsd:sequence>
1825     <xsd:element name="rPr" type="CT_RPrElt" minOccurs="0" maxOccurs="1"/>
1826     <xsd:element name="t" type="s:ST_Xstring" minOccurs="1" maxOccurs="1"/>
1827   </xsd:sequence>
1828 </xsd:complexType>
1829 <xsd:complexType name="CT_RPrElt">
1830   <xsd:choice maxOccurs="unbounded">
1831     <xsd:element name="rFont" type="CT_FontName" minOccurs="0" maxOccurs="1"/>
1832     <xsd:element name="charset" type="CT_IntProperty" minOccurs="0" maxOccurs="1"/>
1833     <xsd:element name="family" type="CT_IntProperty" minOccurs="0" maxOccurs="1"/>
1834     <xsd:element name="b" type="CT_BooleanProperty" minOccurs="0" maxOccurs="1"/>
1835     <xsd:element name="i" type="CT_BooleanProperty" minOccurs="0" maxOccurs="1"/>
1836     <xsd:element name="strike" type="CT_BooleanProperty" minOccurs="0" maxOccurs="1"/>
1837     <xsd:element name="outline" type="CT_BooleanProperty" minOccurs="0" maxOccurs="1"/>
1838     <xsd:element name="shadow" type="CT_BooleanProperty" minOccurs="0" maxOccurs="1"/>
1839     <xsd:element name="condense" type="CT_BooleanProperty" minOccurs="0" maxOccurs="1"/>
1840     <xsd:element name="extend" type="CT_BooleanProperty" minOccurs="0" maxOccurs="1"/>
1841     <xsd:element name="color" type="CT_Color" minOccurs="0" maxOccurs="1"/>
1842     <xsd:element name="sz" type="CT_FontSize" minOccurs="0" maxOccurs="1"/>
1843     <xsd:element name="u" type="CT_UnderlineProperty" minOccurs="0" maxOccurs="1"/>
1844     <xsd:element name="vertAlign" type="CT_VerticalAlignFontProperty" minOccurs="0"
1845       maxOccurs="1"/>
1846     <xsd:element name="scheme" type="CT_FontScheme" minOccurs="0" maxOccurs="1"/>
1847   </xsd:choice>
1848 </xsd:complexType>
1849 <xsd:complexType name="CT_Rst">
1850   <xsd:sequence>
1851     <xsd:element name="t" type="s:ST_Xstring" minOccurs="0" maxOccurs="1"/>

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1852     <xsd:element name="r" type="CT_RelT" minOccurs="0" maxOccurs="unbounded"/>
1853     <xsd:element name="rPh" type="CT_PhoneticRun" minOccurs="0" maxOccurs="unbounded"/>
1854     <xsd:element name="phoneticPr" minOccurs="0" maxOccurs="1" type="CT_PhoneticPr"/>
1855   </xsd:sequence>
1856 </xsd:complexType>
1857 <xsd:complexType name="CT_PhoneticPr">
1858   <xsd:attribute name="fontId" type="ST_FontId" use="required"/>
1859   <xsd:attribute name="type" type="ST_PhoneticType" use="optional" default="fullwidthKatakana"/>
1860   <xsd:attribute name="alignment" type="ST_PhoneticAlignment" use="optional" default="left"/>
1861 </xsd:complexType>
1862 <xsd:element name="headers" type="CT_RevisionHeaders"/>
1863 <xsd:element name="revisions" type="CT_Revisions"/>
1864 <xsd:complexType name="CT_RevisionHeaders">
1865   <xsd:sequence>
1866     <xsd:element name="header" type="CT_RevisionHeader" minOccurs="1" maxOccurs="unbounded"/>
1867   </xsd:sequence>
1868   <xsd:attribute name="guid" type="s:ST_Guid" use="required"/>
1869   <xsd:attribute name="lastGuid" type="s:ST_Guid" use="optional"/>
1870   <xsd:attribute name="shared" type="xsd:boolean" default="true"/>
1871   <xsd:attribute name="diskRevisions" type="xsd:boolean" default="false"/>
1872   <xsd:attribute name="history" type="xsd:boolean" default="true"/>
1873   <xsd:attribute name="trackRevisions" type="xsd:boolean" default="true"/>
1874   <xsd:attribute name="exclusive" type="xsd:boolean" default="false"/>
1875   <xsd:attribute name="revisionId" type="xsd:unsignedInt" default="0"/>
1876   <xsd:attribute name="version" type="xsd:int" default="1"/>
1877   <xsd:attribute name="keepChangeHistory" type="xsd:boolean" use="optional" default="true"/>
1878   <xsd:attribute name="protected" type="xsd:boolean" use="optional" default="false"/>
1879   <xsd:attribute name="preserveHistory" type="xsd:unsignedInt" default="30"/>
1880 </xsd:complexType>
1881 <xsd:complexType name="CT_Revisions">
1882   <xsd:choice maxOccurs="unbounded">
1883     <xsd:element name="rrc" type="CT_RevisionRowColumn" minOccurs="0" maxOccurs="unbounded"/>
1884     <xsd:element name="rm" type="CT_RevisionMove" minOccurs="0" maxOccurs="unbounded"/>
1885     <xsd:element name="rcv" type="CT_RevisionCustomView" minOccurs="0" maxOccurs="unbounded"/>
1886     <xsd:element name="rsnm" type="CT_RevisionSheetRename" minOccurs="0"
1887       maxOccurs="unbounded"/>
1888     <xsd:element name="ris" type="CT_RevisionInsertSheet" minOccurs="0"
1889       maxOccurs="unbounded"/>
1890     <xsd:element name="rcc" type="CT_RevisionCellChange" minOccurs="0" maxOccurs="unbounded"/>
1891     <xsd:element name="rfmt" type="CT_RevisionFormatting" minOccurs="0"
1892       maxOccurs="unbounded"/>
1893     <xsd:element name="raf" type="CT_RevisionAutoFormatting" minOccurs="0"
1894       maxOccurs="unbounded"/>
1895     <xsd:element name="rdn" type="CT_RevisionDefinedName" minOccurs="0"
1896       maxOccurs="unbounded"/>
1897     <xsd:element name="rcmt" type="CT_RevisionComment" minOccurs="0" maxOccurs="unbounded"/>
1898     <xsd:element name="rqt" type="CT_RevisionQueryTableField" minOccurs="0"
1899       maxOccurs="unbounded"/>
1900     <xsd:element name="rcft" type="CT_RevisionConflict" minOccurs="0" maxOccurs="unbounded"/>
1901   </xsd:choice>
1902 </xsd:complexType>
1903 <xsd:attributeGroup name="AG_RevData">
1904   <xsd:attribute name="rId" type="xsd:unsignedInt" use="required"/>

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1905     <xsd:attribute name="ua" type="xsd:boolean" use="optional" default="false"/>
1906     <xsd:attribute name="ra" type="xsd:boolean" use="optional" default="false"/>
1907 </xsd:attributeGroup>
1908 <xsd:complexType name="CT_RevisionHeader">
1909     <xsd:sequence>
1910         <xsd:element name="sheetIdMap" minOccurs="1" maxOccurs="1" type="CT_SheetIdMap"/>
1911         <xsd:element name="reviewedList" minOccurs="0" maxOccurs="1" type="CT_ReviewedRevisions"/>
1912         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
1913     </xsd:sequence>
1914     <xsd:attribute name="guid" type="s:ST_Guid" use="required"/>
1915     <xsd:attribute name="dateTime" type="xsd:dateTime" use="required"/>
1916     <xsd:attribute name="maxSheetId" type="xsd:unsignedInt" use="required"/>
1917     <xsd:attribute name="userName" type="s:ST_Xstring" use="required"/>
1918     <xsd:attribute ref="r:id" use="required"/>
1919     <xsd:attribute name="minRId" type="xsd:unsignedInt" use="optional"/>
1920     <xsd:attribute name="maxRId" type="xsd:unsignedInt" use="optional"/>
1921 </xsd:complexType>
1922 <xsd:complexType name="CT_SheetIdMap">
1923     <xsd:sequence>
1924         <xsd:element name="sheetId" type="CT_SheetId" minOccurs="1" maxOccurs="unbounded"/>
1925     </xsd:sequence>
1926     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
1927 </xsd:complexType>
1928 <xsd:complexType name="CT_SheetId">
1929     <xsd:attribute name="val" type="xsd:unsignedInt" use="required"/>
1930 </xsd:complexType>
1931 <xsd:complexType name="CT_ReviewedRevisions">
1932     <xsd:sequence>
1933         <xsd:element name="reviewed" type="CT_Reviewed" minOccurs="1" maxOccurs="unbounded"/>
1934     </xsd:sequence>
1935     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
1936 </xsd:complexType>
1937 <xsd:complexType name="CT_Reviewed">
1938     <xsd:attribute name="rId" type="xsd:unsignedInt" use="required"/>
1939 </xsd:complexType>
1940 <xsd:complexType name="CT_UndoInfo">
1941     <xsd:attribute name="index" type="xsd:unsignedInt" use="required"/>
1942     <xsd:attribute name="exp" type="ST_FormulaExpression" use="required"/>
1943     <xsd:attribute name="ref3D" type="xsd:boolean" use="optional" default="false"/>
1944     <xsd:attribute name="array" type="xsd:boolean" use="optional" default="false"/>
1945     <xsd:attribute name="v" type="xsd:boolean" use="optional" default="false"/>
1946     <xsd:attribute name="nf" type="xsd:boolean" use="optional" default="false"/>
1947     <xsd:attribute name="cs" type="xsd:boolean" use="optional" default="false"/>
1948     <xsd:attribute name="dr" type="ST_RefA" use="required"/>
1949     <xsd:attribute name="dn" type="s:ST_Xstring" use="optional"/>
1950     <xsd:attribute name="r" type="ST_CellRef" use="optional"/>
1951     <xsd:attribute name="sId" type="xsd:unsignedInt" use="optional"/>
1952 </xsd:complexType>
1953 <xsd:complexType name="CT_RevisionRowColumn">
1954     <xsd:choice minOccurs="0" maxOccurs="unbounded">
1955         <xsd:element name="undo" type="CT_UndoInfo" minOccurs="0" maxOccurs="unbounded"/>
1956         <xsd:element name="rcc" type="CT_RevisionCellChange" minOccurs="0" maxOccurs="unbounded"/>

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1957     <xsd:element name="rfmt" type="CT_RevisionFormatting" minOccurs="0"
1958         maxOccurs="unbounded"/>
1959 </xsd:choice>
1960 <xsd:attributeGroup ref="AG_RevData"/>
1961 <xsd:attribute name="sId" type="xsd:unsignedInt" use="required"/>
1962 <xsd:attribute name="eol" type="xsd:boolean" use="optional" default="false"/>
1963 <xsd:attribute name="ref" type="ST_Ref" use="required"/>
1964 <xsd:attribute name="action" type="ST_rwColActionType" use="required"/>
1965 <xsd:attribute name="edge" type="xsd:boolean" use="optional" default="false"/>
1966 </xsd:complexType>
1967 <xsd:complexType name="CT_RevisionMove">
1968     <xsd:choice minOccurs="0" maxOccurs="unbounded">
1969         <xsd:element name="undo" type="CT_UndoInfo" minOccurs="0" maxOccurs="unbounded"/>
1970         <xsd:element name="rcc" type="CT_RevisionCellChange" minOccurs="0" maxOccurs="unbounded"/>
1971         <xsd:element name="rfmt" type="CT_RevisionFormatting" minOccurs="0"
1972             maxOccurs="unbounded"/>
1973     </xsd:choice>
1974     <xsd:attributeGroup ref="AG_RevData"/>
1975     <xsd:attribute name="sheetId" type="xsd:unsignedInt" use="required"/>
1976     <xsd:attribute name="source" type="ST_Ref" use="required"/>
1977     <xsd:attribute name="destination" type="ST_Ref" use="required"/>
1978     <xsd:attribute name="sourceSheetId" type="xsd:unsignedInt" use="optional" default="0"/>
1979 </xsd:complexType>
1980 <xsd:complexType name="CT_RevisionCustomView">
1981     <xsd:attribute name="guid" type="s:ST_Guid" use="required"/>
1982     <xsd:attribute name="action" type="ST_RevisionAction" use="required"/>
1983 </xsd:complexType>
1984 <xsd:complexType name="CT_RevisionSheetRename">
1985     <xsd:sequence>
1986         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
1987     </xsd:sequence>
1988     <xsd:attributeGroup ref="AG_RevData"/>
1989     <xsd:attribute name="sheetId" type="xsd:unsignedInt" use="required"/>
1990     <xsd:attribute name="oldName" type="s:ST_Xstring" use="required"/>
1991     <xsd:attribute name="newName" type="s:ST_Xstring" use="required"/>
1992 </xsd:complexType>
1993 <xsd:complexType name="CT_RevisionInsertSheet">
1994     <xsd:attributeGroup ref="AG_RevData"/>
1995     <xsd:attribute name="sheetId" type="xsd:unsignedInt" use="required"/>
1996     <xsd:attribute name="name" type="s:ST_Xstring" use="required"/>
1997     <xsd:attribute name="sheetPosition" type="xsd:unsignedInt" use="required"/>
1998 </xsd:complexType>
1999 <xsd:complexType name="CT_RevisionCellChange">
2000     <xsd:sequence>
2001         <xsd:element name="oc" type="CT_Cell" minOccurs="0" maxOccurs="1"/>
2002         <xsd:element name="nc" type="CT_Cell" minOccurs="1" maxOccurs="1"/>
2003         <xsd:element name="odxf" type="CT_Dxf" minOccurs="0" maxOccurs="1"/>
2004         <xsd:element name="ndx" type="CT_Dxf" minOccurs="0" maxOccurs="1"/>
2005         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
2006     </xsd:sequence>
2007     <xsd:attributeGroup ref="AG_RevData"/>
2008     <xsd:attribute name="sId" type="xsd:unsignedInt" use="required"/>
2009     <xsd:attribute name="odxf" type="xsd:boolean" default="false"/>

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2010     <xsd:attribute name="xfDxf" type="xsd:boolean" use="optional" default="false"/>
2011     <xsd:attribute name="s" type="xsd:boolean" use="optional" default="false"/>
2012     <xsd:attribute name="dxf" type="xsd:boolean" default="false"/>
2013     <xsd:attribute name="numFmtId" type="ST_NumFmtId" use="optional"/>
2014     <xsd:attribute name="quotePrefix" type="xsd:boolean" use="optional" default="false"/>
2015     <xsd:attribute name="oldQuotePrefix" type="xsd:boolean" use="optional" default="false"/>
2016     <xsd:attribute name="ph" type="xsd:boolean" default="false"/>
2017     <xsd:attribute name="oldPh" type="xsd:boolean" default="false"/>
2018     <xsd:attribute name="endOfListFormulaUpdate" type="xsd:boolean" default="false"/>
2019 </xsd:complexType>
2020 <xsd:complexType name="CT_RevisionFormatting">
2021     <xsd:sequence>
2022         <xsd:element name="dxf" type="CT_Dxf" minOccurs="0" maxOccurs="1"/>
2023         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
2024     </xsd:sequence>
2025     <xsd:attribute name="sheetId" type="xsd:unsignedInt" use="required"/>
2026     <xsd:attribute name="xfDxf" type="xsd:boolean" use="optional" default="false"/>
2027     <xsd:attribute name="s" type="xsd:boolean" use="optional" default="false"/>
2028     <xsd:attribute name="sqref" type="ST_Sqref" use="required"/>
2029     <xsd:attribute name="start" type="xsd:unsignedInt" use="optional"/>
2030     <xsd:attribute name="length" type="xsd:unsignedInt" use="optional"/>
2031 </xsd:complexType>
2032 <xsd:complexType name="CT_RevisionAutoFormatting">
2033     <xsd:attribute name="sheetId" type="xsd:unsignedInt" use="required"/>
2034     <xsd:attributeGroup ref="AG_AutoFormat"/>
2035     <xsd:attribute name="ref" type="ST_Ref" use="required"/>
2036 </xsd:complexType>
2037 <xsd:complexType name="CT_RevisionComment">
2038     <xsd:attribute name="sheetId" type="xsd:unsignedInt" use="required"/>
2039     <xsd:attribute name="cell" type="ST_CellRef" use="required"/>
2040     <xsd:attribute name="guid" type="s:ST_Guid" use="required"/>
2041     <xsd:attribute name="action" type="ST_RevisionAction" default="add"/>
2042     <xsd:attribute name="alwaysShow" type="xsd:boolean" use="optional" default="false"/>
2043     <xsd:attribute name="old" type="xsd:boolean" use="optional" default="false"/>
2044     <xsd:attribute name="hiddenRow" type="xsd:boolean" use="optional" default="false"/>
2045     <xsd:attribute name="hiddenColumn" type="xsd:boolean" use="optional" default="false"/>
2046     <xsd:attribute name="author" type="s:ST_Xstring" use="required"/>
2047     <xsd:attribute name="oldLength" type="xsd:unsignedInt" default="0"/>
2048     <xsd:attribute name="newLength" type="xsd:unsignedInt" default="0"/>
2049 </xsd:complexType>
2050 <xsd:complexType name="CT_RevisionDefinedName">
2051     <xsd:sequence>
2052         <xsd:element name="formula" type="ST_Formula" minOccurs="0" maxOccurs="1"/>
2053         <xsd:element name="oldFormula" type="ST_Formula" minOccurs="0" maxOccurs="1"/>
2054         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
2055     </xsd:sequence>
2056     <xsd:attributeGroup ref="AG_RevData"/>
2057     <xsd:attribute name="localSheetId" type="xsd:unsignedInt" use="optional"/>
2058     <xsd:attribute name="customView" type="xsd:boolean" use="optional" default="false"/>
2059     <xsd:attribute name="name" type="s:ST_Xstring" use="required"/>
2060     <xsd:attribute name="function" type="xsd:boolean" use="optional" default="false"/>
2061     <xsd:attribute name="oldFunction" type="xsd:boolean" default="false"/>
2062     <xsd:attribute name="functionGroupId" type="xsd:unsignedByte" use="optional"/>

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2063     <xsd:attribute name="oldFunctionGroupId" type="xsd:unsignedByte" use="optional"/>
2064     <xsd:attribute name="shortcutKey" type="xsd:unsignedByte" use="optional"/>
2065     <xsd:attribute name="oldShortcutKey" type="xsd:unsignedByte" use="optional"/>
2066     <xsd:attribute name="hidden" type="xsd:boolean" use="optional" default="false"/>
2067     <xsd:attribute name="oldHidden" type="xsd:boolean" use="optional" default="false"/>
2068     <xsd:attribute name="customMenu" type="s:ST Xstring" use="optional"/>
2069     <xsd:attribute name="oldCustomMenu" type="s:ST Xstring" use="optional"/>
2070     <xsd:attribute name="description" type="s:ST Xstring" use="optional"/>
2071     <xsd:attribute name="oldDescription" type="s:ST Xstring" use="optional"/>
2072     <xsd:attribute name="help" type="s:ST Xstring" use="optional"/>
2073     <xsd:attribute name="oldHelp" type="s:ST Xstring" use="optional"/>
2074     <xsd:attribute name="statusBar" type="s:ST Xstring" use="optional"/>
2075     <xsd:attribute name="oldStatusBar" type="s:ST Xstring" use="optional"/>
2076     <xsd:attribute name="comment" type="s:ST Xstring" use="optional"/>
2077     <xsd:attribute name="oldComment" type="s:ST Xstring" use="optional"/>
2078 </xsd:complexType>
2079 <xsd:complexType name="CT_RevisionConflict">
2080     <xsd:attributeGroup ref="AG_RevData"/>
2081     <xsd:attribute name="sheetId" type="xsd:unsignedInt" use="optional"/>
2082 </xsd:complexType>
2083 <xsd:complexType name="CT_RevisionQueryTableField">
2084     <xsd:attribute name="sheetId" type="xsd:unsignedInt" use="required"/>
2085     <xsd:attribute name="ref" type="ST_Ref" use="required"/>
2086     <xsd:attribute name="fieldId" type="xsd:unsignedInt" use="required"/>
2087 </xsd:complexType>
2088 <xsd:simpleType name="ST_rwColActionType">
2089     <xsd:restriction base="xsd:string">
2090         <xsd:enumeration value="insertRow"/>
2091         <xsd:enumeration value="deleteRow"/>
2092         <xsd:enumeration value="insertCol"/>
2093         <xsd:enumeration value="deleteCol"/>
2094     </xsd:restriction>
2095 </xsd:simpleType>
2096 <xsd:simpleType name="ST_RevisionAction">
2097     <xsd:restriction base="xsd:string">
2098         <xsd:enumeration value="add"/>
2099         <xsd:enumeration value="delete"/>
2100     </xsd:restriction>
2101 </xsd:simpleType>
2102 <xsd:simpleType name="ST_FormulaExpression">
2103     <xsd:restriction base="xsd:string">
2104         <xsd:enumeration value="ref"/>
2105         <xsd:enumeration value="refError"/>
2106         <xsd:enumeration value="area"/>
2107         <xsd:enumeration value="areaError"/>
2108         <xsd:enumeration value="computedArea"/>
2109     </xsd:restriction>
2110 </xsd:simpleType>
2111 <xsd:element name="users" type="CT_Users"/>
2112 <xsd:complexType name="CT_Users">
2113     <xsd:sequence>
2114         <xsd:element name="userInfo" minOccurs="0" maxOccurs="256" type="CT_SharedUser"/>
2115     </xsd:sequence>

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2116     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
2117 </xsd:complexType>
2118 <xsd:complexType name="CT_SharedUser">
2119     <xsd:sequence>
2120         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
2121     </xsd:sequence>
2122     <xsd:attribute name="guid" type="s:ST_Guid" use="required"/>
2123     <xsd:attribute name="name" type="s:ST_Xstring" use="required"/>
2124     <xsd:attribute name="id" type="xsd:int" use="required"/>
2125     <xsd:attribute name="dateTime" type="xsd:dateTime" use="required"/>
2126 </xsd:complexType>
2127 <xsd:element name="worksheet" type="CT_Worksheet"/>
2128 <xsd:element name="chartsheet" type="CT_Chartsheet"/>
2129 <xsd:element name="dialogsheet" type="CT_Dialogsheet"/>
2130 <xsd:complexType name="CT_Macrosheet">
2131     <xsd:sequence>
2132         <xsd:element name="sheetPr" type="CT_SheetPr" minOccurs="0" maxOccurs="1"/>
2133         <xsd:element name="dimension" type="CT_SheetDimension" minOccurs="0" maxOccurs="1"/>
2134         <xsd:element name="sheetViews" type="CT_SheetViews" minOccurs="0" maxOccurs="1"/>
2135         <xsd:element name="sheetFormatPr" type="CT_SheetFormatPr" minOccurs="0" maxOccurs="1"/>
2136         <xsd:element name="cols" type="CT_Cols" minOccurs="0" maxOccurs="unbounded"/>
2137         <xsd:element name="sheetData" type="CT_SheetData" minOccurs="1" maxOccurs="1"/>
2138         <xsd:element name="sheetProtection" type="CT_SheetProtection" minOccurs="0"
2139             maxOccurs="1"/>
2140         <xsd:element name="autoFilter" type="CT_AutoFilter" minOccurs="0" maxOccurs="1"/>
2141         <xsd:element name="sortState" type="CT_SortState" minOccurs="0" maxOccurs="1"/>
2142         <xsd:element name="dataConsolidate" type="CT_DataConsolidate" minOccurs="0"
2143             maxOccurs="1"/>
2144         <xsd:element name="customSheetViews" type="CT_CustomSheetViews" minOccurs="0"
2145             maxOccurs="1"/>
2146         <xsd:element name="phoneticPr" type="CT_PhoneticPr" minOccurs="0" maxOccurs="1"/>
2147         <xsd:element name="conditionalFormatting" type="CT_ConditionalFormatting" minOccurs="0"
2148             maxOccurs="unbounded"/>
2149         <xsd:element name="printOptions" type="CT_PrintOptions" minOccurs="0" maxOccurs="1"/>
2150         <xsd:element name="pageMargins" type="CT_PageMargins" minOccurs="0" maxOccurs="1"/>
2151         <xsd:element name="pageSetup" type="CT_PageSetup" minOccurs="0" maxOccurs="1"/>
2152         <xsd:element name="headerFooter" type="CT_HeaderFooter" minOccurs="0" maxOccurs="1"/>
2153         <xsd:element name="rowBreaks" type="CT_PageBreak" minOccurs="0" maxOccurs="1"/>
2154         <xsd:element name="colBreaks" type="CT_PageBreak" minOccurs="0" maxOccurs="1"/>
2155         <xsd:element name="customProperties" type="CT_CustomProperties" minOccurs="0"
2156             maxOccurs="1"/>
2157         <xsd:element name="drawing" type="CT_Drawing" minOccurs="0" maxOccurs="1"/>
2158         <xsd:element name="drawingHF" type="CT_DrawingHF" minOccurs="0" maxOccurs="1"/>
2159         <xsd:element name="picture" type="CT_SheetBackgroundPicture" minOccurs="0" maxOccurs="1"/>
2160         <xsd:element name="oleObjects" type="CT_OleObjects" minOccurs="0" maxOccurs="1"/>
2161         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
2162     </xsd:sequence>
2163 </xsd:complexType>
2164 <xsd:complexType name="CT_Dialogsheet">
2165     <xsd:sequence>
2166         <xsd:element name="sheetPr" minOccurs="0" type="CT_SheetPr"/>
2167         <xsd:element name="sheetViews" minOccurs="0" type="CT_SheetViews"/>
2168         <xsd:element name="sheetFormatPr" minOccurs="0" type="CT_SheetFormatPr"/>

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2169     <xsd:element name="sheetProtection" type="CT_SheetProtection" minOccurs="0"
2170         maxOccurs="1"/>
2171     <xsd:element name="customSheetViews" minOccurs="0" type="CT_CustomSheetViews"/>
2172     <xsd:element name="printOptions" minOccurs="0" type="CT_PrintOptions"/>
2173     <xsd:element name="pageMargins" minOccurs="0" type="CT_PageMargins"/>
2174     <xsd:element name="pageSetup" minOccurs="0" type="CT_PageSetup"/>
2175     <xsd:element name="headerFooter" minOccurs="0" type="CT_HeaderFooter"/>
2176     <xsd:element name="drawing" minOccurs="0" type="CT_Drawing"/>
2177     <xsd:element name="drawingHF" type="CT_DrawingHF" minOccurs="0" maxOccurs="1"/>
2178     <xsd:element name="oleObjects" type="CT_OleObjects" minOccurs="0" maxOccurs="1"/>
2179     <xsd:element name="controls" type="CT_Controls" minOccurs="0" maxOccurs="1"/>
2180     <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
2181 </xsd:sequence>
2182 </xsd:complexType>
2183 <xsd:complexType name="CT_Worksheet">
2184     <xsd:sequence>
2185         <xsd:element name="sheetPr" type="CT_SheetPr" minOccurs="0" maxOccurs="1"/>
2186         <xsd:element name="dimension" type="CT_SheetDimension" minOccurs="0" maxOccurs="1"/>
2187         <xsd:element name="sheetViews" type="CT_SheetViews" minOccurs="0" maxOccurs="1"/>
2188         <xsd:element name="sheetFormatPr" type="CT_SheetFormatPr" minOccurs="0" maxOccurs="1"/>
2189         <xsd:element name="cols" type="CT_Cols" minOccurs="0" maxOccurs="unbounded"/>
2190         <xsd:element name="sheetData" type="CT_SheetData" minOccurs="1" maxOccurs="1"/>
2191         <xsd:element name="sheetCalcPr" type="CT_SheetCalcPr" minOccurs="0" maxOccurs="1"/>
2192         <xsd:element name="sheetProtection" type="CT_SheetProtection" minOccurs="0"
2193             maxOccurs="1"/>
2194         <xsd:element name="protectedRanges" type="CT_ProtectedRanges" minOccurs="0"
2195             maxOccurs="1"/>
2196         <xsd:element name="scenarios" type="CT_Scenarios" minOccurs="0" maxOccurs="1"/>
2197         <xsd:element name="autoFilter" type="CT_AutoFilter" minOccurs="0" maxOccurs="1"/>
2198         <xsd:element name="sortState" type="CT_SortState" minOccurs="0" maxOccurs="1"/>
2199         <xsd:element name="dataConsolidate" type="CT_DataConsolidate" minOccurs="0"
2200             maxOccurs="1"/>
2201         <xsd:element name="customSheetViews" type="CT_CustomSheetViews" minOccurs="0"
2202             maxOccurs="1"/>
2203         <xsd:element name="mergeCells" type="CT_MergeCells" minOccurs="0" maxOccurs="1"/>
2204         <xsd:element name="phoneticPr" type="CT_PhoneticPr" minOccurs="0" maxOccurs="1"/>
2205         <xsd:element name="conditionalFormatting" type="CT_ConditionalFormatting" minOccurs="0"
2206             maxOccurs="unbounded"/>
2207         <xsd:element name="dataValidations" type="CT_DataValidations" minOccurs="0"
2208             maxOccurs="1"/>
2209         <xsd:element name="hyperlinks" type="CT_Hyperlinks" minOccurs="0" maxOccurs="1"/>
2210         <xsd:element name="printOptions" type="CT_PrintOptions" minOccurs="0" maxOccurs="1"/>
2211         <xsd:element name="pageMargins" type="CT_PageMargins" minOccurs="0" maxOccurs="1"/>
2212         <xsd:element name="pageSetup" type="CT_PageSetup" minOccurs="0" maxOccurs="1"/>
2213         <xsd:element name="headerFooter" type="CT_HeaderFooter" minOccurs="0" maxOccurs="1"/>
2214         <xsd:element name="rowBreaks" type="CT_PageBreak" minOccurs="0" maxOccurs="1"/>
2215         <xsd:element name="colBreaks" type="CT_PageBreak" minOccurs="0" maxOccurs="1"/>
2216         <xsd:element name="customProperties" type="CT_CustomProperties" minOccurs="0"
2217             maxOccurs="1"/>
2218         <xsd:element name="cellWatches" type="CT_CellWatches" minOccurs="0" maxOccurs="1"/>
2219         <xsd:element name="ignoredErrors" type="CT_IgnoredErrors" minOccurs="0" maxOccurs="1"/>
2220         <xsd:element name="smartTags" type="CT_SmartTags" minOccurs="0" maxOccurs="1"/>
2221         <xsd:element name="drawing" type="CT_Drawing" minOccurs="0" maxOccurs="1"/>

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2222     <xsd:element name="drawingHF" type="CT_DrawingHF" minOccurs="0" maxOccurs="1"/>
2223     <xsd:element name="picture" type="CT_SheetBackgroundPicture" minOccurs="0" maxOccurs="1"/>
2224     <xsd:element name="oleObjects" type="CT_OleObjects" minOccurs="0" maxOccurs="1"/>
2225     <xsd:element name="controls" type="CT_Controls" minOccurs="0" maxOccurs="1"/>
2226     <xsd:element name="webPublishItems" type="CT_WebPublishItems" minOccurs="0"
2227         maxOccurs="1"/>
2228     <xsd:element name="tableParts" type="CT_TableParts" minOccurs="0" maxOccurs="1"/>
2229     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
2230 </xsd:sequence>
2231 </xsd:complexType>
2232 <xsd:complexType name="CT_SheetData">
2233     <xsd:sequence>
2234         <xsd:element name="row" type="CT_Row" minOccurs="0" maxOccurs="unbounded"/>
2235     </xsd:sequence>
2236 </xsd:complexType>
2237 <xsd:complexType name="CT_SheetCalcPr">
2238     <xsd:attribute name="fullCalcOnLoad" type="xsd:boolean" use="optional" default="false"/>
2239 </xsd:complexType>
2240 <xsd:complexType name="CT_SheetFormatPr">
2241     <xsd:attribute name="baseColWidth" type="xsd:unsignedInt" use="optional" default="8"/>
2242     <xsd:attribute name="defaultColWidth" type="xsd:double" use="optional"/>
2243     <xsd:attribute name="defaultRowHeight" type="xsd:double" use="required"/>
2244     <xsd:attribute name="customHeight" type="xsd:boolean" use="optional" default="false"/>
2245     <xsd:attribute name="zeroHeight" type="xsd:boolean" use="optional" default="false"/>
2246     <xsd:attribute name="thickTop" type="xsd:boolean" use="optional" default="false"/>
2247     <xsd:attribute name="thickBottom" type="xsd:boolean" use="optional" default="false"/>
2248     <xsd:attribute name="outlineLevelRow" type="xsd:unsignedByte" use="optional" default="0"/>
2249     <xsd:attribute name="outlineLevelCol" type="xsd:unsignedByte" use="optional" default="0"/>
2250 </xsd:complexType>
2251 <xsd:complexType name="CT_Cols">
2252     <xsd:sequence>
2253         <xsd:element name="col" type="CT_Col" minOccurs="1" maxOccurs="unbounded"/>
2254     </xsd:sequence>
2255 </xsd:complexType>
2256 <xsd:complexType name="CT_Col">
2257     <xsd:attribute name="min" type="xsd:unsignedInt" use="required"/>
2258     <xsd:attribute name="max" type="xsd:unsignedInt" use="required"/>
2259     <xsd:attribute name="width" type="xsd:double" use="optional"/>
2260     <xsd:attribute name="style" type="xsd:unsignedInt" use="optional" default="0"/>
2261     <xsd:attribute name="hidden" type="xsd:boolean" use="optional" default="false"/>
2262     <xsd:attribute name="bestFit" type="xsd:boolean" use="optional" default="false"/>
2263     <xsd:attribute name="customWidth" type="xsd:boolean" use="optional" default="false"/>
2264     <xsd:attribute name="phonetic" type="xsd:boolean" use="optional" default="false"/>
2265     <xsd:attribute name="outlineLevel" type="xsd:unsignedByte" use="optional" default="0"/>
2266     <xsd:attribute name="collapsed" type="xsd:boolean" use="optional" default="false"/>
2267 </xsd:complexType>
2268 <xsd:simpleType name="ST_CellSpan">
2269     <xsd:restriction base="xsd:string"/>
2270 </xsd:simpleType>
2271 <xsd:simpleType name="ST_CellSpans">
2272     <xsd:list itemType="ST_CellSpan"/>
2273 </xsd:simpleType>
2274 <xsd:complexType name="CT_Row">

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2275     <xsd:sequence>
2276       <xsd:element name="c" type="CT_Cell" minOccurs="0" maxOccurs="unbounded"/>
2277       <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
2278     </xsd:sequence>
2279     <xsd:attribute name="r" type="xsd:unsignedInt" use="optional"/>
2280     <xsd:attribute name="spans" type="ST_CellSpans" use="optional"/>
2281     <xsd:attribute name="s" type="xsd:unsignedInt" use="optional" default="0"/>
2282     <xsd:attribute name="customFormat" type="xsd:boolean" use="optional" default="false"/>
2283     <xsd:attribute name="ht" type="xsd:double" use="optional"/>
2284     <xsd:attribute name="hidden" type="xsd:boolean" use="optional" default="false"/>
2285     <xsd:attribute name="customHeight" type="xsd:boolean" use="optional" default="false"/>
2286     <xsd:attribute name="outlineLevel" type="xsd:unsignedByte" use="optional" default="0"/>
2287     <xsd:attribute name="collapsed" type="xsd:boolean" use="optional" default="false"/>
2288     <xsd:attribute name="thickTop" type="xsd:boolean" use="optional" default="false"/>
2289     <xsd:attribute name="thickBot" type="xsd:boolean" use="optional" default="false"/>
2290     <xsd:attribute name="ph" type="xsd:boolean" use="optional" default="false"/>
2291   </xsd:complexType>
2292   <xsd:complexType name="CT_Cell">
2293     <xsd:sequence>
2294       <xsd:element name="f" type="CT_CellFormula" minOccurs="0" maxOccurs="1"/>
2295       <xsd:element name="v" type="s:ST_Xstring" minOccurs="0" maxOccurs="1"/>
2296       <xsd:element name="is" type="CT_Rst" minOccurs="0" maxOccurs="1"/>
2297       <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
2298     </xsd:sequence>
2299     <xsd:attribute name="r" type="ST_CellRef" use="optional"/>
2300     <xsd:attribute name="s" type="xsd:unsignedInt" use="optional" default="0"/>
2301     <xsd:attribute name="t" type="ST_CellType" use="optional" default="n"/>
2302     <xsd:attribute name="cm" type="xsd:unsignedInt" use="optional" default="0"/>
2303     <xsd:attribute name="vm" type="xsd:unsignedInt" use="optional" default="0"/>
2304     <xsd:attribute name="ph" type="xsd:boolean" use="optional" default="false"/>
2305   </xsd:complexType>
2306   <xsd:simpleType name="ST_CellType">
2307     <xsd:restriction base="xsd:string">
2308       <xsd:enumeration value="b"/>
2309       <xsd:enumeration value="d"/>
2310       <xsd:enumeration value="n"/>
2311       <xsd:enumeration value="e"/>
2312       <xsd:enumeration value="s"/>
2313       <xsd:enumeration value="str"/>
2314       <xsd:enumeration value="inlineStr"/>
2315     </xsd:restriction>
2316   </xsd:simpleType>
2317   <xsd:simpleType name="ST_CellFormulaType">
2318     <xsd:restriction base="xsd:string">
2319       <xsd:enumeration value="normal"/>
2320       <xsd:enumeration value="array"/>
2321       <xsd:enumeration value="dataTable"/>
2322       <xsd:enumeration value="shared"/>
2323     </xsd:restriction>
2324   </xsd:simpleType>
2325   <xsd:complexType name="CT_SheetPr">
2326     <xsd:sequence>
2327       <xsd:element name="tabColor" type="CT_Color" minOccurs="0" maxOccurs="1"/>

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2328     <xsd:element name="outlinePr" type="CT_OutlinePr" minOccurs="0" maxOccurs="1"/>
2329     <xsd:element name="pageSetUpPr" type="CT_PageSetUpPr" minOccurs="0" maxOccurs="1"/>
2330 </xsd:sequence>
2331 <xsd:attribute name="syncHorizontal" type="xsd:boolean" use="optional" default="false"/>
2332 <xsd:attribute name="syncVertical" type="xsd:boolean" use="optional" default="false"/>
2333 <xsd:attribute name="syncRef" type="ST_Ref" use="optional"/>
2334 <xsd:attribute name="transitionEvaluation" type="xsd:boolean" use="optional" default="false"/>
2335 <xsd:attribute name="transitionEntry" type="xsd:boolean" use="optional" default="false"/>
2336 <xsd:attribute name="published" type="xsd:boolean" use="optional" default="true"/>
2337 <xsd:attribute name="codeName" type="xsd:string" use="optional"/>
2338 <xsd:attribute name="filterMode" type="xsd:boolean" use="optional" default="false"/>
2339 <xsd:attribute name="enableFormatConditionsCalculation" type="xsd:boolean" use="optional"
2340     default="true"/>
2341 </xsd:complexType>
2342 <xsd:complexType name="CT_SheetDimension">
2343     <xsd:attribute name="ref" type="ST_Ref" use="required"/>
2344 </xsd:complexType>
2345 <xsd:complexType name="CT_SheetViews">
2346     <xsd:sequence>
2347         <xsd:element name="sheetView" type="CT_SheetView" minOccurs="1" maxOccurs="unbounded"/>
2348         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
2349     </xsd:sequence>
2350 </xsd:complexType>
2351 <xsd:complexType name="CT_SheetView">
2352     <xsd:sequence>
2353         <xsd:element name="pane" type="CT_Pane" minOccurs="0" maxOccurs="1"/>
2354         <xsd:element name="selection" type="CT_Selection" minOccurs="0" maxOccurs="4"/>
2355         <xsd:element name="pivotSelection" type="CT_PivotSelection" minOccurs="0" maxOccurs="4"/>
2356         <xsd:element name="extLst" minOccurs="0" maxOccurs="1" type="CT_ExtensionList"/>
2357     </xsd:sequence>
2358     <xsd:attribute name="windowProtection" type="xsd:boolean" use="optional" default="false"/>
2359     <xsd:attribute name="showFormulas" type="xsd:boolean" use="optional" default="false"/>
2360     <xsd:attribute name="showGridLines" type="xsd:boolean" use="optional" default="true"/>
2361     <xsd:attribute name="showRowColHeaders" type="xsd:boolean" use="optional" default="true"/>
2362     <xsd:attribute name="showZeros" type="xsd:boolean" use="optional" default="true"/>
2363     <xsd:attribute name="rightToLeft" type="xsd:boolean" use="optional" default="false"/>
2364     <xsd:attribute name="tabSelected" type="xsd:boolean" use="optional" default="false"/>
2365     <xsd:attribute name="showRuler" type="xsd:boolean" use="optional" default="true"/>
2366     <xsd:attribute name="showOutlineSymbols" type="xsd:boolean" use="optional" default="true"/>
2367     <xsd:attribute name="defaultGridColor" type="xsd:boolean" use="optional" default="true"/>
2368     <xsd:attribute name="showWhiteSpace" type="xsd:boolean" use="optional" default="true"/>
2369     <xsd:attribute name="view" type="ST_SheetViewType" use="optional" default="normal"/>
2370     <xsd:attribute name="topLeftCell" type="ST_CellRef" use="optional"/>
2371     <xsd:attribute name="colorId" type="xsd:unsignedInt" use="optional" default="64"/>
2372     <xsd:attribute name="zoomScale" type="xsd:unsignedInt" use="optional" default="100"/>
2373     <xsd:attribute name="zoomScaleNormal" type="xsd:unsignedInt" use="optional" default="0"/>
2374     <xsd:attribute name="zoomScaleSheetLayoutView" type="xsd:unsignedInt" use="optional"
2375         default="0"/>
2376     <xsd:attribute name="zoomScalePageLayoutView" type="xsd:unsignedInt" use="optional"
2377         default="0"/>
2378     <xsd:attribute name="workbookViewId" type="xsd:unsignedInt" use="required"/>
2379 </xsd:complexType>
2380 <xsd:complexType name="CT_Pane">

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2381     <xsd:attribute name="xSplit" type="xsd:double" use="optional" default="0"/>
2382     <xsd:attribute name="ySplit" type="xsd:double" use="optional" default="0"/>
2383     <xsd:attribute name="topLeftCell" type="ST_CellRef" use="optional"/>
2384     <xsd:attribute name="activePane" type="ST_Pane" use="optional" default="topLeft"/>
2385     <xsd:attribute name="state" type="ST_PaneState" use="optional" default="split"/>
2386 </xsd:complexType>
2387 <xsd:complexType name="CT_PivotSelection">
2388     <xsd:sequence>
2389         <xsd:element name="pivotArea" type="CT_PivotArea"/>
2390     </xsd:sequence>
2391     <xsd:attribute name="pane" type="ST_Pane" use="optional" default="topLeft"/>
2392     <xsd:attribute name="showHeader" type="xsd:boolean" default="false"/>
2393     <xsd:attribute name="label" type="xsd:boolean" default="false"/>
2394     <xsd:attribute name="data" type="xsd:boolean" default="false"/>
2395     <xsd:attribute name="extendable" type="xsd:boolean" default="false"/>
2396     <xsd:attribute name="count" type="xsd:unsignedInt" default="0"/>
2397     <xsd:attribute name="axis" type="ST_Axis" use="optional"/>
2398     <xsd:attribute name="dimension" type="xsd:unsignedInt" default="0"/>
2399     <xsd:attribute name="start" type="xsd:unsignedInt" default="0"/>
2400     <xsd:attribute name="min" type="xsd:unsignedInt" default="0"/>
2401     <xsd:attribute name="max" type="xsd:unsignedInt" default="0"/>
2402     <xsd:attribute name="activeRow" type="xsd:unsignedInt" default="0"/>
2403     <xsd:attribute name="activeCol" type="xsd:unsignedInt" default="0"/>
2404     <xsd:attribute name="previousRow" type="xsd:unsignedInt" default="0"/>
2405     <xsd:attribute name="previousCol" type="xsd:unsignedInt" default="0"/>
2406     <xsd:attribute name="click" type="xsd:unsignedInt" default="0"/>
2407     <xsd:attribute ref="r:id" use="optional"/>
2408 </xsd:complexType>
2409 <xsd:complexType name="CT_Selection">
2410     <xsd:attribute name="pane" type="ST_Pane" use="optional" default="topLeft"/>
2411     <xsd:attribute name="activeCell" type="ST_CellRef" use="optional"/>
2412     <xsd:attribute name="activeCellId" type="xsd:unsignedInt" use="optional" default="0"/>
2413     <xsd:attribute name="sqref" type="ST_Sqref" use="optional" default="A1"/>
2414 </xsd:complexType>
2415 <xsd:simpleType name="ST_Pane">
2416     <xsd:restriction base="xsd:string">
2417         <xsd:enumeration value="bottomRight"/>
2418         <xsd:enumeration value="topRight"/>
2419         <xsd:enumeration value="bottomLeft"/>
2420         <xsd:enumeration value="topLeft"/>
2421     </xsd:restriction>
2422 </xsd:simpleType>
2423 <xsd:complexType name="CT_PageBreak">
2424     <xsd:sequence>
2425         <xsd:element name="brk" type="CT_Break" minOccurs="0" maxOccurs="unbounded"/>
2426     </xsd:sequence>
2427     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional" default="0"/>
2428     <xsd:attribute name="manualBreakCount" type="xsd:unsignedInt" use="optional" default="0"/>
2429 </xsd:complexType>
2430 <xsd:complexType name="CT_Break">
2431     <xsd:attribute name="id" type="xsd:unsignedInt" use="optional" default="0"/>
2432     <xsd:attribute name="min" type="xsd:unsignedInt" use="optional" default="0"/>
2433     <xsd:attribute name="max" type="xsd:unsignedInt" use="optional" default="0"/>

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2434     <xsd:attribute name="man" type="xsd:boolean" use="optional" default="false"/>
2435     <xsd:attribute name="pt" type="xsd:boolean" use="optional" default="false"/>
2436 </xsd:complexType>
2437 <xsd:simpleType name="ST_SheetViewType">
2438     <xsd:restriction base="xsd:string">
2439         <xsd:enumeration value="normal"/>
2440         <xsd:enumeration value="pageBreakPreview"/>
2441         <xsd:enumeration value="pageLayout"/>
2442     </xsd:restriction>
2443 </xsd:simpleType>
2444 <xsd:complexType name="CT_OutlinePr">
2445     <xsd:attribute name="applyStyles" type="xsd:boolean" use="optional" default="false"/>
2446     <xsd:attribute name="summaryBelow" type="xsd:boolean" use="optional" default="true"/>
2447     <xsd:attribute name="summaryRight" type="xsd:boolean" use="optional" default="true"/>
2448     <xsd:attribute name="showOutlineSymbols" type="xsd:boolean" use="optional" default="true"/>
2449 </xsd:complexType>
2450 <xsd:complexType name="CT_PageSetUpPr">
2451     <xsd:attribute name="autoPageBreaks" type="xsd:boolean" use="optional" default="true"/>
2452     <xsd:attribute name="fitToPage" type="xsd:boolean" use="optional" default="false"/>
2453 </xsd:complexType>
2454 <xsd:complexType name="CT_DataConsolidate">
2455     <xsd:sequence>
2456         <xsd:element name="dataRefs" type="CT_DataRefs" minOccurs="0" maxOccurs="1"/>
2457     </xsd:sequence>
2458     <xsd:attribute name="function" type="ST_DataConsolidateFunction" use="optional"
2459         default="sum"/>
2460     <xsd:attribute name="startLabels" type="xsd:boolean" use="optional" default="false"/>
2461     <xsd:attribute name="topLabels" type="xsd:boolean" use="optional" default="false"/>
2462     <xsd:attribute name="link" type="xsd:boolean" use="optional" default="false"/>
2463 </xsd:complexType>
2464 <xsd:simpleType name="ST_DataConsolidateFunction">
2465     <xsd:restriction base="xsd:string">
2466         <xsd:enumeration value="average"/>
2467         <xsd:enumeration value="count"/>
2468         <xsd:enumeration value="countNums"/>
2469         <xsd:enumeration value="max"/>
2470         <xsd:enumeration value="min"/>
2471         <xsd:enumeration value="product"/>
2472         <xsd:enumeration value="stdDev"/>
2473         <xsd:enumeration value="stdDevp"/>
2474         <xsd:enumeration value="sum"/>
2475         <xsd:enumeration value="var"/>
2476         <xsd:enumeration value="varp"/>
2477     </xsd:restriction>
2478 </xsd:simpleType>
2479 <xsd:complexType name="CT_DataRefs">
2480     <xsd:sequence>
2481         <xsd:element name="dataRef" type="CT_DataRef" minOccurs="0" maxOccurs="unbounded"/>
2482     </xsd:sequence>
2483     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
2484 </xsd:complexType>
2485 <xsd:complexType name="CT_DataRef">
2486     <xsd:attribute name="ref" type="ST_Ref" use="optional"/>

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2487     <xsd:attribute name="name" type="s:ST Xstring" use="optional"/>
2488     <xsd:attribute name="sheet" type="s:ST Xstring" use="optional"/>
2489     <xsd:attribute ref="r:id" use="optional"/>
2490 </xsd:complexType>
2491 <xsd:complexType name="CT_MergeCells">
2492     <xsd:sequence>
2493         <xsd:element name="mergeCell" type="CT MergeCell" minOccurs="1" maxOccurs="unbounded"/>
2494     </xsd:sequence>
2495     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
2496 </xsd:complexType>
2497 <xsd:complexType name="CT_MergeCell">
2498     <xsd:attribute name="ref" type="ST Ref" use="required"/>
2499 </xsd:complexType>
2500 <xsd:complexType name="CT_SmartTags">
2501     <xsd:sequence>
2502         <xsd:element name="cellSmartTags" type="CT CellSmartTags" minOccurs="1"
2503             maxOccurs="unbounded"/>
2504     </xsd:sequence>
2505 </xsd:complexType>
2506 <xsd:complexType name="CT_CellSmartTags">
2507     <xsd:sequence>
2508         <xsd:element name="cellSmartTag" type="CT CellSmartTag" minOccurs="1"
2509             maxOccurs="unbounded"/>
2510     </xsd:sequence>
2511     <xsd:attribute name="r" type="ST CellRef" use="required"/>
2512 </xsd:complexType>
2513 <xsd:complexType name="CT_CellSmartTag">
2514     <xsd:sequence>
2515         <xsd:element name="cellSmartTagPr" minOccurs="0" maxOccurs="unbounded"
2516             type="CT CellSmartTagPr" />
2517     </xsd:sequence>
2518     <xsd:attribute name="type" type="xsd:unsignedInt" use="required"/>
2519     <xsd:attribute name="deleted" type="xsd:boolean" use="optional" default="false"/>
2520     <xsd:attribute name="xmlBased" type="xsd:boolean" use="optional" default="false"/>
2521 </xsd:complexType>
2522 <xsd:complexType name="CT_CellSmartTagPr">
2523     <xsd:attribute name="key" type="s:ST Xstring" use="required"/>
2524     <xsd:attribute name="val" type="s:ST Xstring" use="required"/>
2525 </xsd:complexType>
2526 <xsd:complexType name="CT_Drawing">
2527     <xsd:attribute ref="r:id" use="required"/>
2528 </xsd:complexType>
2529 <xsd:complexType name="CT_DrawingHF">
2530     <xsd:attribute ref="r:id" use="required"/>
2531     <xsd:attribute name="lho" type="xsd:unsignedInt" use="optional"/>
2532     <xsd:attribute name="lhe" type="xsd:unsignedInt" use="optional"/>
2533     <xsd:attribute name="lhf" type="xsd:unsignedInt" use="optional"/>
2534     <xsd:attribute name="cho" type="xsd:unsignedInt" use="optional"/>
2535     <xsd:attribute name="che" type="xsd:unsignedInt" use="optional"/>
2536     <xsd:attribute name="chf" type="xsd:unsignedInt" use="optional"/>
2537     <xsd:attribute name="rho" type="xsd:unsignedInt" use="optional"/>
2538     <xsd:attribute name="rhe" type="xsd:unsignedInt" use="optional"/>
2539     <xsd:attribute name="rhf" type="xsd:unsignedInt" use="optional"/>

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2540     <xsd:attribute name="lfo" type="xsd:unsignedInt" use="optional"/>
2541     <xsd:attribute name="lfe" type="xsd:unsignedInt" use="optional"/>
2542     <xsd:attribute name="lff" type="xsd:unsignedInt" use="optional"/>
2543     <xsd:attribute name="cfo" type="xsd:unsignedInt" use="optional"/>
2544     <xsd:attribute name="cfe" type="xsd:unsignedInt" use="optional"/>
2545     <xsd:attribute name="cff" type="xsd:unsignedInt" use="optional"/>
2546     <xsd:attribute name="rfo" type="xsd:unsignedInt" use="optional"/>
2547     <xsd:attribute name="rfe" type="xsd:unsignedInt" use="optional"/>
2548     <xsd:attribute name="rff" type="xsd:unsignedInt" use="optional"/>
2549 </xsd:complexType>
2550 <xsd:complexType name="CT_CustomSheetViews">
2551     <xsd:sequence>
2552         <xsd:element name="customSheetView" minOccurs="1" maxOccurs="unbounded"
2553             type="CT_CustomSheetView"/>
2554     </xsd:sequence>
2555 </xsd:complexType>
2556 <xsd:complexType name="CT_CustomSheetView">
2557     <xsd:sequence>
2558         <xsd:element name="pane" type="CT_Pane" minOccurs="0" maxOccurs="1"/>
2559         <xsd:element name="selection" type="CT_Selection" minOccurs="0" maxOccurs="1"/>
2560         <xsd:element name="rowBreaks" type="CT_PageBreak" minOccurs="0" maxOccurs="1"/>
2561         <xsd:element name="colBreaks" type="CT_PageBreak" minOccurs="0" maxOccurs="1"/>
2562         <xsd:element name="pageMargins" type="CT_PageMargins" minOccurs="0" maxOccurs="1"/>
2563         <xsd:element name="printOptions" type="CT_PrintOptions" minOccurs="0" maxOccurs="1"/>
2564         <xsd:element name="pageSetup" type="CT_PageSetup" minOccurs="0" maxOccurs="1"/>
2565         <xsd:element name="headerFooter" type="CT_HeaderFooter" minOccurs="0" maxOccurs="1"/>
2566         <xsd:element name="autoFilter" type="CT_AutoFilter" minOccurs="0" maxOccurs="1"/>
2567         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
2568     </xsd:sequence>
2569     <xsd:attribute name="guid" type="s:ST_Guid" use="required"/>
2570     <xsd:attribute name="scale" type="xsd:unsignedInt" default="100"/>
2571     <xsd:attribute name="colorId" type="xsd:unsignedInt" default="64"/>
2572     <xsd:attribute name="showPageBreaks" type="xsd:boolean" use="optional" default="false"/>
2573     <xsd:attribute name="showFormulas" type="xsd:boolean" use="optional" default="false"/>
2574     <xsd:attribute name="showGridLines" type="xsd:boolean" use="optional" default="true"/>
2575     <xsd:attribute name="showRowCol" type="xsd:boolean" use="optional" default="true"/>
2576     <xsd:attribute name="outlineSymbols" type="xsd:boolean" use="optional" default="true"/>
2577     <xsd:attribute name="zeroValues" type="xsd:boolean" use="optional" default="true"/>
2578     <xsd:attribute name="fitToPage" type="xsd:boolean" use="optional" default="false"/>
2579     <xsd:attribute name="printArea" type="xsd:boolean" use="optional" default="false"/>
2580     <xsd:attribute name="filter" type="xsd:boolean" use="optional" default="false"/>
2581     <xsd:attribute name="showAutoFilter" type="xsd:boolean" use="optional" default="false"/>
2582     <xsd:attribute name="hiddenRows" type="xsd:boolean" use="optional" default="false"/>
2583     <xsd:attribute name="hiddenColumns" type="xsd:boolean" use="optional" default="false"/>
2584     <xsd:attribute name="state" type="ST_SheetState" default="visible"/>
2585     <xsd:attribute name="filterUnique" type="xsd:boolean" use="optional" default="false"/>
2586     <xsd:attribute name="view" type="ST_SheetViewType" default="normal"/>
2587     <xsd:attribute name="showRuler" type="xsd:boolean" use="optional" default="true"/>
2588     <xsd:attribute name="topLeftCell" type="ST_CellRef" use="optional"/>
2589 </xsd:complexType>
2590 <xsd:complexType name="CT_DataValidations">
2591     <xsd:sequence>

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2592     <xsd:element name="dataValidation" type="CT_DataValidation" minOccurs="1"
2593         maxOccurs="unbounded"/>
2594 </xsd:sequence>
2595 <xsd:attribute name="disablePrompts" type="xsd:boolean" use="optional" default="false"/>
2596 <xsd:attribute name="xWindow" type="xsd:unsignedInt" use="optional"/>
2597 <xsd:attribute name="yWindow" type="xsd:unsignedInt" use="optional"/>
2598 <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
2599 </xsd:complexType>
2600 <xsd:complexType name="CT_DataValidation">
2601     <xsd:sequence>
2602         <xsd:element name="formula1" type="ST_Formula" minOccurs="0" maxOccurs="1"/>
2603         <xsd:element name="formula2" type="ST_Formula" minOccurs="0" maxOccurs="1"/>
2604     </xsd:sequence>
2605     <xsd:attribute name="type" type="ST_DataValidationType" use="optional" default="none"/>
2606     <xsd:attribute name="errorStyle" type="ST_DataValidationErrorStyle" use="optional"
2607         default="stop"/>
2608     <xsd:attribute name="imeMode" type="ST_DataValidationImeMode" use="optional"
2609         default="noControl"/>
2610     <xsd:attribute name="operator" type="ST_DataValidationOperator" use="optional"
2611         default="between"/>
2612     <xsd:attribute name="allowBlank" type="xsd:boolean" use="optional" default="false"/>
2613     <xsd:attribute name="showDropDown" type="xsd:boolean" use="optional" default="false"/>
2614     <xsd:attribute name="showInputMessage" type="xsd:boolean" use="optional" default="false"/>
2615     <xsd:attribute name="showErrorMessage" type="xsd:boolean" use="optional" default="false"/>
2616     <xsd:attribute name="errorTitle" type="s:ST_Xstring" use="optional"/>
2617     <xsd:attribute name="error" type="s:ST_Xstring" use="optional"/>
2618     <xsd:attribute name="promptTitle" type="s:ST_Xstring" use="optional"/>
2619     <xsd:attribute name="prompt" type="s:ST_Xstring" use="optional"/>
2620     <xsd:attribute name="sqref" type="ST_Sqref" use="required"/>
2621 </xsd:complexType>
2622 <xsd:simpleType name="ST_DataValidationType">
2623     <xsd:restriction base="xsd:string">
2624         <xsd:enumeration value="none"/>
2625         <xsd:enumeration value="whole"/>
2626         <xsd:enumeration value="decimal"/>
2627         <xsd:enumeration value="list"/>
2628         <xsd:enumeration value="date"/>
2629         <xsd:enumeration value="time"/>
2630         <xsd:enumeration value="textLength"/>
2631         <xsd:enumeration value="custom"/>
2632     </xsd:restriction>
2633 </xsd:simpleType>
2634 <xsd:simpleType name="ST_DataValidationOperator">
2635     <xsd:restriction base="xsd:string">
2636         <xsd:enumeration value="between"/>
2637         <xsd:enumeration value="notBetween"/>
2638         <xsd:enumeration value="equal"/>
2639         <xsd:enumeration value="notEqual"/>
2640         <xsd:enumeration value="lessThan"/>
2641         <xsd:enumeration value="lessThanOrEqual"/>
2642         <xsd:enumeration value="greaterThan"/>
2643         <xsd:enumeration value="greaterThanOrEqual"/>
2644     </xsd:restriction>

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2645 </xsd:simpleType>
2646 <xsd:simpleType name="ST_DataValidationErrorStyle">
2647     <xsd:restriction base="xsd:string">
2648         <xsd:enumeration value="stop"/>
2649         <xsd:enumeration value="warning"/>
2650         <xsd:enumeration value="information"/>
2651     </xsd:restriction>
2652 </xsd:simpleType>
2653 <xsd:simpleType name="ST_DataValidationImeMode">
2654     <xsd:restriction base="xsd:string">
2655         <xsd:enumeration value="noControl"/>
2656         <xsd:enumeration value="off"/>
2657         <xsd:enumeration value="on"/>
2658         <xsd:enumeration value="disabled"/>
2659         <xsd:enumeration value="hiragana"/>
2660         <xsd:enumeration value="fullKatakana"/>
2661         <xsd:enumeration value="halfKatakana"/>
2662         <xsd:enumeration value="fullAlpha"/>
2663         <xsd:enumeration value="halfAlpha"/>
2664         <xsd:enumeration value="fullHangul"/>
2665         <xsd:enumeration value="halfHangul"/>
2666     </xsd:restriction>
2667 </xsd:simpleType>
2668 <xsd:simpleType name="ST_CfType">
2669     <xsd:restriction base="xsd:string">
2670         <xsd:enumeration value="expression"/>
2671         <xsd:enumeration value="cellIs"/>
2672         <xsd:enumeration value="colorScale"/>
2673         <xsd:enumeration value="dataBar"/>
2674         <xsd:enumeration value="iconSet"/>
2675         <xsd:enumeration value="top10"/>
2676         <xsd:enumeration value="uniqueValues"/>
2677         <xsd:enumeration value="duplicateValues"/>
2678         <xsd:enumeration value="containsText"/>
2679         <xsd:enumeration value="notContainsText"/>
2680         <xsd:enumeration value="beginsWith"/>
2681         <xsd:enumeration value="endsWith"/>
2682         <xsd:enumeration value="containsBlanks"/>
2683         <xsd:enumeration value="notContainsBlanks"/>
2684         <xsd:enumeration value="containsErrors"/>
2685         <xsd:enumeration value="notContainsErrors"/>
2686         <xsd:enumeration value="timePeriod"/>
2687         <xsd:enumeration value="aboveAverage"/>
2688     </xsd:restriction>
2689 </xsd:simpleType>
2690 <xsd:simpleType name="ST_TimePeriod">
2691     <xsd:restriction base="xsd:string">
2692         <xsd:enumeration value="today"/>
2693         <xsd:enumeration value="yesterday"/>
2694         <xsd:enumeration value="tomorrow"/>
2695         <xsd:enumeration value="last7Days"/>
2696         <xsd:enumeration value="thisMonth"/>
2697         <xsd:enumeration value="lastMonth"/>

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2698         <xsd:enumeration value="nextMonth"/>
2699         <xsd:enumeration value="thisWeek"/>
2700         <xsd:enumeration value="lastWeek"/>
2701         <xsd:enumeration value="nextWeek"/>
2702     </xsd:restriction>
2703 </xsd:simpleType>
2704 <xsd:simpleType name="ST_ConditionalFormattingOperator">
2705     <xsd:restriction base="xsd:string">
2706         <xsd:enumeration value="lessThan"/>
2707         <xsd:enumeration value="lessThanOrEqual"/>
2708         <xsd:enumeration value="equal"/>
2709         <xsd:enumeration value="notEqual"/>
2710         <xsd:enumeration value="greaterThanOrEqual"/>
2711         <xsd:enumeration value="greaterThan"/>
2712         <xsd:enumeration value="between"/>
2713         <xsd:enumeration value="notBetween"/>
2714         <xsd:enumeration value="containsText"/>
2715         <xsd:enumeration value="notContains"/>
2716         <xsd:enumeration value="beginsWith"/>
2717         <xsd:enumeration value="endsWith"/>
2718     </xsd:restriction>
2719 </xsd:simpleType>
2720 <xsd:simpleType name="ST_CfvoType">
2721     <xsd:restriction base="xsd:string">
2722         <xsd:enumeration value="num"/>
2723         <xsd:enumeration value="percent"/>
2724         <xsd:enumeration value="max"/>
2725         <xsd:enumeration value="min"/>
2726         <xsd:enumeration value="formula"/>
2727         <xsd:enumeration value="percentile"/>
2728     </xsd:restriction>
2729 </xsd:simpleType>
2730 <xsd:complexType name="CT_ConditionalFormatting">
2731     <xsd:sequence>
2732         <xsd:element name="cfRule" type="CT_CfRule" minOccurs="1" maxOccurs="unbounded"/>
2733         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
2734     </xsd:sequence>
2735     <xsd:attribute name="pivot" type="xsd:boolean" default="false"/>
2736     <xsd:attribute name="sqref" type="ST_Sqref"/>
2737 </xsd:complexType>
2738 <xsd:complexType name="CT_CfRule">
2739     <xsd:sequence>
2740         <xsd:element name="formula" type="ST_Formula" minOccurs="0" maxOccurs="3"/>
2741         <xsd:element name="colorScale" type="CT_ColorScale" minOccurs="0" maxOccurs="1"/>
2742         <xsd:element name="dataBar" type="CT_DataBar" minOccurs="0" maxOccurs="1"/>
2743         <xsd:element name="iconSet" type="CT_IconSet" minOccurs="0" maxOccurs="1"/>
2744         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
2745     </xsd:sequence>
2746     <xsd:attribute name="type" type="ST_CfType"/>
2747     <xsd:attribute name="dxfId" type="ST_DxfId" use="optional"/>
2748     <xsd:attribute name="priority" type="xsd:int" use="required"/>
2749     <xsd:attribute name="stopIfTrue" type="xsd:boolean" use="optional" default="false"/>
2750     <xsd:attribute name="aboveAverage" type="xsd:boolean" use="optional" default="true"/>

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2751     <xsd:attribute name="percent" type="xsd:boolean" use="optional" default="false"/>
2752     <xsd:attribute name="bottom" type="xsd:boolean" use="optional" default="false"/>
2753     <xsd:attribute name="operator" type="ST_ConditionalFormattingOperator" use="optional"/>
2754     <xsd:attribute name="text" type="xsd:string" use="optional"/>
2755     <xsd:attribute name="timePeriod" type="ST_TimePeriod" use="optional"/>
2756     <xsd:attribute name="rank" type="xsd:unsignedInt" use="optional"/>
2757     <xsd:attribute name="stdDev" type="xsd:int" use="optional"/>
2758     <xsd:attribute name="equalAverage" type="xsd:boolean" use="optional" default="false"/>
2759 </xsd:complexType>
2760 <xsd:complexType name="CT_Hyperlinks">
2761     <xsd:sequence>
2762         <xsd:element name="hyperlink" type="CT_Hyperlink" minOccurs="1" maxOccurs="unbounded"/>
2763     </xsd:sequence>
2764 </xsd:complexType>
2765 <xsd:complexType name="CT_Hyperlink">
2766     <xsd:attribute name="ref" type="ST_Ref" use="required"/>
2767     <xsd:attribute ref="r:id" use="optional"/>
2768     <xsd:attribute name="location" type="s:ST_Xstring" use="optional"/>
2769     <xsd:attribute name="tooltip" type="s:ST_Xstring" use="optional"/>
2770     <xsd:attribute name="display" type="s:ST_Xstring" use="optional"/>
2771 </xsd:complexType>
2772 <xsd:complexType name="CT_CellFormula">
2773     <xsd:simpleContent>
2774         <xsd:extension base="ST_Formula">
2775             <xsd:attribute name="t" type="ST_CellFormulaType" use="optional" default="normal"/>
2776             <xsd:attribute name="aca" type="xsd:boolean" use="optional" default="false"/>
2777             <xsd:attribute name="ref" type="ST_Ref" use="optional"/>
2778             <xsd:attribute name="dt2D" type="xsd:boolean" use="optional" default="false"/>
2779             <xsd:attribute name="dtr" type="xsd:boolean" use="optional" default="false"/>
2780             <xsd:attribute name="del1" type="xsd:boolean" use="optional" default="false"/>
2781             <xsd:attribute name="del2" type="xsd:boolean" use="optional" default="false"/>
2782             <xsd:attribute name="r1" type="ST_CellRef" use="optional"/>
2783             <xsd:attribute name="r2" type="ST_CellRef" use="optional"/>
2784             <xsd:attribute name="ca" type="xsd:boolean" use="optional" default="false"/>
2785             <xsd:attribute name="si" type="xsd:unsignedInt" use="optional"/>
2786             <xsd:attribute name="bx" type="xsd:boolean" use="optional" default="false"/>
2787         </xsd:extension>
2788     </xsd:simpleContent>
2789 </xsd:complexType>
2790 <xsd:complexType name="CT_ColorScale">
2791     <xsd:sequence>
2792         <xsd:element name="cfvo" type="CT_Cfvo" minOccurs="2" maxOccurs="unbounded"/>
2793         <xsd:element name="color" type="CT_Color" minOccurs="2" maxOccurs="unbounded"/>
2794     </xsd:sequence>
2795 </xsd:complexType>
2796 <xsd:complexType name="CT_DataBar">
2797     <xsd:sequence>
2798         <xsd:element name="cfvo" type="CT_Cfvo" minOccurs="2" maxOccurs="2"/>
2799         <xsd:element name="color" type="CT_Color" minOccurs="1" maxOccurs="1"/>
2800     </xsd:sequence>
2801     <xsd:attribute name="minLength" type="xsd:unsignedInt" use="optional" default="10"/>
2802     <xsd:attribute name="maxLength" type="xsd:unsignedInt" use="optional" default="90"/>
2803     <xsd:attribute name="showValue" type="xsd:boolean" use="optional" default="true"/>

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2804 </xsd:complexType>
2805 <xsd:complexType name="CT_IconSet">
2806   <xsd:sequence>
2807     <xsd:element name="cfvo" type="CT_Cfvo" minOccurs="2" maxOccurs="unbounded"/>
2808   </xsd:sequence>
2809   <xsd:attribute name="iconSet" type="ST_IconSetType" use="optional" default="3TrafficLights1"/>
2810   <xsd:attribute name="showValue" type="xsd:boolean" use="optional" default="true"/>
2811   <xsd:attribute name="percent" type="xsd:boolean" default="true"/>
2812   <xsd:attribute name="reverse" type="xsd:boolean" use="optional" default="false"/>
2813 </xsd:complexType>
2814 <xsd:complexType name="CT_Cfvo">
2815   <xsd:sequence>
2816     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
2817   </xsd:sequence>
2818   <xsd:attribute name="type" type="ST_CfvoType" use="required"/>
2819   <xsd:attribute name="val" type="s:ST_Xstring" use="optional"/>
2820   <xsd:attribute name="gte" type="xsd:boolean" use="optional" default="true"/>
2821 </xsd:complexType>
2822 <xsd:complexType name="CT_PageMargins">
2823   <xsd:attribute name="left" type="xsd:double" use="required"/>
2824   <xsd:attribute name="right" type="xsd:double" use="required"/>
2825   <xsd:attribute name="top" type="xsd:double" use="required"/>
2826   <xsd:attribute name="bottom" type="xsd:double" use="required"/>
2827   <xsd:attribute name="header" type="xsd:double" use="required"/>
2828   <xsd:attribute name="footer" type="xsd:double" use="required"/>
2829 </xsd:complexType>
2830 <xsd:complexType name="CT_PrintOptions">
2831   <xsd:attribute name="horizontalCentered" type="xsd:boolean" use="optional" default="false"/>
2832   <xsd:attribute name="verticalCentered" type="xsd:boolean" use="optional" default="false"/>
2833   <xsd:attribute name="headings" type="xsd:boolean" use="optional" default="false"/>
2834   <xsd:attribute name="gridLines" type="xsd:boolean" use="optional" default="false"/>
2835   <xsd:attribute name="gridLinesSet" type="xsd:boolean" use="optional" default="true"/>
2836 </xsd:complexType>
2837 <xsd:complexType name="CT_PageSetup">
2838   <xsd:attribute name="paperSize" type="xsd:unsignedInt" use="optional" default="1"/>
2839   <xsd:attribute name="paperHeight" type="s:ST_PositiveUniversalMeasure" use="optional"/>
2840   <xsd:attribute name="paperWidth" type="s:ST_PositiveUniversalMeasure" use="optional"/>
2841   <xsd:attribute name="scale" type="xsd:unsignedInt" use="optional" default="100"/>
2842   <xsd:attribute name="firstPageNumber" type="xsd:unsignedInt" use="optional" default="1"/>
2843   <xsd:attribute name="fitToWidth" type="xsd:unsignedInt" use="optional" default="1"/>
2844   <xsd:attribute name="fitToHeight" type="xsd:unsignedInt" use="optional" default="1"/>
2845   <xsd:attribute name="pageOrder" type="ST_PageOrder" use="optional" default="downThenOver"/>
2846   <xsd:attribute name="orientation" type="ST_Orientation" use="optional" default="default"/>
2847   <xsd:attribute name="usePrinterDefaults" type="xsd:boolean" use="optional" default="true"/>
2848   <xsd:attribute name="blackAndWhite" type="xsd:boolean" use="optional" default="false"/>
2849   <xsd:attribute name="draft" type="xsd:boolean" use="optional" default="false"/>
2850   <xsd:attribute name="cellComments" type="ST_CellComments" use="optional" default="none"/>
2851   <xsd:attribute name="useFirstPageNumber" type="xsd:boolean" use="optional" default="false"/>
2852   <xsd:attribute name="errors" type="ST_PrintError" use="optional" default="displayed"/>
2853   <xsd:attribute name="horizontalDpi" type="xsd:unsignedInt" use="optional" default="600"/>
2854   <xsd:attribute name="verticalDpi" type="xsd:unsignedInt" use="optional" default="600"/>
2855   <xsd:attribute name="copies" type="xsd:unsignedInt" use="optional" default="1"/>
2856   <xsd:attribute ref="r:id" use="optional"/>

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2857 </xsd:complexType>
2858 <xsd:simpleType name="ST_PageOrder">
2859   <xsd:restriction base="xsd:string">
2860     <xsd:enumeration value="downThenOver"/>
2861     <xsd:enumeration value="overThenDown"/>
2862   </xsd:restriction>
2863 </xsd:simpleType>
2864 <xsd:simpleType name="ST_Orientation">
2865   <xsd:restriction base="xsd:string">
2866     <xsd:enumeration value="default"/>
2867     <xsd:enumeration value="portrait"/>
2868     <xsd:enumeration value="landscape"/>
2869   </xsd:restriction>
2870 </xsd:simpleType>
2871 <xsd:simpleType name="ST_CellComments">
2872   <xsd:restriction base="xsd:string">
2873     <xsd:enumeration value="none"/>
2874     <xsd:enumeration value="asDisplayed"/>
2875     <xsd:enumeration value="atEnd"/>
2876   </xsd:restriction>
2877 </xsd:simpleType>
2878 <xsd:complexType name="CT_HeaderFooter">
2879   <xsd:sequence>
2880     <xsd:element name="oddHeader" type="s:ST_Xstring" minOccurs="0" maxOccurs="1"/>
2881     <xsd:element name="oddFooter" type="s:ST_Xstring" minOccurs="0" maxOccurs="1"/>
2882     <xsd:element name="evenHeader" type="s:ST_Xstring" minOccurs="0" maxOccurs="1"/>
2883     <xsd:element name="evenFooter" type="s:ST_Xstring" minOccurs="0" maxOccurs="1"/>
2884     <xsd:element name="firstHeader" type="s:ST_Xstring" minOccurs="0" maxOccurs="1"/>
2885     <xsd:element name="firstFooter" type="s:ST_Xstring" minOccurs="0" maxOccurs="1"/>
2886   </xsd:sequence>
2887   <xsd:attribute name="differentOddEven" type="xsd:boolean" default="false"/>
2888   <xsd:attribute name="differentFirst" type="xsd:boolean" default="false"/>
2889   <xsd:attribute name="scaleWithDoc" type="xsd:boolean" default="true"/>
2890   <xsd:attribute name="alignWithMargins" type="xsd:boolean" default="true"/>
2891 </xsd:complexType>
2892 <xsd:simpleType name="ST_PrintError">
2893   <xsd:restriction base="xsd:string">
2894     <xsd:enumeration value="displayed"/>
2895     <xsd:enumeration value="blank"/>
2896     <xsd:enumeration value="dash"/>
2897     <xsd:enumeration value="NA"/>
2898   </xsd:restriction>
2899 </xsd:simpleType>
2900 <xsd:complexType name="CT_Scenarios">
2901   <xsd:sequence>
2902     <xsd:element name="scenario" type="CT_Scenario" minOccurs="1" maxOccurs="unbounded"/>
2903   </xsd:sequence>
2904   <xsd:attribute name="current" type="xsd:unsignedInt" use="optional"/>
2905   <xsd:attribute name="show" type="xsd:unsignedInt" use="optional"/>
2906   <xsd:attribute name="sqref" type="ST_Sqref" use="optional"/>
2907 </xsd:complexType>
2908 <xsd:complexType name="CT_SheetProtection">
2909   <xsd:attribute name="algorithmName" type="s:ST_Xstring" use="optional"/>

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2910     <xsd:attribute name="hashValue" type="xsd:base64Binary" use="optional"/>
2911     <xsd:attribute name="saltValue" type="xsd:base64Binary" use="optional"/>
2912     <xsd:attribute name="spinCount" type="xsd:unsignedInt" use="optional"/>
2913     <xsd:attribute name="sheet" type="xsd:boolean" use="optional" default="false"/>
2914     <xsd:attribute name="objects" type="xsd:boolean" use="optional" default="false"/>
2915     <xsd:attribute name="scenarios" type="xsd:boolean" use="optional" default="false"/>
2916     <xsd:attribute name="formatCells" type="xsd:boolean" use="optional" default="true"/>
2917     <xsd:attribute name="formatColumns" type="xsd:boolean" use="optional" default="true"/>
2918     <xsd:attribute name="formatRows" type="xsd:boolean" use="optional" default="true"/>
2919     <xsd:attribute name="insertColumns" type="xsd:boolean" use="optional" default="true"/>
2920     <xsd:attribute name="insertRows" type="xsd:boolean" use="optional" default="true"/>
2921     <xsd:attribute name="insertHyperlinks" type="xsd:boolean" use="optional" default="true"/>
2922     <xsd:attribute name="deleteColumns" type="xsd:boolean" use="optional" default="true"/>
2923     <xsd:attribute name="deleteRows" type="xsd:boolean" use="optional" default="true"/>
2924     <xsd:attribute name="selectLockedCells" type="xsd:boolean" use="optional" default="false"/>
2925     <xsd:attribute name="sort" type="xsd:boolean" use="optional" default="true"/>
2926     <xsd:attribute name="autoFilter" type="xsd:boolean" use="optional" default="true"/>
2927     <xsd:attribute name="pivotTables" type="xsd:boolean" use="optional" default="true"/>
2928     <xsd:attribute name="selectUnlockedCells" type="xsd:boolean" use="optional" default="false"/>
2929 </xsd:complexType>
2930 <xsd:complexType name="CT_ProtectedRanges">
2931     <xsd:sequence>
2932         <xsd:element name="protectedRange" type="CT_ProtectedRange" minOccurs="1"
2933             maxOccurs="unbounded"/>
2934     </xsd:sequence>
2935 </xsd:complexType>
2936 <xsd:complexType name="CT_ProtectedRange">
2937     <xsd:sequence>
2938         <xsd:element name="securityDescriptor" type="xsd:string" minOccurs="0"
2939             maxOccurs="unbounded"/>
2940     </xsd:sequence>
2941     <xsd:attribute name="sqref" type="ST_Sqref" use="required"/>
2942     <xsd:attribute name="name" type="s:ST_Xstring" use="required"/>
2943     <xsd:attribute name="algorithmName" type="s:ST_Xstring" use="optional"/>
2944     <xsd:attribute name="hashValue" type="xsd:base64Binary" use="optional"/>
2945     <xsd:attribute name="saltValue" type="xsd:base64Binary" use="optional"/>
2946     <xsd:attribute name="spinCount" type="xsd:unsignedInt" use="optional"/>
2947 </xsd:complexType>
2948 <xsd:complexType name="CT_Scenario">
2949     <xsd:sequence>
2950         <xsd:element name="inputCells" type="CT_InputCells" minOccurs="1" maxOccurs="unbounded"/>
2951     </xsd:sequence>
2952     <xsd:attribute name="name" type="s:ST_Xstring" use="required"/>
2953     <xsd:attribute name="locked" type="xsd:boolean" use="optional" default="false"/>
2954     <xsd:attribute name="hidden" type="xsd:boolean" use="optional" default="false"/>
2955     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
2956     <xsd:attribute name="user" type="s:ST_Xstring" use="optional"/>
2957     <xsd:attribute name="comment" type="s:ST_Xstring" use="optional"/>
2958 </xsd:complexType>
2959 <xsd:complexType name="CT_InputCells">
2960     <xsd:attribute name="r" type="ST_CellRef" use="required"/>
2961     <xsd:attribute name="deleted" type="xsd:boolean" use="optional" default="false"/>
2962     <xsd:attribute name="undone" type="xsd:boolean" use="optional" default="false"/>

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2963     <xsd:attribute name="val" type="s:ST Xstring" use="required"/>
2964     <xsd:attribute name="numFmtId" type="ST NumFmtId" use="optional"/>
2965 </xsd:complexType>
2966 <xsd:complexType name="CT_CellWatches">
2967     <xsd:sequence>
2968         <xsd:element name="cellWatch" type="CT CellWatch" minOccurs="1" maxOccurs="unbounded"/>
2969     </xsd:sequence>
2970 </xsd:complexType>
2971 <xsd:complexType name="CT_CellWatch">
2972     <xsd:attribute name="r" type="ST CellRef" use="required"/>
2973 </xsd:complexType>
2974 <xsd:complexType name="CT_Chartsheet">
2975     <xsd:sequence>
2976         <xsd:element name="sheetPr" type="CT ChartsheetPr" minOccurs="0" maxOccurs="1"/>
2977         <xsd:element name="sheetViews" type="CT ChartsheetViews" minOccurs="1" maxOccurs="1"/>
2978         <xsd:element name="sheetProtection" type="CT ChartsheetProtection" minOccurs="0"
2979             maxOccurs="1"/>
2980         <xsd:element name="customSheetViews" type="CT CustomChartsheetViews" minOccurs="0"
2981             maxOccurs="1"/>
2982         <xsd:element name="pageMargins" minOccurs="0" type="CT PageMargins"/>
2983         <xsd:element name="pageSetup" type="CT CsPageSetup" minOccurs="0" maxOccurs="1"/>
2984         <xsd:element name="headerFooter" minOccurs="0" type="CT HeaderFooter"/>
2985         <xsd:element name="drawing" type="CT Drawing" minOccurs="1" maxOccurs="1"/>
2986         <xsd:element name="drawingHF" type="CT DrawingHF" minOccurs="0" maxOccurs="1"/>
2987         <xsd:element name="picture" type="CT SheetBackgroundPicture" minOccurs="0" maxOccurs="1"/>
2988         <xsd:element name="webPublishItems" type="CT WebPublishItems" minOccurs="0"
2989             maxOccurs="1"/>
2990         <xsd:element name="extLst" type="CT ExtensionList" minOccurs="0" maxOccurs="1"/>
2991     </xsd:sequence>
2992 </xsd:complexType>
2993 <xsd:complexType name="CT_ChartsheetPr">
2994     <xsd:sequence>
2995         <xsd:element name="tabColor" type="CT Color" minOccurs="0" maxOccurs="1"/>
2996     </xsd:sequence>
2997     <xsd:attribute name="published" type="xsd:boolean" use="optional" default="true"/>
2998     <xsd:attribute name="codeName" type="xsd:string" use="optional"/>
2999 </xsd:complexType>
3000 <xsd:complexType name="CT_ChartsheetViews">
3001     <xsd:sequence>
3002         <xsd:element name="sheetView" type="CT ChartsheetView" minOccurs="1"
3003             maxOccurs="unbounded"/>
3004         <xsd:element name="extLst" type="CT ExtensionList" minOccurs="0" maxOccurs="1"/>
3005     </xsd:sequence>
3006 </xsd:complexType>
3007 <xsd:complexType name="CT_ChartsheetView">
3008     <xsd:sequence>
3009         <xsd:element name="extLst" type="CT ExtensionList" minOccurs="0" maxOccurs="1"/>
3010     </xsd:sequence>
3011     <xsd:attribute name="tabSelected" type="xsd:boolean" use="optional" default="false"/>
3012     <xsd:attribute name="zoomScale" type="xsd:unsignedInt" default="100" use="optional"/>
3013     <xsd:attribute name="workbookViewId" type="xsd:unsignedInt" use="required"/>
3014     <xsd:attribute name="zoomToFit" type="xsd:boolean" use="optional" default="false"/>
3015 </xsd:complexType>

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3016 <xsd:complexType name="CT_ChartsheetProtection">
3017   <xsd:attribute name="algorithmName" type="s:ST Xstring" use="optional"/>
3018   <xsd:attribute name="hashValue" type="xsd:base64Binary" use="optional"/>
3019   <xsd:attribute name="saltValue" type="xsd:base64Binary" use="optional"/>
3020   <xsd:attribute name="spinCount" type="xsd:unsignedInt" use="optional"/>
3021   <xsd:attribute name="content" type="xsd:boolean" use="optional" default="false"/>
3022   <xsd:attribute name="objects" type="xsd:boolean" use="optional" default="false"/>
3023 </xsd:complexType>
3024 <xsd:complexType name="CT_CsPageSetup">
3025   <xsd:attribute name="paperSize" type="xsd:unsignedInt" use="optional" default="1"/>
3026   <xsd:attribute name="paperHeight" type="s:ST PositiveUniversalMeasure" use="optional"/>
3027   <xsd:attribute name="paperWidth" type="s:ST PositiveUniversalMeasure" use="optional"/>
3028   <xsd:attribute name="firstPageNumber" type="xsd:unsignedInt" use="optional" default="1"/>
3029   <xsd:attribute name="orientation" type="ST Orientation" use="optional" default="default"/>
3030   <xsd:attribute name="usePrinterDefaults" type="xsd:boolean" use="optional" default="true"/>
3031   <xsd:attribute name="blackAndWhite" type="xsd:boolean" use="optional" default="false"/>
3032   <xsd:attribute name="draft" type="xsd:boolean" use="optional" default="false"/>
3033   <xsd:attribute name="useFirstPageNumber" type="xsd:boolean" use="optional" default="false"/>
3034   <xsd:attribute name="horizontalDpi" type="xsd:unsignedInt" use="optional" default="600"/>
3035   <xsd:attribute name="verticalDpi" type="xsd:unsignedInt" use="optional" default="600"/>
3036   <xsd:attribute name="copies" type="xsd:unsignedInt" use="optional" default="1"/>
3037   <xsd:attribute ref="r:id" use="optional"/>
3038 </xsd:complexType>
3039 <xsd:complexType name="CT_CustomChartsheetViews">
3040   <xsd:sequence>
3041     <xsd:element name="customSheetView" minOccurs="0" maxOccurs="unbounded"
3042       type="CT CustomChartsheetView"/>
3043   </xsd:sequence>
3044 </xsd:complexType>
3045 <xsd:complexType name="CT_CustomChartsheetView">
3046   <xsd:sequence>
3047     <xsd:element name="pageMargins" type="CT PageMargins" minOccurs="0" maxOccurs="1"/>
3048     <xsd:element name="pageSetup" type="CT_CsPageSetup" minOccurs="0" maxOccurs="1"/>
3049     <xsd:element name="headerFooter" type="CT HeaderFooter" minOccurs="0" maxOccurs="1"/>
3050   </xsd:sequence>
3051   <xsd:attribute name="guid" type="s:ST Guid" use="required"/>
3052   <xsd:attribute name="scale" type="xsd:unsignedInt" default="100"/>
3053   <xsd:attribute name="state" type="ST SheetState" default="visible"/>
3054   <xsd:attribute name="zoomToFit" type="xsd:boolean" use="optional" default="false"/>
3055 </xsd:complexType>
3056 <xsd:complexType name="CT_CustomProperties">
3057   <xsd:sequence>
3058     <xsd:element name="customPr" type="CT CustomProperty" minOccurs="1"
3059       maxOccurs="unbounded"/>
3060   </xsd:sequence>
3061 </xsd:complexType>
3062 <xsd:complexType name="CT_CustomProperty">
3063   <xsd:attribute name="name" type="s:ST Xstring" use="required"/>
3064   <xsd:attribute ref="r:id" use="required"/>
3065 </xsd:complexType>
3066 <xsd:complexType name="CT_OleObjects">
3067   <xsd:sequence>
3068     <xsd:element name="oleObject" type="CT OleObject" minOccurs="1" maxOccurs="unbounded"/>

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3069     </xsd:sequence>
3070 </xsd:complexType>
3071 <xsd:complexType name="CT_OleObject">
3072     <xsd:sequence>
3073         <xsd:element name="objectPr" type="CT_ObjectPr" minOccurs="0" maxOccurs="1"/>
3074     </xsd:sequence>
3075     <xsd:attribute name="progId" type="xsd:string" use="optional"/>
3076     <xsd:attribute name="dvAspect" type="ST_DvAspect" use="optional" default="DVASPECT_CONTENT"/>
3077     <xsd:attribute name="link" type="s:ST_Xstring" use="optional"/>
3078     <xsd:attribute name="oleUpdate" type="ST_OleUpdate" use="optional"/>
3079     <xsd:attribute name="autoload" type="xsd:boolean" use="optional" default="false"/>
3080     <xsd:attribute name="shapeId" type="xsd:unsignedInt" use="required"/>
3081     <xsd:attribute ref="r:id" use="optional"/>
3082 </xsd:complexType>
3083 <xsd:complexType name="CT_ObjectPr">
3084     <xsd:sequence>
3085         <xsd:element name="anchor" type="CT_ObjectAnchor" minOccurs="1" maxOccurs="1"/>
3086     </xsd:sequence>
3087     <xsd:attribute name="locked" type="xsd:boolean" use="optional" default="true"/>
3088     <xsd:attribute name="defaultSize" type="xsd:boolean" use="optional" default="true"/>
3089     <xsd:attribute name="print" type="xsd:boolean" use="optional" default="true"/>
3090     <xsd:attribute name="disabled" type="xsd:boolean" use="optional" default="false"/>
3091     <xsd:attribute name="uiObject" type="xsd:boolean" use="optional" default="false"/>
3092     <xsd:attribute name="autoFill" type="xsd:boolean" use="optional" default="true"/>
3093     <xsd:attribute name="autoLine" type="xsd:boolean" use="optional" default="true"/>
3094     <xsd:attribute name="autoPict" type="xsd:boolean" use="optional" default="true"/>
3095     <xsd:attribute name="macro" type="ST_Formula" use="optional"/>
3096     <xsd:attribute name="altText" type="s:ST_Xstring" use="optional"/>
3097     <xsd:attribute name="dde" type="xsd:boolean" use="optional" default="false"/>
3098     <xsd:attribute ref="r:id" use="optional"/>
3099 </xsd:complexType>
3100 <xsd:simpleType name="ST_DvAspect">
3101     <xsd:restriction base="xsd:string">
3102         <xsd:enumeration value="DVASPECT_CONTENT"/>
3103         <xsd:enumeration value="DVASPECT_ICON"/>
3104     </xsd:restriction>
3105 </xsd:simpleType>
3106 <xsd:simpleType name="ST_OleUpdate">
3107     <xsd:restriction base="xsd:string">
3108         <xsd:enumeration value="OLEUPDATE_ALWAYS"/>
3109         <xsd:enumeration value="OLEUPDATE_ONCALL"/>
3110     </xsd:restriction>
3111 </xsd:simpleType>
3112 <xsd:complexType name="CT_WebPublishItems">
3113     <xsd:sequence>
3114         <xsd:element name="webPublishItem" type="CT_WebPublishItem" minOccurs="1"
3115             maxOccurs="unbounded"/>
3116     </xsd:sequence>
3117     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
3118 </xsd:complexType>
3119 <xsd:complexType name="CT_WebPublishItem">
3120     <xsd:attribute name="id" type="xsd:unsignedInt" use="required"/>
3121     <xsd:attribute name="divId" type="s:ST_Xstring" use="required"/>

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3122     <xsd:attribute name="sourceType" type="ST_WebSourceType" use="required"/>
3123     <xsd:attribute name="sourceRef" type="ST_Ref" use="optional"/>
3124     <xsd:attribute name="sourceObject" type="s:ST_Xstring" use="optional"/>
3125     <xsd:attribute name="destinationFile" type="s:ST_Xstring" use="required"/>
3126     <xsd:attribute name="title" type="s:ST_Xstring" use="optional"/>
3127     <xsd:attribute name="autoRepublish" type="xsd:boolean" use="optional" default="false"/>
3128 </xsd:complexType>
3129 <xsd:complexType name="CT_Controls">
3130     <xsd:sequence>
3131         <xsd:element name="control" type="CT_Control" minOccurs="1" maxOccurs="unbounded"/>
3132     </xsd:sequence>
3133 </xsd:complexType>
3134 <xsd:complexType name="CT_Control">
3135     <xsd:sequence>
3136         <xsd:element name="controlPr" type="CT_ControlPr" minOccurs="0" maxOccurs="1"/>
3137     </xsd:sequence>
3138     <xsd:attribute name="shapeId" type="xsd:unsignedInt" use="required"/>
3139     <xsd:attribute ref="r:id" use="required"/>
3140     <xsd:attribute name="name" type="xsd:string" use="optional"/>
3141 </xsd:complexType>
3142 <xsd:complexType name="CT_ControlPr">
3143     <xsd:sequence>
3144         <xsd:element name="anchor" type="CT_ObjectAnchor" minOccurs="1" maxOccurs="1"/>
3145     </xsd:sequence>
3146     <xsd:attribute name="locked" type="xsd:boolean" use="optional" default="true"/>
3147     <xsd:attribute name="defaultSize" type="xsd:boolean" use="optional" default="true"/>
3148     <xsd:attribute name="print" type="xsd:boolean" use="optional" default="true"/>
3149     <xsd:attribute name="disabled" type="xsd:boolean" use="optional" default="false"/>
3150     <xsd:attribute name="recalcAlways" type="xsd:boolean" use="optional" default="false"/>
3151     <xsd:attribute name="uiObject" type="xsd:boolean" use="optional" default="false"/>
3152     <xsd:attribute name="autoFill" type="xsd:boolean" use="optional" default="true"/>
3153     <xsd:attribute name="autoLine" type="xsd:boolean" use="optional" default="true"/>
3154     <xsd:attribute name="autoPict" type="xsd:boolean" use="optional" default="true"/>
3155     <xsd:attribute name="macro" type="ST_Formula" use="optional"/>
3156     <xsd:attribute name="altText" type="s:ST_Xstring" use="optional"/>
3157     <xsd:attribute name="linkedCell" type="ST_Formula" use="optional"/>
3158     <xsd:attribute name="listFillRange" type="ST_Formula" use="optional"/>
3159     <xsd:attribute name="cf" type="s:ST_Xstring" use="optional" default="pict"/>
3160     <xsd:attribute ref="r:id" use="optional"/>
3161 </xsd:complexType>
3162 <xsd:simpleType name="ST_WebSourceType">
3163     <xsd:restriction base="xsd:string">
3164         <xsd:enumeration value="sheet"/>
3165         <xsd:enumeration value="printArea"/>
3166         <xsd:enumeration value="autoFilter"/>
3167         <xsd:enumeration value="range"/>
3168         <xsd:enumeration value="chart"/>
3169         <xsd:enumeration value="pivotTable"/>
3170         <xsd:enumeration value="query"/>
3171         <xsd:enumeration value="label"/>
3172     </xsd:restriction>
3173 </xsd:simpleType>
3174 <xsd:complexType name="CT_IgnoredErrors">

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3175     <xsd:sequence>
3176         <xsd:element name="ignoredError" type="CT_IgnoredError" minOccurs="1"
3177             maxOccurs="unbounded"/>
3178         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
3179     </xsd:sequence>
3180 </xsd:complexType>
3181 <xsd:complexType name="CT_IgnoredError">
3182     <xsd:attribute name="sqref" type="ST_Sqref" use="required"/>
3183     <xsd:attribute name="evalError" type="xsd:boolean" use="optional" default="false"/>
3184     <xsd:attribute name="twoDigitTextYear" type="xsd:boolean" use="optional" default="false"/>
3185     <xsd:attribute name="numberStoredAsText" type="xsd:boolean" use="optional" default="false"/>
3186     <xsd:attribute name="formula" type="xsd:boolean" use="optional" default="false"/>
3187     <xsd:attribute name="formulaRange" type="xsd:boolean" use="optional" default="false"/>
3188     <xsd:attribute name="unlockedFormula" type="xsd:boolean" use="optional" default="false"/>
3189     <xsd:attribute name="emptyCellReference" type="xsd:boolean" use="optional" default="false"/>
3190     <xsd:attribute name="listDataValidation" type="xsd:boolean" use="optional" default="false"/>
3191     <xsd:attribute name="calculatedColumn" type="xsd:boolean" use="optional" default="false"/>
3192 </xsd:complexType>
3193 <xsd:simpleType name="ST_PaneState">
3194     <xsd:restriction base="xsd:string">
3195         <xsd:enumeration value="split"/>
3196         <xsd:enumeration value="frozen"/>
3197         <xsd:enumeration value="frozenSplit"/>
3198     </xsd:restriction>
3199 </xsd:simpleType>
3200 <xsd:complexType name="CT_TableParts">
3201     <xsd:sequence>
3202         <xsd:element name="tablePart" type="CT_TablePart" minOccurs="0" maxOccurs="unbounded"/>
3203     </xsd:sequence>
3204     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
3205 </xsd:complexType>
3206 <xsd:complexType name="CT_TablePart">
3207     <xsd:attribute ref="r:id" use="required"/>
3208 </xsd:complexType>
3209 <xsd:element name="metadata" type="CT_Metadata"/>
3210 <xsd:complexType name="CT_Metadata">
3211     <xsd:sequence>
3212         <xsd:element name="metadataTypes" type="CT_MetadataTypes" minOccurs="0" maxOccurs="1"/>
3213         <xsd:element name="metadataStrings" type="CT_MetadataStrings" minOccurs="0"
3214             maxOccurs="1"/>
3215         <xsd:element name="mdxMetadata" type="CT_MdxMetadata" minOccurs="0" maxOccurs="1"/>
3216         <xsd:element name="futureMetadata" type="CT_FutureMetadata" minOccurs="0"
3217             maxOccurs="unbounded"/>
3218         <xsd:element name="cellMetadata" type="CT_MetadataBlocks" minOccurs="0" maxOccurs="1"/>
3219         <xsd:element name="valueMetadata" type="CT_MetadataBlocks" minOccurs="0" maxOccurs="1"/>
3220         <xsd:element name="extLst" minOccurs="0" maxOccurs="1" type="CT_ExtensionList"/>
3221     </xsd:sequence>
3222 </xsd:complexType>
3223 <xsd:complexType name="CT_MetadataTypes">
3224     <xsd:sequence>
3225         <xsd:element name="metadataType" type="CT_MetadataType" minOccurs="1"
3226             maxOccurs="unbounded"/>
3227     </xsd:sequence>

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3228     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional" default="0"/>
3229 </xsd:complexType>
3230 <xsd:complexType name="CT_MetadataType">
3231     <xsd:attribute name="name" type="s:ST_Xstring" use="required"/>
3232     <xsd:attribute name="minSupportedVersion" type="xsd:unsignedInt" use="required"/>
3233     <xsd:attribute name="ghostRow" type="xsd:boolean" use="optional" default="false"/>
3234     <xsd:attribute name="ghostCol" type="xsd:boolean" use="optional" default="false"/>
3235     <xsd:attribute name="edit" type="xsd:boolean" use="optional" default="false"/>
3236     <xsd:attribute name="delete" type="xsd:boolean" use="optional" default="false"/>
3237     <xsd:attribute name="copy" type="xsd:boolean" use="optional" default="false"/>
3238     <xsd:attribute name="pasteAll" type="xsd:boolean" use="optional" default="false"/>
3239     <xsd:attribute name="pasteFormulas" type="xsd:boolean" use="optional" default="false"/>
3240     <xsd:attribute name="pasteValues" type="xsd:boolean" use="optional" default="false"/>
3241     <xsd:attribute name="pasteFormats" type="xsd:boolean" use="optional" default="false"/>
3242     <xsd:attribute name="pasteComments" type="xsd:boolean" use="optional" default="false"/>
3243     <xsd:attribute name="pasteDataValidation" type="xsd:boolean" use="optional" default="false"/>
3244     <xsd:attribute name="pasteBorders" type="xsd:boolean" use="optional" default="false"/>
3245     <xsd:attribute name="pasteColWidths" type="xsd:boolean" use="optional" default="false"/>
3246     <xsd:attribute name="pasteNumberFormats" type="xsd:boolean" use="optional" default="false"/>
3247     <xsd:attribute name="merge" type="xsd:boolean" use="optional" default="false"/>
3248     <xsd:attribute name="splitFirst" type="xsd:boolean" use="optional" default="false"/>
3249     <xsd:attribute name="splitAll" type="xsd:boolean" use="optional" default="false"/>
3250     <xsd:attribute name="rowColShift" type="xsd:boolean" use="optional" default="false"/>
3251     <xsd:attribute name="clearAll" type="xsd:boolean" default="false"/>
3252     <xsd:attribute name="clearFormats" type="xsd:boolean" use="optional" default="false"/>
3253     <xsd:attribute name="clearContents" type="xsd:boolean" use="optional" default="false"/>
3254     <xsd:attribute name="clearComments" type="xsd:boolean" use="optional" default="false"/>
3255     <xsd:attribute name="assign" type="xsd:boolean" use="optional" default="false"/>
3256     <xsd:attribute name="coerce" type="xsd:boolean" use="optional" default="false"/>
3257     <xsd:attribute name="adjust" type="xsd:boolean" use="optional" default="false"/>
3258     <xsd:attribute name="cellMeta" type="xsd:boolean" use="optional" default="false"/>
3259 </xsd:complexType>
3260 <xsd:complexType name="CT_MetadataBlocks">
3261     <xsd:sequence>
3262         <xsd:element name="bk" type="CT_MetadataBlock" minOccurs="1" maxOccurs="unbounded"/>
3263     </xsd:sequence>
3264     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional" default="0"/>
3265 </xsd:complexType>
3266 <xsd:complexType name="CT_MetadataBlock">
3267     <xsd:sequence>
3268         <xsd:element name="rc" type="CT_MetadataRecord" minOccurs="1" maxOccurs="unbounded"/>
3269     </xsd:sequence>
3270 </xsd:complexType>
3271 <xsd:complexType name="CT_MetadataRecord">
3272     <xsd:attribute name="t" type="xsd:unsignedInt" use="required"/>
3273     <xsd:attribute name="v" type="xsd:unsignedInt" use="required"/>
3274 </xsd:complexType>
3275 <xsd:complexType name="CT_FutureMetadata">
3276     <xsd:sequence>
3277         <xsd:element name="bk" type="CT_FutureMetadataBlock" minOccurs="0" maxOccurs="unbounded"/>
3278         <xsd:element name="extLst" minOccurs="0" maxOccurs="1" type="CT_ExtensionList"/>
3279     </xsd:sequence>
3280     <xsd:attribute name="name" type="s:ST_Xstring" use="required"/>

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3281     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional" default="0"/>
3282 </xsd:complexType>
3283 <xsd:complexType name="CT_FutureMetadataBlock">
3284     <xsd:sequence>
3285         <xsd:element name="extLst" minOccurs="0" maxOccurs="1" type="CT_ExtensionList"/>
3286     </xsd:sequence>
3287 </xsd:complexType>
3288 <xsd:complexType name="CT_MdxMetadata">
3289     <xsd:sequence>
3290         <xsd:element name="mdx" type="CT_Mdx" minOccurs="1" maxOccurs="unbounded"/>
3291     </xsd:sequence>
3292     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional" default="0"/>
3293 </xsd:complexType>
3294 <xsd:complexType name="CT_Mdx">
3295     <xsd:choice minOccurs="1" maxOccurs="1">
3296         <xsd:element name="t" type="CT_MdxTuple"/>
3297         <xsd:element name="ms" type="CT_MdxSet"/>
3298         <xsd:element name="p" type="CT_MdxMemberProp"/>
3299         <xsd:element name="k" type="CT_MdxKPI"/>
3300     </xsd:choice>
3301     <xsd:attribute name="n" type="xsd:unsignedInt" use="required"/>
3302     <xsd:attribute name="f" type="ST_MdxFunctionType" use="required"/>
3303 </xsd:complexType>
3304 <xsd:simpleType name="ST_MdxFunctionType">
3305     <xsd:restriction base="xsd:string">
3306         <xsd:enumeration value="m"/>
3307         <xsd:enumeration value="v"/>
3308         <xsd:enumeration value="s"/>
3309         <xsd:enumeration value="c"/>
3310         <xsd:enumeration value="r"/>
3311         <xsd:enumeration value="p"/>
3312         <xsd:enumeration value="k"/>
3313     </xsd:restriction>
3314 </xsd:simpleType>
3315 <xsd:complexType name="CT_MdxTuple">
3316     <xsd:sequence>
3317         <xsd:element name="n" type="CT_MetadataStringIndex" minOccurs="0" maxOccurs="unbounded"/>
3318     </xsd:sequence>
3319     <xsd:attribute name="c" type="xsd:unsignedInt" use="optional" default="0"/>
3320     <xsd:attribute name="ct" type="s:ST_Xstring" use="optional"/>
3321     <xsd:attribute name="si" type="xsd:unsignedInt" use="optional"/>
3322     <xsd:attribute name="fi" type="xsd:unsignedInt" use="optional"/>
3323     <xsd:attribute name="bc" type="ST_UnsignedIntHex" use="optional"/>
3324     <xsd:attribute name="fc" type="ST_UnsignedIntHex" use="optional"/>
3325     <xsd:attribute name="i" type="xsd:boolean" use="optional" default="false"/>
3326     <xsd:attribute name="u" type="xsd:boolean" use="optional" default="false"/>
3327     <xsd:attribute name="st" type="xsd:boolean" use="optional" default="false"/>
3328     <xsd:attribute name="b" type="xsd:boolean" use="optional" default="false"/>
3329 </xsd:complexType>
3330 <xsd:complexType name="CT_MdxSet">
3331     <xsd:sequence>
3332         <xsd:element name="n" type="CT_MetadataStringIndex" minOccurs="0" maxOccurs="unbounded"/>
3333     </xsd:sequence>

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3334     <xsd:attribute name="ns" type="xsd:unsignedInt" use="required"/>
3335     <xsd:attribute name="c" type="xsd:unsignedInt" use="optional" default="0"/>
3336     <xsd:attribute name="o" type="ST_MdxSetOrder" use="optional" default="u"/>
3337 </xsd:complexType>
3338 <xsd:simpleType name="ST_MdxSetOrder">
3339     <xsd:restriction base="xsd:string">
3340         <xsd:enumeration value="u"/>
3341         <xsd:enumeration value="a"/>
3342         <xsd:enumeration value="d"/>
3343         <xsd:enumeration value="aa"/>
3344         <xsd:enumeration value="ad"/>
3345         <xsd:enumeration value="na"/>
3346         <xsd:enumeration value="nd"/>
3347     </xsd:restriction>
3348 </xsd:simpleType>
3349 <xsd:complexType name="CT_MdxMemberProp">
3350     <xsd:attribute name="n" type="xsd:unsignedInt" use="required"/>
3351     <xsd:attribute name="np" type="xsd:unsignedInt" use="required"/>
3352 </xsd:complexType>
3353 <xsd:complexType name="CT_MdxKPI">
3354     <xsd:attribute name="n" type="xsd:unsignedInt" use="required"/>
3355     <xsd:attribute name="np" type="xsd:unsignedInt" use="required"/>
3356     <xsd:attribute name="p" type="ST_MdxKPIProperty" use="required"/>
3357 </xsd:complexType>
3358 <xsd:simpleType name="ST_MdxKPIProperty">
3359     <xsd:restriction base="xsd:string">
3360         <xsd:enumeration value="v"/>
3361         <xsd:enumeration value="g"/>
3362         <xsd:enumeration value="s"/>
3363         <xsd:enumeration value="t"/>
3364         <xsd:enumeration value="w"/>
3365         <xsd:enumeration value="m"/>
3366     </xsd:restriction>
3367 </xsd:simpleType>
3368 <xsd:complexType name="CT_MetadataStringIndex">
3369     <xsd:attribute name="x" type="xsd:unsignedInt" use="required"/>
3370     <xsd:attribute name="s" type="xsd:boolean" use="optional" default="false"/>
3371 </xsd:complexType>
3372 <xsd:complexType name="CT_MetadataStrings">
3373     <xsd:sequence>
3374         <xsd:element name="s" type="CT_XStringElement" minOccurs="1" maxOccurs="unbounded"/>
3375     </xsd:sequence>
3376     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional" default="0"/>
3377 </xsd:complexType>
3378 <xsd:element name="singleXmlCells" type="CT_SingleXmlCells"/>
3379 <xsd:complexType name="CT_SingleXmlCells">
3380     <xsd:sequence>
3381         <xsd:element name="singleXmlCell" type="CT_SingleXmlCell" maxOccurs="unbounded"/>
3382     </xsd:sequence>
3383 </xsd:complexType>
3384 <xsd:complexType name="CT_SingleXmlCell">
3385     <xsd:sequence>
3386         <xsd:element name="xmlCellPr" type="CT_XmlCellPr" minOccurs="1" maxOccurs="1"/>

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3387     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
3388 </xsd:sequence>
3389 <xsd:attribute name="id" type="xsd:unsignedInt" use="required"/>
3390 <xsd:attribute name="r" type="ST_CellRef" use="required"/>
3391 <xsd:attribute name="connectionId" type="xsd:unsignedInt" use="required"/>
3392 </xsd:complexType>
3393 <xsd:complexType name="CT_XmlCellPr">
3394     <xsd:sequence>
3395         <xsd:element name="xmlPr" type="CT_XmlPr" minOccurs="1" maxOccurs="1"/>
3396         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
3397     </xsd:sequence>
3398     <xsd:attribute name="id" type="xsd:unsignedInt" use="required"/>
3399     <xsd:attribute name="uniqueName" type="s:ST_Xstring" use="optional"/>
3400 </xsd:complexType>
3401 <xsd:complexType name="CT_XmlPr">
3402     <xsd:sequence>
3403         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
3404     </xsd:sequence>
3405     <xsd:attribute name="mapId" type="xsd:unsignedInt" use="required"/>
3406     <xsd:attribute name="xpath" type="s:ST_Xstring" use="required"/>
3407     <xsd:attribute name="xmlDataType" type="ST_XmlDataType" use="required"/>
3408 </xsd:complexType>
3409 <xsd:element name="styleSheet" type="CT_Stylesheet"/>
3410 <xsd:complexType name="CT_Stylesheet">
3411     <xsd:sequence>
3412         <xsd:element name="numFmts" type="CT_NumFmts" minOccurs="0" maxOccurs="1"/>
3413         <xsd:element name="fonts" type="CT_Fonts" minOccurs="0" maxOccurs="1"/>
3414         <xsd:element name="fills" type="CT_Fills" minOccurs="0" maxOccurs="1"/>
3415         <xsd:element name="borders" type="CT_Borders" minOccurs="0" maxOccurs="1"/>
3416         <xsd:element name="cellStyleXfs" type="CT_CellStyleXfs" minOccurs="0" maxOccurs="1"/>
3417         <xsd:element name="cellXfs" type="CT_CellXfs" minOccurs="0" maxOccurs="1"/>
3418         <xsd:element name="cellStyles" type="CT_CellStyles" minOccurs="0" maxOccurs="1"/>
3419         <xsd:element name="dxfs" type="CT_Dxfs" minOccurs="0" maxOccurs="1"/>
3420         <xsd:element name="tableStyles" type="CT_TableStyles" minOccurs="0" maxOccurs="1"/>
3421         <xsd:element name="colors" type="CT_Colors" minOccurs="0" maxOccurs="1"/>
3422         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
3423     </xsd:sequence>
3424 </xsd:complexType>
3425 <xsd:complexType name="CT_CellAlignment">
3426     <xsd:attribute name="horizontal" type="ST_HorizontalAlignment" use="optional"/>
3427     <xsd:attribute name="vertical" type="ST_VerticalAlignment" use="optional"/>
3428     <xsd:attribute name="textRotation" type="xsd:unsignedInt" use="optional"/>
3429     <xsd:attribute name="wrapText" type="xsd:boolean" use="optional"/>
3430     <xsd:attribute name="indent" type="xsd:unsignedInt" use="optional"/>
3431     <xsd:attribute name="relativeIndent" type="xsd:int" use="optional"/>
3432     <xsd:attribute name="justifyLastLine" type="xsd:boolean" use="optional"/>
3433     <xsd:attribute name="shrinkToFit" type="xsd:boolean" use="optional"/>
3434     <xsd:attribute name="readingOrder" type="xsd:unsignedInt" use="optional"/>
3435 </xsd:complexType>
3436 <xsd:simpleType name="ST_BorderStyle">
3437     <xsd:restriction base="xsd:string">
3438         <xsd:enumeration value="none"/>
3439         <xsd:enumeration value="thin"/>

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3440     <xsd:enumeration value="medium"/>
3441     <xsd:enumeration value="dashed"/>
3442     <xsd:enumeration value="dotted"/>
3443     <xsd:enumeration value="thick"/>
3444     <xsd:enumeration value="double"/>
3445     <xsd:enumeration value="hair"/>
3446     <xsd:enumeration value="mediumDashed"/>
3447     <xsd:enumeration value="dashDot"/>
3448     <xsd:enumeration value="mediumDashDot"/>
3449     <xsd:enumeration value="dashDotDot"/>
3450     <xsd:enumeration value="mediumDashDotDot"/>
3451     <xsd:enumeration value="slantDashDot"/>
3452 </xsd:restriction>
3453 </xsd:simpleType>
3454 <xsd:complexType name="CT_Borders">
3455     <xsd:sequence>
3456         <xsd:element name="border" type="CT_Border" minOccurs="0" maxOccurs="unbounded"/>
3457     </xsd:sequence>
3458     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
3459 </xsd:complexType>
3460 <xsd:complexType name="CT_Border">
3461     <xsd:sequence>
3462         <xsd:element name="start" type="CT_BorderPr" minOccurs="0" maxOccurs="1"/>
3463         <xsd:element name="end" type="CT_BorderPr" minOccurs="0" maxOccurs="1"/>
3464         <xsd:element name="top" type="CT_BorderPr" minOccurs="0" maxOccurs="1"/>
3465         <xsd:element name="bottom" type="CT_BorderPr" minOccurs="0" maxOccurs="1"/>
3466         <xsd:element name="diagonal" type="CT_BorderPr" minOccurs="0" maxOccurs="1"/>
3467         <xsd:element name="vertical" type="CT_BorderPr" minOccurs="0" maxOccurs="1"/>
3468         <xsd:element name="horizontal" type="CT_BorderPr" minOccurs="0" maxOccurs="1"/>
3469     </xsd:sequence>
3470     <xsd:attribute name="diagonalUp" type="xsd:boolean" use="optional"/>
3471     <xsd:attribute name="diagonalDown" type="xsd:boolean" use="optional"/>
3472     <xsd:attribute name="outline" type="xsd:boolean" use="optional" default="true"/>
3473 </xsd:complexType>
3474 <xsd:complexType name="CT_BorderPr">
3475     <xsd:sequence>
3476         <xsd:element name="color" type="CT_Color" minOccurs="0" maxOccurs="1"/>
3477     </xsd:sequence>
3478     <xsd:attribute name="style" type="ST_BorderStyle" use="optional" default="none"/>
3479 </xsd:complexType>
3480 <xsd:complexType name="CT_CellProtection">
3481     <xsd:attribute name="locked" type="xsd:boolean" use="optional"/>
3482     <xsd:attribute name="hidden" type="xsd:boolean" use="optional"/>
3483 </xsd:complexType>
3484 <xsd:complexType name="CT_Fonts">
3485     <xsd:sequence>
3486         <xsd:element name="font" type="CT_Font" minOccurs="0" maxOccurs="unbounded"/>
3487     </xsd:sequence>
3488     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
3489 </xsd:complexType>
3490 <xsd:complexType name="CT_Fills">
3491     <xsd:sequence>
3492         <xsd:element name="fill" type="CT_Fill" minOccurs="0" maxOccurs="unbounded"/>

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3493     </xsd:sequence>
3494     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
3495 </xsd:complexType>
3496 <xsd:complexType name="CT_Fill">
3497     <xsd:choice minOccurs="1" maxOccurs="1">
3498         <xsd:element name="patternFill" type="CT_PatternFill" minOccurs="0" maxOccurs="1"/>
3499         <xsd:element name="gradientFill" type="CT_GradientFill" minOccurs="0" maxOccurs="1"/>
3500     </xsd:choice>
3501 </xsd:complexType>
3502 <xsd:complexType name="CT_PatternFill">
3503     <xsd:sequence>
3504         <xsd:element name="fgColor" type="CT_Color" minOccurs="0" maxOccurs="1"/>
3505         <xsd:element name="bgColor" type="CT_Color" minOccurs="0" maxOccurs="1"/>
3506     </xsd:sequence>
3507     <xsd:attribute name="patternType" type="ST_PatternType" use="optional"/>
3508 </xsd:complexType>
3509 <xsd:complexType name="CT_Color">
3510     <xsd:attribute name="auto" type="xsd:boolean" use="optional"/>
3511     <xsd:attribute name="indexed" type="xsd:unsignedInt" use="optional"/>
3512     <xsd:attribute name="rgb" type="ST_UnsignedIntHex" use="optional"/>
3513     <xsd:attribute name="theme" type="xsd:unsignedInt" use="optional"/>
3514     <xsd:attribute name="tint" type="xsd:double" use="optional" default="0.0"/>
3515 </xsd:complexType>
3516 <xsd:simpleType name="ST_PatternType">
3517     <xsd:restriction base="xsd:string">
3518         <xsd:enumeration value="none"/>
3519         <xsd:enumeration value="solid"/>
3520         <xsd:enumeration value="mediumGray"/>
3521         <xsd:enumeration value="darkGray"/>
3522         <xsd:enumeration value="lightGray"/>
3523         <xsd:enumeration value="darkHorizontal"/>
3524         <xsd:enumeration value="darkVertical"/>
3525         <xsd:enumeration value="darkDown"/>
3526         <xsd:enumeration value="darkUp"/>
3527         <xsd:enumeration value="darkGrid"/>
3528         <xsd:enumeration value="darkTrellis"/>
3529         <xsd:enumeration value="lightHorizontal"/>
3530         <xsd:enumeration value="lightVertical"/>
3531         <xsd:enumeration value="lightDown"/>
3532         <xsd:enumeration value="lightUp"/>
3533         <xsd:enumeration value="lightGrid"/>
3534         <xsd:enumeration value="lightTrellis"/>
3535         <xsd:enumeration value="gray125"/>
3536         <xsd:enumeration value="gray0625"/>
3537     </xsd:restriction>
3538 </xsd:simpleType>
3539 <xsd:complexType name="CT_GradientFill">
3540     <xsd:sequence>
3541         <xsd:element name="stop" type="CT_GradientStop" minOccurs="0" maxOccurs="unbounded"/>
3542     </xsd:sequence>
3543     <xsd:attribute name="type" type="ST_GradientType" use="optional" default="linear"/>
3544     <xsd:attribute name="degree" type="xsd:double" use="optional" default="0"/>
3545     <xsd:attribute name="left" type="xsd:double" use="optional" default="0"/>

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3546     <xsd:attribute name="right" type="xsd:double" use="optional" default="0"/>
3547     <xsd:attribute name="top" type="xsd:double" use="optional" default="0"/>
3548     <xsd:attribute name="bottom" type="xsd:double" use="optional" default="0"/>
3549 </xsd:complexType>
3550 <xsd:complexType name="CT_GradientStop">
3551     <xsd:sequence>
3552         <xsd:element name="color" type="CT_Color" minOccurs="1" maxOccurs="1"/>
3553     </xsd:sequence>
3554     <xsd:attribute name="position" type="xsd:double" use="required"/>
3555 </xsd:complexType>
3556 <xsd:simpleType name="ST_GradientType">
3557     <xsd:restriction base="xsd:string">
3558         <xsd:enumeration value="linear"/>
3559         <xsd:enumeration value="path"/>
3560     </xsd:restriction>
3561 </xsd:simpleType>
3562 <xsd:simpleType name="ST_HorizontalAlignment">
3563     <xsd:restriction base="xsd:string">
3564         <xsd:enumeration value="general"/>
3565         <xsd:enumeration value="left"/>
3566         <xsd:enumeration value="center"/>
3567         <xsd:enumeration value="right"/>
3568         <xsd:enumeration value="fill"/>
3569         <xsd:enumeration value="justify"/>
3570         <xsd:enumeration value="centerContinuous"/>
3571         <xsd:enumeration value="distributed"/>
3572     </xsd:restriction>
3573 </xsd:simpleType>
3574 <xsd:simpleType name="ST_VerticalAlignment">
3575     <xsd:restriction base="xsd:string">
3576         <xsd:enumeration value="top"/>
3577         <xsd:enumeration value="center"/>
3578         <xsd:enumeration value="bottom"/>
3579         <xsd:enumeration value="justify"/>
3580         <xsd:enumeration value="distributed"/>
3581     </xsd:restriction>
3582 </xsd:simpleType>
3583 <xsd:complexType name="CT_NumFmts">
3584     <xsd:sequence>
3585         <xsd:element name="numFmt" type="CT_NumFmt" minOccurs="0" maxOccurs="unbounded"/>
3586     </xsd:sequence>
3587     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
3588 </xsd:complexType>
3589 <xsd:complexType name="CT_NumFmt">
3590     <xsd:attribute name="numFmtId" type="ST_NumFmtId" use="required"/>
3591     <xsd:attribute name="formatCode" type="s:ST_Xstring" use="required"/>
3592 </xsd:complexType>
3593 <xsd:complexType name="CT_CellStyleXfs">
3594     <xsd:sequence>
3595         <xsd:element name="xf" type="CT_Xf" minOccurs="1" maxOccurs="unbounded"/>
3596     </xsd:sequence>
3597     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
3598 </xsd:complexType>

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3599 <xsd:complexType name="CT_CellXfs">
3600   <xsd:sequence>
3601     <xsd:element name="xf" type="CT_Xf" minOccurs="1" maxOccurs="unbounded"/>
3602   </xsd:sequence>
3603   <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
3604 </xsd:complexType>
3605 <xsd:complexType name="CT_Xf">
3606   <xsd:sequence>
3607     <xsd:element name="alignment" type="CT_CellAlignment" minOccurs="0" maxOccurs="1"/>
3608     <xsd:element name="protection" type="CT_CellProtection" minOccurs="0" maxOccurs="1"/>
3609     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
3610   </xsd:sequence>
3611   <xsd:attribute name="numFmtId" type="ST_NumFmtId" use="optional"/>
3612   <xsd:attribute name="fontId" type="ST_FontId" use="optional"/>
3613   <xsd:attribute name="fillId" type="ST_FillId" use="optional"/>
3614   <xsd:attribute name="borderId" type="ST_BorderId" use="optional"/>
3615   <xsd:attribute name="xfId" type="ST_CellStyleXfId" use="optional"/>
3616   <xsd:attribute name="quotePrefix" type="xsd:boolean" use="optional" default="false"/>
3617   <xsd:attribute name="pivotButton" type="xsd:boolean" use="optional" default="false"/>
3618   <xsd:attribute name="applyNumberFormat" type="xsd:boolean" use="optional"/>
3619   <xsd:attribute name="applyFont" type="xsd:boolean" use="optional"/>
3620   <xsd:attribute name="applyFill" type="xsd:boolean" use="optional"/>
3621   <xsd:attribute name="applyBorder" type="xsd:boolean" use="optional"/>
3622   <xsd:attribute name="applyAlignment" type="xsd:boolean" use="optional"/>
3623   <xsd:attribute name="applyProtection" type="xsd:boolean" use="optional"/>
3624 </xsd:complexType>
3625 <xsd:complexType name="CT_CellStyles">
3626   <xsd:sequence>
3627     <xsd:element name="cellStyle" type="CT_CellStyle" minOccurs="1" maxOccurs="unbounded"/>
3628   </xsd:sequence>
3629   <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
3630 </xsd:complexType>
3631 <xsd:complexType name="CT_CellStyle">
3632   <xsd:sequence>
3633     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
3634   </xsd:sequence>
3635   <xsd:attribute name="name" type="s:ST_Xstring" use="optional"/>
3636   <xsd:attribute name="xfId" type="ST_CellStyleXfId" use="required"/>
3637   <xsd:attribute name="builtinId" type="xsd:unsignedInt" use="optional"/>
3638   <xsd:attribute name="iLevel" type="xsd:unsignedInt" use="optional"/>
3639   <xsd:attribute name="hidden" type="xsd:boolean" use="optional"/>
3640   <xsd:attribute name="customBuiltin" type="xsd:boolean" use="optional"/>
3641 </xsd:complexType>
3642 <xsd:complexType name="CT_Dxfs">
3643   <xsd:sequence>
3644     <xsd:element name="dxf" type="CT_Dxf" minOccurs="0" maxOccurs="unbounded"/>
3645   </xsd:sequence>
3646   <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
3647 </xsd:complexType>
3648 <xsd:complexType name="CT_Dxf">
3649   <xsd:sequence>
3650     <xsd:element name="font" type="CT_Font" minOccurs="0" maxOccurs="1"/>
3651     <xsd:element name="numFmt" type="CT_NumFmt" minOccurs="0" maxOccurs="1"/>

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3652     <xsd:element name="fill" type="CT_Fill" minOccurs="0" maxOccurs="1"/>
3653     <xsd:element name="alignment" type="CT_CellAlignment" minOccurs="0" maxOccurs="1"/>
3654     <xsd:element name="border" type="CT_Border" minOccurs="0" maxOccurs="1"/>
3655     <xsd:element name="protection" type="CT_CellProtection" minOccurs="0" maxOccurs="1"/>
3656     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
3657   </xsd:sequence>
3658 </xsd:complexType>
3659 <xsd:simpleType name="ST_NumFmtId">
3660   <xsd:restriction base="xsd:unsignedInt"/>
3661 </xsd:simpleType>
3662 <xsd:simpleType name="ST_FontId">
3663   <xsd:restriction base="xsd:unsignedInt"/>
3664 </xsd:simpleType>
3665 <xsd:simpleType name="ST_FillId">
3666   <xsd:restriction base="xsd:unsignedInt"/>
3667 </xsd:simpleType>
3668 <xsd:simpleType name="ST_BorderId">
3669   <xsd:restriction base="xsd:unsignedInt"/>
3670 </xsd:simpleType>
3671 <xsd:simpleType name="ST_CellStyleXfId">
3672   <xsd:restriction base="xsd:unsignedInt"/>
3673 </xsd:simpleType>
3674 <xsd:simpleType name="ST_DxfId">
3675   <xsd:restriction base="xsd:unsignedInt"/>
3676 </xsd:simpleType>
3677 <xsd:complexType name="CT_Colors">
3678   <xsd:sequence>
3679     <xsd:element name="indexedColors" type="CT_IndexedColors" minOccurs="0" maxOccurs="1"/>
3680     <xsd:element name="mruColors" type="CT_MRUColors" minOccurs="0" maxOccurs="1"/>
3681   </xsd:sequence>
3682 </xsd:complexType>
3683 <xsd:complexType name="CT_IndexedColors">
3684   <xsd:sequence>
3685     <xsd:element name="rgbColor" type="CT_RgbColor" minOccurs="1" maxOccurs="unbounded"/>
3686   </xsd:sequence>
3687 </xsd:complexType>
3688 <xsd:complexType name="CT_MRUColors">
3689   <xsd:sequence>
3690     <xsd:element name="color" type="CT_Color" minOccurs="1" maxOccurs="unbounded"/>
3691   </xsd:sequence>
3692 </xsd:complexType>
3693 <xsd:complexType name="CT_RgbColor">
3694   <xsd:attribute name="rgb" type="ST_UnsignedIntHex" use="optional"/>
3695 </xsd:complexType>
3696 <xsd:complexType name="CT_TableStyles">
3697   <xsd:sequence>
3698     <xsd:element name="tableStyle" type="CT_TableStyle" minOccurs="0" maxOccurs="unbounded"/>
3699   </xsd:sequence>
3700   <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
3701   <xsd:attribute name="defaultTableStyle" type="xsd:string" use="optional"/>
3702   <xsd:attribute name="defaultPivotStyle" type="xsd:string" use="optional"/>
3703 </xsd:complexType>
3704 <xsd:complexType name="CT_TableStyle">

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3705     <xsd:sequence>
3706         <xsd:element name="tableStyleElement" type="CT_TableStyleElement" minOccurs="0"
3707             maxOccurs="unbounded"/>
3708     </xsd:sequence>
3709     <xsd:attribute name="name" type="xsd:string" use="required"/>
3710     <xsd:attribute name="pivot" type="xsd:boolean" use="optional" default="true"/>
3711     <xsd:attribute name="table" type="xsd:boolean" use="optional" default="true"/>
3712     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
3713 </xsd:complexType>
3714 <xsd:complexType name="CT_TableStyleElement">
3715     <xsd:attribute name="type" type="ST_TableStyleType" use="required"/>
3716     <xsd:attribute name="size" type="xsd:unsignedInt" use="optional" default="1"/>
3717     <xsd:attribute name="dxfId" type="ST_DxfId" use="optional"/>
3718 </xsd:complexType>
3719 <xsd:simpleType name="ST_TableStyleType">
3720     <xsd:restriction base="xsd:string">
3721         <xsd:enumeration value="wholeTable"/>
3722         <xsd:enumeration value="headerRow"/>
3723         <xsd:enumeration value="totalRow"/>
3724         <xsd:enumeration value="firstColumn"/>
3725         <xsd:enumeration value="lastColumn"/>
3726         <xsd:enumeration value="firstRowStripe"/>
3727         <xsd:enumeration value="secondRowStripe"/>
3728         <xsd:enumeration value="firstColumnStripe"/>
3729         <xsd:enumeration value="secondColumnStripe"/>
3730         <xsd:enumeration value="firstHeaderCell"/>
3731         <xsd:enumeration value="lastHeaderCell"/>
3732         <xsd:enumeration value="firstTotalCell"/>
3733         <xsd:enumeration value="lastTotalCell"/>
3734         <xsd:enumeration value="firstSubtotalColumn"/>
3735         <xsd:enumeration value="secondSubtotalColumn"/>
3736         <xsd:enumeration value="thirdSubtotalColumn"/>
3737         <xsd:enumeration value="firstSubtotalRow"/>
3738         <xsd:enumeration value="secondSubtotalRow"/>
3739         <xsd:enumeration value="thirdSubtotalRow"/>
3740         <xsd:enumeration value="blankRow"/>
3741         <xsd:enumeration value="firstColumnSubheading"/>
3742         <xsd:enumeration value="secondColumnSubheading"/>
3743         <xsd:enumeration value="thirdColumnSubheading"/>
3744         <xsd:enumeration value="firstRowSubheading"/>
3745         <xsd:enumeration value="secondRowSubheading"/>
3746         <xsd:enumeration value="thirdRowSubheading"/>
3747         <xsd:enumeration value="pageFieldLabels"/>
3748         <xsd:enumeration value="pageFieldValues"/>
3749     </xsd:restriction>
3750 </xsd:simpleType>
3751 <xsd:complexType name="CT_BooleanProperty">
3752     <xsd:attribute name="val" type="xsd:boolean" use="optional" default="true"/>
3753 </xsd:complexType>
3754 <xsd:complexType name="CT_FontSize">
3755     <xsd:attribute name="val" type="xsd:double" use="required"/>
3756 </xsd:complexType>
3757 <xsd:complexType name="CT_IntProperty">

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3758     <xsd:attribute name="val" type="xsd:int" use="required"/>
3759 </xsd:complexType>
3760 <xsd:complexType name="CT_FontName">
3761     <xsd:attribute name="val" type="s:ST_Xstring" use="required"/>
3762 </xsd:complexType>
3763 <xsd:complexType name="CT_VerticalAlignFontProperty">
3764     <xsd:attribute name="val" type="s:ST_VerticalAlignRun" use="required"/>
3765 </xsd:complexType>
3766 <xsd:complexType name="CT_FontScheme">
3767     <xsd:attribute name="val" type="ST_FontScheme" use="required"/>
3768 </xsd:complexType>
3769 <xsd:simpleType name="ST_FontScheme">
3770     <xsd:restriction base="xsd:string">
3771         <xsd:enumeration value="none"/>
3772         <xsd:enumeration value="major"/>
3773         <xsd:enumeration value="minor"/>
3774     </xsd:restriction>
3775 </xsd:simpleType>
3776 <xsd:complexType name="CT_UnderlineProperty">
3777     <xsd:attribute name="val" type="ST_UnderlineValues" use="optional" default="single"/>
3778 </xsd:complexType>
3779 <xsd:simpleType name="ST_UnderlineValues">
3780     <xsd:restriction base="xsd:string">
3781         <xsd:enumeration value="single"/>
3782         <xsd:enumeration value="double"/>
3783         <xsd:enumeration value="singleAccounting"/>
3784         <xsd:enumeration value="doubleAccounting"/>
3785         <xsd:enumeration value="none"/>
3786     </xsd:restriction>
3787 </xsd:simpleType>
3788 <xsd:complexType name="CT_FontFamily">
3789     <xsd:attribute name="val" type="ST_FontFamily" use="required"/>
3790 </xsd:complexType>
3791 <xsd:simpleType name="ST_FontFamily">
3792     <xsd:restriction base="xsd:integer">
3793         <xsd:minInclusive value="0"/>
3794         <xsd:maxInclusive value="14"/>
3795     </xsd:restriction>
3796 </xsd:simpleType>
3797 <xsd:complexType name="CT_Font">
3798     <xsd:choice maxOccurs="unbounded">
3799         <xsd:element name="name" type="CT_FontName" minOccurs="0" maxOccurs="1"/>
3800         <xsd:element name="charset" type="CT_IntProperty" minOccurs="0" maxOccurs="1"/>
3801         <xsd:element name="family" type="CT_FontFamily" minOccurs="0" maxOccurs="1"/>
3802         <xsd:element name="b" type="CT_BooleanProperty" minOccurs="0" maxOccurs="1"/>
3803         <xsd:element name="i" type="CT_BooleanProperty" minOccurs="0" maxOccurs="1"/>
3804         <xsd:element name="strike" type="CT_BooleanProperty" minOccurs="0" maxOccurs="1"/>
3805         <xsd:element name="outline" type="CT_BooleanProperty" minOccurs="0" maxOccurs="1"/>
3806         <xsd:element name="shadow" type="CT_BooleanProperty" minOccurs="0" maxOccurs="1"/>
3807         <xsd:element name="condense" type="CT_BooleanProperty" minOccurs="0" maxOccurs="1"/>
3808         <xsd:element name="extend" type="CT_BooleanProperty" minOccurs="0" maxOccurs="1"/>
3809         <xsd:element name="color" type="CT_Color" minOccurs="0" maxOccurs="1"/>
3810         <xsd:element name="sz" type="CT_FontSize" minOccurs="0" maxOccurs="1"/>

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3811     <xsd:element name="u" type="CT_UnderlineProperty" minOccurs="0" maxOccurs="1"/>
3812     <xsd:element name="vertAlign" type="CT_VerticalAlignFontProperty" minOccurs="0"
3813         maxOccurs="1"/>
3814     <xsd:element name="scheme" type="CT_FontScheme" minOccurs="0" maxOccurs="1"/>
3815 </xsd:choice>
3816 </xsd:complexType>
3817 <xsd:attributeGroup name="AG_AutoFormat">
3818     <xsd:attribute name="autoFormatId" type="xsd:unsignedInt"/>
3819     <xsd:attribute name="applyNumberFormats" type="xsd:boolean"/>
3820     <xsd:attribute name="applyBorderFormats" type="xsd:boolean"/>
3821     <xsd:attribute name="applyFontFormats" type="xsd:boolean"/>
3822     <xsd:attribute name="applyPatternFormats" type="xsd:boolean"/>
3823     <xsd:attribute name="applyAlignmentFormats" type="xsd:boolean"/>
3824     <xsd:attribute name="applyWidthHeightFormats" type="xsd:boolean"/>
3825 </xsd:attributeGroup>
3826 <xsd:element name="externalLink" type="CT_ExternalLink"/>
3827 <xsd:complexType name="CT_ExternalLink">
3828     <xsd:sequence>
3829         <xsd:choice>
3830             <xsd:element name="externalBook" type="CT_ExternalBook" minOccurs="0" maxOccurs="1"/>
3831             <xsd:element name="ddeLink" type="CT_DdeLink" minOccurs="0" maxOccurs="1"/>
3832             <xsd:element name="oleLink" type="CT_OleLink" minOccurs="0" maxOccurs="1"/>
3833         </xsd:choice>
3834         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
3835     </xsd:sequence>
3836 </xsd:complexType>
3837 <xsd:complexType name="CT_ExternalBook">
3838     <xsd:sequence>
3839         <xsd:element name="sheetNames" type="CT_ExternalSheetNames" minOccurs="0" maxOccurs="1"/>
3840         <xsd:element name="definedNames" type="CT_ExternalDefinedNames" minOccurs="0"
3841             maxOccurs="1"/>
3842         <xsd:element name="sheetDataSet" type="CT_ExternalSheetDataSet" minOccurs="0"
3843             maxOccurs="1"/>
3844     </xsd:sequence>
3845     <xsd:attribute ref="r:id" use="required"/>
3846 </xsd:complexType>
3847 <xsd:complexType name="CT_ExternalSheetNames">
3848     <xsd:sequence>
3849         <xsd:element name="sheetName" minOccurs="1" maxOccurs="unbounded"
3850             type="CT_ExternalSheetName"/>
3851     </xsd:sequence>
3852 </xsd:complexType>
3853 <xsd:complexType name="CT_ExternalSheetName">
3854     <xsd:attribute name="val" type="s:ST_Xstring"/>
3855 </xsd:complexType>
3856 <xsd:complexType name="CT_ExternalDefinedNames">
3857     <xsd:sequence>
3858         <xsd:element name="definedName" type="CT_ExternalDefinedName" minOccurs="0"
3859             maxOccurs="unbounded"/>
3860     </xsd:sequence>
3861 </xsd:complexType>
3862 <xsd:complexType name="CT_ExternalDefinedName">
3863     <xsd:attribute name="name" type="s:ST_Xstring" use="required"/>

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3864     <xsd:attribute name="refersTo" type="s:ST Xstring" use="optional"/>
3865     <xsd:attribute name="sheetId" type="xsd:unsignedInt" use="optional"/>
3866   </xsd:complexType>
3867   <xsd:complexType name="CT_ExternalSheetDataSet">
3868     <xsd:sequence>
3869       <xsd:element name="sheetData" type="CT_ExternalSheetData" minOccurs="1"
3870         maxOccurs="unbounded"/>
3871     </xsd:sequence>
3872   </xsd:complexType>
3873   <xsd:complexType name="CT_ExternalSheetData">
3874     <xsd:sequence>
3875       <xsd:element name="row" type="CT_ExternalRow" minOccurs="0" maxOccurs="unbounded"/>
3876     </xsd:sequence>
3877     <xsd:attribute name="sheetId" type="xsd:unsignedInt" use="required"/>
3878     <xsd:attribute name="refreshError" type="xsd:boolean" use="optional" default="false"/>
3879   </xsd:complexType>
3880   <xsd:complexType name="CT_ExternalRow">
3881     <xsd:sequence>
3882       <xsd:element name="cell" type="CT_ExternalCell" minOccurs="0" maxOccurs="unbounded"/>
3883     </xsd:sequence>
3884     <xsd:attribute name="r" type="xsd:unsignedInt" use="required"/>
3885   </xsd:complexType>
3886   <xsd:complexType name="CT_ExternalCell">
3887     <xsd:sequence>
3888       <xsd:element name="v" type="s:ST Xstring" minOccurs="0" maxOccurs="1"/>
3889     </xsd:sequence>
3890     <xsd:attribute name="r" type="ST_CellRef" use="optional"/>
3891     <xsd:attribute name="t" type="ST_CellType" use="optional" default="n"/>
3892     <xsd:attribute name="vm" type="xsd:unsignedInt" use="optional" default="0"/>
3893   </xsd:complexType>
3894   <xsd:complexType name="CT_DdeLink">
3895     <xsd:sequence>
3896       <xsd:element name="ddeItems" type="CT_DdeItems" minOccurs="0" maxOccurs="1"/>
3897     </xsd:sequence>
3898     <xsd:attribute name="ddeService" type="s:ST Xstring" use="required"/>
3899     <xsd:attribute name="ddeTopic" type="s:ST Xstring" use="required"/>
3900   </xsd:complexType>
3901   <xsd:complexType name="CT_DdeItems">
3902     <xsd:sequence>
3903       <xsd:element name="ddeItem" type="CT_DdeItem" minOccurs="0" maxOccurs="unbounded"/>
3904     </xsd:sequence>
3905   </xsd:complexType>
3906   <xsd:complexType name="CT_DdeItem">
3907     <xsd:sequence>
3908       <xsd:element name="values" type="CT_DdeValues" minOccurs="0" maxOccurs="1"/>
3909     </xsd:sequence>
3910     <xsd:attribute name="name" type="s:ST Xstring" default="0"/>
3911     <xsd:attribute name="ole" type="xsd:boolean" use="optional" default="false"/>
3912     <xsd:attribute name="advise" type="xsd:boolean" use="optional" default="false"/>
3913     <xsd:attribute name="preferPic" type="xsd:boolean" use="optional" default="false"/>
3914   </xsd:complexType>
3915   <xsd:complexType name="CT_DdeValues">
3916     <xsd:sequence>

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3917     <xsd:element name="value" minOccurs="1" maxOccurs="unbounded" type="CT_DdeValue"/>
3918   </xsd:sequence>
3919   <xsd:attribute name="rows" type="xsd:unsignedInt" use="optional" default="1"/>
3920   <xsd:attribute name="cols" type="xsd:unsignedInt" use="optional" default="1"/>
3921 </xsd:complexType>
3922 <xsd:complexType name="CT_DdeValue">
3923   <xsd:sequence>
3924     <xsd:element name="val" type="s:ST_Xstring" minOccurs="1" maxOccurs="1"/>
3925   </xsd:sequence>
3926   <xsd:attribute name="t" type="ST_DdeValueType" use="optional" default="n"/>
3927 </xsd:complexType>
3928 <xsd:simpleType name="ST_DdeValueType">
3929   <xsd:restriction base="xsd:string">
3930     <xsd:enumeration value="nil"/>
3931     <xsd:enumeration value="b"/>
3932     <xsd:enumeration value="n"/>
3933     <xsd:enumeration value="e"/>
3934     <xsd:enumeration value="str"/>
3935   </xsd:restriction>
3936 </xsd:simpleType>
3937 <xsd:complexType name="CT_OleLink">
3938   <xsd:sequence>
3939     <xsd:element name="oleItems" type="CT_OleItems" minOccurs="0" maxOccurs="1"/>
3940   </xsd:sequence>
3941   <xsd:attribute ref="r:id" use="required"/>
3942   <xsd:attribute name="progId" type="s:ST_Xstring" use="required"/>
3943 </xsd:complexType>
3944 <xsd:complexType name="CT_OleItems">
3945   <xsd:sequence>
3946     <xsd:element name="oleItem" type="CT_OleItem" minOccurs="0" maxOccurs="unbounded"/>
3947   </xsd:sequence>
3948 </xsd:complexType>
3949 <xsd:complexType name="CT_OleItem">
3950   <xsd:attribute name="name" type="s:ST_Xstring" use="required"/>
3951   <xsd:attribute name="icon" type="xsd:boolean" use="optional" default="false"/>
3952   <xsd:attribute name="advise" type="xsd:boolean" use="optional" default="false"/>
3953   <xsd:attribute name="preferPic" type="xsd:boolean" use="optional" default="false"/>
3954 </xsd:complexType>
3955 <xsd:element name="table" type="CT_Table"/>
3956 <xsd:complexType name="CT_Table">
3957   <xsd:sequence>
3958     <xsd:element name="autoFilter" type="CT_AutoFilter" minOccurs="0" maxOccurs="1"/>
3959     <xsd:element name="sortState" type="CT_SortState" minOccurs="0" maxOccurs="1"/>
3960     <xsd:element name="tableColumns" type="CT_TableColumns" minOccurs="1" maxOccurs="1"/>
3961     <xsd:element name="tableStyleInfo" type="CT_TableStyleInfo" minOccurs="0" maxOccurs="1"/>
3962     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
3963   </xsd:sequence>
3964   <xsd:attribute name="id" type="xsd:unsignedInt" use="required"/>
3965   <xsd:attribute name="name" type="s:ST_Xstring" use="optional"/>
3966   <xsd:attribute name="displayName" type="s:ST_Xstring" use="required"/>
3967   <xsd:attribute name="comment" type="s:ST_Xstring" use="optional"/>
3968   <xsd:attribute name="ref" type="ST_Ref" use="required"/>
3969   <xsd:attribute name="tableType" type="ST_TableType" use="optional" default="worksheet"/>

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3970 <xsd:attribute name="headerRowCount" type="xsd:unsignedInt" use="optional" default="1"/>
3971 <xsd:attribute name="insertRow" type="xsd:boolean" use="optional" default="false"/>
3972 <xsd:attribute name="insertRowShift" type="xsd:boolean" use="optional" default="false"/>
3973 <xsd:attribute name="totalsRowCount" type="xsd:unsignedInt" use="optional" default="0"/>
3974 <xsd:attribute name="totalsRowShown" type="xsd:boolean" use="optional" default="true"/>
3975 <xsd:attribute name="published" type="xsd:boolean" use="optional" default="false"/>
3976 <xsd:attribute name="headerRowDxfId" type="ST DxfId" use="optional"/>
3977 <xsd:attribute name="dataDxfId" type="ST DxfId" use="optional"/>
3978 <xsd:attribute name="totalsRowDxfId" type="ST DxfId" use="optional"/>
3979 <xsd:attribute name="headerRowBorderDxfId" type="ST DxfId" use="optional"/>
3980 <xsd:attribute name="tableBorderDxfId" type="ST DxfId" use="optional"/>
3981 <xsd:attribute name="totalsRowBorderDxfId" type="ST DxfId" use="optional"/>
3982 <xsd:attribute name="headerRowCellStyle" type="s:ST Xstring" use="optional"/>
3983 <xsd:attribute name="dataCellStyle" type="s:ST Xstring" use="optional"/>
3984 <xsd:attribute name="totalsRowCellStyle" type="s:ST Xstring" use="optional"/>
3985 <xsd:attribute name="connectionId" type="xsd:unsignedInt" use="optional"/>
3986 </xsd:complexType>
3987 <xsd:simpleType name="ST_TableType">
3988   <xsd:restriction base="xsd:string">
3989     <xsd:enumeration value="worksheet"/>
3990     <xsd:enumeration value="xml"/>
3991     <xsd:enumeration value="queryTable"/>
3992   </xsd:restriction>
3993 </xsd:simpleType>
3994 <xsd:complexType name="CT_TableStyleInfo">
3995   <xsd:attribute name="name" type="s:ST Xstring" use="optional"/>
3996   <xsd:attribute name="showFirstColumn" type="xsd:boolean" use="optional"/>
3997   <xsd:attribute name="showLastColumn" type="xsd:boolean" use="optional"/>
3998   <xsd:attribute name="showRowStripes" type="xsd:boolean" use="optional"/>
3999   <xsd:attribute name="showColumnStripes" type="xsd:boolean" use="optional"/>
4000 </xsd:complexType>
4001 <xsd:complexType name="CT_TableColumns">
4002   <xsd:sequence>
4003     <xsd:element name="tableColumn" type="CT_TableColumn" minOccurs="1"
4004       maxOccurs="unbounded"/>
4005   </xsd:sequence>
4006   <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
4007 </xsd:complexType>
4008 <xsd:complexType name="CT_TableColumn">
4009   <xsd:sequence>
4010     <xsd:element name="calculatedColumnFormula" type="CT_TableFormula" minOccurs="0"
4011       maxOccurs="1"/>
4012     <xsd:element name="totalsRowFormula" type="CT_TableFormula" minOccurs="0" maxOccurs="1"/>
4013     <xsd:element name="xmlColumnPr" type="CT_XmlColumnPr" minOccurs="0" maxOccurs="1"/>
4014     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
4015   </xsd:sequence>
4016   <xsd:attribute name="id" type="xsd:unsignedInt" use="required"/>
4017   <xsd:attribute name="uniqueName" type="s:ST Xstring" use="optional"/>
4018   <xsd:attribute name="name" type="s:ST Xstring" use="required"/>
4019   <xsd:attribute name="totalsRowFunction" type="ST TotalsRowFunction" use="optional"
4020     default="none"/>
4021   <xsd:attribute name="totalsRowLabel" type="s:ST Xstring" use="optional"/>
4022   <xsd:attribute name="queryTableFieldId" type="xsd:unsignedInt" use="optional"/>

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4023     <xsd:attribute name="headerRowDxfId" type="ST_DxfId" use="optional"/>
4024     <xsd:attribute name="dataDxfId" type="ST_DxfId" use="optional"/>
4025     <xsd:attribute name="totalsRowDxfId" type="ST_DxfId" use="optional"/>
4026     <xsd:attribute name="headerRowCellStyle" type="s:ST_Xstring" use="optional"/>
4027     <xsd:attribute name="dataCellStyle" type="s:ST_Xstring" use="optional"/>
4028     <xsd:attribute name="totalsRowCellStyle" type="s:ST_Xstring" use="optional"/>
4029 </xsd:complexType>
4030 <xsd:complexType name="CT_TableFormula">
4031     <xsd:simpleContent>
4032         <xsd:extension base="ST_Formula">
4033             <xsd:attribute name="array" type="xsd:boolean" default="false"/>
4034         </xsd:extension>
4035     </xsd:simpleContent>
4036 </xsd:complexType>
4037 <xsd:simpleType name="ST_TotalsRowFunction">
4038     <xsd:restriction base="xsd:string">
4039         <xsd:enumeration value="none"/>
4040         <xsd:enumeration value="sum"/>
4041         <xsd:enumeration value="min"/>
4042         <xsd:enumeration value="max"/>
4043         <xsd:enumeration value="average"/>
4044         <xsd:enumeration value="count"/>
4045         <xsd:enumeration value="countNums"/>
4046         <xsd:enumeration value="stdDev"/>
4047         <xsd:enumeration value="var"/>
4048         <xsd:enumeration value="custom"/>
4049     </xsd:restriction>
4050 </xsd:simpleType>
4051 <xsd:complexType name="CT_XmlColumnPr">
4052     <xsd:sequence>
4053         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
4054     </xsd:sequence>
4055     <xsd:attribute name="mapId" type="xsd:unsignedInt" use="required"/>
4056     <xsd:attribute name="xpath" type="s:ST_Xstring" use="required"/>
4057     <xsd:attribute name="denormalized" type="xsd:boolean" use="optional" default="false"/>
4058     <xsd:attribute name="xmlDataType" type="ST_XmlDataType" use="required"/>
4059 </xsd:complexType>
4060 <xsd:simpleType name="ST_XmlDataType">
4061     <xsd:restriction base="xsd:string"/>
4062 </xsd:simpleType>
4063 <xsd:element name="volTypes" type="CT_VolTypes"/>
4064 <xsd:complexType name="CT_VolTypes">
4065     <xsd:sequence>
4066         <xsd:element name="volType" type="CT_VolType" minOccurs="1" maxOccurs="unbounded"/>
4067         <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
4068     </xsd:sequence>
4069 </xsd:complexType>
4070 <xsd:complexType name="CT_VolType">
4071     <xsd:sequence>
4072         <xsd:element name="main" type="CT_VolMain" minOccurs="1" maxOccurs="unbounded"/>
4073     </xsd:sequence>
4074     <xsd:attribute name="type" type="ST_VolDepType" use="required"/>
4075 </xsd:complexType>

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4076 <xsd:complexType name="CT_VolMain">
4077   <xsd:sequence>
4078     <xsd:element name="tp" type="CT_VolTopic" minOccurs="1" maxOccurs="unbounded"/>
4079   </xsd:sequence>
4080   <xsd:attribute name="first" type="s:ST_Xstring" use="required"/>
4081 </xsd:complexType>
4082 <xsd:complexType name="CT_VolTopic">
4083   <xsd:sequence>
4084     <xsd:element name="v" type="s:ST_Xstring" minOccurs="1" maxOccurs="1"/>
4085     <xsd:element name="stp" type="s:ST_Xstring" minOccurs="0" maxOccurs="unbounded"/>
4086     <xsd:element name="tr" type="CT_VolTopicRef" minOccurs="1" maxOccurs="unbounded"/>
4087   </xsd:sequence>
4088   <xsd:attribute name="t" type="ST_VolValueType" use="optional" default="n"/>
4089 </xsd:complexType>
4090 <xsd:complexType name="CT_VolTopicRef">
4091   <xsd:attribute name="r" type="ST_CellRef" use="required"/>
4092   <xsd:attribute name="s" type="xsd:unsignedInt" use="required"/>
4093 </xsd:complexType>
4094 <xsd:simpleType name="ST_VolDepType">
4095   <xsd:restriction base="xsd:string">
4096     <xsd:enumeration value="realTimeData"/>
4097     <xsd:enumeration value="olapFunctions"/>
4098   </xsd:restriction>
4099 </xsd:simpleType>
4100 <xsd:simpleType name="ST_VolValueType">
4101   <xsd:restriction base="xsd:string">
4102     <xsd:enumeration value="b"/>
4103     <xsd:enumeration value="n"/>
4104     <xsd:enumeration value="e"/>
4105     <xsd:enumeration value="s"/>
4106   </xsd:restriction>
4107 </xsd:simpleType>
4108 <xsd:element name="workbook" type="CT_Workbook"/>
4109 <xsd:complexType name="CT_Workbook">
4110   <xsd:sequence>
4111     <xsd:element name="fileVersion" type="CT_FileVersion" minOccurs="0" maxOccurs="1"/>
4112     <xsd:element name="fileSharing" type="CT_FileSharing" minOccurs="0" maxOccurs="1"/>
4113     <xsd:element name="workbookPr" type="CT_WorkbookPr" minOccurs="0" maxOccurs="1"/>
4114     <xsd:element name="workbookProtection" type="CT_WorkbookProtection" minOccurs="0"
4115       maxOccurs="1"/>
4116     <xsd:element name="bookViews" type="CT_BookViews" minOccurs="0" maxOccurs="1"/>
4117     <xsd:element name="sheets" type="CT_Sheets" minOccurs="1" maxOccurs="1"/>
4118     <xsd:element name="functionGroups" type="CT_FunctionGroups" minOccurs="0" maxOccurs="1"/>
4119     <xsd:element name="externalReferences" type="CT_ExternalReferences" minOccurs="0"
4120       maxOccurs="1"/>
4121     <xsd:element name="definedNames" type="CT_DefinedNames" minOccurs="0" maxOccurs="1"/>
4122     <xsd:element name="calcPr" type="CT_CalcPr" minOccurs="0" maxOccurs="1"/>
4123     <xsd:element name="oleSize" type="CT_OleSize" minOccurs="0" maxOccurs="1"/>
4124     <xsd:element name="customWorkbookViews" type="CT_CustomWorkbookViews" minOccurs="0"
4125       maxOccurs="1"/>
4126     <xsd:element name="pivotCaches" type="CT_PivotCaches" minOccurs="0" maxOccurs="1"/>
4127     <xsd:element name="smartTagPr" type="CT_SmartTagPr" minOccurs="0" maxOccurs="1"/>
4128     <xsd:element name="smartTagTypes" type="CT_SmartTagTypes" minOccurs="0" maxOccurs="1"/>

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4129     <xsd:element name="webPublishing" type="CT_WebPublishing" minOccurs="0" maxOccurs="1"/>
4130     <xsd:element name="fileRecoveryPr" type="CT_FileRecoveryPr" minOccurs="0"
4131         maxOccurs="unbounded"/>
4132     <xsd:element name="webPublishObjects" type="CT_WebPublishObjects" minOccurs="0"
4133         maxOccurs="1"/>
4134     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
4135 </xsd:sequence>
4136 <xsd:attribute name="conformance" type="s:ST_ConformanceClass"/>
4137 </xsd:complexType>
4138 <xsd:complexType name="CT_FileVersion">
4139     <xsd:attribute name="appName" type="xsd:string" use="optional"/>
4140     <xsd:attribute name="lastEdited" type="xsd:string" use="optional"/>
4141     <xsd:attribute name="lowestEdited" type="xsd:string" use="optional"/>
4142     <xsd:attribute name="rupBuild" type="xsd:string" use="optional"/>
4143     <xsd:attribute name="codeName" type="s:ST_Guid" use="optional"/>
4144 </xsd:complexType>
4145 <xsd:complexType name="CT_BookViews">
4146     <xsd:sequence>
4147         <xsd:element name="workbookView" type="CT_BookView" minOccurs="1" maxOccurs="unbounded"/>
4148     </xsd:sequence>
4149 </xsd:complexType>
4150 <xsd:complexType name="CT_BookView">
4151     <xsd:sequence>
4152         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
4153     </xsd:sequence>
4154     <xsd:attribute name="visibility" type="ST_Visibility" use="optional" default="visible"/>
4155     <xsd:attribute name="minimized" type="xsd:boolean" use="optional" default="false"/>
4156     <xsd:attribute name="showHorizontalScroll" type="xsd:boolean" use="optional" default="true"/>
4157     <xsd:attribute name="showVerticalScroll" type="xsd:boolean" use="optional" default="true"/>
4158     <xsd:attribute name="showSheetTabs" type="xsd:boolean" use="optional" default="true"/>
4159     <xsd:attribute name="xWindow" type="xsd:int" use="optional"/>
4160     <xsd:attribute name="yWindow" type="xsd:int" use="optional"/>
4161     <xsd:attribute name="windowWidth" type="xsd:unsignedInt" use="optional"/>
4162     <xsd:attribute name="windowHeight" type="xsd:unsignedInt" use="optional"/>
4163     <xsd:attribute name="tabRatio" type="xsd:unsignedInt" use="optional" default="600"/>
4164     <xsd:attribute name="firstSheet" type="xsd:unsignedInt" use="optional" default="0"/>
4165     <xsd:attribute name="activeTab" type="xsd:unsignedInt" use="optional" default="0"/>
4166     <xsd:attribute name="autoFilterDateGrouping" type="xsd:boolean" use="optional"
4167         default="true"/>
4168 </xsd:complexType>
4169 <xsd:simpleType name="ST_Visibility">
4170     <xsd:restriction base="xsd:string">
4171         <xsd:enumeration value="visible"/>
4172         <xsd:enumeration value="hidden"/>
4173         <xsd:enumeration value="veryHidden"/>
4174     </xsd:restriction>
4175 </xsd:simpleType>
4176 <xsd:complexType name="CT_CustomWorkbookViews">
4177     <xsd:sequence>
4178         <xsd:element name="customWorkbookView" minOccurs="1" maxOccurs="unbounded"
4179             type="CT_CustomWorkbookView"/>
4180     </xsd:sequence>
4181 </xsd:complexType>

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4182 <xsd:complexType name="CT_CustomWorkbookView">
4183   <xsd:sequence>
4184     <xsd:element name="extLst" minOccurs="0" type="CT_ExtensionList"/>
4185   </xsd:sequence>
4186   <xsd:attribute name="name" type="s:ST_Xstring" use="required"/>
4187   <xsd:attribute name="guid" type="s:ST_Guid" use="required"/>
4188   <xsd:attribute name="autoUpdate" type="xsd:boolean" use="optional" default="false"/>
4189   <xsd:attribute name="mergeInterval" type="xsd:unsignedInt" use="optional"/>
4190   <xsd:attribute name="changesSavedWin" type="xsd:boolean" use="optional" default="false"/>
4191   <xsd:attribute name="onlySync" type="xsd:boolean" use="optional" default="false"/>
4192   <xsd:attribute name="personalView" type="xsd:boolean" use="optional" default="false"/>
4193   <xsd:attribute name="includePrintSettings" type="xsd:boolean" use="optional" default="true"/>
4194   <xsd:attribute name="includeHiddenRowCol" type="xsd:boolean" use="optional" default="true"/>
4195   <xsd:attribute name="maximized" type="xsd:boolean" use="optional" default="false"/>
4196   <xsd:attribute name="minimized" type="xsd:boolean" use="optional" default="false"/>
4197   <xsd:attribute name="showHorizontalScroll" type="xsd:boolean" use="optional" default="true"/>
4198   <xsd:attribute name="showVerticalScroll" type="xsd:boolean" use="optional" default="true"/>
4199   <xsd:attribute name="showSheetTabs" type="xsd:boolean" use="optional" default="true"/>
4200   <xsd:attribute name="xWindow" type="xsd:int" use="optional" default="0"/>
4201   <xsd:attribute name="yWindow" type="xsd:int" use="optional" default="0"/>
4202   <xsd:attribute name="windowWidth" type="xsd:unsignedInt" use="required"/>
4203   <xsd:attribute name="windowHeight" type="xsd:unsignedInt" use="required"/>
4204   <xsd:attribute name="tabRatio" type="xsd:unsignedInt" use="optional" default="600"/>
4205   <xsd:attribute name="activeSheetId" type="xsd:unsignedInt" use="required"/>
4206   <xsd:attribute name="showFormulaBar" type="xsd:boolean" use="optional" default="true"/>
4207   <xsd:attribute name="showStatusbar" type="xsd:boolean" use="optional" default="true"/>
4208   <xsd:attribute name="showComments" type="ST_Comments" use="optional" default="commIndicator"/>
4209   <xsd:attribute name="showObjects" type="ST_Objects" use="optional" default="all"/>
4210 </xsd:complexType>
4211 <xsd:simpleType name="ST_Comments">
4212   <xsd:restriction base="xsd:string">
4213     <xsd:enumeration value="commNone"/>
4214     <xsd:enumeration value="commIndicator"/>
4215     <xsd:enumeration value="commIndAndComment"/>
4216   </xsd:restriction>
4217 </xsd:simpleType>
4218 <xsd:simpleType name="ST_Objects">
4219   <xsd:restriction base="xsd:string">
4220     <xsd:enumeration value="all"/>
4221     <xsd:enumeration value="placeholders"/>
4222     <xsd:enumeration value="none"/>
4223   </xsd:restriction>
4224 </xsd:simpleType>
4225 <xsd:complexType name="CT_Sheets">
4226   <xsd:sequence>
4227     <xsd:element name="sheet" type="CT_Sheet" minOccurs="1" maxOccurs="unbounded"/>
4228   </xsd:sequence>
4229 </xsd:complexType>
4230 <xsd:complexType name="CT_Sheet">
4231   <xsd:attribute name="name" type="s:ST_Xstring" use="required"/>
4232   <xsd:attribute name="sheetId" type="xsd:unsignedInt" use="required"/>
4233   <xsd:attribute name="state" type="ST_SheetState" use="optional" default="visible"/>
4234   <xsd:attribute ref="r:id" use="required"/>

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4235 </xsd:complexType>
4236 <xsd:simpleType name="ST_SheetState">
4237   <xsd:restriction base="xsd:string">
4238     <xsd:enumeration value="visible"/>
4239     <xsd:enumeration value="hidden"/>
4240     <xsd:enumeration value="veryHidden"/>
4241   </xsd:restriction>
4242 </xsd:simpleType>
4243 <xsd:complexType name="CT_WorkbookPr">
4244   <xsd:attribute name="date1904" type="xsd:boolean" use="optional" default="false"/>
4245   <xsd:attribute name="showObjects" type="ST_Objects" use="optional" default="all"/>
4246   <xsd:attribute name="showBorderUnselectedTables" type="xsd:boolean" use="optional"
4247     default="true"/>
4248   <xsd:attribute name="filterPrivacy" type="xsd:boolean" use="optional" default="false"/>
4249   <xsd:attribute name="promptedSolutions" type="xsd:boolean" use="optional" default="false"/>
4250   <xsd:attribute name="showInkAnnotation" type="xsd:boolean" use="optional" default="true"/>
4251   <xsd:attribute name="backupFile" type="xsd:boolean" use="optional" default="false"/>
4252   <xsd:attribute name="saveExternalLinkValues" type="xsd:boolean" use="optional"
4253     default="true"/>
4254   <xsd:attribute name="updateLinks" type="ST_UpdateLinks" use="optional" default="userSet"/>
4255   <xsd:attribute name="codeName" type="xsd:string" use="optional"/>
4256   <xsd:attribute name="hidePivotFieldList" type="xsd:boolean" use="optional" default="false"/>
4257   <xsd:attribute name="showPivotChartFilter" type="xsd:boolean" default="false"/>
4258   <xsd:attribute name="allowRefreshQuery" type="xsd:boolean" use="optional" default="false"/>
4259   <xsd:attribute name="publishItems" type="xsd:boolean" use="optional" default="false"/>
4260   <xsd:attribute name="checkCompatibility" type="xsd:boolean" use="optional" default="false"/>
4261   <xsd:attribute name="autoCompressPictures" type="xsd:boolean" use="optional" default="true"/>
4262   <xsd:attribute name="refreshAllConnections" type="xsd:boolean" use="optional"
4263     default="false"/>
4264   <xsd:attribute name="defaultThemeVersion" type="xsd:unsignedInt" use="optional"/>
4265 </xsd:complexType>
4266 <xsd:simpleType name="ST_UpdateLinks">
4267   <xsd:restriction base="xsd:string">
4268     <xsd:enumeration value="userSet"/>
4269     <xsd:enumeration value="never"/>
4270     <xsd:enumeration value="always"/>
4271   </xsd:restriction>
4272 </xsd:simpleType>
4273 <xsd:complexType name="CT_SmartTagPr">
4274   <xsd:attribute name="embed" type="xsd:boolean" use="optional" default="false"/>
4275   <xsd:attribute name="show" type="ST_SmartTagShow" use="optional" default="all"/>
4276 </xsd:complexType>
4277 <xsd:simpleType name="ST_SmartTagShow">
4278   <xsd:restriction base="xsd:string">
4279     <xsd:enumeration value="all"/>
4280     <xsd:enumeration value="none"/>
4281     <xsd:enumeration value="noIndicator"/>
4282   </xsd:restriction>
4283 </xsd:simpleType>
4284 <xsd:complexType name="CT_SmartTagTypes">
4285   <xsd:sequence>
4286     <xsd:element name="smartTagType" type="CT_SmartTagType" minOccurs="0"
4287       maxOccurs="unbounded"/>

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4288     </xsd:sequence>
4289 </xsd:complexType>
4290 <xsd:complexType name="CT_SmartTagType">
4291     <xsd:attribute name="namespaceUri" type="s:ST_Xstring" use="optional"/>
4292     <xsd:attribute name="name" type="s:ST_Xstring" use="optional"/>
4293     <xsd:attribute name="url" type="s:ST_Xstring" use="optional"/>
4294 </xsd:complexType>
4295 <xsd:complexType name="CT_FileRecoveryPr">
4296     <xsd:attribute name="autoRecover" type="xsd:boolean" use="optional" default="true"/>
4297     <xsd:attribute name="crashSave" type="xsd:boolean" use="optional" default="false"/>
4298     <xsd:attribute name="dataExtractLoad" type="xsd:boolean" use="optional" default="false"/>
4299     <xsd:attribute name="repairLoad" type="xsd:boolean" use="optional" default="false"/>
4300 </xsd:complexType>
4301 <xsd:complexType name="CT_CalcPr">
4302     <xsd:attribute name="calcId" type="xsd:unsignedInt"/>
4303     <xsd:attribute name="calcMode" type="ST_CalcMode" use="optional" default="auto"/>
4304     <xsd:attribute name="fullCalcOnLoad" type="xsd:boolean" use="optional" default="false"/>
4305     <xsd:attribute name="refMode" type="ST_RefMode" use="optional" default="A1"/>
4306     <xsd:attribute name="iterate" type="xsd:boolean" use="optional" default="false"/>
4307     <xsd:attribute name="iterateCount" type="xsd:unsignedInt" use="optional" default="100"/>
4308     <xsd:attribute name="iterateDelta" type="xsd:double" use="optional" default="0.001"/>
4309     <xsd:attribute name="fullPrecision" type="xsd:boolean" use="optional" default="true"/>
4310     <xsd:attribute name="calcCompleted" type="xsd:boolean" use="optional" default="true"/>
4311     <xsd:attribute name="calcOnSave" type="xsd:boolean" use="optional" default="true"/>
4312     <xsd:attribute name="concurrentCalc" type="xsd:boolean" use="optional" default="true"/>
4313     <xsd:attribute name="concurrentManualCount" type="xsd:unsignedInt" use="optional"/>
4314     <xsd:attribute name="forceFullCalc" type="xsd:boolean" use="optional"/>
4315 </xsd:complexType>
4316 <xsd:simpleType name="ST_CalcMode">
4317     <xsd:restriction base="xsd:string">
4318         <xsd:enumeration value="manual"/>
4319         <xsd:enumeration value="auto"/>
4320         <xsd:enumeration value="autoNoTable"/>
4321     </xsd:restriction>
4322 </xsd:simpleType>
4323 <xsd:simpleType name="ST_RefMode">
4324     <xsd:restriction base="xsd:string">
4325         <xsd:enumeration value="A1"/>
4326         <xsd:enumeration value="R1C1"/>
4327     </xsd:restriction>
4328 </xsd:simpleType>
4329 <xsd:complexType name="CT_DefinedNames">
4330     <xsd:sequence>
4331         <xsd:element name="definedName" type="CT_DefinedName" minOccurs="0"
4332             maxOccurs="unbounded"/>
4333     </xsd:sequence>
4334 </xsd:complexType>
4335 <xsd:complexType name="CT_DefinedName">
4336     <xsd:simpleContent>
4337         <xsd:extension base="ST_Formula">
4338             <xsd:attribute name="name" type="s:ST_Xstring" use="required"/>
4339             <xsd:attribute name="comment" type="s:ST_Xstring" use="optional"/>
4340             <xsd:attribute name="customMenu" type="s:ST_Xstring" use="optional"/>

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4341     <xsd:attribute name="description" type="s:ST Xstring" use="optional"/>
4342     <xsd:attribute name="help" type="s:ST Xstring" use="optional"/>
4343     <xsd:attribute name="statusBar" type="s:ST Xstring" use="optional"/>
4344     <xsd:attribute name="localSheetId" type="xsd:unsignedInt" use="optional"/>
4345     <xsd:attribute name="hidden" type="xsd:boolean" use="optional" default="false"/>
4346     <xsd:attribute name="function" type="xsd:boolean" use="optional" default="false"/>
4347     <xsd:attribute name="vbProcedure" type="xsd:boolean" use="optional" default="false"/>
4348     <xsd:attribute name="xlm" type="xsd:boolean" use="optional" default="false"/>
4349     <xsd:attribute name="functionGroupId" type="xsd:unsignedInt" use="optional"/>
4350     <xsd:attribute name="shortcutKey" type="s:ST Xstring" use="optional"/>
4351     <xsd:attribute name="publishToServer" type="xsd:boolean" use="optional"
4352         default="false"/>
4353     <xsd:attribute name="workbookParameter" type="xsd:boolean" use="optional"
4354         default="false"/>
4355     </xsd:extension>
4356 </xsd:simpleContent>
4357 </xsd:complexType>
4358 <xsd:complexType name="CT_ExternalReferences">
4359     <xsd:sequence>
4360         <xsd:element name="externalReference" type="CT_ExternalReference" minOccurs="1"
4361             maxOccurs="unbounded"/>
4362     </xsd:sequence>
4363 </xsd:complexType>
4364 <xsd:complexType name="CT_ExternalReference">
4365     <xsd:attribute ref="r:id" use="required"/>
4366 </xsd:complexType>
4367 <xsd:complexType name="CT_SheetBackgroundPicture">
4368     <xsd:attribute ref="r:id" use="required"/>
4369 </xsd:complexType>
4370 <xsd:complexType name="CT_PivotCaches">
4371     <xsd:sequence>
4372         <xsd:element name="pivotCache" type="CT_PivotCache" minOccurs="1" maxOccurs="unbounded"/>
4373     </xsd:sequence>
4374 </xsd:complexType>
4375 <xsd:complexType name="CT_PivotCache">
4376     <xsd:attribute name="cacheId" type="xsd:unsignedInt" use="required"/>
4377     <xsd:attribute ref="r:id" use="required"/>
4378 </xsd:complexType>
4379 <xsd:complexType name="CT_FileSharing">
4380     <xsd:attribute name="readOnlyRecommended" type="xsd:boolean" use="optional" default="false"/>
4381     <xsd:attribute name="userName" type="s:ST Xstring"/>
4382     <xsd:attribute name="algorithmName" type="s:ST Xstring" use="optional"/>
4383     <xsd:attribute name="hashValue" type="xsd:base64Binary" use="optional"/>
4384     <xsd:attribute name="saltValue" type="xsd:base64Binary" use="optional"/>
4385     <xsd:attribute name="spinCount" type="xsd:unsignedInt" use="optional"/>
4386 </xsd:complexType>
4387 <xsd:complexType name="CT_OleSize">
4388     <xsd:attribute name="ref" type="ST_Ref" use="required"/>
4389 </xsd:complexType>
4390 <xsd:complexType name="CT_WorkbookProtection">
4391     <xsd:attribute name="lockStructure" type="xsd:boolean" use="optional" default="false"/>
4392     <xsd:attribute name="lockWindows" type="xsd:boolean" use="optional" default="false"/>
4393     <xsd:attribute name="lockRevision" type="xsd:boolean" use="optional" default="false"/>

```

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4394     <xsd:attribute name="revisionsAlgorithmName" type="s:ST_Xstring" use="optional"/>
4395     <xsd:attribute name="revisionsHashValue" type="xsd:base64Binary" use="optional"/>
4396     <xsd:attribute name="revisionsSaltValue" type="xsd:base64Binary" use="optional"/>
4397     <xsd:attribute name="revisionsSpinCount" type="xsd:unsignedInt" use="optional"/>
4398     <xsd:attribute name="workbookAlgorithmName" type="s:ST_Xstring" use="optional"/>
4399     <xsd:attribute name="workbookHashValue" type="xsd:base64Binary" use="optional"/>
4400     <xsd:attribute name="workbookSaltValue" type="xsd:base64Binary" use="optional"/>
4401     <xsd:attribute name="workbookSpinCount" type="xsd:unsignedInt" use="optional"/>
4402 </xsd:complexType>
4403 <xsd:complexType name="CT_WebPublishing">
4404     <xsd:attribute name="css" type="xsd:boolean" use="optional" default="true"/>
4405     <xsd:attribute name="thicket" type="xsd:boolean" use="optional" default="true"/>
4406     <xsd:attribute name="longFileNames" type="xsd:boolean" use="optional" default="true"/>
4407     <xsd:attribute name="vml" type="xsd:boolean" use="optional" default="false"/>
4408     <xsd:attribute name="allowPng" type="xsd:boolean" use="optional" default="false"/>
4409     <xsd:attribute name="targetScreenSize" type="ST_TargetScreenSize" use="optional"
4410         default="800x600"/>
4411     <xsd:attribute name="dpi" type="xsd:unsignedInt" use="optional" default="96"/>
4412     <xsd:attribute name="characterSet" type="xsd:string" use="optional"/>
4413 </xsd:complexType>
4414 <xsd:simpleType name="ST_TargetScreenSize">
4415     <xsd:restriction base="xsd:string">
4416         <xsd:enumeration value="544x376"/>
4417         <xsd:enumeration value="640x480"/>
4418         <xsd:enumeration value="720x512"/>
4419         <xsd:enumeration value="800x600"/>
4420         <xsd:enumeration value="1024x768"/>
4421         <xsd:enumeration value="1152x882"/>
4422         <xsd:enumeration value="1152x900"/>
4423         <xsd:enumeration value="1280x1024"/>
4424         <xsd:enumeration value="1600x1200"/>
4425         <xsd:enumeration value="1800x1440"/>
4426         <xsd:enumeration value="1920x1200"/>
4427     </xsd:restriction>
4428 </xsd:simpleType>
4429 <xsd:complexType name="CT_FunctionGroups">
4430     <xsd:sequence maxOccurs="unbounded">
4431         <xsd:element name="functionGroup" type="CT_FunctionGroup" minOccurs="0"/>
4432     </xsd:sequence>
4433     <xsd:attribute name="builtInGroupCount" type="xsd:unsignedInt" default="16" use="optional"/>
4434 </xsd:complexType>
4435 <xsd:complexType name="CT_FunctionGroup">
4436     <xsd:attribute name="name" type="s:ST_Xstring"/>
4437 </xsd:complexType>
4438 <xsd:complexType name="CT_WebPublishObjects">
4439     <xsd:sequence>
4440         <xsd:element name="webPublishObject" type="CT_WebPublishObject" minOccurs="1"
4441             maxOccurs="unbounded"/>
4442     </xsd:sequence>
4443     <xsd:attribute name="count" type="xsd:unsignedInt" use="optional"/>
4444 </xsd:complexType>
4445 <xsd:complexType name="CT_WebPublishObject">
4446     <xsd:attribute name="id" type="xsd:unsignedInt" use="required"/>

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4447     <xsd:attribute name="divId" type="s:ST Xstring" use="required"/>
4448     <xsd:attribute name="sourceObject" type="s:ST Xstring" use="optional"/>
4449     <xsd:attribute name="destinationFile" type="s:ST Xstring" use="required"/>
4450     <xsd:attribute name="title" type="s:ST Xstring" use="optional"/>
4451     <xsd:attribute name="autoRepublish" type="xsd:boolean" use="optional" default="false"/>
4452   </xsd:complexType>
4453 </xsd:schema>

```

A.3 PresentationML

This schema is available in the file pml.xsd.

```

1  <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
2    xmlns="http://purl.oclc.org/ooxml/presentationml/main"
3    xmlns:p="http://purl.oclc.org/ooxml/presentationml/main"
4    xmlns:a="http://purl.oclc.org/ooxml/drawingml/main"
5    xmlns:r="http://purl.oclc.org/ooxml/officeDocument/relationships"
6    xmlns:s="http://purl.oclc.org/ooxml/officeDocument/sharedTypes" elementFormDefault="qualified"
7    targetNamespace="http://purl.oclc.org/ooxml/presentationml/main">
8    <xsd:import namespace="http://purl.oclc.org/ooxml/officeDocument/relationships"
9      schemaLocation="shared-relationshipReference.xsd"/>
10   <xsd:import namespace="http://purl.oclc.org/ooxml/drawingml/main" schemaLocation="dml-main.xsd"/>
11   <xsd:import namespace="http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
12     schemaLocation="shared-commonSimpleTypes.xsd"/>
13   <xsd:simpleType name="ST_TransitionSideDirectionType">
14     <xsd:restriction base="xsd:token">
15       <xsd:enumeration value="l"/>
16       <xsd:enumeration value="u"/>
17       <xsd:enumeration value="r"/>
18       <xsd:enumeration value="d"/>
19     </xsd:restriction>
20   </xsd:simpleType>
21   <xsd:simpleType name="ST_TransitionCornerDirectionType">
22     <xsd:restriction base="xsd:token">
23       <xsd:enumeration value="lu"/>
24       <xsd:enumeration value="ru"/>
25       <xsd:enumeration value="ld"/>
26       <xsd:enumeration value="rd"/>
27     </xsd:restriction>
28   </xsd:simpleType>
29   <xsd:simpleType name="ST_TransitionInOutDirectionType">
30     <xsd:restriction base="xsd:token">
31       <xsd:enumeration value="out"/>
32       <xsd:enumeration value="in"/>
33     </xsd:restriction>
34   </xsd:simpleType>
35   <xsd:complexType name="CT_SideDirectionTransition">
36     <xsd:attribute name="dir" type="ST_TransitionSideDirectionType" use="optional" default="l"/>
37   </xsd:complexType>
38   <xsd:complexType name="CT_CornerDirectionTransition">
39     <xsd:attribute name="dir" type="ST_TransitionCornerDirectionType" use="optional"
40       default="lu"/>
41   </xsd:complexType>

```

```

42 <xsd:simpleType name="ST_TransitionEightDirectionType">
43   <xsd:union memberTypes="ST_TransitionSideDirectionType ST_TransitionCornerDirectionType"/>
44 </xsd:simpleType>
45 <xsd:complexType name="CT_EightDirectionTransition">
46   <xsd:attribute name="dir" type="ST_TransitionEightDirectionType" use="optional" default="1"/>
47 </xsd:complexType>
48 <xsd:complexType name="CT_OrientationTransition">
49   <xsd:attribute name="dir" type="ST_Direction" use="optional" default="horz"/>
50 </xsd:complexType>
51 <xsd:complexType name="CT_InOutTransition">
52   <xsd:attribute name="dir" type="ST_TransitionInOutDirectionType" use="optional"
53     default="out"/>
54 </xsd:complexType>
55 <xsd:complexType name="CT_OptionalBlackTransition">
56   <xsd:attribute name="thruBlk" type="xsd:boolean" use="optional" default="false"/>
57 </xsd:complexType>
58 <xsd:complexType name="CT_SplitTransition">
59   <xsd:attribute name="orient" type="ST_Direction" use="optional" default="horz"/>
60   <xsd:attribute name="dir" type="ST_TransitionInOutDirectionType" use="optional"
61     default="out"/>
62 </xsd:complexType>
63 <xsd:complexType name="CT_WheelTransition">
64   <xsd:attribute name="spokes" type="xsd:unsignedInt" use="optional" default="4"/>
65 </xsd:complexType>
66 <xsd:complexType name="CT_TransitionStartSoundAction">
67   <xsd:sequence>
68     <xsd:element minOccurs="1" maxOccurs="1" name="snd" type="a:CT_EmbeddedWAVAudioFile"/>
69   </xsd:sequence>
70   <xsd:attribute name="loop" type="xsd:boolean" use="optional" default="false"/>
71 </xsd:complexType>
72 <xsd:complexType name="CT_TransitionSoundAction">
73   <xsd:choice minOccurs="1" maxOccurs="1">
74     <xsd:element name="stSnd" type="CT_TransitionStartSoundAction"/>
75     <xsd:element name="endSnd" type="CT_Empty"/>
76   </xsd:choice>
77 </xsd:complexType>
78 <xsd:simpleType name="ST_TransitionSpeed">
79   <xsd:restriction base="xsd:token">
80     <xsd:enumeration value="slow"/>
81     <xsd:enumeration value="med"/>
82     <xsd:enumeration value="fast"/>
83   </xsd:restriction>
84 </xsd:simpleType>
85 <xsd:complexType name="CT_SlideTransition">
86   <xsd:sequence>
87     <xsd:choice minOccurs="0" maxOccurs="1">
88       <xsd:element name="blinds" type="CT_OrientationTransition"/>
89       <xsd:element name="checker" type="CT_OrientationTransition"/>
90       <xsd:element name="circle" type="CT_Empty"/>
91       <xsd:element name="dissolve" type="CT_Empty"/>
92       <xsd:element name="comb" type="CT_OrientationTransition"/>
93       <xsd:element name="cover" type="CT_EightDirectionTransition"/>
94       <xsd:element name="cut" type="CT_OptionalBlackTransition"/>

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95     <xsd:element name="diamond" type="CT_Empty"/>
96     <xsd:element name="fade" type="CT_OptionalBlackTransition"/>
97     <xsd:element name="newsflash" type="CT_Empty"/>
98     <xsd:element name="plus" type="CT_Empty"/>
99     <xsd:element name="pull" type="CT_EightDirectionTransition"/>
100    <xsd:element name="push" type="CT_SideDirectionTransition"/>
101    <xsd:element name="random" type="CT_Empty"/>
102    <xsd:element name="randomBar" type="CT_OrientationTransition"/>
103    <xsd:element name="split" type="CT_SplitTransition"/>
104    <xsd:element name="strips" type="CT_CornerDirectionTransition"/>
105    <xsd:element name="wedge" type="CT_Empty"/>
106    <xsd:element name="wheel" type="CT_WheelTransition"/>
107    <xsd:element name="wipe" type="CT_SideDirectionTransition"/>
108    <xsd:element name="zoom" type="CT_InOutTransition"/>
109  </xsd:choice>
110  <xsd:element name="sndAc" minOccurs="0" maxOccurs="1" type="CT_TransitionSoundAction"/>
111  <xsd:element name="extLst" type="CT_ExtensionListModify" minOccurs="0" maxOccurs="1"/>
112 </xsd:sequence>
113 <xsd:attribute name="spd" type="ST_TransitionSpeed" use="optional" default="fast"/>
114 <xsd:attribute name="advClick" type="xsd:boolean" use="optional" default="true"/>
115 <xsd:attribute name="advTm" type="xsd:unsignedInt" use="optional"/>
116 </xsd:complexType>
117 <xsd:simpleType name="ST_TLTimeIndefinite">
118   <xsd:restriction base="xsd:token">
119     <xsd:enumeration value="indefinite"/>
120   </xsd:restriction>
121 </xsd:simpleType>
122 <xsd:simpleType name="ST_TLTime">
123   <xsd:union memberTypes="xsd:unsignedInt ST_TLTimeIndefinite"/>
124 </xsd:simpleType>
125 <xsd:simpleType name="ST_TLTimeNodeID">
126   <xsd:restriction base="xsd:unsignedInt"/>
127 </xsd:simpleType>
128 <xsd:complexType name="CT_TLIterateIntervalTime">
129   <xsd:attribute name="val" type="ST_TLTime" use="required"/>
130 </xsd:complexType>
131 <xsd:complexType name="CT_TLIterateIntervalPercentage">
132   <xsd:attribute name="val" type="a:ST_PositivePercentage" use="required"/>
133 </xsd:complexType>
134 <xsd:simpleType name="ST_IterateType">
135   <xsd:restriction base="xsd:token">
136     <xsd:enumeration value="el"/>
137     <xsd:enumeration value="wd"/>
138     <xsd:enumeration value="lt"/>
139   </xsd:restriction>
140 </xsd:simpleType>
141 <xsd:complexType name="CT_TLIterateData">
142   <xsd:choice minOccurs="1" maxOccurs="1">
143     <xsd:element name="tmAbs" type="CT_TLIterateIntervalTime"/>
144     <xsd:element name="tmPct" type="CT_TLIterateIntervalPercentage"/>
145   </xsd:choice>
146   <xsd:attribute name="type" type="ST_IterateType" use="optional" default="el"/>
147   <xsd:attribute name="backwards" type="xsd:boolean" use="optional" default="false"/>

```

```

148 </xsd:complexType>
149 <xsd:complexType name="CT_TLSubShapeId">
150   <xsd:attribute name="spid" type="a:ST_ShapeID" use="required"/>
151 </xsd:complexType>
152 <xsd:complexType name="CT_TLTextTargetElement">
153   <xsd:choice minOccurs="0" maxOccurs="1">
154     <xsd:element name="charRg" type="CT_IndexRange"/>
155     <xsd:element name="pRg" type="CT_IndexRange"/>
156   </xsd:choice>
157 </xsd:complexType>
158 <xsd:simpleType name="ST_TLChartSubelementType">
159   <xsd:restriction base="xsd:token">
160     <xsd:enumeration value="gridLegend"/>
161     <xsd:enumeration value="series"/>
162     <xsd:enumeration value="category"/>
163     <xsd:enumeration value="ptInSeries"/>
164     <xsd:enumeration value="ptInCategory"/>
165   </xsd:restriction>
166 </xsd:simpleType>
167 <xsd:complexType name="CT_TLOleChartTargetElement">
168   <xsd:attribute name="type" type="ST_TLChartSubelementType" use="required"/>
169   <xsd:attribute name="lvl" type="xsd:unsignedInt" use="optional" default="0"/>
170 </xsd:complexType>
171 <xsd:complexType name="CT_TLShapeTargetElement">
172   <xsd:choice minOccurs="0" maxOccurs="1">
173     <xsd:element name="bg" type="CT_Empty"/>
174     <xsd:element name="subSp" type="CT_TLSubShapeId"/>
175     <xsd:element name="oleChartEl" type="CT_TLOleChartTargetElement"/>
176     <xsd:element name="txEl" type="CT_TLTextTargetElement"/>
177     <xsd:element name="graphicEl" type="a:CT_AnimationElementChoice"/>
178   </xsd:choice>
179   <xsd:attribute name="spid" type="a:ST_DrawingElementId" use="required"/>
180 </xsd:complexType>
181 <xsd:complexType name="CT_TLTimeTargetElement">
182   <xsd:choice minOccurs="1" maxOccurs="1">
183     <xsd:element name="sldTgt" type="CT_Empty"/>
184     <xsd:element name="sndTgt" type="a:CT_EmbeddedWAVAudioFile"/>
185     <xsd:element name="spTgt" type="CT_TLShapeTargetElement"/>
186     <xsd:element name="inkTgt" type="CT_TLSubShapeId"/>
187   </xsd:choice>
188 </xsd:complexType>
189 <xsd:complexType name="CT_TLTriggerTimeNodeID">
190   <xsd:attribute name="val" type="ST_TLTimeNodeID" use="required"/>
191 </xsd:complexType>
192 <xsd:simpleType name="ST_TLTriggerRuntimeNode">
193   <xsd:restriction base="xsd:token">
194     <xsd:enumeration value="first"/>
195     <xsd:enumeration value="last"/>
196     <xsd:enumeration value="all"/>
197   </xsd:restriction>
198 </xsd:simpleType>
199 <xsd:complexType name="CT_TLTriggerRuntimeNode">
200   <xsd:attribute name="val" type="ST_TLTriggerRuntimeNode" use="required"/>

```

```

201 </xsd:complexType>
202 <xsd:simpleType name="ST_TLTriggerEvent">
203   <xsd:restriction base="xsd:token">
204     <xsd:enumeration value="onBegin"/>
205     <xsd:enumeration value="onEnd"/>
206     <xsd:enumeration value="begin"/>
207     <xsd:enumeration value="end"/>
208     <xsd:enumeration value="onClick"/>
209     <xsd:enumeration value="onDbClick"/>
210     <xsd:enumeration value="onMouseOver"/>
211     <xsd:enumeration value="onMouseOut"/>
212     <xsd:enumeration value="onNext"/>
213     <xsd:enumeration value="onPrev"/>
214     <xsd:enumeration value="onStopAudio"/>
215   </xsd:restriction>
216 </xsd:simpleType>
217 <xsd:complexType name="CT_TLTimeCondition">
218   <xsd:choice minOccurs="0" maxOccurs="1">
219     <xsd:element name="tgtEl" type="CT_TLTimeTargetElement"/>
220     <xsd:element name="tn" type="CT_TLTriggerTimeNodeID"/>
221     <xsd:element name="rtn" type="CT_TLTriggerRuntimeNode"/>
222   </xsd:choice>
223   <xsd:attribute name="evt" use="optional" type="ST_TLTriggerEvent"/>
224   <xsd:attribute name="delay" type="ST_TLTime" use="optional"/>
225 </xsd:complexType>
226 <xsd:complexType name="CT_TLTimeConditionList">
227   <xsd:sequence>
228     <xsd:element name="cond" type="CT_TLTimeCondition" minOccurs="1" maxOccurs="unbounded"/>
229   </xsd:sequence>
230 </xsd:complexType>
231 <xsd:complexType name="CT_TimeNodeList">
232   <xsd:choice minOccurs="1" maxOccurs="unbounded">
233     <xsd:element name="par" type="CT_TLTimeNodeParallel"/>
234     <xsd:element name="seq" type="CT_TLTimeNodeSequence"/>
235     <xsd:element name="excl" type="CT_TLTimeNodeExclusive"/>
236     <xsd:element name="anim" type="CT_TLAnimateBehavior"/>
237     <xsd:element name="animClr" type="CT_TLAnimateColorBehavior"/>
238     <xsd:element name="animEffect" type="CT_TLAnimateEffectBehavior"/>
239     <xsd:element name="animMotion" type="CT_TLAnimateMotionBehavior"/>
240     <xsd:element name="animRot" type="CT_TLAnimateRotationBehavior"/>
241     <xsd:element name="animScale" type="CT_TLAnimateScaleBehavior"/>
242     <xsd:element name="cmd" type="CT_TLCommandBehavior"/>
243     <xsd:element name="set" type="CT_TLSetBehavior"/>
244     <xsd:element name="audio" type="CT_TLMediaNodeAudio"/>
245     <xsd:element name="video" type="CT_TLMediaNodeVideo"/>
246   </xsd:choice>
247 </xsd:complexType>
248 <xsd:simpleType name="ST_TLTimeNodePresetClassType">
249   <xsd:restriction base="xsd:token">
250     <xsd:enumeration value="entr"/>
251     <xsd:enumeration value="exit"/>
252     <xsd:enumeration value="emph"/>
253     <xsd:enumeration value="path"/>

```

```

254         <xsd:enumeration value="verb"/>
255         <xsd:enumeration value="mediacall"/>
256     </xsd:restriction>
257 </xsd:simpleType>
258 <xsd:simpleType name="ST_TLTimeNodeRestartType">
259     <xsd:restriction base="xsd:token">
260         <xsd:enumeration value="always"/>
261         <xsd:enumeration value="whenNotActive"/>
262         <xsd:enumeration value="never"/>
263     </xsd:restriction>
264 </xsd:simpleType>
265 <xsd:simpleType name="ST_TLTimeNodeFillType">
266     <xsd:restriction base="xsd:token">
267         <xsd:enumeration value="remove"/>
268         <xsd:enumeration value="freeze"/>
269         <xsd:enumeration value="hold"/>
270         <xsd:enumeration value="transition"/>
271     </xsd:restriction>
272 </xsd:simpleType>
273 <xsd:simpleType name="ST_TLTimeNodeSyncType">
274     <xsd:restriction base="xsd:token">
275         <xsd:enumeration value="canSlip"/>
276         <xsd:enumeration value="locked"/>
277     </xsd:restriction>
278 </xsd:simpleType>
279 <xsd:simpleType name="ST_TLTimeNodeMasterRelation">
280     <xsd:restriction base="xsd:token">
281         <xsd:enumeration value="sameClick"/>
282         <xsd:enumeration value="lastClick"/>
283         <xsd:enumeration value="nextClick"/>
284     </xsd:restriction>
285 </xsd:simpleType>
286 <xsd:simpleType name="ST_TLTimeNodeType">
287     <xsd:restriction base="xsd:token">
288         <xsd:enumeration value="clickEffect"/>
289         <xsd:enumeration value="withEffect"/>
290         <xsd:enumeration value="afterEffect"/>
291         <xsd:enumeration value="mainSeq"/>
292         <xsd:enumeration value="interactiveSeq"/>
293         <xsd:enumeration value="clickPar"/>
294         <xsd:enumeration value="withGroup"/>
295         <xsd:enumeration value="afterGroup"/>
296         <xsd:enumeration value="tmRoot"/>
297     </xsd:restriction>
298 </xsd:simpleType>
299 <xsd:complexType name="CT_TLCommonTimeNodeData">
300     <xsd:sequence>
301         <xsd:element name="stCondLst" type="CT_TLTimeConditionList" minOccurs="0" maxOccurs="1"/>
302         <xsd:element name="endCondLst" type="CT_TLTimeConditionList" minOccurs="0" maxOccurs="1"/>
303         <xsd:element name="endSync" type="CT_TLTimeCondition" minOccurs="0" maxOccurs="1"/>
304         <xsd:element name="iterate" type="CT_TLIterateData" minOccurs="0" maxOccurs="1"/>
305         <xsd:element name="childTnLst" type="CT_TimeNodeList" minOccurs="0" maxOccurs="1"/>
306         <xsd:element name="subTnLst" type="CT_TimeNodeList" minOccurs="0" maxOccurs="1"/>

```

```

307     </xsd:sequence>
308     <xsd:attribute name="id" type="ST_TLTimeNodeID" use="optional"/>
309     <xsd:attribute name="presetID" type="xsd:int" use="optional"/>
310     <xsd:attribute name="presetClass" type="ST_TLTimeNodePresetClassType" use="optional"/>
311     <xsd:attribute name="presetSubtype" type="xsd:int" use="optional"/>
312     <xsd:attribute name="dur" type="ST_TLTime" use="optional"/>
313     <xsd:attribute name="repeatCount" type="ST_TLTime" use="optional" default="1000"/>
314     <xsd:attribute name="repeatDur" type="ST_TLTime" use="optional"/>
315     <xsd:attribute name="spd" type="a:ST_Percentage" use="optional" default="100%"/>
316     <xsd:attribute name="accel" type="a:ST_PositiveFixedPercentage" use="optional" default="0%"/>
317     <xsd:attribute name="decel" type="a:ST_PositiveFixedPercentage" use="optional" default="0%"/>
318     <xsd:attribute name="autoRev" type="xsd:boolean" use="optional" default="false"/>
319     <xsd:attribute name="restart" type="ST_TLTimeNodeRestartType" use="optional"/>
320     <xsd:attribute name="fill" type="ST_TLTimeNodeFillType" use="optional"/>
321     <xsd:attribute name="syncBehavior" type="ST_TLTimeNodeSyncType" use="optional"/>
322     <xsd:attribute name="tmFilter" type="xsd:string" use="optional"/>
323     <xsd:attribute name="evtFilter" type="xsd:string" use="optional"/>
324     <xsd:attribute name="display" type="xsd:boolean" use="optional"/>
325     <xsd:attribute name="masterRel" type="ST_TLTimeNodeMasterRelation" use="optional"/>
326     <xsd:attribute name="bldLvl" type="xsd:int" use="optional"/>
327     <xsd:attribute name="grpId" type="xsd:unsignedInt" use="optional"/>
328     <xsd:attribute name="afterEffect" type="xsd:boolean" use="optional"/>
329     <xsd:attribute name="nodeType" type="ST_TLTimeNodeType" use="optional"/>
330     <xsd:attribute name="nodePh" type="xsd:boolean" use="optional"/>
331 </xsd:complexType>
332 <xsd:complexType name="CT_TLTimeNodeParallel">
333     <xsd:sequence>
334         <xsd:element name="cTn" type="CT_TLCommonTimeNodeData" minOccurs="1" maxOccurs="1"/>
335     </xsd:sequence>
336 </xsd:complexType>
337 <xsd:simpleType name="ST_TLNextActionType">
338     <xsd:restriction base="xsd:token">
339         <xsd:enumeration value="none"/>
340         <xsd:enumeration value="seek"/>
341     </xsd:restriction>
342 </xsd:simpleType>
343 <xsd:simpleType name="ST_TLPreviousActionType">
344     <xsd:restriction base="xsd:token">
345         <xsd:enumeration value="none"/>
346         <xsd:enumeration value="skipTimed"/>
347     </xsd:restriction>
348 </xsd:simpleType>
349 <xsd:complexType name="CT_TLTimeNodeSequence">
350     <xsd:sequence>
351         <xsd:element name="cTn" type="CT_TLCommonTimeNodeData" minOccurs="1" maxOccurs="1"/>
352         <xsd:element name="prevCondLst" type="CT_TLTimeConditionList" minOccurs="0"
353             maxOccurs="1"/>
354         <xsd:element name="nextCondLst" type="CT_TLTimeConditionList" minOccurs="0"
355             maxOccurs="1"/>
356     </xsd:sequence>
357     <xsd:attribute name="concurrent" type="xsd:boolean" use="optional"/>
358     <xsd:attribute name="prevAc" type="ST_TLPreviousActionType" use="optional"/>
359     <xsd:attribute name="nextAc" type="ST_TLNextActionType" use="optional"/>

```

```

360 </xsd:complexType>
361 <xsd:complexType name="CT_TLTimeNodeExclusive">
362   <xsd:sequence>
363     <xsd:element name="cTn" type="CT_TLCommonTimeNodeData" minOccurs="1" maxOccurs="1"/>
364   </xsd:sequence>
365 </xsd:complexType>
366 <xsd:complexType name="CT_TLBehaviorAttributeNameList">
367   <xsd:sequence>
368     <xsd:element name="attrName" type="xsd:string" minOccurs="1" maxOccurs="unbounded"/>
369   </xsd:sequence>
370 </xsd:complexType>
371 <xsd:simpleType name="ST_TLBehaviorAdditiveType">
372   <xsd:restriction base="xsd:token">
373     <xsd:enumeration value="base"/>
374     <xsd:enumeration value="sum"/>
375     <xsd:enumeration value="repl"/>
376     <xsd:enumeration value="mult"/>
377     <xsd:enumeration value="none"/>
378   </xsd:restriction>
379 </xsd:simpleType>
380 <xsd:simpleType name="ST_TLBehaviorAccumulateType">
381   <xsd:restriction base="xsd:token">
382     <xsd:enumeration value="none"/>
383     <xsd:enumeration value="always"/>
384   </xsd:restriction>
385 </xsd:simpleType>
386 <xsd:simpleType name="ST_TLBehaviorTransformType">
387   <xsd:restriction base="xsd:token">
388     <xsd:enumeration value="pt"/>
389     <xsd:enumeration value="img"/>
390   </xsd:restriction>
391 </xsd:simpleType>
392 <xsd:simpleType name="ST_TLBehaviorOverrideType">
393   <xsd:restriction base="xsd:token">
394     <xsd:enumeration value="normal"/>
395     <xsd:enumeration value="childStyle"/>
396   </xsd:restriction>
397 </xsd:simpleType>
398 <xsd:complexType name="CT_TLCommonBehaviorData">
399   <xsd:sequence>
400     <xsd:element name="cTn" type="CT_TLCommonTimeNodeData" minOccurs="1" maxOccurs="1"/>
401     <xsd:element name="tgtEl" type="CT_TLTimeTargetElement" minOccurs="1" maxOccurs="1"/>
402     <xsd:element name="attrNameList" type="CT_TLBehaviorAttributeNameList" minOccurs="0"
403       maxOccurs="1"/>
404   </xsd:sequence>
405   <xsd:attribute name="additive" type="ST_TLBehaviorAdditiveType" use="optional"/>
406   <xsd:attribute name="accumulate" type="ST_TLBehaviorAccumulateType" use="optional"/>
407   <xsd:attribute name="xfrmType" type="ST_TLBehaviorTransformType" use="optional"/>
408   <xsd:attribute name="from" type="xsd:string" use="optional"/>
409   <xsd:attribute name="to" type="xsd:string" use="optional"/>
410   <xsd:attribute name="by" type="xsd:string" use="optional"/>
411   <xsd:attribute name="rctx" type="xsd:string" use="optional"/>
412   <xsd:attribute name="override" type="ST_TLBehaviorOverrideType" use="optional"/>

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413 </xsd:complexType>
414 <xsd:complexType name="CT_TLAnimVariantBooleanVal">
415   <xsd:attribute name="val" type="xsd:boolean" use="required"/>
416 </xsd:complexType>
417 <xsd:complexType name="CT_TLAnimVariantIntegerVal">
418   <xsd:attribute name="val" type="xsd:int" use="required"/>
419 </xsd:complexType>
420 <xsd:complexType name="CT_TLAnimVariantFloatVal">
421   <xsd:attribute name="val" type="xsd:float" use="required"/>
422 </xsd:complexType>
423 <xsd:complexType name="CT_TLAnimVariantStringVal">
424   <xsd:attribute name="val" type="xsd:string" use="required"/>
425 </xsd:complexType>
426 <xsd:complexType name="CT_TLAnimVariant">
427   <xsd:choice minOccurs="1" maxOccurs="1">
428     <xsd:element name="boolVal" type="CT_TLAnimVariantBooleanVal"/>
429     <xsd:element name="intVal" type="CT_TLAnimVariantIntegerVal"/>
430     <xsd:element name="fltVal" type="CT_TLAnimVariantFloatVal"/>
431     <xsd:element name="strVal" type="CT_TLAnimVariantStringVal"/>
432     <xsd:element name="clrVal" type="a:CT_Color"/>
433   </xsd:choice>
434 </xsd:complexType>
435 <xsd:simpleType name="ST_TLTimeAnimateValueTime">
436   <xsd:union memberTypes="a:ST_PositiveFixedPercentage ST_TLTimeIndefinite"/>
437 </xsd:simpleType>
438 <xsd:complexType name="CT_TLTimeAnimateValue">
439   <xsd:sequence>
440     <xsd:element name="val" type="CT_TLAnimVariant" minOccurs="0" maxOccurs="1"/>
441   </xsd:sequence>
442   <xsd:attribute name="tm" type="ST_TLTimeAnimateValueTime" use="optional"
443     default="indefinite"/>
444   <xsd:attribute name="fm1a" type="xsd:string" use="optional" default=""/>
445 </xsd:complexType>
446 <xsd:complexType name="CT_TLTimeAnimateValueList">
447   <xsd:sequence>
448     <xsd:element name="tav" type="CT_TLTimeAnimateValue" minOccurs="0" maxOccurs="unbounded"/>
449   </xsd:sequence>
450 </xsd:complexType>
451 <xsd:simpleType name="ST_TLAnimateBehaviorCalcMode">
452   <xsd:restriction base="xsd:token">
453     <xsd:enumeration value="discrete"/>
454     <xsd:enumeration value="lin"/>
455     <xsd:enumeration value="fm1a"/>
456   </xsd:restriction>
457 </xsd:simpleType>
458 <xsd:simpleType name="ST_TLAnimateBehaviorValueType">
459   <xsd:restriction base="xsd:token">
460     <xsd:enumeration value="str"/>
461     <xsd:enumeration value="num"/>
462     <xsd:enumeration value="clr"/>
463   </xsd:restriction>
464 </xsd:simpleType>
465 <xsd:complexType name="CT_TLAnimateBehavior">

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466     <xsd:sequence>
467         <xsd:element name="cBhvr" type="CT_TLCommonBehaviorData" minOccurs="1" maxOccurs="1"/>
468         <xsd:element name="tavLst" type="CT_TLTimeAnimateValueList" minOccurs="0" maxOccurs="1"/>
469     </xsd:sequence>
470     <xsd:attribute name="by" type="xsd:string" use="optional"/>
471     <xsd:attribute name="from" type="xsd:string" use="optional"/>
472     <xsd:attribute name="to" type="xsd:string" use="optional"/>
473     <xsd:attribute name="calcmode" type="ST_TLAnimateBehaviorCalcMode" use="optional"/>
474     <xsd:attribute name="valueType" type="ST_TLAnimateBehaviorValueType" use="optional"/>
475 </xsd:complexType>
476 <xsd:complexType name="CT_TLByRgbColorTransform">
477     <xsd:attribute name="r" type="a:ST_FixedPercentage" use="required"/>
478     <xsd:attribute name="g" type="a:ST_FixedPercentage" use="required"/>
479     <xsd:attribute name="b" type="a:ST_FixedPercentage" use="required"/>
480 </xsd:complexType>
481 <xsd:complexType name="CT_TLByHslColorTransform">
482     <xsd:attribute name="h" type="a:ST_Angle" use="required"/>
483     <xsd:attribute name="s" type="a:ST_FixedPercentage" use="required"/>
484     <xsd:attribute name="l" type="a:ST_FixedPercentage" use="required"/>
485 </xsd:complexType>
486 <xsd:complexType name="CT_TLByAnimateColorTransform">
487     <xsd:choice minOccurs="1" maxOccurs="1">
488         <xsd:element name="rgb" type="CT_TLByRgbColorTransform"/>
489         <xsd:element name="hsl" type="CT_TLByHslColorTransform"/>
490     </xsd:choice>
491 </xsd:complexType>
492 <xsd:simpleType name="ST_TLAnimateColorSpace">
493     <xsd:restriction base="xsd:token">
494         <xsd:enumeration value="rgb"/>
495         <xsd:enumeration value="hsl"/>
496     </xsd:restriction>
497 </xsd:simpleType>
498 <xsd:simpleType name="ST_TLAnimateColorDirection">
499     <xsd:restriction base="xsd:token">
500         <xsd:enumeration value="cw"/>
501         <xsd:enumeration value="ccw"/>
502     </xsd:restriction>
503 </xsd:simpleType>
504 <xsd:complexType name="CT_TLAnimateColorBehavior">
505     <xsd:sequence>
506         <xsd:element name="cBhvr" type="CT_TLCommonBehaviorData" minOccurs="1" maxOccurs="1"/>
507         <xsd:element name="by" type="CT_TLByAnimateColorTransform" minOccurs="0" maxOccurs="1"/>
508         <xsd:element name="from" type="a:CT_Color" minOccurs="0" maxOccurs="1"/>
509         <xsd:element name="to" type="a:CT_Color" minOccurs="0" maxOccurs="1"/>
510     </xsd:sequence>
511     <xsd:attribute name="clrSpc" type="ST_TLAnimateColorSpace" use="optional"/>
512     <xsd:attribute name="dir" type="ST_TLAnimateColorDirection" use="optional"/>
513 </xsd:complexType>
514 <xsd:simpleType name="ST_TLAnimateEffectTransition">
515     <xsd:restriction base="xsd:token">
516         <xsd:enumeration value="in"/>
517         <xsd:enumeration value="out"/>
518         <xsd:enumeration value="none"/>

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519     </xsd:restriction>
520 </xsd:simpleType>
521 <xsd:complexType name="CT_TLAnimateEffectBehavior">
522     <xsd:sequence>
523         <xsd:element name="cBhvr" type="CT_TLCommonBehaviorData" minOccurs="1" maxOccurs="1"/>
524         <xsd:element name="progress" type="CT_TLAnimVariant" minOccurs="0" maxOccurs="1"/>
525     </xsd:sequence>
526     <xsd:attribute name="transition" type="ST_TLAnimateEffectTransition" use="optional"/>
527     <xsd:attribute name="filter" type="xsd:string" use="optional"/>
528     <xsd:attribute name="prLst" type="xsd:string" use="optional"/>
529 </xsd:complexType>
530 <xsd:simpleType name="ST_TLAnimateMotionBehaviorOrigin">
531     <xsd:restriction base="xsd:token">
532         <xsd:enumeration value="parent"/>
533         <xsd:enumeration value="layout"/>
534     </xsd:restriction>
535 </xsd:simpleType>
536 <xsd:simpleType name="ST_TLAnimateMotionPathEditMode">
537     <xsd:restriction base="xsd:token">
538         <xsd:enumeration value="relative"/>
539         <xsd:enumeration value="fixed"/>
540     </xsd:restriction>
541 </xsd:simpleType>
542 <xsd:complexType name="CT_TLPoint">
543     <xsd:attribute name="x" type="a:ST_Percentage" use="required"/>
544     <xsd:attribute name="y" type="a:ST_Percentage" use="required"/>
545 </xsd:complexType>
546 <xsd:complexType name="CT_TLAnimateMotionBehavior">
547     <xsd:sequence>
548         <xsd:element name="cBhvr" type="CT_TLCommonBehaviorData" minOccurs="1" maxOccurs="1"/>
549         <xsd:element name="by" type="CT_TLPoint" minOccurs="0" maxOccurs="1"/>
550         <xsd:element name="from" type="CT_TLPoint" minOccurs="0" maxOccurs="1"/>
551         <xsd:element name="to" type="CT_TLPoint" minOccurs="0" maxOccurs="1"/>
552         <xsd:element name="rCtr" type="CT_TLPoint" minOccurs="0" maxOccurs="1"/>
553     </xsd:sequence>
554     <xsd:attribute name="origin" type="ST_TLAnimateMotionBehaviorOrigin" use="optional"/>
555     <xsd:attribute name="path" type="xsd:string" use="optional"/>
556     <xsd:attribute name="pathEditMode" type="ST_TLAnimateMotionPathEditMode" use="optional"/>
557     <xsd:attribute name="rAng" type="a:ST_Angle" use="optional"/>
558     <xsd:attribute name="ptsTypes" type="xsd:string" use="optional"/>
559 </xsd:complexType>
560 <xsd:complexType name="CT_TLAnimateRotationBehavior">
561     <xsd:sequence>
562         <xsd:element name="cBhvr" type="CT_TLCommonBehaviorData" minOccurs="1" maxOccurs="1"/>
563     </xsd:sequence>
564     <xsd:attribute name="by" type="a:ST_Angle" use="optional"/>
565     <xsd:attribute name="from" type="a:ST_Angle" use="optional"/>
566     <xsd:attribute name="to" type="a:ST_Angle" use="optional"/>
567 </xsd:complexType>
568 <xsd:complexType name="CT_TLAnimateScaleBehavior">
569     <xsd:sequence>
570         <xsd:element name="cBhvr" type="CT_TLCommonBehaviorData" minOccurs="1" maxOccurs="1"/>
571         <xsd:element name="by" type="CT_TLPoint" minOccurs="0" maxOccurs="1"/>

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572     <xsd:element name="from" type="CT_TLPoint" minOccurs="0" maxOccurs="1"/>
573     <xsd:element name="to" type="CT_TLPoint" minOccurs="0" maxOccurs="1"/>
574   </xsd:sequence>
575   <xsd:attribute name="zoomContents" type="xsd:boolean" use="optional"/>
576 </xsd:complexType>
577 <xsd:simpleType name="ST_TLCommandType">
578   <xsd:restriction base="xsd:token">
579     <xsd:enumeration value="evt"/>
580     <xsd:enumeration value="call"/>
581     <xsd:enumeration value="verb"/>
582   </xsd:restriction>
583 </xsd:simpleType>
584 <xsd:complexType name="CT_TLCommandBehavior">
585   <xsd:sequence>
586     <xsd:element name="cBhvr" type="CT_TLCommonBehaviorData" minOccurs="1" maxOccurs="1"/>
587   </xsd:sequence>
588   <xsd:attribute type="ST_TLCommandType" name="type" use="optional"/>
589   <xsd:attribute name="cmd" type="xsd:string" use="optional"/>
590 </xsd:complexType>
591 <xsd:complexType name="CT_TLSetBehavior">
592   <xsd:sequence>
593     <xsd:element name="cBhvr" type="CT_TLCommonBehaviorData" minOccurs="1" maxOccurs="1"/>
594     <xsd:element name="to" type="CT_TLAnimVariant" minOccurs="0" maxOccurs="1"/>
595   </xsd:sequence>
596 </xsd:complexType>
597 <xsd:complexType name="CT_TLCommonMediaNodeData">
598   <xsd:sequence>
599     <xsd:element name="cTn" type="CT_TLCommonTimeNodeData" minOccurs="1" maxOccurs="1"/>
600     <xsd:element name="tgtEl" type="CT_TLTimeTargetElement" minOccurs="1" maxOccurs="1"/>
601   </xsd:sequence>
602   <xsd:attribute name="vol" type="a:ST_PositiveFixedPercentage" default="50%" use="optional"/>
603   <xsd:attribute name="mute" type="xsd:boolean" use="optional" default="false"/>
604   <xsd:attribute name="numSld" type="xsd:unsignedInt" use="optional" default="1"/>
605   <xsd:attribute name="showWhenStopped" type="xsd:boolean" use="optional" default="true"/>
606 </xsd:complexType>
607 <xsd:complexType name="CT_TLMediaNodeAudio">
608   <xsd:sequence>
609     <xsd:element name="cMediaNode" type="CT_TLCommonMediaNodeData" minOccurs="1"
610       maxOccurs="1"/>
611   </xsd:sequence>
612   <xsd:attribute name="isNarration" type="xsd:boolean" use="optional" default="false"/>
613 </xsd:complexType>
614 <xsd:complexType name="CT_TLMediaNodeVideo">
615   <xsd:sequence>
616     <xsd:element name="cMediaNode" type="CT_TLCommonMediaNodeData" minOccurs="1"
617       maxOccurs="1"/>
618   </xsd:sequence>
619   <xsd:attribute name="fullScrn" type="xsd:boolean" use="optional" default="false"/>
620 </xsd:complexType>
621 <xsd:attributeGroup name="AG_TLBuild">
622   <xsd:attribute name="spid" type="a:ST_DrawingElementId" use="required"/>
623   <xsd:attribute name="grpId" type="xsd:unsignedInt" use="required"/>
624   <xsd:attribute name="uiExpand" type="xsd:boolean" use="optional" default="false"/>

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625 </xsd:attributeGroup>
626 <xsd:complexType name="CT_TLTemplate">
627   <xsd:sequence>
628     <xsd:element name="tnLst" type="CT_TimeNodeList" minOccurs="1" maxOccurs="1"/>
629   </xsd:sequence>
630   <xsd:attribute name="lvl" type="xsd:unsignedInt" use="optional" default="0"/>
631 </xsd:complexType>
632 <xsd:complexType name="CT_TLTemplateList">
633   <xsd:sequence>
634     <xsd:element name="tmpl" type="CT_TLTemplate" minOccurs="0" maxOccurs="9"/>
635   </xsd:sequence>
636 </xsd:complexType>
637 <xsd:simpleType name="ST_TLParaBuildType">
638   <xsd:restriction base="xsd:token">
639     <xsd:enumeration value="allAtOnce"/>
640     <xsd:enumeration value="p"/>
641     <xsd:enumeration value="cust"/>
642     <xsd:enumeration value="whole"/>
643   </xsd:restriction>
644 </xsd:simpleType>
645 <xsd:complexType name="CT_TLBuildParagraph">
646   <xsd:sequence>
647     <xsd:element name="tmplLst" type="CT_TLTemplateList" minOccurs="0" maxOccurs="1"/>
648   </xsd:sequence>
649   <xsd:attributeGroup ref="AG_TLBuild"/>
650   <xsd:attribute name="build" type="ST_TLParaBuildType" use="optional" default="whole"/>
651   <xsd:attribute name="bldLvl" type="xsd:unsignedInt" use="optional" default="1"/>
652   <xsd:attribute name="animBg" type="xsd:boolean" use="optional" default="false"/>
653   <xsd:attribute name="autoUpdateAnimBg" type="xsd:boolean" default="true" use="optional"/>
654   <xsd:attribute name="rev" type="xsd:boolean" use="optional" default="false"/>
655   <xsd:attribute name="advAuto" type="ST_TLTime" use="optional" default="indefinite"/>
656 </xsd:complexType>
657 <xsd:simpleType name="ST_TLDiagramBuildType">
658   <xsd:restriction base="xsd:token">
659     <xsd:enumeration value="whole"/>
660     <xsd:enumeration value="depthByNode"/>
661     <xsd:enumeration value="depthByBranch"/>
662     <xsd:enumeration value="breadthByNode"/>
663     <xsd:enumeration value="breadthByLvl"/>
664     <xsd:enumeration value="cw"/>
665     <xsd:enumeration value="cwIn"/>
666     <xsd:enumeration value="cwOut"/>
667     <xsd:enumeration value="ccw"/>
668     <xsd:enumeration value="ccwIn"/>
669     <xsd:enumeration value="ccwOut"/>
670     <xsd:enumeration value="inByRing"/>
671     <xsd:enumeration value="outByRing"/>
672     <xsd:enumeration value="up"/>
673     <xsd:enumeration value="down"/>
674     <xsd:enumeration value="allAtOnce"/>
675     <xsd:enumeration value="cust"/>
676   </xsd:restriction>
677 </xsd:simpleType>

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678 <xsd:complexType name="CT_TLBuildDiagram">
679   <xsd:attributeGroup ref="AG_TLBuild"/>
680   <xsd:attribute name="bld" type="ST_TLDiagramBuildType" use="optional" default="whole"/>
681 </xsd:complexType>
682 <xsd:simpleType name="ST_TLOleChartBuildType">
683   <xsd:restriction base="xsd:token">
684     <xsd:enumeration value="allAtOnce"/>
685     <xsd:enumeration value="series"/>
686     <xsd:enumeration value="category"/>
687     <xsd:enumeration value="seriesEl"/>
688     <xsd:enumeration value="categoryEl"/>
689   </xsd:restriction>
690 </xsd:simpleType>
691 <xsd:complexType name="CT_TLOleBuildChart">
692   <xsd:attributeGroup ref="AG_TLBuild"/>
693   <xsd:attribute name="bld" type="ST_TLOleChartBuildType" use="optional" default="allAtOnce"/>
694   <xsd:attribute name="animBg" type="xsd:boolean" use="optional" default="true"/>
695 </xsd:complexType>
696 <xsd:complexType name="CT_TLGraphicalObjectBuild">
697   <xsd:choice minOccurs="1" maxOccurs="1">
698     <xsd:element name="bldAsOne" type="CT_Empty"/>
699     <xsd:element name="bldSub" type="a:CT_AnimationGraphicalObjectBuildProperties"/>
700   </xsd:choice>
701   <xsd:attributeGroup ref="AG_TLBuild"/>
702 </xsd:complexType>
703 <xsd:complexType name="CT_BuildList">
704   <xsd:choice minOccurs="1" maxOccurs="unbounded">
705     <xsd:element name="bldP" type="CT_TLBuildParagraph"/>
706     <xsd:element name="bldDgm" type="CT_TLBuildDiagram"/>
707     <xsd:element name="bldOleChart" type="CT_TLOleBuildChart"/>
708     <xsd:element name="bldGraphic" type="CT_TLGraphicalObjectBuild"/>
709   </xsd:choice>
710 </xsd:complexType>
711 <xsd:complexType name="CT_SlideTiming">
712   <xsd:sequence>
713     <xsd:element name="tnLst" type="CT_TimeNodeList" minOccurs="0" maxOccurs="1"/>
714     <xsd:element name="bldLst" type="CT_BuildList" minOccurs="0" maxOccurs="1"/>
715     <xsd:element name="extLst" type="CT_ExtensionListModify" minOccurs="0" maxOccurs="1"/>
716   </xsd:sequence>
717 </xsd:complexType>
718 <xsd:complexType name="CT_Empty"/>
719 <xsd:simpleType name="ST_Name">
720   <xsd:restriction base="xsd:string"/>
721 </xsd:simpleType>
722 <xsd:simpleType name="ST_Direction">
723   <xsd:restriction base="xsd:token">
724     <xsd:enumeration value="horz"/>
725     <xsd:enumeration value="vert"/>
726   </xsd:restriction>
727 </xsd:simpleType>
728 <xsd:simpleType name="ST_Index">
729   <xsd:restriction base="xsd:unsignedInt"/>
730 </xsd:simpleType>

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731 <xsd:complexType name="CT_IndexRange">
732   <xsd:attribute name="st" type="ST_Index" use="required"/>
733   <xsd:attribute name="end" type="ST_Index" use="required"/>
734 </xsd:complexType>
735 <xsd:complexType name="CT_SlideRelationshipListEntry">
736   <xsd:attribute ref="r:id" use="required"/>
737 </xsd:complexType>
738 <xsd:complexType name="CT_SlideRelationshipList">
739   <xsd:sequence>
740     <xsd:element name="sld" type="CT_SlideRelationshipListEntry" minOccurs="0"
741       maxOccurs="unbounded"/>
742   </xsd:sequence>
743 </xsd:complexType>
744 <xsd:complexType name="CT_CustomShowId">
745   <xsd:attribute name="id" type="xsd:unsignedInt" use="required"/>
746 </xsd:complexType>
747 <xsd:group name="EG_SlideListChoice">
748   <xsd:choice>
749     <xsd:element name="sldAll" type="CT_Empty"/>
750     <xsd:element name="sldRg" type="CT_IndexRange"/>
751     <xsd:element name="custShow" type="CT_CustomShowId"/>
752   </xsd:choice>
753 </xsd:group>
754 <xsd:complexType name="CT_CustomerData">
755   <xsd:attribute ref="r:id" use="required"/>
756 </xsd:complexType>
757 <xsd:complexType name="CT_TagsData">
758   <xsd:attribute ref="r:id" use="required"/>
759 </xsd:complexType>
760 <xsd:complexType name="CT_CustomerDataList">
761   <xsd:sequence minOccurs="0" maxOccurs="1">
762     <xsd:element name="custData" type="CT_CustomerData" minOccurs="0" maxOccurs="unbounded"/>
763     <xsd:element name="tags" type="CT_TagsData" minOccurs="0" maxOccurs="1"/>
764   </xsd:sequence>
765 </xsd:complexType>
766 <xsd:complexType name="CT_Extension">
767   <xsd:sequence>
768     <xsd:any processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
769   </xsd:sequence>
770   <xsd:attribute name="uri" type="xsd:token" use="required"/>
771 </xsd:complexType>
772 <xsd:group name="EG_ExtensionList">
773   <xsd:sequence>
774     <xsd:element name="ext" type="CT_Extension" minOccurs="0" maxOccurs="unbounded"/>
775   </xsd:sequence>
776 </xsd:group>
777 <xsd:complexType name="CT_ExtensionList">
778   <xsd:sequence>
779     <xsd:group ref="EG_ExtensionList" minOccurs="0" maxOccurs="1"/>
780   </xsd:sequence>
781 </xsd:complexType>
782 <xsd:complexType name="CT_ExtensionListModify">
783   <xsd:sequence>

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784     <xsd:group ref="EG_ExtensionList" minOccurs="0" maxOccurs="1"/>
785   </xsd:sequence>
786   <xsd:attribute name="mod" type="xsd:boolean" use="optional" default="false"/>
787 </xsd:complexType>
788 <xsd:complexType name="CT_CommentAuthor">
789   <xsd:sequence>
790     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
791   </xsd:sequence>
792   <xsd:attribute name="id" type="xsd:unsignedInt" use="required"/>
793   <xsd:attribute name="name" type="ST_Name" use="required"/>
794   <xsd:attribute name="initials" type="ST_Name" use="required"/>
795   <xsd:attribute name="lastIdx" type="xsd:unsignedInt" use="required"/>
796   <xsd:attribute name="clrIdx" type="xsd:unsignedInt" use="required"/>
797 </xsd:complexType>
798 <xsd:complexType name="CT_CommentAuthorList">
799   <xsd:sequence>
800     <xsd:element name="cmAuthor" type="CT_CommentAuthor" minOccurs="0" maxOccurs="unbounded"/>
801   </xsd:sequence>
802 </xsd:complexType>
803 <xsd:element name="cmAuthorLst" type="CT_CommentAuthorList"/>
804 <xsd:complexType name="CT_Comment">
805   <xsd:sequence>
806     <xsd:element name="pos" type="a:CT_Point2D" minOccurs="1" maxOccurs="1"/>
807     <xsd:element name="text" type="xsd:string" minOccurs="1" maxOccurs="1"/>
808     <xsd:element name="extLst" type="CT_ExtensionListModify" minOccurs="0" maxOccurs="1"/>
809   </xsd:sequence>
810   <xsd:attribute name="authorId" type="xsd:unsignedInt" use="required"/>
811   <xsd:attribute name="dt" type="xsd:dateTime" use="optional"/>
812   <xsd:attribute name="idx" type="ST_Index" use="required"/>
813 </xsd:complexType>
814 <xsd:complexType name="CT_CommentList">
815   <xsd:sequence>
816     <xsd:element name="cm" type="CT_Comment" minOccurs="0" maxOccurs="unbounded"/>
817   </xsd:sequence>
818 </xsd:complexType>
819 <xsd:element name="cmLst" type="CT_CommentList"/>
820 <xsd:attributeGroup name="AG_Ole">
821   <xsd:attribute name="name" type="xsd:string" use="optional" default=""/>
822   <xsd:attribute name="showAsIcon" type="xsd:boolean" use="optional" default="false"/>
823   <xsd:attribute ref="r:id" use="optional"/>
824   <xsd:attribute name="imgW" type="a:ST_PositiveCoordinate32" use="optional"/>
825   <xsd:attribute name="imgH" type="a:ST_PositiveCoordinate32" use="optional"/>
826 </xsd:attributeGroup>
827 <xsd:simpleType name="ST_OleObjectFollowColorScheme">
828   <xsd:restriction base="xsd:token">
829     <xsd:enumeration value="none"/>
830     <xsd:enumeration value="full"/>
831     <xsd:enumeration value="textAndBackground"/>
832   </xsd:restriction>
833 </xsd:simpleType>
834 <xsd:complexType name="CT_OleObjectEmbed">
835   <xsd:sequence>
836     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>

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837     </xsd:sequence>
838     <xsd:attribute name="followColorScheme" type="ST_OleObjectFollowColorScheme" use="optional"
839       default="none"/>
840   </xsd:complexType>
841   <xsd:complexType name="CT_OleObjectLink">
842     <xsd:sequence>
843       <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
844     </xsd:sequence>
845     <xsd:attribute name="updateAutomatic" type="xsd:boolean" use="optional" default="false"/>
846   </xsd:complexType>
847   <xsd:complexType name="CT_OleObject">
848     <xsd:sequence>
849       <xsd:choice minOccurs="1" maxOccurs="1">
850         <xsd:element name="embed" type="CT_OleObjectEmbed"/>
851         <xsd:element name="link" type="CT_OleObjectLink"/>
852       </xsd:choice>
853       <xsd:element name="pic" type="CT_Picture" minOccurs="1" maxOccurs="1"/>
854     </xsd:sequence>
855     <xsd:attributeGroup ref="AG_Ole"/>
856     <xsd:attribute name="progId" type="xsd:string" use="optional"/>
857   </xsd:complexType>
858   <xsd:element name="oleObj" type="CT_OleObject"/>
859   <xsd:complexType name="CT_Control">
860     <xsd:sequence>
861       <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
862       <xsd:element name="pic" type="CT_Picture" minOccurs="0" maxOccurs="1"/>
863     </xsd:sequence>
864     <xsd:attributeGroup ref="AG_Ole"/>
865   </xsd:complexType>
866   <xsd:complexType name="CT_ControlList">
867     <xsd:sequence>
868       <xsd:element name="control" type="CT_Control" minOccurs="0" maxOccurs="unbounded"/>
869     </xsd:sequence>
870   </xsd:complexType>
871   <xsd:simpleType name="ST_SlideId">
872     <xsd:restriction base="xsd:unsignedInt">
873       <xsd:minInclusive value="256"/>
874       <xsd:maxExclusive value="2147483648"/>
875     </xsd:restriction>
876   </xsd:simpleType>
877   <xsd:complexType name="CT_SlideIdListEntry">
878     <xsd:sequence>
879       <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
880     </xsd:sequence>
881     <xsd:attribute name="id" type="ST_SlideId" use="required"/>
882     <xsd:attribute ref="r:id" use="required"/>
883   </xsd:complexType>
884   <xsd:complexType name="CT_SlideIdList">
885     <xsd:sequence>
886       <xsd:element name="sldId" type="CT_SlideIdListEntry" minOccurs="0" maxOccurs="unbounded"/>
887     </xsd:sequence>
888   </xsd:complexType>
889   <xsd:simpleType name="ST_SlideMasterId">

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890     <xsd:restriction base="xsd:unsignedInt">
891         <xsd:minInclusive value="2147483648"/>
892     </xsd:restriction>
893 </xsd:simpleType>
894 <xsd:complexType name="CT_SlideMasterIdListEntry">
895     <xsd:sequence>
896         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
897     </xsd:sequence>
898     <xsd:attribute name="id" type="ST_SlideMasterId" use="optional"/>
899     <xsd:attribute ref="r:id" use="required"/>
900 </xsd:complexType>
901 <xsd:complexType name="CT_SlideMasterIdList">
902     <xsd:sequence>
903         <xsd:element name="sldMasterId" type="CT_SlideMasterIdListEntry" minOccurs="0"
904             maxOccurs="unbounded"/>
905     </xsd:sequence>
906 </xsd:complexType>
907 <xsd:complexType name="CT_NotesMasterIdListEntry">
908     <xsd:sequence>
909         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
910     </xsd:sequence>
911     <xsd:attribute ref="r:id" use="required"/>
912 </xsd:complexType>
913 <xsd:complexType name="CT_NotesMasterIdList">
914     <xsd:sequence>
915         <xsd:element name="notesMasterId" type="CT_NotesMasterIdListEntry" minOccurs="0"
916             maxOccurs="1"/>
917     </xsd:sequence>
918 </xsd:complexType>
919 <xsd:complexType name="CT_HandoutMasterIdListEntry">
920     <xsd:sequence>
921         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
922     </xsd:sequence>
923     <xsd:attribute ref="r:id" use="required"/>
924 </xsd:complexType>
925 <xsd:complexType name="CT_HandoutMasterIdList">
926     <xsd:sequence>
927         <xsd:element name="handoutMasterId" type="CT_HandoutMasterIdListEntry" minOccurs="0"
928             maxOccurs="1"/>
929     </xsd:sequence>
930 </xsd:complexType>
931 <xsd:complexType name="CT_EmbeddedFontDataId">
932     <xsd:attribute ref="r:id" use="required"/>
933 </xsd:complexType>
934 <xsd:complexType name="CT_EmbeddedFontListEntry">
935     <xsd:sequence>
936         <xsd:element name="font" type="a:CT_TextFont" minOccurs="1" maxOccurs="1"/>
937         <xsd:element name="regular" type="CT_EmbeddedFontDataId" minOccurs="0" maxOccurs="1"/>
938         <xsd:element name="bold" type="CT_EmbeddedFontDataId" minOccurs="0" maxOccurs="1"/>
939         <xsd:element name="italic" type="CT_EmbeddedFontDataId" minOccurs="0" maxOccurs="1"/>
940         <xsd:element name="boldItalic" type="CT_EmbeddedFontDataId" minOccurs="0" maxOccurs="1"/>
941     </xsd:sequence>
942 </xsd:complexType>

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943 <xsd:complexType name="CT_EmbeddedFontList">
944   <xsd:sequence>
945     <xsd:element name="embeddedFont" type="CT_EmbeddedFontListEntry" minOccurs="0"
946       maxOccurs="unbounded"/>
947   </xsd:sequence>
948 </xsd:complexType>
949 <xsd:complexType name="CT_SmartTags">
950   <xsd:attribute ref="r:id" use="required"/>
951 </xsd:complexType>
952 <xsd:complexType name="CT_CustomShow">
953   <xsd:sequence>
954     <xsd:element name="sldLst" type="CT_SlideRelationshipList" minOccurs="1" maxOccurs="1"/>
955     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
956   </xsd:sequence>
957   <xsd:attribute name="name" type="ST_Name" use="required"/>
958   <xsd:attribute name="id" type="xsd:unsignedInt" use="required"/>
959 </xsd:complexType>
960 <xsd:complexType name="CT_CustomShowList">
961   <xsd:sequence>
962     <xsd:element name="custShow" type="CT_CustomShow" minOccurs="0" maxOccurs="unbounded"/>
963   </xsd:sequence>
964 </xsd:complexType>
965 <xsd:simpleType name="ST_PhotoAlbumLayout">
966   <xsd:restriction base="xsd:token">
967     <xsd:enumeration value="fitToSlide"/>
968     <xsd:enumeration value="1pic"/>
969     <xsd:enumeration value="2pic"/>
970     <xsd:enumeration value="4pic"/>
971     <xsd:enumeration value="1picTitle"/>
972     <xsd:enumeration value="2picTitle"/>
973     <xsd:enumeration value="4picTitle"/>
974   </xsd:restriction>
975 </xsd:simpleType>
976 <xsd:simpleType name="ST_PhotoAlbumFrameShape">
977   <xsd:restriction base="xsd:token">
978     <xsd:enumeration value="frameStyle1"/>
979     <xsd:enumeration value="frameStyle2"/>
980     <xsd:enumeration value="frameStyle3"/>
981     <xsd:enumeration value="frameStyle4"/>
982     <xsd:enumeration value="frameStyle5"/>
983     <xsd:enumeration value="frameStyle6"/>
984     <xsd:enumeration value="frameStyle7"/>
985   </xsd:restriction>
986 </xsd:simpleType>
987 <xsd:complexType name="CT_PhotoAlbum">
988   <xsd:sequence>
989     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
990   </xsd:sequence>
991   <xsd:attribute name="bw" type="xsd:boolean" use="optional" default="false"/>
992   <xsd:attribute name="showCaptions" type="xsd:boolean" use="optional" default="false"/>
993   <xsd:attribute name="layout" type="ST_PhotoAlbumLayout" use="optional" default="fitToSlide"/>
994   <xsd:attribute name="frame" type="ST_PhotoAlbumFrameShape" use="optional"
995     default="frameStyle1"/>

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996 </xsd:complexType>
997 <xsd:simpleType name="ST_SlideSizeCoordinate">
998   <xsd:restriction base="a:ST_PositiveCoordinate32">
999     <xsd:minInclusive value="914400"/>
1000     <xsd:maxInclusive value="51206400"/>
1001   </xsd:restriction>
1002 </xsd:simpleType>
1003 <xsd:simpleType name="ST_SlideSizeType">
1004   <xsd:restriction base="xsd:token">
1005     <xsd:enumeration value="screen4x3"/>
1006     <xsd:enumeration value="letter"/>
1007     <xsd:enumeration value="A4"/>
1008     <xsd:enumeration value="35mm"/>
1009     <xsd:enumeration value="overhead"/>
1010     <xsd:enumeration value="banner"/>
1011     <xsd:enumeration value="custom"/>
1012     <xsd:enumeration value="ledger"/>
1013     <xsd:enumeration value="A3"/>
1014     <xsd:enumeration value="B4ISO"/>
1015     <xsd:enumeration value="B5ISO"/>
1016     <xsd:enumeration value="B4JIS"/>
1017     <xsd:enumeration value="B5JIS"/>
1018     <xsd:enumeration value="hagakiCard"/>
1019     <xsd:enumeration value="screen16x9"/>
1020     <xsd:enumeration value="screen16x10"/>
1021   </xsd:restriction>
1022 </xsd:simpleType>
1023 <xsd:complexType name="CT_SlideSize">
1024   <xsd:attribute name="cx" type="ST_SlideSizeCoordinate" use="required"/>
1025   <xsd:attribute name="cy" type="ST_SlideSizeCoordinate" use="required"/>
1026   <xsd:attribute name="type" type="ST_SlideSizeType" use="optional" default="custom"/>
1027 </xsd:complexType>
1028 <xsd:complexType name="CT_Kinsoku">
1029   <xsd:attribute name="lang" type="xsd:string" use="optional"/>
1030   <xsd:attribute name="invalStChars" type="xsd:string" use="required"/>
1031   <xsd:attribute name="invalEndChars" type="xsd:string" use="required"/>
1032 </xsd:complexType>
1033 <xsd:simpleType name="ST_BookmarkIdSeed">
1034   <xsd:restriction base="xsd:unsignedInt">
1035     <xsd:minInclusive value="1"/>
1036     <xsd:maxExclusive value="2147483648"/>
1037   </xsd:restriction>
1038 </xsd:simpleType>
1039 <xsd:complexType name="CT_ModifyVerifier">
1040   <xsd:attribute name="algorithmName" type="xsd:string" use="optional"/>
1041   <xsd:attribute name="hashValue" type="xsd:base64Binary" use="optional"/>
1042   <xsd:attribute name="saltValue" type="xsd:base64Binary" use="optional"/>
1043   <xsd:attribute name="spinValue" type="xsd:unsignedInt" use="optional"/>
1044 </xsd:complexType>
1045 <xsd:complexType name="CT_Presentation">
1046   <xsd:sequence>
1047     <xsd:element name="sldMasterIdList" type="CT_SlideMasterIdList" minOccurs="0"
1048       maxOccurs="1"/>

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1049     <xsd:element name="notesMasterIdList" type="CT_NotesMasterIdList" minOccurs="0"
1050         maxOccurs="1"/>
1051     <xsd:element name="handoutMasterIdList" type="CT_HandoutMasterIdList" minOccurs="0"
1052         maxOccurs="1"/>
1053     <xsd:element name="sldIdList" type="CT_SlideIdList" minOccurs="0" maxOccurs="1"/>
1054     <xsd:element name="sldSz" type="CT_SlideSize" minOccurs="0" maxOccurs="1"/>
1055     <xsd:element name="notesSz" type="a:CT_PositiveSize2D" minOccurs="1" maxOccurs="1"/>
1056     <xsd:element name="smartTags" type="CT_SmartTags" minOccurs="0" maxOccurs="1"/>
1057     <xsd:element name="embeddedFontList" type="CT_EmbeddedFontList" minOccurs="0"
1058         maxOccurs="1"/>
1059     <xsd:element name="custShowList" type="CT_CustomShowList" minOccurs="0" maxOccurs="1"/>
1060     <xsd:element name="photoAlbum" type="CT_PhotoAlbum" minOccurs="0" maxOccurs="1"/>
1061     <xsd:element name="custDataList" type="CT_CustomerDataList" minOccurs="0" maxOccurs="1"/>
1062     <xsd:element name="kinsoku" type="CT_Kinsoku" minOccurs="0"/>
1063     <xsd:element name="defaultTextStyle" type="a:CT_TextListStyle" minOccurs="0"
1064         maxOccurs="1"/>
1065     <xsd:element name="modifyVerifier" type="CT_ModifyVerifier" minOccurs="0" maxOccurs="1"/>
1066     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1067 </xsd:sequence>
1068 <xsd:attribute name="serverZoom" type="a:ST_Percentage" use="optional" default="50%"/>
1069 <xsd:attribute name="firstSlideNum" type="xsd:int" use="optional" default="1"/>
1070 <xsd:attribute name="showSpecialPlsOnTitleSld" type="xsd:boolean" use="optional"
1071     default="true"/>
1072 <xsd:attribute name="rtl" type="xsd:boolean" use="optional" default="false"/>
1073 <xsd:attribute name="removePersonalInfoOnSave" type="xsd:boolean" use="optional"
1074     default="false"/>
1075 <xsd:attribute name="compatMode" type="xsd:boolean" use="optional" default="false"/>
1076 <xsd:attribute name="strictFirstAndLastChars" type="xsd:boolean" use="optional"
1077     default="true"/>
1078 <xsd:attribute name="embedTrueTypeFonts" type="xsd:boolean" use="optional" default="false"/>
1079 <xsd:attribute name="saveSubsetFonts" type="xsd:boolean" use="optional" default="false"/>
1080 <xsd:attribute name="autoCompressPictures" type="xsd:boolean" use="optional" default="true"/>
1081 <xsd:attribute name="bookmarkIdSeed" type="ST_BookmarkIdSeed" use="optional" default="1"/>
1082 <xsd:attribute name="conformance" type="s:ST_ConformanceClass"/>
1083 </xsd:complexType>
1084 <xsd:element name="presentation" type="CT_Presentation"/>
1085 <xsd:complexType name="CT_HtmlPublishProperties">
1086     <xsd:sequence>
1087         <xsd:group ref="EG_SlideListChoice" minOccurs="1" maxOccurs="1"/>
1088         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1089     </xsd:sequence>
1090     <xsd:attribute name="showSpeakerNotes" type="xsd:boolean" use="optional" default="true"/>
1091     <xsd:attribute name="target" type="xsd:string" use="optional"/>
1092     <xsd:attribute name="title" type="xsd:string" use="optional" default=""/>
1093     <xsd:attribute ref="r:id" use="required"/>
1094 </xsd:complexType>
1095 <xsd:simpleType name="ST_PrintWhat">
1096     <xsd:restriction base="xsd:token">
1097         <xsd:enumeration value="slides"/>
1098         <xsd:enumeration value="handouts1"/>
1099         <xsd:enumeration value="handouts2"/>
1100         <xsd:enumeration value="handouts3"/>
1101         <xsd:enumeration value="handouts4"/>

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1102         <xsd:enumeration value="handouts6"/>
1103         <xsd:enumeration value="handouts9"/>
1104         <xsd:enumeration value="notes"/>
1105         <xsd:enumeration value="outline"/>
1106     </xsd:restriction>
1107 </xsd:simpleType>
1108 <xsd:simpleType name="ST_PrintColorMode">
1109     <xsd:restriction base="xsd:token">
1110         <xsd:enumeration value="bw"/>
1111         <xsd:enumeration value="gray"/>
1112         <xsd:enumeration value="clr"/>
1113     </xsd:restriction>
1114 </xsd:simpleType>
1115 <xsd:complexType name="CT_PrintProperties">
1116     <xsd:sequence>
1117         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1118     </xsd:sequence>
1119     <xsd:attribute name="prnWhat" type="ST_PrintWhat" use="optional" default="slides"/>
1120     <xsd:attribute name="clrMode" type="ST_PrintColorMode" use="optional" default="clr"/>
1121     <xsd:attribute name="hiddenSlides" type="xsd:boolean" use="optional" default="false"/>
1122     <xsd:attribute name="scaleToFitPaper" type="xsd:boolean" use="optional" default="false"/>
1123     <xsd:attribute name="frameSlides" type="xsd:boolean" use="optional" default="false"/>
1124 </xsd:complexType>
1125 <xsd:complexType name="CT_ShowInfoBrowse">
1126     <xsd:attribute name="showScrollbar" type="xsd:boolean" use="optional" default="true"/>
1127 </xsd:complexType>
1128 <xsd:complexType name="CT_ShowInfoKiosk">
1129     <xsd:attribute name="restart" type="xsd:unsignedInt" use="optional" default="300000"/>
1130 </xsd:complexType>
1131 <xsd:group name="EG_ShowType">
1132     <xsd:choice>
1133         <xsd:element name="present" type="CT_Empty"/>
1134         <xsd:element name="browse" type="CT_ShowInfoBrowse"/>
1135         <xsd:element name="kiosk" type="CT_ShowInfoKiosk"/>
1136     </xsd:choice>
1137 </xsd:group>
1138 <xsd:complexType name="CT_ShowProperties">
1139     <xsd:sequence minOccurs="0" maxOccurs="1">
1140         <xsd:group ref="EG_ShowType" minOccurs="0" maxOccurs="1"/>
1141         <xsd:group ref="EG_SlideListChoice" minOccurs="0" maxOccurs="1"/>
1142         <xsd:element name="penClr" type="a:CT_Color" minOccurs="0" maxOccurs="1"/>
1143         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1144     </xsd:sequence>
1145     <xsd:attribute name="loop" type="xsd:boolean" use="optional" default="false"/>
1146     <xsd:attribute name="showNarration" type="xsd:boolean" use="optional" default="false"/>
1147     <xsd:attribute name="showAnimation" type="xsd:boolean" use="optional" default="true"/>
1148     <xsd:attribute name="useTimings" type="xsd:boolean" use="optional" default="true"/>
1149 </xsd:complexType>
1150 <xsd:complexType name="CT_PresentationProperties">
1151     <xsd:sequence>
1152         <xsd:element name="prnPr" type="CT_PrintProperties" minOccurs="0" maxOccurs="1"/>
1153         <xsd:element name="showPr" type="CT_ShowProperties" minOccurs="0" maxOccurs="1"/>
1154         <xsd:element name="clrMru" type="a:CT_ColorMRU" minOccurs="0" maxOccurs="1"/>

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1155     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1156   </xsd:sequence>
1157 </xsd:complexType>
1158 <xsd:element name="presentationPr" type="CT_PresentationProperties"/>
1159 <xsd:complexType name="CT_HeaderFooter">
1160   <xsd:sequence>
1161     <xsd:element name="extLst" type="CT_ExtensionListModify" minOccurs="0" maxOccurs="1"/>
1162   </xsd:sequence>
1163   <xsd:attribute name="sldNum" type="xsd:boolean" use="optional" default="true"/>
1164   <xsd:attribute name="hdr" type="xsd:boolean" use="optional" default="true"/>
1165   <xsd:attribute name="ftr" type="xsd:boolean" use="optional" default="true"/>
1166   <xsd:attribute name="dt" type="xsd:boolean" use="optional" default="true"/>
1167 </xsd:complexType>
1168 <xsd:simpleType name="ST_PlaceholderType">
1169   <xsd:restriction base="xsd:token">
1170     <xsd:enumeration value="title"/>
1171     <xsd:enumeration value="body"/>
1172     <xsd:enumeration value="ctrTitle"/>
1173     <xsd:enumeration value="subTitle"/>
1174     <xsd:enumeration value="dt"/>
1175     <xsd:enumeration value="sldNum"/>
1176     <xsd:enumeration value="ftr"/>
1177     <xsd:enumeration value="hdr"/>
1178     <xsd:enumeration value="obj"/>
1179     <xsd:enumeration value="chart"/>
1180     <xsd:enumeration value="tbl"/>
1181     <xsd:enumeration value="clipArt"/>
1182     <xsd:enumeration value="dgm"/>
1183     <xsd:enumeration value="media"/>
1184     <xsd:enumeration value="sldImg"/>
1185     <xsd:enumeration value="pic"/>
1186   </xsd:restriction>
1187 </xsd:simpleType>
1188 <xsd:simpleType name="ST_PlaceholderSize">
1189   <xsd:restriction base="xsd:token">
1190     <xsd:enumeration value="full"/>
1191     <xsd:enumeration value="half"/>
1192     <xsd:enumeration value="quarter"/>
1193   </xsd:restriction>
1194 </xsd:simpleType>
1195 <xsd:complexType name="CT_Placeholder">
1196   <xsd:sequence>
1197     <xsd:element name="extLst" type="CT_ExtensionListModify" minOccurs="0" maxOccurs="1"/>
1198   </xsd:sequence>
1199   <xsd:attribute name="type" type="ST_PlaceholderType" use="optional" default="obj"/>
1200   <xsd:attribute name="orient" type="ST_Direction" use="optional" default="horz"/>
1201   <xsd:attribute name="sz" type="ST_PlaceholderSize" use="optional" default="full"/>
1202   <xsd:attribute name="idx" type="xsd:unsignedInt" use="optional" default="0"/>
1203   <xsd:attribute name="hasCustomPrompt" type="xsd:boolean" use="optional" default="false"/>
1204 </xsd:complexType>
1205 <xsd:complexType name="CT_ApplicationNonVisualDrawingProps">
1206   <xsd:sequence>
1207     <xsd:element name="ph" type="CT_Placeholder" minOccurs="0" maxOccurs="1"/>

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1208     <xsd:group ref="a:EG_Media" minOccurs="0" maxOccurs="1"/>
1209     <xsd:element name="custDataLst" type="CT_CustomerDataList" minOccurs="0" maxOccurs="1"/>
1210     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1211 </xsd:sequence>
1212 <xsd:attribute name="isPhoto" type="xsd:boolean" use="optional" default="false"/>
1213 <xsd:attribute name="userDrawn" type="xsd:boolean" use="optional" default="false"/>
1214 </xsd:complexType>
1215 <xsd:complexType name="CT_ShapeNonVisual">
1216     <xsd:sequence>
1217         <xsd:element name="cNvPr" type="a:CT_NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
1218         <xsd:element name="cNvSpPr" type="a:CT_NonVisualDrawingShapeProps" minOccurs="1"
1219             maxOccurs="1"/>
1220         <xsd:element name="nvPr" type="CT_ApplicationNonVisualDrawingProps" minOccurs="1"
1221             maxOccurs="1"/>
1222     </xsd:sequence>
1223 </xsd:complexType>
1224 <xsd:complexType name="CT_Shape">
1225     <xsd:sequence>
1226         <xsd:element name="nvSpPr" type="CT_ShapeNonVisual" minOccurs="1" maxOccurs="1"/>
1227         <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="1" maxOccurs="1"/>
1228         <xsd:element name="style" type="a:CT_ShapeStyle" minOccurs="0" maxOccurs="1"/>
1229         <xsd:element name="txBody" type="a:CT_TextBody" minOccurs="0" maxOccurs="1"/>
1230         <xsd:element name="extLst" type="CT_ExtensionListModify" minOccurs="0" maxOccurs="1"/>
1231     </xsd:sequence>
1232     <xsd:attribute name="useBgFill" type="xsd:boolean" use="optional" default="false"/>
1233 </xsd:complexType>
1234 <xsd:complexType name="CT_ConnectorNonVisual">
1235     <xsd:sequence>
1236         <xsd:element name="cNvPr" type="a:CT_NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
1237         <xsd:element name="cNvCxnSpPr" type="a:CT_NonVisualConnectorProperties" minOccurs="1"
1238             maxOccurs="1"/>
1239         <xsd:element name="nvPr" type="CT_ApplicationNonVisualDrawingProps" minOccurs="1"
1240             maxOccurs="1"/>
1241     </xsd:sequence>
1242 </xsd:complexType>
1243 <xsd:complexType name="CT_Connector">
1244     <xsd:sequence>
1245         <xsd:element name="nvCxnSpPr" type="CT_ConnectorNonVisual" minOccurs="1" maxOccurs="1"/>
1246         <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="1" maxOccurs="1"/>
1247         <xsd:element name="style" type="a:CT_ShapeStyle" minOccurs="0" maxOccurs="1"/>
1248         <xsd:element name="extLst" type="CT_ExtensionListModify" minOccurs="0" maxOccurs="1"/>
1249     </xsd:sequence>
1250 </xsd:complexType>
1251 <xsd:complexType name="CT_PictureNonVisual">
1252     <xsd:sequence>
1253         <xsd:element name="cNvPr" type="a:CT_NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
1254         <xsd:element name="cNvPicPr" type="a:CT_NonVisualPictureProperties" minOccurs="1"
1255             maxOccurs="1"/>
1256         <xsd:element name="nvPr" type="CT_ApplicationNonVisualDrawingProps" minOccurs="1"
1257             maxOccurs="1"/>
1258     </xsd:sequence>
1259 </xsd:complexType>
1260 <xsd:complexType name="CT_Picture">

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1261     <xsd:sequence>
1262         <xsd:element name="nvPicPr" type="CT PictureNonVisual" minOccurs="1" maxOccurs="1"/>
1263         <xsd:element name="blipFill" type="a:CT BlipFillProperties" minOccurs="1" maxOccurs="1"/>
1264         <xsd:element name="spPr" type="a:CT ShapeProperties" minOccurs="1" maxOccurs="1"/>
1265         <xsd:element name="style" type="a:CT ShapeStyle" minOccurs="0" maxOccurs="1"/>
1266         <xsd:element name="extLst" type="CT ExtensionListModify" minOccurs="0" maxOccurs="1"/>
1267     </xsd:sequence>
1268 </xsd:complexType>
1269 <xsd:complexType name="CT_GraphicalObjectFrameNonVisual">
1270     <xsd:sequence>
1271         <xsd:element name="cNvPr" type="a:CT NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
1272         <xsd:element name="cNvGraphicFramePr" type="a:CT NonVisualGraphicFrameProperties"
1273             minOccurs="1" maxOccurs="1"/>
1274         <xsd:element name="nvPr" type="CT ApplicationNonVisualDrawingProps" minOccurs="1"
1275             maxOccurs="1"/>
1276     </xsd:sequence>
1277 </xsd:complexType>
1278 <xsd:complexType name="CT_GraphicalObjectFrame">
1279     <xsd:sequence>
1280         <xsd:element name="nvGraphicFramePr" type="CT GraphicalObjectFrameNonVisual" minOccurs="1"
1281             maxOccurs="1"/>
1282         <xsd:element name="xfrm" type="a:CT Transform2D" minOccurs="1" maxOccurs="1"/>
1283         <xsd:element ref="a:graphic" minOccurs="1" maxOccurs="1"/>
1284         <xsd:element name="extLst" type="CT ExtensionListModify" minOccurs="0" maxOccurs="1"/>
1285     </xsd:sequence>
1286     <xsd:attribute name="bwMode" type="a:ST_BlackWhiteMode" use="optional"/>
1287 </xsd:complexType>
1288 <xsd:complexType name="CT_GroupShapeNonVisual">
1289     <xsd:sequence>
1290         <xsd:element name="cNvPr" type="a:CT NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
1291         <xsd:element name="cNvGrpSpPr" type="a:CT NonVisualGroupDrawingShapeProps" minOccurs="1"
1292             maxOccurs="1"/>
1293         <xsd:element name="nvPr" type="CT ApplicationNonVisualDrawingProps" minOccurs="1"
1294             maxOccurs="1"/>
1295     </xsd:sequence>
1296 </xsd:complexType>
1297 <xsd:complexType name="CT_GroupShape">
1298     <xsd:sequence>
1299         <xsd:element name="nvGrpSpPr" type="CT GroupShapeNonVisual" minOccurs="1" maxOccurs="1"/>
1300         <xsd:element name="grpSpPr" type="a:CT GroupShapeProperties" minOccurs="1" maxOccurs="1"/>
1301         <xsd:choice minOccurs="0" maxOccurs="unbounded">
1302             <xsd:element name="sp" type="CT Shape"/>
1303             <xsd:element name="grpSp" type="CT GroupShape"/>
1304             <xsd:element name="graphicFrame" type="CT GraphicalObjectFrame"/>
1305             <xsd:element name="cxnSp" type="CT Connector"/>
1306             <xsd:element name="pic" type="CT Picture"/>
1307             <xsd:element name="contentPart" type="CT Rel"/>
1308         </xsd:choice>
1309         <xsd:element name="extLst" type="CT ExtensionListModify" minOccurs="0" maxOccurs="1"/>
1310     </xsd:sequence>
1311 </xsd:complexType>
1312 <xsd:complexType name="CT_Rel">
1313     <xsd:attribute ref="r:id" use="required"/>

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1314 </xsd:complexType>
1315 <xsd:group name="EG_TopLevelSlide">
1316   <xsd:sequence>
1317     <xsd:element name="clrMap" type="a:CT_ColorMapping" minOccurs="1" maxOccurs="1"/>
1318   </xsd:sequence>
1319 </xsd:group>
1320 <xsd:group name="EG_ChildSlide">
1321   <xsd:sequence>
1322     <xsd:element name="clrMapOvr" type="a:CT_ColorMappingOverride" minOccurs="0"
1323       maxOccurs="1"/>
1324   </xsd:sequence>
1325 </xsd:group>
1326 <xsd:attributeGroup name="AG_ChildSlide">
1327   <xsd:attribute name="showMasterSp" type="xsd:boolean" use="optional" default="true"/>
1328   <xsd:attribute name="showMasterPhAnim" type="xsd:boolean" use="optional" default="true"/>
1329 </xsd:attributeGroup>
1330 <xsd:complexType name="CT_BackgroundProperties">
1331   <xsd:sequence>
1332     <xsd:group ref="a:EG_FillProperties" minOccurs="1" maxOccurs="1"/>
1333     <xsd:group ref="a:EG_EffectProperties" minOccurs="0" maxOccurs="1"/>
1334     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1335   </xsd:sequence>
1336   <xsd:attribute name="shadeToTitle" type="xsd:boolean" use="optional" default="false"/>
1337 </xsd:complexType>
1338 <xsd:group name="EG_Background">
1339   <xsd:choice>
1340     <xsd:element name="bgPr" type="CT_BackgroundProperties"/>
1341     <xsd:element name="bgRef" type="a:CT_StyleMatrixReference"/>
1342   </xsd:choice>
1343 </xsd:group>
1344 <xsd:complexType name="CT_Background">
1345   <xsd:sequence>
1346     <xsd:group ref="EG_Background"/>
1347   </xsd:sequence>
1348   <xsd:attribute name="bwMode" type="a:ST_BlackWhiteMode" use="optional" default="white"/>
1349 </xsd:complexType>
1350 <xsd:complexType name="CT_CommonSlideData">
1351   <xsd:sequence>
1352     <xsd:element name="bg" type="CT_Background" minOccurs="0" maxOccurs="1"/>
1353     <xsd:element name="spTree" type="CT_GroupShape" minOccurs="1" maxOccurs="1"/>
1354     <xsd:element name="custDataLst" type="CT_CustomerDataList" minOccurs="0" maxOccurs="1"/>
1355     <xsd:element name="controls" type="CT_ControlList" minOccurs="0" maxOccurs="1"/>
1356     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1357   </xsd:sequence>
1358   <xsd:attribute name="name" type="xsd:string" use="optional" default=""/>
1359 </xsd:complexType>
1360 <xsd:complexType name="CT_Slide">
1361   <xsd:sequence minOccurs="1" maxOccurs="1">
1362     <xsd:element name="cSld" type="CT_CommonSlideData" minOccurs="1" maxOccurs="1"/>
1363     <xsd:group ref="EG_ChildSlide" minOccurs="0" maxOccurs="1"/>
1364     <xsd:element name="transition" type="CT_SlideTransition" minOccurs="0" maxOccurs="1"/>
1365     <xsd:element name="timing" type="CT_SlideTiming" minOccurs="0" maxOccurs="1"/>
1366     <xsd:element name="extLst" type="CT_ExtensionListModify" minOccurs="0" maxOccurs="1"/>

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1367     </xsd:sequence>
1368     <xsd:attributeGroup ref="AG_ChildSlide"/>
1369     <xsd:attribute name="show" type="xsd:boolean" use="optional" default="true"/>
1370 </xsd:complexType>
1371 <xsd:element name="sld" type="CT_Slide"/>
1372 <xsd:simpleType name="ST_SlideLayoutType">
1373     <xsd:restriction base="xsd:token">
1374         <xsd:enumeration value="title"/>
1375         <xsd:enumeration value="tx"/>
1376         <xsd:enumeration value="twoColTx"/>
1377         <xsd:enumeration value="tbl"/>
1378         <xsd:enumeration value="txAndChart"/>
1379         <xsd:enumeration value="chartAndTx"/>
1380         <xsd:enumeration value="dgm"/>
1381         <xsd:enumeration value="chart"/>
1382         <xsd:enumeration value="txAndClipArt"/>
1383         <xsd:enumeration value="clipArtAndTx"/>
1384         <xsd:enumeration value="titleOnly"/>
1385         <xsd:enumeration value="blank"/>
1386         <xsd:enumeration value="txAndObj"/>
1387         <xsd:enumeration value="objAndTx"/>
1388         <xsd:enumeration value="objOnly"/>
1389         <xsd:enumeration value="obj"/>
1390         <xsd:enumeration value="txAndMedia"/>
1391         <xsd:enumeration value="mediaAndTx"/>
1392         <xsd:enumeration value="objOverTx"/>
1393         <xsd:enumeration value="txOverObj"/>
1394         <xsd:enumeration value="txAndTwoObj"/>
1395         <xsd:enumeration value="twoObjAndTx"/>
1396         <xsd:enumeration value="twoObjOverTx"/>
1397         <xsd:enumeration value="fourObj"/>
1398         <xsd:enumeration value="vertTx"/>
1399         <xsd:enumeration value="clipArtAndVertTx"/>
1400         <xsd:enumeration value="vertTitleAndTx"/>
1401         <xsd:enumeration value="vertTitleAndTxOverChart"/>
1402         <xsd:enumeration value="twoObj"/>
1403         <xsd:enumeration value="objAndTwoObj"/>
1404         <xsd:enumeration value="twoObjAndObj"/>
1405         <xsd:enumeration value="cust"/>
1406         <xsd:enumeration value="secHead"/>
1407         <xsd:enumeration value="twoTxTwoObj"/>
1408         <xsd:enumeration value="objTx"/>
1409         <xsd:enumeration value="picTx"/>
1410     </xsd:restriction>
1411 </xsd:simpleType>
1412 <xsd:complexType name="CT_SlideLayout">
1413     <xsd:sequence minOccurs="1" maxOccurs="1">
1414         <xsd:element name="cSld" type="CT_CommonSlideData" minOccurs="1" maxOccurs="1"/>
1415         <xsd:group ref="EG_ChildSlide" minOccurs="0" maxOccurs="1"/>
1416         <xsd:element name="transition" type="CT_SlideTransition" minOccurs="0" maxOccurs="1"/>
1417         <xsd:element name="timing" type="CT_SlideTiming" minOccurs="0" maxOccurs="1"/>
1418         <xsd:element name="hf" type="CT_HeaderFooter" minOccurs="0" maxOccurs="1"/>
1419         <xsd:element name="extLst" type="CT_ExtensionListModify" minOccurs="0" maxOccurs="1"/>

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1420     </xsd:sequence>
1421     <xsd:attributeGroup ref="AG_ChildSlide"/>
1422     <xsd:attribute name="matchingName" type="xsd:string" use="optional" default=""/>
1423     <xsd:attribute name="type" type="ST_SlideLayoutType" use="optional" default="cust"/>
1424     <xsd:attribute name="preserve" type="xsd:boolean" use="optional" default="false"/>
1425     <xsd:attribute name="userDrawn" type="xsd:boolean" use="optional" default="false"/>
1426 </xsd:complexType>
1427 <xsd:element name="sldLayout" type="CT_SlideLayout"/>
1428 <xsd:complexType name="CT_SlideMasterTextStyles">
1429     <xsd:sequence>
1430         <xsd:element name="titleStyle" type="a:CT_TextListStyle" minOccurs="0" maxOccurs="1"/>
1431         <xsd:element name="bodyStyle" type="a:CT_TextListStyle" minOccurs="0" maxOccurs="1"/>
1432         <xsd:element name="otherStyle" type="a:CT_TextListStyle" minOccurs="0" maxOccurs="1"/>
1433         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1434     </xsd:sequence>
1435 </xsd:complexType>
1436 <xsd:simpleType name="ST_SlideLayoutId">
1437     <xsd:restriction base="xsd:unsignedInt">
1438         <xsd:minInclusive value="2147483648"/>
1439     </xsd:restriction>
1440 </xsd:simpleType>
1441 <xsd:complexType name="CT_SlideLayoutIdListEntry">
1442     <xsd:sequence>
1443         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1444     </xsd:sequence>
1445     <xsd:attribute name="id" type="ST_SlideLayoutId" use="optional"/>
1446     <xsd:attribute ref="r:id" use="required"/>
1447 </xsd:complexType>
1448 <xsd:complexType name="CT_SlideLayoutIdList">
1449     <xsd:sequence>
1450         <xsd:element name="sldLayoutId" type="CT_SlideLayoutIdListEntry" minOccurs="0"
1451             maxOccurs="unbounded"/>
1452     </xsd:sequence>
1453 </xsd:complexType>
1454 <xsd:complexType name="CT_SlideMaster">
1455     <xsd:sequence minOccurs="1" maxOccurs="1">
1456         <xsd:element name="cSld" type="CT_CommonSlideData" minOccurs="1" maxOccurs="1"/>
1457         <xsd:group ref="EG_TopLevelSlide" minOccurs="1" maxOccurs="1"/>
1458         <xsd:element name="sldLayoutIdLst" type="CT_SlideLayoutIdList" minOccurs="0"
1459             maxOccurs="1"/>
1460         <xsd:element name="transition" type="CT_SlideTransition" minOccurs="0" maxOccurs="1"/>
1461         <xsd:element name="timing" type="CT_SlideTiming" minOccurs="0" maxOccurs="1"/>
1462         <xsd:element name="hf" type="CT_HeaderFooter" minOccurs="0" maxOccurs="1"/>
1463         <xsd:element name="txStyles" type="CT_SlideMasterTextStyles" minOccurs="0" maxOccurs="1"/>
1464         <xsd:element name="extLst" type="CT_ExtensionListModify" minOccurs="0" maxOccurs="1"/>
1465     </xsd:sequence>
1466     <xsd:attribute name="preserve" type="xsd:boolean" use="optional" default="false"/>
1467 </xsd:complexType>
1468 <xsd:element name="sldMaster" type="CT_SlideMaster"/>
1469 <xsd:complexType name="CT_HandoutMaster">
1470     <xsd:sequence>
1471         <xsd:element name="cSld" type="CT_CommonSlideData" minOccurs="1" maxOccurs="1"/>
1472         <xsd:group ref="EG_TopLevelSlide" minOccurs="1" maxOccurs="1"/>

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1473     <xsd:element name="hf" type="CT_HeaderFooter" minOccurs="0" maxOccurs="1"/>
1474     <xsd:element name="extLst" type="CT_ExtensionListModify" minOccurs="0" maxOccurs="1"/>
1475   </xsd:sequence>
1476 </xsd:complexType>
1477 <xsd:element name="handoutMaster" type="CT_HandoutMaster"/>
1478 <xsd:complexType name="CT_NotesMaster">
1479   <xsd:sequence>
1480     <xsd:element name="cSld" type="CT_CommonSlideData" minOccurs="1" maxOccurs="1"/>
1481     <xsd:group ref="EG_TopLevelSlide" minOccurs="1" maxOccurs="1"/>
1482     <xsd:element name="hf" type="CT_HeaderFooter" minOccurs="0" maxOccurs="1"/>
1483     <xsd:element name="notesStyle" type="a:CT_TextListStyle" minOccurs="0" maxOccurs="1"/>
1484     <xsd:element name="extLst" type="CT_ExtensionListModify" minOccurs="0" maxOccurs="1"/>
1485   </xsd:sequence>
1486 </xsd:complexType>
1487 <xsd:element name="notesMaster" type="CT_NotesMaster"/>
1488 <xsd:complexType name="CT_NotesSlide">
1489   <xsd:sequence minOccurs="1" maxOccurs="1">
1490     <xsd:element name="cSld" type="CT_CommonSlideData" minOccurs="1" maxOccurs="1"/>
1491     <xsd:group ref="EG_ChildSlide" minOccurs="0" maxOccurs="1"/>
1492     <xsd:element name="extLst" type="CT_ExtensionListModify" minOccurs="0" maxOccurs="1"/>
1493   </xsd:sequence>
1494   <xsd:attributeGroup ref="AG_ChildSlide"/>
1495 </xsd:complexType>
1496 <xsd:element name="notes" type="CT_NotesSlide"/>
1497 <xsd:complexType name="CT_SlideSyncProperties">
1498   <xsd:sequence>
1499     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1500   </xsd:sequence>
1501   <xsd:attribute name="serverSldId" type="xsd:string" use="required"/>
1502   <xsd:attribute name="serverSldModifiedTime" type="xsd:dateTime" use="required"/>
1503   <xsd:attribute name="clientInsertedTime" type="xsd:dateTime" use="required"/>
1504 </xsd:complexType>
1505 <xsd:element name="sldSyncPr" type="CT_SlideSyncProperties"/>
1506 <xsd:complexType name="CT_StringTag">
1507   <xsd:attribute name="name" type="xsd:string" use="required"/>
1508   <xsd:attribute name="val" type="xsd:string" use="required"/>
1509 </xsd:complexType>
1510 <xsd:complexType name="CT_TagList">
1511   <xsd:sequence>
1512     <xsd:element name="tag" type="CT_StringTag" minOccurs="0" maxOccurs="unbounded"/>
1513   </xsd:sequence>
1514 </xsd:complexType>
1515 <xsd:element name="tagLst" type="CT_TagList"/>
1516 <xsd:simpleType name="ST_SplitterBarState">
1517   <xsd:restriction base="xsd:token">
1518     <xsd:enumeration value="minimized"/>
1519     <xsd:enumeration value="restored"/>
1520     <xsd:enumeration value="maximized"/>
1521   </xsd:restriction>
1522 </xsd:simpleType>
1523 <xsd:simpleType name="ST_ViewType">
1524   <xsd:restriction base="xsd:token">
1525     <xsd:enumeration value="sldView"/>

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1526     <xsd:enumeration value="sldMasterView"/>
1527     <xsd:enumeration value="notesView"/>
1528     <xsd:enumeration value="handoutView"/>
1529     <xsd:enumeration value="notesMasterView"/>
1530     <xsd:enumeration value="outlineView"/>
1531     <xsd:enumeration value="sldSorterView"/>
1532     <xsd:enumeration value="sldThumbnailView"/>
1533 </xsd:restriction>
1534 </xsd:simpleType>
1535 <xsd:complexType name="CT_NormalViewPortion">
1536     <xsd:attribute name="sz" type="a:ST_PositiveFixedPercentage" use="required"/>
1537     <xsd:attribute name="autoAdjust" type="xsd:boolean" use="optional" default="true"/>
1538 </xsd:complexType>
1539 <xsd:complexType name="CT_NormalViewProperties">
1540     <xsd:sequence>
1541         <xsd:element name="restoredLeft" type="CT_NormalViewPortion" minOccurs="1" maxOccurs="1"/>
1542         <xsd:element name="restoredTop" type="CT_NormalViewPortion" minOccurs="1" maxOccurs="1"/>
1543         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1544     </xsd:sequence>
1545     <xsd:attribute name="showOutlineIcons" type="xsd:boolean" use="optional" default="true"/>
1546     <xsd:attribute name="snapVertSplitter" type="xsd:boolean" use="optional" default="false"/>
1547     <xsd:attribute name="vertBarState" type="ST_SplitterBarState" use="optional"
1548         default="restored"/>
1549     <xsd:attribute name="horzBarState" type="ST_SplitterBarState" use="optional"
1550         default="restored"/>
1551     <xsd:attribute name="preferSingleView" type="xsd:boolean" use="optional" default="false"/>
1552 </xsd:complexType>
1553 <xsd:complexType name="CT_CommonViewProperties">
1554     <xsd:sequence>
1555         <xsd:element name="scale" type="a:CT_Scale2D" minOccurs="1" maxOccurs="1"/>
1556         <xsd:element name="origin" type="a:CT_Point2D" minOccurs="1" maxOccurs="1"/>
1557     </xsd:sequence>
1558     <xsd:attribute name="varScale" type="xsd:boolean" use="optional" default="false"/>
1559 </xsd:complexType>
1560 <xsd:complexType name="CT_NotesTextViewProperties">
1561     <xsd:sequence minOccurs="1" maxOccurs="1">
1562         <xsd:element name="cViewPr" type="CT_CommonViewProperties" minOccurs="1" maxOccurs="1"/>
1563         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1564     </xsd:sequence>
1565 </xsd:complexType>
1566 <xsd:complexType name="CT_OutlineViewSlideEntry">
1567     <xsd:attribute ref="r:id" use="required"/>
1568     <xsd:attribute name="collapse" type="xsd:boolean" use="optional" default="false"/>
1569 </xsd:complexType>
1570 <xsd:complexType name="CT_OutlineViewSlideList">
1571     <xsd:sequence>
1572         <xsd:element name="sld" type="CT_OutlineViewSlideEntry" minOccurs="0"
1573             maxOccurs="unbounded"/>
1574     </xsd:sequence>
1575 </xsd:complexType>
1576 <xsd:complexType name="CT_OutlineViewProperties">
1577     <xsd:sequence minOccurs="1" maxOccurs="1">
1578         <xsd:element name="cViewPr" type="CT_CommonViewProperties" minOccurs="1" maxOccurs="1"/>

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1579     <xsd:element name="sldLst" type="CT_OutlineViewSlideList" minOccurs="0" maxOccurs="1"/>
1580     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1581   </xsd:sequence>
1582 </xsd:complexType>
1583 <xsd:complexType name="CT_SlideSorterViewProperties">
1584   <xsd:sequence minOccurs="1" maxOccurs="1">
1585     <xsd:element name="cViewPr" type="CT_CommonViewProperties" minOccurs="1" maxOccurs="1"/>
1586     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1587   </xsd:sequence>
1588   <xsd:attribute name="showFormatting" type="xsd:boolean" use="optional" default="true"/>
1589 </xsd:complexType>
1590 <xsd:complexType name="CT_Guide">
1591   <xsd:attribute name="orient" type="ST_Direction" use="optional" default="vert"/>
1592   <xsd:attribute name="pos" type="a:ST_Coordinate32" use="optional" default="0"/>
1593 </xsd:complexType>
1594 <xsd:complexType name="CT_GuideList">
1595   <xsd:sequence minOccurs="0" maxOccurs="1">
1596     <xsd:element name="guide" type="CT_Guide" minOccurs="0" maxOccurs="unbounded"/>
1597   </xsd:sequence>
1598 </xsd:complexType>
1599 <xsd:complexType name="CT_CommonSlideViewProperties">
1600   <xsd:sequence>
1601     <xsd:element name="cViewPr" type="CT_CommonViewProperties" minOccurs="1" maxOccurs="1"/>
1602     <xsd:element name="guideLst" type="CT_GuideList" minOccurs="0" maxOccurs="1"/>
1603   </xsd:sequence>
1604   <xsd:attribute name="snapToGrid" type="xsd:boolean" use="optional" default="true"/>
1605   <xsd:attribute name="snapToObjects" type="xsd:boolean" use="optional" default="false"/>
1606   <xsd:attribute name="showGuides" type="xsd:boolean" use="optional" default="false"/>
1607 </xsd:complexType>
1608 <xsd:complexType name="CT_SlideViewProperties">
1609   <xsd:sequence>
1610     <xsd:element name="cSldViewPr" type="CT_CommonSlideViewProperties" minOccurs="1"
1611       maxOccurs="1"/>
1612     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1613   </xsd:sequence>
1614 </xsd:complexType>
1615 <xsd:complexType name="CT_NotesViewProperties">
1616   <xsd:sequence>
1617     <xsd:element name="cSldViewPr" type="CT_CommonSlideViewProperties" minOccurs="1"
1618       maxOccurs="1"/>
1619     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1620   </xsd:sequence>
1621 </xsd:complexType>
1622 <xsd:complexType name="CT_ViewProperties">
1623   <xsd:sequence minOccurs="0" maxOccurs="1">
1624     <xsd:element name="normalViewPr" type="CT_NormalViewProperties" minOccurs="0"
1625       maxOccurs="1"/>
1626     <xsd:element name="slideViewPr" type="CT_SlideViewProperties" minOccurs="0"
1627       maxOccurs="1"/>
1628     <xsd:element name="outlineViewPr" type="CT_OutlineViewProperties" minOccurs="0"
1629       maxOccurs="1"/>
1630     <xsd:element name="notesTextViewPr" type="CT_NotesTextViewProperties" minOccurs="0"
1631       maxOccurs="1"/>

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1632     <xsd:element name="sorterViewPr" type="CT_SlideSorterViewProperties" minOccurs="0"
1633         maxOccurs="1"/>
1634     <xsd:element name="notesViewPr" type="CT_NotesViewProperties" minOccurs="0"
1635         maxOccurs="1"/>
1636     <xsd:element name="gridSpacing" type="a:CT_PositiveSize2D" minOccurs="0" maxOccurs="1"/>
1637     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1638 </xsd:sequence>
1639     <xsd:attribute name="lastView" type="ST_ViewType" use="optional" default="sldView"/>
1640     <xsd:attribute name="showComments" type="xsd:boolean" use="optional" default="true"/>
1641 </xsd:complexType>
1642     <xsd:element name="viewPr" type="CT_ViewProperties"/>
1643 </xsd:schema>

```

A.4 DrawingML - Framework

A.4.1 DrawingML – Main

This schema is available in the file dml-main.xsd.

```

1 <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
2   xmlns:r="http://purl.oclc.org/ooxml/officeDocument/relationships"
3   xmlns:s="http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
4   xmlns="http://purl.oclc.org/ooxml/drawingml/main"
5   targetNamespace="http://purl.oclc.org/ooxml/drawingml/main" elementFormDefault="qualified">
6   <xsd:import namespace="http://purl.oclc.org/ooxml/officeDocument/relationships"
7       schemaLocation="shared-relationshipReference.xsd"/>
8   <xsd:import namespace="http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
9       schemaLocation="shared-commonSimpleTypes.xsd"/>
10  <xsd:import namespace="http://purl.oclc.org/ooxml/drawingml/diagram" schemaLocation="dml-
11  diagram.xsd"/>
12  <xsd:import namespace="http://purl.oclc.org/ooxml/drawingml/chart" schemaLocation="dml-
13  chart.xsd"/>
14  <xsd:import namespace="http://purl.oclc.org/ooxml/drawingml/picture" schemaLocation="dml-
15  picture.xsd"/>
16  <xsd:import namespace="http://purl.oclc.org/ooxml/drawingml/lockedCanvas" schemaLocation="dml-
17  lockedCanvas.xsd"/>
18  <xsd:complexType name="CT_AudioFile">
19      <xsd:sequence>
20          <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
21      </xsd:sequence>
22      <xsd:attribute ref="r:link" use="required"/>
23      <xsd:attribute name="contentType" type="xsd:string" use="optional"/>
24  </xsd:complexType>
25  <xsd:complexType name="CT_VideoFile">
26      <xsd:sequence>
27          <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
28      </xsd:sequence>
29      <xsd:attribute ref="r:link" use="required"/>
30      <xsd:attribute name="contentType" type="xsd:string" use="optional"/>
31  </xsd:complexType>
32  <xsd:complexType name="CT_QuickTimeFile">
33      <xsd:sequence>
34          <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>

```

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35     </xsd:sequence>
36     <xsd:attribute ref="r:link" use="required"/>
37 </xsd:complexType>
38 <xsd:complexType name="CT_AudioCDTime">
39     <xsd:attribute name="track" type="xsd:unsignedByte" use="required"/>
40     <xsd:attribute name="time" type="xsd:unsignedInt" use="optional" default="0"/>
41 </xsd:complexType>
42 <xsd:complexType name="CT_AudioCD">
43     <xsd:sequence>
44         <xsd:element name="st" type="CT_AudioCDTime" minOccurs="1" maxOccurs="1"/>
45         <xsd:element name="end" type="CT_AudioCDTime" minOccurs="1" maxOccurs="1"/>
46         <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
47     </xsd:sequence>
48 </xsd:complexType>
49 <xsd:group name="EG_Media">
50     <xsd:choice>
51         <xsd:element name="audioCd" type="CT_AudioCD"/>
52         <xsd:element name="wavAudioFile" type="CT_EmbeddedWAVAudioFile"/>
53         <xsd:element name="audioFile" type="CT_AudioFile"/>
54         <xsd:element name="videoFile" type="CT_VideoFile"/>
55         <xsd:element name="quickTimeFile" type="CT_QuickTimeFile"/>
56     </xsd:choice>
57 </xsd:group>
58 <xsd:element name="videoFile" type="CT_VideoFile"/>
59 <xsd:simpleType name="ST_StyleMatrixColumnIndex">
60     <xsd:restriction base="xsd:unsignedInt"/>
61 </xsd:simpleType>
62 <xsd:simpleType name="ST_FontCollectionIndex">
63     <xsd:restriction base="xsd:token">
64         <xsd:enumeration value="major"/>
65         <xsd:enumeration value="minor"/>
66         <xsd:enumeration value="none"/>
67     </xsd:restriction>
68 </xsd:simpleType>
69 <xsd:simpleType name="ST_ColorSchemeIndex">
70     <xsd:restriction base="xsd:token">
71         <xsd:enumeration value="dk1"/>
72         <xsd:enumeration value="lt1"/>
73         <xsd:enumeration value="dk2"/>
74         <xsd:enumeration value="lt2"/>
75         <xsd:enumeration value="accent1"/>
76         <xsd:enumeration value="accent2"/>
77         <xsd:enumeration value="accent3"/>
78         <xsd:enumeration value="accent4"/>
79         <xsd:enumeration value="accent5"/>
80         <xsd:enumeration value="accent6"/>
81         <xsd:enumeration value="hlink"/>
82         <xsd:enumeration value="folHlink"/>
83     </xsd:restriction>
84 </xsd:simpleType>
85 <xsd:complexType name="CT_ColorScheme">
86     <xsd:sequence>
87         <xsd:element name="dk1" type="CT_Color" minOccurs="1" maxOccurs="1"/>

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88     <xsd:element name="lt1" type="CT_Color" minOccurs="1" maxOccurs="1"/>
89     <xsd:element name="dk2" type="CT_Color" minOccurs="1" maxOccurs="1"/>
90     <xsd:element name="lt2" type="CT_Color" minOccurs="1" maxOccurs="1"/>
91     <xsd:element name="accent1" type="CT_Color" minOccurs="1" maxOccurs="1"/>
92     <xsd:element name="accent2" type="CT_Color" minOccurs="1" maxOccurs="1"/>
93     <xsd:element name="accent3" type="CT_Color" minOccurs="1" maxOccurs="1"/>
94     <xsd:element name="accent4" type="CT_Color" minOccurs="1" maxOccurs="1"/>
95     <xsd:element name="accent5" type="CT_Color" minOccurs="1" maxOccurs="1"/>
96     <xsd:element name="accent6" type="CT_Color" minOccurs="1" maxOccurs="1"/>
97     <xsd:element name="hlink" type="CT_Color" minOccurs="1" maxOccurs="1"/>
98     <xsd:element name="folHlink" type="CT_Color" minOccurs="1" maxOccurs="1"/>
99     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
100  </xsd:sequence>
101  <xsd:attribute name="name" type="xsd:string" use="required"/>
102 </xsd:complexType>
103 <xsd:complexType name="CT_CustomColor">
104     <xsd:sequence>
105         <xsd:group ref="EG_ColorChoice" minOccurs="1" maxOccurs="1"/>
106     </xsd:sequence>
107     <xsd:attribute name="name" type="xsd:string" use="optional" default=""/>
108 </xsd:complexType>
109 <xsd:complexType name="CT_SupplementalFont">
110     <xsd:attribute name="script" type="xsd:string" use="required"/>
111     <xsd:attribute name="typeface" type="ST_TextTypeface" use="required"/>
112 </xsd:complexType>
113 <xsd:complexType name="CT_CustomColorList">
114     <xsd:sequence>
115         <xsd:element name="custClr" type="CT_CustomColor" minOccurs="0" maxOccurs="unbounded"/>
116     </xsd:sequence>
117 </xsd:complexType>
118 <xsd:complexType name="CT_FontCollection">
119     <xsd:sequence>
120         <xsd:element name="latin" type="CT_TextFont" minOccurs="1" maxOccurs="1"/>
121         <xsd:element name="ea" type="CT_TextFont" minOccurs="1" maxOccurs="1"/>
122         <xsd:element name="cs" type="CT_TextFont" minOccurs="1" maxOccurs="1"/>
123         <xsd:element name="font" type="CT_SupplementalFont" minOccurs="0" maxOccurs="unbounded"/>
124         <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
125     </xsd:sequence>
126 </xsd:complexType>
127 <xsd:complexType name="CT_EffectStyleItem">
128     <xsd:sequence>
129         <xsd:group ref="EG_EffectProperties" minOccurs="1" maxOccurs="1"/>
130         <xsd:element name="scene3d" type="CT_Scene3D" minOccurs="0" maxOccurs="1"/>
131         <xsd:element name="sp3d" type="CT_Shape3D" minOccurs="0" maxOccurs="1"/>
132     </xsd:sequence>
133 </xsd:complexType>
134 <xsd:complexType name="CT_FontScheme">
135     <xsd:sequence>
136         <xsd:element name="majorFont" type="CT_FontCollection" minOccurs="1" maxOccurs="1"/>
137         <xsd:element name="minorFont" type="CT_FontCollection" minOccurs="1" maxOccurs="1"/>
138         <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
139     </xsd:sequence>
140     <xsd:attribute name="name" type="xsd:string" use="required"/>

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141 </xsd:complexType>
142 <xsd:complexType name="CT_FillStyleList">
143   <xsd:sequence>
144     <xsd:group ref="EG_FillProperties" minOccurs="3" maxOccurs="unbounded"/>
145   </xsd:sequence>
146 </xsd:complexType>
147 <xsd:complexType name="CT_LineStyleList">
148   <xsd:sequence>
149     <xsd:element name="ln" type="CT_LineProperties" minOccurs="3" maxOccurs="unbounded"/>
150   </xsd:sequence>
151 </xsd:complexType>
152 <xsd:complexType name="CT_EffectStyleList">
153   <xsd:sequence>
154     <xsd:element name="effectStyle" type="CT_EffectStyleItem" minOccurs="3"
155       maxOccurs="unbounded"/>
156   </xsd:sequence>
157 </xsd:complexType>
158 <xsd:complexType name="CT_BackgroundFillStyleList">
159   <xsd:sequence>
160     <xsd:group ref="EG_FillProperties" minOccurs="3" maxOccurs="unbounded"/>
161   </xsd:sequence>
162 </xsd:complexType>
163 <xsd:complexType name="CT_StyleMatrix">
164   <xsd:sequence>
165     <xsd:element name="fillStyleLst" type="CT_FillStyleList" minOccurs="1" maxOccurs="1"/>
166     <xsd:element name="lnStyleLst" type="CT_LineStyleList" minOccurs="1" maxOccurs="1"/>
167     <xsd:element name="effectStyleLst" type="CT_EffectStyleList" minOccurs="1" maxOccurs="1"/>
168     <xsd:element name="bgFillStyleLst" type="CT_BackgroundFillStyleList" minOccurs="1"
169       maxOccurs="1"/>
170   </xsd:sequence>
171   <xsd:attribute name="name" type="xsd:string" use="optional" default=""/>
172 </xsd:complexType>
173 <xsd:complexType name="CT_BaseStyles">
174   <xsd:sequence>
175     <xsd:element name="clrScheme" type="CT_ColorScheme" minOccurs="1" maxOccurs="1"/>
176     <xsd:element name="fontScheme" type="CT_FontScheme" minOccurs="1" maxOccurs="1"/>
177     <xsd:element name="fmtScheme" type="CT_StyleMatrix" minOccurs="1" maxOccurs="1"/>
178     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
179   </xsd:sequence>
180 </xsd:complexType>
181 <xsd:complexType name="CT_OfficeArtExtension">
182   <xsd:sequence>
183     <xsd:any processContents="lax" minOccurs="0" maxOccurs="unbounded"/>
184   </xsd:sequence>
185   <xsd:attribute name="uri" type="xsd:token" use="required"/>
186 </xsd:complexType>
187 <xsd:simpleType name="ST_Coordinate">
188   <xsd:union memberTypes="ST_CoordinateUnqualified s:ST_UniversalMeasure"/>
189 </xsd:simpleType>
190 <xsd:simpleType name="ST_CoordinateUnqualified">
191   <xsd:restriction base="xsd:long">
192     <xsd:minInclusive value="-27273042329600"/>
193     <xsd:maxInclusive value="27273042316900"/>

```

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194     </xsd:restriction>
195 </xsd:simpleType>
196 <xsd:simpleType name="ST_Coordinate32">
197     <xsd:union memberTypes="ST_Coordinate32Unqualified s:ST_UniversalMeasure"/>
198 </xsd:simpleType>
199 <xsd:simpleType name="ST_Coordinate32Unqualified">
200     <xsd:restriction base="xsd:int"/>
201 </xsd:simpleType>
202 <xsd:simpleType name="ST_PositiveCoordinate">
203     <xsd:restriction base="xsd:long">
204         <xsd:minInclusive value="0"/>
205         <xsd:maxInclusive value="27273042316900"/>
206     </xsd:restriction>
207 </xsd:simpleType>
208 <xsd:simpleType name="ST_PositiveCoordinate32">
209     <xsd:restriction base="ST_Coordinate32Unqualified">
210         <xsd:minInclusive value="0"/>
211     </xsd:restriction>
212 </xsd:simpleType>
213 <xsd:simpleType name="ST_Angle">
214     <xsd:restriction base="xsd:int"/>
215 </xsd:simpleType>
216 <xsd:complexType name="CT_Angle">
217     <xsd:attribute name="val" type="ST_Angle" use="required"/>
218 </xsd:complexType>
219 <xsd:simpleType name="ST_FixedAngle">
220     <xsd:restriction base="ST_Angle">
221         <xsd:minExclusive value="-5400000"/>
222         <xsd:maxExclusive value="5400000"/>
223     </xsd:restriction>
224 </xsd:simpleType>
225 <xsd:simpleType name="ST_PositiveFixedAngle">
226     <xsd:restriction base="ST_Angle">
227         <xsd:minInclusive value="0"/>
228         <xsd:maxExclusive value="21600000"/>
229     </xsd:restriction>
230 </xsd:simpleType>
231 <xsd:complexType name="CT_PositiveFixedAngle">
232     <xsd:attribute name="val" type="ST_PositiveFixedAngle" use="required"/>
233 </xsd:complexType>
234 <xsd:simpleType name="ST_Percentage">
235     <xsd:union memberTypes="s:ST_Percentage"/>
236 </xsd:simpleType>
237 <xsd:complexType name="CT_Percentage">
238     <xsd:attribute name="val" type="ST_Percentage" use="required"/>
239 </xsd:complexType>
240 <xsd:simpleType name="ST_PositivePercentage">
241     <xsd:union memberTypes="s:ST_PositivePercentage"/>
242 </xsd:simpleType>
243 <xsd:complexType name="CT_PositivePercentage">
244     <xsd:attribute name="val" type="ST_PositivePercentage" use="required"/>
245 </xsd:complexType>
246 <xsd:simpleType name="ST_FixedPercentage">

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247     <xsd:union memberTypes="s:ST_FixedPercentage"/>
248 </xsd:simpleType>
249 <xsd:complexType name="CT_FixedPercentage">
250     <xsd:attribute name="val" type="ST_FixedPercentage" use="required"/>
251 </xsd:complexType>
252 <xsd:simpleType name="ST_PositiveFixedPercentage">
253     <xsd:union memberTypes="s:ST_PositiveFixedPercentage"/>
254 </xsd:simpleType>
255 <xsd:complexType name="CT_PositiveFixedPercentage">
256     <xsd:attribute name="val" type="ST_PositiveFixedPercentage" use="required"/>
257 </xsd:complexType>
258 <xsd:complexType name="CT_Ratio">
259     <xsd:attribute name="n" type="xsd:long" use="required"/>
260     <xsd:attribute name="d" type="xsd:long" use="required"/>
261 </xsd:complexType>
262 <xsd:complexType name="CT_Point2D">
263     <xsd:attribute name="x" type="ST_Coordinate" use="required"/>
264     <xsd:attribute name="y" type="ST_Coordinate" use="required"/>
265 </xsd:complexType>
266 <xsd:complexType name="CT_PositiveSize2D">
267     <xsd:attribute name="cx" type="ST_PositiveCoordinate" use="required"/>
268     <xsd:attribute name="cy" type="ST_PositiveCoordinate" use="required"/>
269 </xsd:complexType>
270 <xsd:complexType name="CT_ComplementTransform"/>
271 <xsd:complexType name="CT_InverseTransform"/>
272 <xsd:complexType name="CT_GrayscaleTransform"/>
273 <xsd:complexType name="CT_GammaTransform"/>
274 <xsd:complexType name="CT_InverseGammaTransform"/>
275 <xsd:group name="EG_ColorTransform">
276     <xsd:choice>
277         <xsd:element name="tint" type="CT_PositiveFixedPercentage" minOccurs="1" maxOccurs="1"/>
278         <xsd:element name="shade" type="CT_PositiveFixedPercentage" minOccurs="1" maxOccurs="1"/>
279         <xsd:element name="comp" type="CT_ComplementTransform" minOccurs="1" maxOccurs="1"/>
280         <xsd:element name="inv" type="CT_InverseTransform" minOccurs="1" maxOccurs="1"/>
281         <xsd:element name="gray" type="CT_GrayscaleTransform" minOccurs="1" maxOccurs="1"/>
282         <xsd:element name="alpha" type="CT_PositiveFixedPercentage" minOccurs="1" maxOccurs="1"/>
283         <xsd:element name="alphaOff" type="CT_FixedPercentage" minOccurs="1" maxOccurs="1"/>
284         <xsd:element name="alphaMod" type="CT_PositivePercentage" minOccurs="1" maxOccurs="1"/>
285         <xsd:element name="hue" type="CT_PositiveFixedAngle" minOccurs="1" maxOccurs="1"/>
286         <xsd:element name="hueOff" type="CT_Angle" minOccurs="1" maxOccurs="1"/>
287         <xsd:element name="hueMod" type="CT_PositivePercentage" minOccurs="1" maxOccurs="1"/>
288         <xsd:element name="sat" type="CT_Percentage" minOccurs="1" maxOccurs="1"/>
289         <xsd:element name="satOff" type="CT_Percentage" minOccurs="1" maxOccurs="1"/>
290         <xsd:element name="satMod" type="CT_Percentage" minOccurs="1" maxOccurs="1"/>
291         <xsd:element name="lum" type="CT_Percentage" minOccurs="1" maxOccurs="1"/>
292         <xsd:element name="lumOff" type="CT_Percentage" minOccurs="1" maxOccurs="1"/>
293         <xsd:element name="lumMod" type="CT_Percentage" minOccurs="1" maxOccurs="1"/>
294         <xsd:element name="red" type="CT_Percentage" minOccurs="1" maxOccurs="1"/>
295         <xsd:element name="redOff" type="CT_Percentage" minOccurs="1" maxOccurs="1"/>
296         <xsd:element name="redMod" type="CT_Percentage" minOccurs="1" maxOccurs="1"/>
297         <xsd:element name="green" type="CT_Percentage" minOccurs="1" maxOccurs="1"/>
298         <xsd:element name="greenOff" type="CT_Percentage" minOccurs="1" maxOccurs="1"/>
299         <xsd:element name="greenMod" type="CT_Percentage" minOccurs="1" maxOccurs="1"/>

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300     <xsd:element name="blue" type="CT_Percentage" minOccurs="1" maxOccurs="1"/>
301     <xsd:element name="blueOff" type="CT_Percentage" minOccurs="1" maxOccurs="1"/>
302     <xsd:element name="blueMod" type="CT_Percentage" minOccurs="1" maxOccurs="1"/>
303     <xsd:element name="gamma" type="CT_GammaTransform" minOccurs="1" maxOccurs="1"/>
304     <xsd:element name="invGamma" type="CT_InverseGammaTransform" minOccurs="1" maxOccurs="1"/>
305   </xsd:choice>
306 </xsd:group>
307 <xsd:complexType name="CT_ScRgbColor">
308   <xsd:sequence>
309     <xsd:group ref="EG_ColorTransform" minOccurs="0" maxOccurs="unbounded"/>
310   </xsd:sequence>
311   <xsd:attribute name="r" type="ST_Percentage" use="required"/>
312   <xsd:attribute name="g" type="ST_Percentage" use="required"/>
313   <xsd:attribute name="b" type="ST_Percentage" use="required"/>
314 </xsd:complexType>
315 <xsd:complexType name="CT_SRgbColor">
316   <xsd:sequence>
317     <xsd:group ref="EG_ColorTransform" minOccurs="0" maxOccurs="unbounded"/>
318   </xsd:sequence>
319   <xsd:attribute name="val" type="s:ST_HexColorRGB" use="required"/>
320 </xsd:complexType>
321 <xsd:complexType name="CT_HslColor">
322   <xsd:sequence>
323     <xsd:group ref="EG_ColorTransform" minOccurs="0" maxOccurs="unbounded"/>
324   </xsd:sequence>
325   <xsd:attribute name="hue" type="ST_PositiveFixedAngle" use="required"/>
326   <xsd:attribute name="sat" type="ST_Percentage" use="required"/>
327   <xsd:attribute name="lum" type="ST_Percentage" use="required"/>
328 </xsd:complexType>
329 <xsd:simpleType name="ST_SystemColorVal">
330   <xsd:restriction base="xsd:token">
331     <xsd:enumeration value="scrollBar"/>
332     <xsd:enumeration value="background"/>
333     <xsd:enumeration value="activeCaption"/>
334     <xsd:enumeration value="inactiveCaption"/>
335     <xsd:enumeration value="menu"/>
336     <xsd:enumeration value="window"/>
337     <xsd:enumeration value="windowFrame"/>
338     <xsd:enumeration value="menuText"/>
339     <xsd:enumeration value="windowText"/>
340     <xsd:enumeration value="captionText"/>
341     <xsd:enumeration value="activeBorder"/>
342     <xsd:enumeration value="inactiveBorder"/>
343     <xsd:enumeration value="appWorkspace"/>
344     <xsd:enumeration value="highlight"/>
345     <xsd:enumeration value="highlightText"/>
346     <xsd:enumeration value="btnFace"/>
347     <xsd:enumeration value="btnShadow"/>
348     <xsd:enumeration value="grayText"/>
349     <xsd:enumeration value="btnText"/>
350     <xsd:enumeration value="inactiveCaptionText"/>
351     <xsd:enumeration value="btnHighlight"/>
352     <xsd:enumeration value="3dDkShadow"/>

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353         <xsd:enumeration value="3dLight"/>
354         <xsd:enumeration value="infoText"/>
355         <xsd:enumeration value="infoBk"/>
356         <xsd:enumeration value="hotLight"/>
357         <xsd:enumeration value="gradientActiveCaption"/>
358         <xsd:enumeration value="gradientInactiveCaption"/>
359         <xsd:enumeration value="menuHighlight"/>
360         <xsd:enumeration value="menuBar"/>
361     </xsd:restriction>
362 </xsd:simpleType>
363 <xsd:complexType name="CT_SystemColor">
364     <xsd:sequence>
365         <xsd:group ref="EG_ColorTransform" minOccurs="0" maxOccurs="unbounded"/>
366     </xsd:sequence>
367     <xsd:attribute name="val" type="ST_SystemColorVal" use="required"/>
368     <xsd:attribute name="lastClr" type="s:ST_HexColorRGB" use="optional"/>
369 </xsd:complexType>
370 <xsd:simpleType name="ST_SchemeColorVal">
371     <xsd:restriction base="xsd:token">
372         <xsd:enumeration value="bg1"/>
373         <xsd:enumeration value="tx1"/>
374         <xsd:enumeration value="bg2"/>
375         <xsd:enumeration value="tx2"/>
376         <xsd:enumeration value="accent1"/>
377         <xsd:enumeration value="accent2"/>
378         <xsd:enumeration value="accent3"/>
379         <xsd:enumeration value="accent4"/>
380         <xsd:enumeration value="accent5"/>
381         <xsd:enumeration value="accent6"/>
382         <xsd:enumeration value="hlink"/>
383         <xsd:enumeration value="folHlink"/>
384         <xsd:enumeration value="phClr"/>
385         <xsd:enumeration value="dk1"/>
386         <xsd:enumeration value="lt1"/>
387         <xsd:enumeration value="dk2"/>
388         <xsd:enumeration value="lt2"/>
389     </xsd:restriction>
390 </xsd:simpleType>
391 <xsd:complexType name="CT_SchemeColor">
392     <xsd:sequence>
393         <xsd:group ref="EG_ColorTransform" minOccurs="0" maxOccurs="unbounded"/>
394     </xsd:sequence>
395     <xsd:attribute name="val" type="ST_SchemeColorVal" use="required"/>
396 </xsd:complexType>
397 <xsd:simpleType name="ST_PresetColorVal">
398     <xsd:restriction base="xsd:token">
399         <xsd:enumeration value="aliceBlue"/>
400         <xsd:enumeration value="antiqueWhite"/>
401         <xsd:enumeration value="aqua"/>
402         <xsd:enumeration value="aquamarine"/>
403         <xsd:enumeration value="azure"/>
404         <xsd:enumeration value="beige"/>
405         <xsd:enumeration value="bisque"/>

```

```

406      <xsd:enumeration value="black"/>
407      <xsd:enumeration value="blanchedAlmond"/>
408      <xsd:enumeration value="blue"/>
409      <xsd:enumeration value="blueViolet"/>
410      <xsd:enumeration value="brown"/>
411      <xsd:enumeration value="burlyWood"/>
412      <xsd:enumeration value="cadetBlue"/>
413      <xsd:enumeration value="chartreuse"/>
414      <xsd:enumeration value="chocolate"/>
415      <xsd:enumeration value="coral"/>
416      <xsd:enumeration value="cornflowerBlue"/>
417      <xsd:enumeration value="cornsilk"/>
418      <xsd:enumeration value="crimson"/>
419      <xsd:enumeration value="cyan"/>
420      <xsd:enumeration value="darkBlue"/>
421      <xsd:enumeration value="darkCyan"/>
422      <xsd:enumeration value="darkGoldenrod"/>
423      <xsd:enumeration value="darkGray"/>
424      <xsd:enumeration value="darkGrey"/>
425      <xsd:enumeration value="darkGreen"/>
426      <xsd:enumeration value="darkKhaki"/>
427      <xsd:enumeration value="darkMagenta"/>
428      <xsd:enumeration value="darkOliveGreen"/>
429      <xsd:enumeration value="darkOrange"/>
430      <xsd:enumeration value="darkOrchid"/>
431      <xsd:enumeration value="darkRed"/>
432      <xsd:enumeration value="darkSalmon"/>
433      <xsd:enumeration value="darkSeaGreen"/>
434      <xsd:enumeration value="darkSlateBlue"/>
435      <xsd:enumeration value="darkSlateGray"/>
436      <xsd:enumeration value="darkSlateGrey"/>
437      <xsd:enumeration value="darkTurquoise"/>
438      <xsd:enumeration value="darkViolet"/>
439      <xsd:enumeration value="dkBlue"/>
440      <xsd:enumeration value="dkCyan"/>
441      <xsd:enumeration value="dkGoldenrod"/>
442      <xsd:enumeration value="dkGray"/>
443      <xsd:enumeration value="dkGrey"/>
444      <xsd:enumeration value="dkGreen"/>
445      <xsd:enumeration value="dkKhaki"/>
446      <xsd:enumeration value="dkMagenta"/>
447      <xsd:enumeration value="dkOliveGreen"/>
448      <xsd:enumeration value="dkOrange"/>
449      <xsd:enumeration value="dkOrchid"/>
450      <xsd:enumeration value="dkRed"/>
451      <xsd:enumeration value="dkSalmon"/>
452      <xsd:enumeration value="dkSeaGreen"/>
453      <xsd:enumeration value="dkSlateBlue"/>
454      <xsd:enumeration value="dkSlateGray"/>
455      <xsd:enumeration value="dkSlateGrey"/>
456      <xsd:enumeration value="dkTurquoise"/>
457      <xsd:enumeration value="dkViolet"/>
458      <xsd:enumeration value="deepPink"/>

```

```

459      <xsd:enumeration value="deepSkyBlue"/>
460      <xsd:enumeration value="dimGray"/>
461      <xsd:enumeration value="dimGrey"/>
462      <xsd:enumeration value="dodgerBlue"/>
463      <xsd:enumeration value="firebrick"/>
464      <xsd:enumeration value="floralWhite"/>
465      <xsd:enumeration value="forestGreen"/>
466      <xsd:enumeration value="fuchsia"/>
467      <xsd:enumeration value="gainsboro"/>
468      <xsd:enumeration value="ghostWhite"/>
469      <xsd:enumeration value="gold"/>
470      <xsd:enumeration value="goldenrod"/>
471      <xsd:enumeration value="gray"/>
472      <xsd:enumeration value="grey"/>
473      <xsd:enumeration value="green"/>
474      <xsd:enumeration value="greenYellow"/>
475      <xsd:enumeration value="honeydew"/>
476      <xsd:enumeration value="hotPink"/>
477      <xsd:enumeration value="indianRed"/>
478      <xsd:enumeration value="indigo"/>
479      <xsd:enumeration value="ivory"/>
480      <xsd:enumeration value="khaki"/>
481      <xsd:enumeration value="lavender"/>
482      <xsd:enumeration value="lavenderBlush"/>
483      <xsd:enumeration value="lawnGreen"/>
484      <xsd:enumeration value="lemonChiffon"/>
485      <xsd:enumeration value="lightBlue"/>
486      <xsd:enumeration value="lightCoral"/>
487      <xsd:enumeration value="lightCyan"/>
488      <xsd:enumeration value="lightGoldenrodYellow"/>
489      <xsd:enumeration value="lightGray"/>
490      <xsd:enumeration value="lightGrey"/>
491      <xsd:enumeration value="lightGreen"/>
492      <xsd:enumeration value="lightPink"/>
493      <xsd:enumeration value="lightSalmon"/>
494      <xsd:enumeration value="lightSeaGreen"/>
495      <xsd:enumeration value="lightSkyBlue"/>
496      <xsd:enumeration value="lightSlateGray"/>
497      <xsd:enumeration value="lightSlateGrey"/>
498      <xsd:enumeration value="lightSteelBlue"/>
499      <xsd:enumeration value="lightYellow"/>
500      <xsd:enumeration value="ltBlue"/>
501      <xsd:enumeration value="ltCoral"/>
502      <xsd:enumeration value="ltCyan"/>
503      <xsd:enumeration value="ltGoldenrodYellow"/>
504      <xsd:enumeration value="ltGray"/>
505      <xsd:enumeration value="ltGrey"/>
506      <xsd:enumeration value="ltGreen"/>
507      <xsd:enumeration value="ltPink"/>
508      <xsd:enumeration value="ltSalmon"/>
509      <xsd:enumeration value="ltSeaGreen"/>
510      <xsd:enumeration value="ltSkyBlue"/>
511      <xsd:enumeration value="ltSlateGray"/>

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512     <xsd:enumeration value="ltSlateGrey"/>
513     <xsd:enumeration value="ltSteelBlue"/>
514     <xsd:enumeration value="ltYellow"/>
515     <xsd:enumeration value="lime"/>
516     <xsd:enumeration value="limeGreen"/>
517     <xsd:enumeration value="linen"/>
518     <xsd:enumeration value="magenta"/>
519     <xsd:enumeration value="maroon"/>
520     <xsd:enumeration value="medAquamarine"/>
521     <xsd:enumeration value="medBlue"/>
522     <xsd:enumeration value="medOrchid"/>
523     <xsd:enumeration value="medPurple"/>
524     <xsd:enumeration value="medSeaGreen"/>
525     <xsd:enumeration value="medSlateBlue"/>
526     <xsd:enumeration value="medSpringGreen"/>
527     <xsd:enumeration value="medTurquoise"/>
528     <xsd:enumeration value="medVioletRed"/>
529     <xsd:enumeration value="mediumAquamarine"/>
530     <xsd:enumeration value="mediumBlue"/>
531     <xsd:enumeration value="mediumOrchid"/>
532     <xsd:enumeration value="mediumPurple"/>
533     <xsd:enumeration value="mediumSeaGreen"/>
534     <xsd:enumeration value="mediumSlateBlue"/>
535     <xsd:enumeration value="mediumSpringGreen"/>
536     <xsd:enumeration value="mediumTurquoise"/>
537     <xsd:enumeration value="mediumVioletRed"/>
538     <xsd:enumeration value="midnightBlue"/>
539     <xsd:enumeration value="mintCream"/>
540     <xsd:enumeration value="mistyRose"/>
541     <xsd:enumeration value="moccasin"/>
542     <xsd:enumeration value="navajoWhite"/>
543     <xsd:enumeration value="navy"/>
544     <xsd:enumeration value="oldLace"/>
545     <xsd:enumeration value="olive"/>
546     <xsd:enumeration value="oliveDrab"/>
547     <xsd:enumeration value="orange"/>
548     <xsd:enumeration value="orangeRed"/>
549     <xsd:enumeration value="orchid"/>
550     <xsd:enumeration value="paleGoldenrod"/>
551     <xsd:enumeration value="paleGreen"/>
552     <xsd:enumeration value="paleTurquoise"/>
553     <xsd:enumeration value="paleVioletRed"/>
554     <xsd:enumeration value="papayaWhip"/>
555     <xsd:enumeration value="peachPuff"/>
556     <xsd:enumeration value="peru"/>
557     <xsd:enumeration value="pink"/>
558     <xsd:enumeration value="plum"/>
559     <xsd:enumeration value="powderBlue"/>
560     <xsd:enumeration value="purple"/>
561     <xsd:enumeration value="red"/>
562     <xsd:enumeration value="rosyBrown"/>
563     <xsd:enumeration value="royalBlue"/>
564     <xsd:enumeration value="saddleBrown"/>

```



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565         <xsd:enumeration value="salmon"/>
566         <xsd:enumeration value="sandyBrown"/>
567         <xsd:enumeration value="seaGreen"/>
568         <xsd:enumeration value="seaShell"/>
569         <xsd:enumeration value="sienna"/>
570         <xsd:enumeration value="silver"/>
571         <xsd:enumeration value="skyBlue"/>
572         <xsd:enumeration value="slateBlue"/>
573         <xsd:enumeration value="slateGray"/>
574         <xsd:enumeration value="slateGrey"/>
575         <xsd:enumeration value="snow"/>
576         <xsd:enumeration value="springGreen"/>
577         <xsd:enumeration value="steelBlue"/>
578         <xsd:enumeration value="tan"/>
579         <xsd:enumeration value="teal"/>
580         <xsd:enumeration value="thistle"/>
581         <xsd:enumeration value="tomato"/>
582         <xsd:enumeration value="turquoise"/>
583         <xsd:enumeration value="violet"/>
584         <xsd:enumeration value="wheat"/>
585         <xsd:enumeration value="white"/>
586         <xsd:enumeration value="whiteSmoke"/>
587         <xsd:enumeration value="yellow"/>
588         <xsd:enumeration value="yellowGreen"/>
589     </xsd:restriction>
590 </xsd:simpleType>
591 <xsd:complexType name="CT_PresetColor">
592     <xsd:sequence>
593         <xsd:group ref="EG_ColorTransform" minOccurs="0" maxOccurs="unbounded"/>
594     </xsd:sequence>
595     <xsd:attribute name="val" type="ST_PresetColorVal" use="required"/>
596 </xsd:complexType>
597 <xsd:group name="EG_OfficeArtExtensionList">
598     <xsd:sequence>
599         <xsd:element name="ext" type="CT_OfficeArtExtension" minOccurs="0" maxOccurs="unbounded"/>
600     </xsd:sequence>
601 </xsd:group>
602 <xsd:complexType name="CT_OfficeArtExtensionList">
603     <xsd:sequence>
604         <xsd:group ref="EG_OfficeArtExtensionList" minOccurs="1" maxOccurs="1"/>
605     </xsd:sequence>
606 </xsd:complexType>
607 <xsd:complexType name="CT_Scale2D">
608     <xsd:sequence>
609         <xsd:element name="sx" type="CT_Ratio" minOccurs="1" maxOccurs="1"/>
610         <xsd:element name="sy" type="CT_Ratio" minOccurs="1" maxOccurs="1"/>
611     </xsd:sequence>
612 </xsd:complexType>
613 <xsd:complexType name="CT_Transform2D">
614     <xsd:sequence>
615         <xsd:element name="off" type="CT_Point2D" minOccurs="0" maxOccurs="1"/>
616         <xsd:element name="ext" type="CT_PositiveSize2D" minOccurs="0" maxOccurs="1"/>
617     </xsd:sequence>

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618     <xsd:attribute name="rot" type="ST_Angle" use="optional" default="0"/>
619     <xsd:attribute name="flipH" type="xsd:boolean" use="optional" default="false"/>
620     <xsd:attribute name="flipV" type="xsd:boolean" use="optional" default="false"/>
621 </xsd:complexType>
622 <xsd:complexType name="CT_GroupTransform2D">
623     <xsd:sequence>
624         <xsd:element name="off" type="CT_Point2D" minOccurs="0" maxOccurs="1"/>
625         <xsd:element name="ext" type="CT_PositiveSize2D" minOccurs="0" maxOccurs="1"/>
626         <xsd:element name="chOff" type="CT_Point2D" minOccurs="0" maxOccurs="1"/>
627         <xsd:element name="chExt" type="CT_PositiveSize2D" minOccurs="0" maxOccurs="1"/>
628     </xsd:sequence>
629     <xsd:attribute name="rot" type="ST_Angle" use="optional" default="0"/>
630     <xsd:attribute name="flipH" type="xsd:boolean" use="optional" default="false"/>
631     <xsd:attribute name="flipV" type="xsd:boolean" use="optional" default="false"/>
632 </xsd:complexType>
633 <xsd:complexType name="CT_Point3D">
634     <xsd:attribute name="x" type="ST_Coordinate" use="required"/>
635     <xsd:attribute name="y" type="ST_Coordinate" use="required"/>
636     <xsd:attribute name="z" type="ST_Coordinate" use="required"/>
637 </xsd:complexType>
638 <xsd:complexType name="CT_Vector3D">
639     <xsd:attribute name="dx" type="ST_Coordinate" use="required"/>
640     <xsd:attribute name="dy" type="ST_Coordinate" use="required"/>
641     <xsd:attribute name="dz" type="ST_Coordinate" use="required"/>
642 </xsd:complexType>
643 <xsd:complexType name="CT_SphereCoords">
644     <xsd:attribute name="lat" type="ST_PositiveFixedAngle" use="required"/>
645     <xsd:attribute name="lon" type="ST_PositiveFixedAngle" use="required"/>
646     <xsd:attribute name="rev" type="ST_PositiveFixedAngle" use="required"/>
647 </xsd:complexType>
648 <xsd:complexType name="CT_RelativeRect">
649     <xsd:attribute name="l" type="ST_Percentage" use="optional" default="0%"/>
650     <xsd:attribute name="t" type="ST_Percentage" use="optional" default="0%"/>
651     <xsd:attribute name="r" type="ST_Percentage" use="optional" default="0%"/>
652     <xsd:attribute name="b" type="ST_Percentage" use="optional" default="0%"/>
653 </xsd:complexType>
654 <xsd:simpleType name="ST_RectAlignment">
655     <xsd:restriction base="xsd:token">
656         <xsd:enumeration value="tl"/>
657         <xsd:enumeration value="t"/>
658         <xsd:enumeration value="tr"/>
659         <xsd:enumeration value="l"/>
660         <xsd:enumeration value="ctr"/>
661         <xsd:enumeration value="r"/>
662         <xsd:enumeration value="bl"/>
663         <xsd:enumeration value="b"/>
664         <xsd:enumeration value="br"/>
665     </xsd:restriction>
666 </xsd:simpleType>
667 <xsd:group name="EG_ColorChoice">
668     <xsd:choice>
669         <xsd:element name="scrgbClr" type="CT_ScRgbColor" minOccurs="1" maxOccurs="1"/>
670         <xsd:element name="srgbClr" type="CT_SRgbColor" minOccurs="1" maxOccurs="1"/>

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671     <xsd:element name="hslClr" type="CT_HslColor" minOccurs="1" maxOccurs="1"/>
672     <xsd:element name="sysClr" type="CT_SystemColor" minOccurs="1" maxOccurs="1"/>
673     <xsd:element name="schemeClr" type="CT_SchemeColor" minOccurs="1" maxOccurs="1"/>
674     <xsd:element name="prstClr" type="CT_PresetColor" minOccurs="1" maxOccurs="1"/>
675   </xsd:choice>
676 </xsd:group>
677 <xsd:complexType name="CT_Color">
678   <xsd:sequence>
679     <xsd:group ref="EG_ColorChoice"/>
680   </xsd:sequence>
681 </xsd:complexType>
682 <xsd:complexType name="CT_ColorMRU">
683   <xsd:sequence>
684     <xsd:group ref="EG_ColorChoice" minOccurs="0" maxOccurs="unbounded"/>
685   </xsd:sequence>
686 </xsd:complexType>
687 <xsd:simpleType name="ST_BlackWhiteMode">
688   <xsd:restriction base="xsd:token">
689     <xsd:enumeration value="clr"/>
690     <xsd:enumeration value="auto"/>
691     <xsd:enumeration value="gray"/>
692     <xsd:enumeration value="ltGray"/>
693     <xsd:enumeration value="invGray"/>
694     <xsd:enumeration value="grayWhite"/>
695     <xsd:enumeration value="blackGray"/>
696     <xsd:enumeration value="blackWhite"/>
697     <xsd:enumeration value="black"/>
698     <xsd:enumeration value="white"/>
699     <xsd:enumeration value="hidden"/>
700   </xsd:restriction>
701 </xsd:simpleType>
702 <xsd:attributeGroup name="AG_Blob">
703   <xsd:attribute ref="r:embed" use="optional" default=""/>
704   <xsd:attribute ref="r:link" use="optional" default=""/>
705 </xsd:attributeGroup>
706 <xsd:complexType name="CT_EmbeddedWAVAudioFile">
707   <xsd:attribute ref="r:embed" use="required"/>
708   <xsd:attribute name="name" type="xsd:string" use="optional" default=""/>
709 </xsd:complexType>
710 <xsd:complexType name="CT_Hyperlink">
711   <xsd:sequence>
712     <xsd:element name="snd" type="CT_EmbeddedWAVAudioFile" minOccurs="0" maxOccurs="1"/>
713     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
714   </xsd:sequence>
715   <xsd:attribute ref="r:id" use="optional"/>
716   <xsd:attribute name="invalidUrl" type="xsd:string" use="optional" default=""/>
717   <xsd:attribute name="action" type="xsd:string" use="optional" default=""/>
718   <xsd:attribute name="tgtFrame" type="xsd:string" use="optional" default=""/>
719   <xsd:attribute name="tooltip" type="xsd:string" use="optional" default=""/>
720   <xsd:attribute name="history" type="xsd:boolean" use="optional" default="true"/>
721   <xsd:attribute name="highlightClick" type="xsd:boolean" use="optional" default="false"/>
722   <xsd:attribute name="endSnd" type="xsd:boolean" use="optional" default="false"/>
723 </xsd:complexType>

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724 <xsd:simpleType name="ST_DrawingElementId">
725   <xsd:restriction base="xsd:unsignedInt"/>
726 </xsd:simpleType>
727 <xsd:attributeGroup name="AG_Locking">
728   <xsd:attribute name="noGrp" type="xsd:boolean" use="optional" default="false"/>
729   <xsd:attribute name="noSelect" type="xsd:boolean" use="optional" default="false"/>
730   <xsd:attribute name="noRot" type="xsd:boolean" use="optional" default="false"/>
731   <xsd:attribute name="noChangeAspect" type="xsd:boolean" use="optional" default="false"/>
732   <xsd:attribute name="noMove" type="xsd:boolean" use="optional" default="false"/>
733   <xsd:attribute name="noResize" type="xsd:boolean" use="optional" default="false"/>
734   <xsd:attribute name="noEditPoints" type="xsd:boolean" use="optional" default="false"/>
735   <xsd:attribute name="noAdjustHandles" type="xsd:boolean" use="optional" default="false"/>
736   <xsd:attribute name="noChangeArrowheads" type="xsd:boolean" use="optional" default="false"/>
737   <xsd:attribute name="noChangeShapeType" type="xsd:boolean" use="optional" default="false"/>
738 </xsd:attributeGroup>
739 <xsd:complexType name="CT_ConnectorLocking">
740   <xsd:sequence>
741     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
742   </xsd:sequence>
743   <xsd:attributeGroup ref="AG_Locking"/>
744 </xsd:complexType>
745 <xsd:complexType name="CT_ShapeLocking">
746   <xsd:sequence>
747     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
748   </xsd:sequence>
749   <xsd:attributeGroup ref="AG_Locking"/>
750   <xsd:attribute name="noTextEdit" type="xsd:boolean" use="optional" default="false"/>
751 </xsd:complexType>
752 <xsd:complexType name="CT_PictureLocking">
753   <xsd:sequence>
754     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
755   </xsd:sequence>
756   <xsd:attributeGroup ref="AG_Locking"/>
757   <xsd:attribute name="noCrop" type="xsd:boolean" use="optional" default="false"/>
758 </xsd:complexType>
759 <xsd:complexType name="CT_GroupLocking">
760   <xsd:sequence>
761     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
762   </xsd:sequence>
763   <xsd:attribute name="noGrp" type="xsd:boolean" use="optional" default="false"/>
764   <xsd:attribute name="noUngrp" type="xsd:boolean" use="optional" default="false"/>
765   <xsd:attribute name="noSelect" type="xsd:boolean" use="optional" default="false"/>
766   <xsd:attribute name="noRot" type="xsd:boolean" use="optional" default="false"/>
767   <xsd:attribute name="noChangeAspect" type="xsd:boolean" use="optional" default="false"/>
768   <xsd:attribute name="noMove" type="xsd:boolean" use="optional" default="false"/>
769   <xsd:attribute name="noResize" type="xsd:boolean" use="optional" default="false"/>
770 </xsd:complexType>
771 <xsd:complexType name="CT_GraphicalObjectFrameLocking">
772   <xsd:sequence>
773     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
774   </xsd:sequence>
775   <xsd:attribute name="noGrp" type="xsd:boolean" use="optional" default="false"/>
776   <xsd:attribute name="noDrilldown" type="xsd:boolean" use="optional" default="false"/>

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777     <xsd:attribute name="noSelect" type="xsd:boolean" use="optional" default="false"/>
778     <xsd:attribute name="noChangeAspect" type="xsd:boolean" use="optional" default="false"/>
779     <xsd:attribute name="noMove" type="xsd:boolean" use="optional" default="false"/>
780     <xsd:attribute name="noResize" type="xsd:boolean" use="optional" default="false"/>
781 </xsd:complexType>
782 <xsd:complexType name="CT_ContentPartLocking">
783     <xsd:sequence>
784         <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
785     </xsd:sequence>
786     <xsd:attributeGroup ref="AG_Locking"/>
787 </xsd:complexType>
788 <xsd:complexType name="CT_NonVisualDrawingProps">
789     <xsd:sequence>
790         <xsd:element name="hlinkClick" type="CT_Hyperlink" minOccurs="0" maxOccurs="1"/>
791         <xsd:element name="hlinkHover" type="CT_Hyperlink" minOccurs="0" maxOccurs="1"/>
792         <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
793     </xsd:sequence>
794     <xsd:attribute name="id" type="ST_DrawingElementId" use="required"/>
795     <xsd:attribute name="name" type="xsd:string" use="required"/>
796     <xsd:attribute name="descr" type="xsd:string" use="optional" default=""/>
797     <xsd:attribute name="hidden" type="xsd:boolean" use="optional" default="false"/>
798     <xsd:attribute name="title" type="xsd:string" use="optional" default=""/>
799 </xsd:complexType>
800 <xsd:complexType name="CT_NonVisualDrawingShapeProps">
801     <xsd:sequence>
802         <xsd:element name="spLocks" type="CT_ShapeLocking" minOccurs="0" maxOccurs="1"/>
803         <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
804     </xsd:sequence>
805     <xsd:attribute name="txBox" type="xsd:boolean" use="optional" default="false"/>
806 </xsd:complexType>
807 <xsd:complexType name="CT_NonVisualConnectorProperties">
808     <xsd:sequence>
809         <xsd:element name="cxnSpLocks" type="CT_ConnectorLocking" minOccurs="0" maxOccurs="1"/>
810         <xsd:element name="stCxn" type="CT_Connection" minOccurs="0" maxOccurs="1"/>
811         <xsd:element name="endCxn" type="CT_Connection" minOccurs="0" maxOccurs="1"/>
812         <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
813     </xsd:sequence>
814 </xsd:complexType>
815 <xsd:complexType name="CT_NonVisualPictureProperties">
816     <xsd:sequence>
817         <xsd:element name="picLocks" type="CT_PictureLocking" minOccurs="0" maxOccurs="1"/>
818         <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
819     </xsd:sequence>
820     <xsd:attribute name="preferRelativeResize" type="xsd:boolean" use="optional" default="true"/>
821 </xsd:complexType>
822 <xsd:complexType name="CT_NonVisualGroupDrawingShapeProps">
823     <xsd:sequence>
824         <xsd:element name="grpSpLocks" type="CT_GroupLocking" minOccurs="0" maxOccurs="1"/>
825         <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
826     </xsd:sequence>
827 </xsd:complexType>
828 <xsd:complexType name="CT_NonVisualGraphicFrameProperties">
829     <xsd:sequence>

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830     <xsd:element name="graphicFrameLocks" type="CT_GraphicalObjectFrameLocking" minOccurs="0"
831       maxOccurs="1"/>
832     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
833   </xsd:sequence>
834 </xsd:complexType>
835 <xsd:complexType name="CT_NonVisualContentPartProperties">
836   <xsd:sequence>
837     <xsd:element name="cpLocks" type="CT_ContentPartLocking" minOccurs="0" maxOccurs="1"/>
838     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
839   </xsd:sequence>
840   <xsd:attribute name="isComment" type="xsd:boolean" use="optional" default="true"/>
841 </xsd:complexType>
842 <xsd:complexType name="CT_GraphicalObjectData">
843   <xsd:sequence>
844     <xsd:any minOccurs="0" maxOccurs="unbounded" processContents="strict"/>
845   </xsd:sequence>
846   <xsd:attribute name="uri" type="xsd:token" use="required"/>
847 </xsd:complexType>
848 <xsd:complexType name="CT_GraphicalObject">
849   <xsd:sequence>
850     <xsd:element name="graphicData" type="CT_GraphicalObjectData"/>
851   </xsd:sequence>
852 </xsd:complexType>
853 <xsd:element name="graphic" type="CT_GraphicalObject"/>
854 <xsd:simpleType name="ST_ChartBuildStep">
855   <xsd:restriction base="xsd:token">
856     <xsd:enumeration value="category"/>
857     <xsd:enumeration value="ptInCategory"/>
858     <xsd:enumeration value="series"/>
859     <xsd:enumeration value="ptInSeries"/>
860     <xsd:enumeration value="allPts"/>
861     <xsd:enumeration value="gridLegend"/>
862   </xsd:restriction>
863 </xsd:simpleType>
864 <xsd:simpleType name="ST_DgmBuildStep">
865   <xsd:restriction base="xsd:token">
866     <xsd:enumeration value="sp"/>
867     <xsd:enumeration value="bg"/>
868   </xsd:restriction>
869 </xsd:simpleType>
870 <xsd:complexType name="CT_AnimationDgmElement">
871   <xsd:attribute name="id" type="s:ST_Guid" use="optional" default="{00000000-0000-0000-0000-
872     000000000000}"/>
873   <xsd:attribute name="bldStep" type="ST_DgmBuildStep" use="optional" default="sp"/>
874 </xsd:complexType>
875 <xsd:complexType name="CT_AnimationChartElement">
876   <xsd:attribute name="seriesIdx" type="xsd:int" use="optional" default="-1"/>
877   <xsd:attribute name="categoryIdx" type="xsd:int" use="optional" default="-1"/>
878   <xsd:attribute name="bldStep" type="ST_ChartBuildStep" use="required"/>
879 </xsd:complexType>
880 <xsd:complexType name="CT_AnimationElementChoice">
881   <xsd:choice minOccurs="1" maxOccurs="1">
882     <xsd:element name="dgm" type="CT_AnimationDgmElement"/>

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883     <xsd:element name="chart" type="CT_AnimationChartElement"/>
884   </xsd:choice>
885 </xsd:complexType>
886 <xsd:simpleType name="ST_AnimationBuildType">
887   <xsd:restriction base="xsd:token">
888     <xsd:enumeration value="allAtOnce"/>
889   </xsd:restriction>
890 </xsd:simpleType>
891 <xsd:simpleType name="ST_AnimationDgmOnlyBuildType">
892   <xsd:restriction base="xsd:token">
893     <xsd:enumeration value="one"/>
894     <xsd:enumeration value="lvlOne"/>
895     <xsd:enumeration value="lvlAtOnce"/>
896   </xsd:restriction>
897 </xsd:simpleType>
898 <xsd:simpleType name="ST_AnimationDgmBuildType">
899   <xsd:union memberTypes="ST_AnimationBuildType ST_AnimationDgmOnlyBuildType"/>
900 </xsd:simpleType>
901 <xsd:complexType name="CT_AnimationDgmBuildProperties">
902   <xsd:attribute name="bld" type="ST_AnimationDgmBuildType" use="optional" default="allAtOnce"/>
903   <xsd:attribute name="rev" type="xsd:boolean" use="optional" default="false"/>
904 </xsd:complexType>
905 <xsd:simpleType name="ST_AnimationChartOnlyBuildType">
906   <xsd:restriction base="xsd:token">
907     <xsd:enumeration value="series"/>
908     <xsd:enumeration value="category"/>
909     <xsd:enumeration value="seriesEl"/>
910     <xsd:enumeration value="categoryEl"/>
911   </xsd:restriction>
912 </xsd:simpleType>
913 <xsd:simpleType name="ST_AnimationChartBuildType">
914   <xsd:union memberTypes="ST_AnimationBuildType ST_AnimationChartOnlyBuildType"/>
915 </xsd:simpleType>
916 <xsd:complexType name="CT_AnimationChartBuildProperties">
917   <xsd:attribute name="bld" type="ST_AnimationChartBuildType" use="optional"
918     default="allAtOnce"/>
919   <xsd:attribute name="animBg" type="xsd:boolean" use="optional" default="true"/>
920 </xsd:complexType>
921 <xsd:complexType name="CT_AnimationGraphicalObjectBuildProperties">
922   <xsd:choice>
923     <xsd:element name="bldDgm" type="CT_AnimationDgmBuildProperties"/>
924     <xsd:element name="bldChart" type="CT_AnimationChartBuildProperties"/>
925   </xsd:choice>
926 </xsd:complexType>
927 <xsd:complexType name="CT_BackgroundFormatting">
928   <xsd:sequence>
929     <xsd:group ref="EG_FillProperties" minOccurs="0" maxOccurs="1"/>
930     <xsd:group ref="EG_EffectProperties" minOccurs="0" maxOccurs="1"/>
931   </xsd:sequence>
932 </xsd:complexType>
933 <xsd:complexType name="CT_WholeE2oFormatting">
934   <xsd:sequence>
935     <xsd:element name="ln" type="CT_LineProperties" minOccurs="0" maxOccurs="1"/>

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936     <xsd:group ref="EG_EffectProperties" minOccurs="0" maxOccurs="1"/>
937   </xsd:sequence>
938 </xsd:complexType>
939 <xsd:complexType name="CT_GvmlUseShapeRectangle"/>
940 <xsd:complexType name="CT_GvmlTextShape">
941   <xsd:sequence>
942     <xsd:element name="txBody" type="CT_TextBody" minOccurs="1" maxOccurs="1"/>
943     <xsd:choice>
944       <xsd:element name="useSpRect" type="CT_GvmlUseShapeRectangle" minOccurs="1"
945         maxOccurs="1"/>
946       <xsd:element name="xfrm" type="CT_Transform2D" minOccurs="1" maxOccurs="1"/>
947     </xsd:choice>
948     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
949   </xsd:sequence>
950 </xsd:complexType>
951 <xsd:complexType name="CT_GvmlShapeNonVisual">
952   <xsd:sequence>
953     <xsd:element name="cNvPr" type="CT_NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
954     <xsd:element name="cNvSpPr" type="CT_NonVisualDrawingShapeProps" minOccurs="1"
955       maxOccurs="1"/>
956   </xsd:sequence>
957 </xsd:complexType>
958 <xsd:complexType name="CT_GvmlShape">
959   <xsd:sequence>
960     <xsd:element name="nvSpPr" type="CT_GvmlShapeNonVisual" minOccurs="1" maxOccurs="1"/>
961     <xsd:element name="spPr" type="CT_ShapeProperties" minOccurs="1" maxOccurs="1"/>
962     <xsd:element name="txSp" type="CT_GvmlTextShape" minOccurs="0" maxOccurs="1"/>
963     <xsd:element name="style" type="CT_ShapeStyle" minOccurs="0" maxOccurs="1"/>
964     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
965   </xsd:sequence>
966 </xsd:complexType>
967 <xsd:complexType name="CT_GvmlConnectorNonVisual">
968   <xsd:sequence>
969     <xsd:element name="cNvPr" type="CT_NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
970     <xsd:element name="cNvCxnSpPr" type="CT_NonVisualConnectorProperties" minOccurs="1"
971       maxOccurs="1"/>
972   </xsd:sequence>
973 </xsd:complexType>
974 <xsd:complexType name="CT_GvmlConnector">
975   <xsd:sequence>
976     <xsd:element name="nvCxnSpPr" type="CT_GvmlConnectorNonVisual" minOccurs="1"
977       maxOccurs="1"/>
978     <xsd:element name="spPr" type="CT_ShapeProperties" minOccurs="1" maxOccurs="1"/>
979     <xsd:element name="style" type="CT_ShapeStyle" minOccurs="0" maxOccurs="1"/>
980     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
981   </xsd:sequence>
982 </xsd:complexType>
983 <xsd:complexType name="CT_GvmlPictureNonVisual">
984   <xsd:sequence>
985     <xsd:element name="cNvPr" type="CT_NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
986     <xsd:element name="cNvPicPr" type="CT_NonVisualPictureProperties" minOccurs="1"
987       maxOccurs="1"/>
988   </xsd:sequence>

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989 </xsd:complexType>
990 <xsd:complexType name="CT_GvmlPicture">
991   <xsd:sequence>
992     <xsd:element name="nvPicPr" type="CT_GvmlPictureNonVisual" minOccurs="1" maxOccurs="1"/>
993     <xsd:element name="blipFill" type="CT_BlipFillProperties" minOccurs="1" maxOccurs="1"/>
994     <xsd:element name="spPr" type="CT_ShapeProperties" minOccurs="1" maxOccurs="1"/>
995     <xsd:element name="style" type="CT_ShapeStyle" minOccurs="0" maxOccurs="1"/>
996     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
997   </xsd:sequence>
998 </xsd:complexType>
999 <xsd:complexType name="CT_GvmlGraphicFrameNonVisual">
1000   <xsd:sequence>
1001     <xsd:element name="cNvPr" type="CT_NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
1002     <xsd:element name="cNvGraphicFramePr" type="CT_NonVisualGraphicFrameProperties"
1003       minOccurs="1" maxOccurs="1"/>
1004   </xsd:sequence>
1005 </xsd:complexType>
1006 <xsd:complexType name="CT_GvmlGraphicalObjectFrame">
1007   <xsd:sequence>
1008     <xsd:element name="nvGraphicFramePr" type="CT_GvmlGraphicFrameNonVisual" minOccurs="1"
1009       maxOccurs="1"/>
1010     <xsd:element ref="graphic" minOccurs="1" maxOccurs="1"/>
1011     <xsd:element name="xfrm" type="CT_Transform2D" minOccurs="1" maxOccurs="1"/>
1012     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
1013   </xsd:sequence>
1014 </xsd:complexType>
1015 <xsd:complexType name="CT_GvmlGroupShapeNonVisual">
1016   <xsd:sequence>
1017     <xsd:element name="cNvPr" type="CT_NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
1018     <xsd:element name="cNvGrpSpPr" type="CT_NonVisualGroupDrawingShapeProps" minOccurs="1"
1019       maxOccurs="1"/>
1020   </xsd:sequence>
1021 </xsd:complexType>
1022 <xsd:complexType name="CT_GvmlGroupShape">
1023   <xsd:sequence>
1024     <xsd:element name="nvGrpSpPr" type="CT_GvmlGroupShapeNonVisual" minOccurs="1"
1025       maxOccurs="1"/>
1026     <xsd:element name="grpSpPr" type="CT_GroupShapeProperties" minOccurs="1" maxOccurs="1"/>
1027     <xsd:choice minOccurs="0" maxOccurs="unbounded">
1028       <xsd:element name="txSp" type="CT_GvmlTextShape"/>
1029       <xsd:element name="sp" type="CT_GvmlShape"/>
1030       <xsd:element name="cxnSp" type="CT_GvmlConnector"/>
1031       <xsd:element name="pic" type="CT_GvmlPicture"/>
1032       <xsd:element name="graphicFrame" type="CT_GvmlGraphicalObjectFrame"/>
1033       <xsd:element name="grpSp" type="CT_GvmlGroupShape"/>
1034     </xsd:choice>
1035     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
1036   </xsd:sequence>
1037 </xsd:complexType>
1038 <xsd:simpleType name="ST_PresetCameraType">
1039   <xsd:restriction base="xsd:token">
1040     <xsd:enumeration value="legacyObliqueTopLeft"/>
1041     <xsd:enumeration value="legacyObliqueTop"/>

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1042     <xsd:enumeration value="legacyObliqueTopRight"/>
1043     <xsd:enumeration value="legacyObliqueLeft"/>
1044     <xsd:enumeration value="legacyObliqueFront"/>
1045     <xsd:enumeration value="legacyObliqueRight"/>
1046     <xsd:enumeration value="legacyObliqueBottomLeft"/>
1047     <xsd:enumeration value="legacyObliqueBottom"/>
1048     <xsd:enumeration value="legacyObliqueBottomRight"/>
1049     <xsd:enumeration value="legacyPerspectiveTopLeft"/>
1050     <xsd:enumeration value="legacyPerspectiveTop"/>
1051     <xsd:enumeration value="legacyPerspectiveTopRight"/>
1052     <xsd:enumeration value="legacyPerspectiveLeft"/>
1053     <xsd:enumeration value="legacyPerspectiveFront"/>
1054     <xsd:enumeration value="legacyPerspectiveRight"/>
1055     <xsd:enumeration value="legacyPerspectiveBottomLeft"/>
1056     <xsd:enumeration value="legacyPerspectiveBottom"/>
1057     <xsd:enumeration value="legacyPerspectiveBottomRight"/>
1058     <xsd:enumeration value="orthographicFront"/>
1059     <xsd:enumeration value="isometricTopUp"/>
1060     <xsd:enumeration value="isometricTopDown"/>
1061     <xsd:enumeration value="isometricBottomUp"/>
1062     <xsd:enumeration value="isometricBottomDown"/>
1063     <xsd:enumeration value="isometricLeftUp"/>
1064     <xsd:enumeration value="isometricLeftDown"/>
1065     <xsd:enumeration value="isometricRightUp"/>
1066     <xsd:enumeration value="isometricRightDown"/>
1067     <xsd:enumeration value="isometricOffAxis1Left"/>
1068     <xsd:enumeration value="isometricOffAxis1Right"/>
1069     <xsd:enumeration value="isometricOffAxis1Top"/>
1070     <xsd:enumeration value="isometricOffAxis2Left"/>
1071     <xsd:enumeration value="isometricOffAxis2Right"/>
1072     <xsd:enumeration value="isometricOffAxis2Top"/>
1073     <xsd:enumeration value="isometricOffAxis3Left"/>
1074     <xsd:enumeration value="isometricOffAxis3Right"/>
1075     <xsd:enumeration value="isometricOffAxis3Bottom"/>
1076     <xsd:enumeration value="isometricOffAxis4Left"/>
1077     <xsd:enumeration value="isometricOffAxis4Right"/>
1078     <xsd:enumeration value="isometricOffAxis4Bottom"/>
1079     <xsd:enumeration value="obliqueTopLeft"/>
1080     <xsd:enumeration value="obliqueTop"/>
1081     <xsd:enumeration value="obliqueTopRight"/>
1082     <xsd:enumeration value="obliqueLeft"/>
1083     <xsd:enumeration value="obliqueRight"/>
1084     <xsd:enumeration value="obliqueBottomLeft"/>
1085     <xsd:enumeration value="obliqueBottom"/>
1086     <xsd:enumeration value="obliqueBottomRight"/>
1087     <xsd:enumeration value="perspectiveFront"/>
1088     <xsd:enumeration value="perspectiveLeft"/>
1089     <xsd:enumeration value="perspectiveRight"/>
1090     <xsd:enumeration value="perspectiveAbove"/>
1091     <xsd:enumeration value="perspectiveBelow"/>
1092     <xsd:enumeration value="perspectiveAboveLeftFacing"/>
1093     <xsd:enumeration value="perspectiveAboveRightFacing"/>
1094     <xsd:enumeration value="perspectiveContrastingLeftFacing"/>

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1095     <xsd:enumeration value="perspectiveContrastingRightFacing"/>
1096     <xsd:enumeration value="perspectiveHeroicLeftFacing"/>
1097     <xsd:enumeration value="perspectiveHeroicRightFacing"/>
1098     <xsd:enumeration value="perspectiveHeroicExtremeLeftFacing"/>
1099     <xsd:enumeration value="perspectiveHeroicExtremeRightFacing"/>
1100     <xsd:enumeration value="perspectiveRelaxed"/>
1101     <xsd:enumeration value="perspectiveRelaxedModerately"/>
1102   </xsd:restriction>
1103 </xsd:simpleType>
1104 <xsd:simpleType name="ST_FOVAngle">
1105   <xsd:restriction base="ST_Angle">
1106     <xsd:minInclusive value="0"/>
1107     <xsd:maxInclusive value="10800000"/>
1108   </xsd:restriction>
1109 </xsd:simpleType>
1110 <xsd:complexType name="CT_Camera">
1111   <xsd:sequence>
1112     <xsd:element name="rot" type="CT_SphereCoords" minOccurs="0" maxOccurs="1"/>
1113   </xsd:sequence>
1114   <xsd:attribute name="prst" type="ST_PresetCameraType" use="required"/>
1115   <xsd:attribute name="fov" type="ST_FOVAngle" use="optional"/>
1116   <xsd:attribute name="zoom" type="ST_PositivePercentage" use="optional" default="100%"/>
1117 </xsd:complexType>
1118 <xsd:simpleType name="ST_LightRigDirection">
1119   <xsd:restriction base="xsd:token">
1120     <xsd:enumeration value="tl"/>
1121     <xsd:enumeration value="t"/>
1122     <xsd:enumeration value="tr"/>
1123     <xsd:enumeration value="l"/>
1124     <xsd:enumeration value="r"/>
1125     <xsd:enumeration value="bl"/>
1126     <xsd:enumeration value="b"/>
1127     <xsd:enumeration value="br"/>
1128   </xsd:restriction>
1129 </xsd:simpleType>
1130 <xsd:simpleType name="ST_LightRigType">
1131   <xsd:restriction base="xsd:token">
1132     <xsd:enumeration value="legacyFlat1"/>
1133     <xsd:enumeration value="legacyFlat2"/>
1134     <xsd:enumeration value="legacyFlat3"/>
1135     <xsd:enumeration value="legacyFlat4"/>
1136     <xsd:enumeration value="legacyNormal1"/>
1137     <xsd:enumeration value="legacyNormal2"/>
1138     <xsd:enumeration value="legacyNormal3"/>
1139     <xsd:enumeration value="legacyNormal4"/>
1140     <xsd:enumeration value="legacyHarsh1"/>
1141     <xsd:enumeration value="legacyHarsh2"/>
1142     <xsd:enumeration value="legacyHarsh3"/>
1143     <xsd:enumeration value="legacyHarsh4"/>
1144     <xsd:enumeration value="threePt"/>
1145     <xsd:enumeration value="balanced"/>
1146     <xsd:enumeration value="soft"/>
1147     <xsd:enumeration value="harsh"/>

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1148     <xsd:enumeration value="flood"/>
1149     <xsd:enumeration value="contrasting"/>
1150     <xsd:enumeration value="morning"/>
1151     <xsd:enumeration value="sunrise"/>
1152     <xsd:enumeration value="sunset"/>
1153     <xsd:enumeration value="chilly"/>
1154     <xsd:enumeration value="freezing"/>
1155     <xsd:enumeration value="flat"/>
1156     <xsd:enumeration value="twoPt"/>
1157     <xsd:enumeration value="glow"/>
1158     <xsd:enumeration value="brightRoom"/>
1159   </xsd:restriction>
1160 </xsd:simpleType>
1161 <xsd:complexType name="CT_LightRig">
1162   <xsd:sequence>
1163     <xsd:element name="rot" type="CT_SphereCoords" minOccurs="0" maxOccurs="1"/>
1164   </xsd:sequence>
1165   <xsd:attribute name="rig" type="ST_LightRigType" use="required"/>
1166   <xsd:attribute name="dir" type="ST_LightRigDirection" use="required"/>
1167 </xsd:complexType>
1168 <xsd:complexType name="CT_Scene3D">
1169   <xsd:sequence>
1170     <xsd:element name="camera" type="CT_Camera" minOccurs="1" maxOccurs="1"/>
1171     <xsd:element name="lightRig" type="CT_LightRig" minOccurs="1" maxOccurs="1"/>
1172     <xsd:element name="backdrop" type="CT_Backdrop" minOccurs="0" maxOccurs="1"/>
1173     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
1174   </xsd:sequence>
1175 </xsd:complexType>
1176 <xsd:complexType name="CT_Backdrop">
1177   <xsd:sequence>
1178     <xsd:element name="anchor" type="CT_Point3D" minOccurs="1" maxOccurs="1"/>
1179     <xsd:element name="norm" type="CT_Vector3D" minOccurs="1" maxOccurs="1"/>
1180     <xsd:element name="up" type="CT_Vector3D" minOccurs="1" maxOccurs="1"/>
1181     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
1182   </xsd:sequence>
1183 </xsd:complexType>
1184 <xsd:simpleType name="ST_BevelPresetType">
1185   <xsd:restriction base="xsd:token">
1186     <xsd:enumeration value="relaxedInset"/>
1187     <xsd:enumeration value="circle"/>
1188     <xsd:enumeration value="slope"/>
1189     <xsd:enumeration value="cross"/>
1190     <xsd:enumeration value="angle"/>
1191     <xsd:enumeration value="softRound"/>
1192     <xsd:enumeration value="convex"/>
1193     <xsd:enumeration value="coolSlant"/>
1194     <xsd:enumeration value="divot"/>
1195     <xsd:enumeration value="ribblet"/>
1196     <xsd:enumeration value="hardEdge"/>
1197     <xsd:enumeration value="artDeco"/>
1198   </xsd:restriction>
1199 </xsd:simpleType>
1200 <xsd:complexType name="CT_Bevel">

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1201     <xsd:attribute name="w" type="ST_PositiveCoordinate" use="optional" default="76200"/>
1202     <xsd:attribute name="h" type="ST_PositiveCoordinate" use="optional" default="76200"/>
1203     <xsd:attribute name="prst" type="ST_BevelPresetType" use="optional" default="circle"/>
1204 </xsd:complexType>
1205 <xsd:simpleType name="ST_PresetMaterialType">
1206     <xsd:restriction base="xsd:token">
1207         <xsd:enumeration value="legacyMatte"/>
1208         <xsd:enumeration value="legacyPlastic"/>
1209         <xsd:enumeration value="legacyMetal"/>
1210         <xsd:enumeration value="legacyWireframe"/>
1211         <xsd:enumeration value="matte"/>
1212         <xsd:enumeration value="plastic"/>
1213         <xsd:enumeration value="metal"/>
1214         <xsd:enumeration value="warmMatte"/>
1215         <xsd:enumeration value="translucentPowder"/>
1216         <xsd:enumeration value="powder"/>
1217         <xsd:enumeration value="dkEdge"/>
1218         <xsd:enumeration value="softEdge"/>
1219         <xsd:enumeration value="clear"/>
1220         <xsd:enumeration value="flat"/>
1221         <xsd:enumeration value="softmetal"/>
1222     </xsd:restriction>
1223 </xsd:simpleType>
1224 <xsd:complexType name="CT_Shape3D">
1225     <xsd:sequence>
1226         <xsd:element name="bevelT" type="CT_Bevel" minOccurs="0" maxOccurs="1"/>
1227         <xsd:element name="bevelB" type="CT_Bevel" minOccurs="0" maxOccurs="1"/>
1228         <xsd:element name="extrusionClr" type="CT_Color" minOccurs="0" maxOccurs="1"/>
1229         <xsd:element name="contourClr" type="CT_Color" minOccurs="0" maxOccurs="1"/>
1230         <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
1231     </xsd:sequence>
1232     <xsd:attribute name="z" type="ST_Coordinate" use="optional" default="0"/>
1233     <xsd:attribute name="extrusionH" type="ST_PositiveCoordinate" use="optional" default="0"/>
1234     <xsd:attribute name="contourW" type="ST_PositiveCoordinate" use="optional" default="0"/>
1235     <xsd:attribute name="prstMaterial" type="ST_PresetMaterialType" use="optional"
1236         default="warmMatte"/>
1237 </xsd:complexType>
1238 <xsd:complexType name="CT_FlatText">
1239     <xsd:attribute name="z" type="ST_Coordinate" use="optional" default="0"/>
1240 </xsd:complexType>
1241 <xsd:group name="EG_Text3D">
1242     <xsd:choice>
1243         <xsd:element name="sp3d" type="CT_Shape3D" minOccurs="1" maxOccurs="1"/>
1244         <xsd:element name="flatTx" type="CT_FlatText" minOccurs="1" maxOccurs="1"/>
1245     </xsd:choice>
1246 </xsd:group>
1247 <xsd:complexType name="CT_AlphaBiLevelEffect">
1248     <xsd:attribute name="thresh" type="ST_PositiveFixedPercentage" use="required"/>
1249 </xsd:complexType>
1250 <xsd:complexType name="CT_AlphaCeilingEffect"/>
1251 <xsd:complexType name="CT_AlphaFloorEffect"/>
1252 <xsd:complexType name="CT_AlphaInverseEffect">
1253     <xsd:sequence>

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1254     <xsd:group ref="EG_ColorChoice" minOccurs="0" maxOccurs="1"/>
1255   </xsd:sequence>
1256 </xsd:complexType>
1257 <xsd:complexType name="CT_AlphaModulateFixedEffect">
1258   <xsd:attribute name="amt" type="ST_PositivePercentage" use="optional" default="100%"/>
1259 </xsd:complexType>
1260 <xsd:complexType name="CT_AlphaOutsetEffect">
1261   <xsd:attribute name="rad" type="ST_Coordinate" use="optional" default="0"/>
1262 </xsd:complexType>
1263 <xsd:complexType name="CT_AlphaReplaceEffect">
1264   <xsd:attribute name="a" type="ST_PositiveFixedPercentage" use="required"/>
1265 </xsd:complexType>
1266 <xsd:complexType name="CT_BiLevelEffect">
1267   <xsd:attribute name="thresh" type="ST_PositiveFixedPercentage" use="required"/>
1268 </xsd:complexType>
1269 <xsd:complexType name="CT_BlurEffect">
1270   <xsd:attribute name="rad" type="ST_PositiveCoordinate" use="optional" default="0"/>
1271   <xsd:attribute name="grow" type="xsd:boolean" use="optional" default="true"/>
1272 </xsd:complexType>
1273 <xsd:complexType name="CT_ColorChangeEffect">
1274   <xsd:sequence>
1275     <xsd:element name="clrFrom" type="CT_Color" minOccurs="1" maxOccurs="1"/>
1276     <xsd:element name="clrTo" type="CT_Color" minOccurs="1" maxOccurs="1"/>
1277   </xsd:sequence>
1278   <xsd:attribute name="useA" type="xsd:boolean" use="optional" default="true"/>
1279 </xsd:complexType>
1280 <xsd:complexType name="CT_ColorReplaceEffect">
1281   <xsd:sequence>
1282     <xsd:group ref="EG_ColorChoice" minOccurs="1" maxOccurs="1"/>
1283   </xsd:sequence>
1284 </xsd:complexType>
1285 <xsd:complexType name="CT_DuotoneEffect">
1286   <xsd:sequence>
1287     <xsd:group ref="EG_ColorChoice" minOccurs="2" maxOccurs="2"/>
1288   </xsd:sequence>
1289 </xsd:complexType>
1290 <xsd:complexType name="CT_GlowEffect">
1291   <xsd:sequence>
1292     <xsd:group ref="EG_ColorChoice" minOccurs="1" maxOccurs="1"/>
1293   </xsd:sequence>
1294   <xsd:attribute name="rad" type="ST_PositiveCoordinate" use="optional" default="0"/>
1295 </xsd:complexType>
1296 <xsd:complexType name="CT_GrayscaleEffect"/>
1297 <xsd:complexType name="CT_HSLEffect">
1298   <xsd:attribute name="hue" type="ST_PositiveFixedAngle" use="optional" default="0"/>
1299   <xsd:attribute name="sat" type="ST_FixedPercentage" use="optional" default="0%"/>
1300   <xsd:attribute name="lum" type="ST_FixedPercentage" use="optional" default="0%"/>
1301 </xsd:complexType>
1302 <xsd:complexType name="CT_InnerShadowEffect">
1303   <xsd:sequence>
1304     <xsd:group ref="EG_ColorChoice" minOccurs="1" maxOccurs="1"/>
1305   </xsd:sequence>
1306   <xsd:attribute name="blurRad" type="ST_PositiveCoordinate" use="optional" default="0"/>

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1307     <xsd:attribute name="dist" type="ST_PositiveCoordinate" use="optional" default="0"/>
1308     <xsd:attribute name="dir" type="ST_PositiveFixedAngle" use="optional" default="0"/>
1309 </xsd:complexType>
1310 <xsd:complexType name="CT_LuminanceEffect">
1311     <xsd:attribute name="bright" type="ST_FixedPercentage" use="optional" default="0%"/>
1312     <xsd:attribute name="contrast" type="ST_FixedPercentage" use="optional" default="0%"/>
1313 </xsd:complexType>
1314 <xsd:complexType name="CT_OuterShadowEffect">
1315     <xsd:sequence>
1316         <xsd:group ref="EG_ColorChoice" minOccurs="1" maxOccurs="1"/>
1317     </xsd:sequence>
1318     <xsd:attribute name="blurRad" type="ST_PositiveCoordinate" use="optional" default="0"/>
1319     <xsd:attribute name="dist" type="ST_PositiveCoordinate" use="optional" default="0"/>
1320     <xsd:attribute name="dir" type="ST_PositiveFixedAngle" use="optional" default="0"/>
1321     <xsd:attribute name="sx" type="ST_Percentage" use="optional" default="100%"/>
1322     <xsd:attribute name="sy" type="ST_Percentage" use="optional" default="100%"/>
1323     <xsd:attribute name="kx" type="ST_FixedAngle" use="optional" default="0"/>
1324     <xsd:attribute name="ky" type="ST_FixedAngle" use="optional" default="0"/>
1325     <xsd:attribute name="align" type="ST_RectAlignment" use="optional" default="b"/>
1326     <xsd:attribute name="rotWithShape" type="xsd:boolean" use="optional" default="true"/>
1327 </xsd:complexType>
1328 <xsd:simpleType name="ST_PresetShadowVal">
1329     <xsd:restriction base="xsd:token">
1330         <xsd:enumeration value="shdw1"/>
1331         <xsd:enumeration value="shdw2"/>
1332         <xsd:enumeration value="shdw3"/>
1333         <xsd:enumeration value="shdw4"/>
1334         <xsd:enumeration value="shdw5"/>
1335         <xsd:enumeration value="shdw6"/>
1336         <xsd:enumeration value="shdw7"/>
1337         <xsd:enumeration value="shdw8"/>
1338         <xsd:enumeration value="shdw9"/>
1339         <xsd:enumeration value="shdw10"/>
1340         <xsd:enumeration value="shdw11"/>
1341         <xsd:enumeration value="shdw12"/>
1342         <xsd:enumeration value="shdw13"/>
1343         <xsd:enumeration value="shdw14"/>
1344         <xsd:enumeration value="shdw15"/>
1345         <xsd:enumeration value="shdw16"/>
1346         <xsd:enumeration value="shdw17"/>
1347         <xsd:enumeration value="shdw18"/>
1348         <xsd:enumeration value="shdw19"/>
1349         <xsd:enumeration value="shdw20"/>
1350     </xsd:restriction>
1351 </xsd:simpleType>
1352 <xsd:complexType name="CT_PresetShadowEffect">
1353     <xsd:sequence>
1354         <xsd:group ref="EG_ColorChoice" minOccurs="1" maxOccurs="1"/>
1355     </xsd:sequence>
1356     <xsd:attribute name="prst" type="ST_PresetShadowVal" use="required"/>
1357     <xsd:attribute name="dist" type="ST_PositiveCoordinate" use="optional" default="0"/>
1358     <xsd:attribute name="dir" type="ST_PositiveFixedAngle" use="optional" default="0"/>
1359 </xsd:complexType>

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1360 <xsd:complexType name="CT_ReflectionEffect">
1361   <xsd:attribute name="blurRad" type="ST_PositiveCoordinate" use="optional" default="0"/>
1362   <xsd:attribute name="stA" type="ST_PositiveFixedPercentage" use="optional" default="100%"/>
1363   <xsd:attribute name="stPos" type="ST_PositiveFixedPercentage" use="optional" default="0%"/>
1364   <xsd:attribute name="endA" type="ST_PositiveFixedPercentage" use="optional" default="0%"/>
1365   <xsd:attribute name="endPos" type="ST_PositiveFixedPercentage" use="optional" default="100%"/>
1366   <xsd:attribute name="dist" type="ST_PositiveCoordinate" use="optional" default="0"/>
1367   <xsd:attribute name="dir" type="ST_PositiveFixedAngle" use="optional" default="0"/>
1368   <xsd:attribute name="fadeDir" type="ST_PositiveFixedAngle" use="optional" default="5400000"/>
1369   <xsd:attribute name="sx" type="ST_Percentage" use="optional" default="100%"/>
1370   <xsd:attribute name="sy" type="ST_Percentage" use="optional" default="100%"/>
1371   <xsd:attribute name="kx" type="ST_FixedAngle" use="optional" default="0"/>
1372   <xsd:attribute name="ky" type="ST_FixedAngle" use="optional" default="0"/>
1373   <xsd:attribute name="align" type="ST_RectAlignment" use="optional" default="b"/>
1374   <xsd:attribute name="rotWithShape" type="xsd:boolean" use="optional" default="true"/>
1375 </xsd:complexType>
1376 <xsd:complexType name="CT_RelativeOffsetEffect">
1377   <xsd:attribute name="tx" type="ST_Percentage" use="optional" default="0%"/>
1378   <xsd:attribute name="ty" type="ST_Percentage" use="optional" default="0%"/>
1379 </xsd:complexType>
1380 <xsd:complexType name="CT_SoftEdgesEffect">
1381   <xsd:attribute name="rad" type="ST_PositiveCoordinate" use="required"/>
1382 </xsd:complexType>
1383 <xsd:complexType name="CT_TintEffect">
1384   <xsd:attribute name="hue" type="ST_PositiveFixedAngle" use="optional" default="0"/>
1385   <xsd:attribute name="amt" type="ST_FixedPercentage" use="optional" default="0%"/>
1386 </xsd:complexType>
1387 <xsd:complexType name="CT_TransformEffect">
1388   <xsd:attribute name="sx" type="ST_Percentage" use="optional" default="100%"/>
1389   <xsd:attribute name="sy" type="ST_Percentage" use="optional" default="100%"/>
1390   <xsd:attribute name="kx" type="ST_FixedAngle" use="optional" default="0"/>
1391   <xsd:attribute name="ky" type="ST_FixedAngle" use="optional" default="0"/>
1392   <xsd:attribute name="tx" type="ST_Coordinate" use="optional" default="0"/>
1393   <xsd:attribute name="ty" type="ST_Coordinate" use="optional" default="0"/>
1394 </xsd:complexType>
1395 <xsd:complexType name="CT_NoFillProperties"/>
1396 <xsd:complexType name="CT_SolidColorFillProperties">
1397   <xsd:sequence>
1398     <xsd:group ref="EG_ColorChoice" minOccurs="0" maxOccurs="1"/>
1399   </xsd:sequence>
1400 </xsd:complexType>
1401 <xsd:complexType name="CT_LinearShadeProperties">
1402   <xsd:attribute name="ang" type="ST_PositiveFixedAngle" use="optional"/>
1403   <xsd:attribute name="scaled" type="xsd:boolean" use="optional"/>
1404 </xsd:complexType>
1405 <xsd:simpleType name="ST_PathShadeType">
1406   <xsd:restriction base="xsd:token">
1407     <xsd:enumeration value="shape"/>
1408     <xsd:enumeration value="circle"/>
1409     <xsd:enumeration value="rect"/>
1410   </xsd:restriction>
1411 </xsd:simpleType>
1412 <xsd:complexType name="CT_PathShadeProperties">

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1413     <xsd:sequence>
1414         <xsd:element name="fillToRect" type="CT_RelativeRect" minOccurs="0" maxOccurs="1"/>
1415     </xsd:sequence>
1416     <xsd:attribute name="path" type="ST_PathShadeType" use="optional"/>
1417 </xsd:complexType>
1418 <xsd:group name="EG_ShadeProperties">
1419     <xsd:choice>
1420         <xsd:element name="lin" type="CT_LinearShadeProperties" minOccurs="1" maxOccurs="1"/>
1421         <xsd:element name="path" type="CT_PathShadeProperties" minOccurs="1" maxOccurs="1"/>
1422     </xsd:choice>
1423 </xsd:group>
1424 <xsd:simpleType name="ST_TileFlipMode">
1425     <xsd:restriction base="xsd:token">
1426         <xsd:enumeration value="none"/>
1427         <xsd:enumeration value="x"/>
1428         <xsd:enumeration value="y"/>
1429         <xsd:enumeration value="xy"/>
1430     </xsd:restriction>
1431 </xsd:simpleType>
1432 <xsd:complexType name="CT_GradientStop">
1433     <xsd:sequence>
1434         <xsd:group ref="EG_ColorChoice" minOccurs="1" maxOccurs="1"/>
1435     </xsd:sequence>
1436     <xsd:attribute name="pos" type="ST_PositiveFixedPercentage" use="required"/>
1437 </xsd:complexType>
1438 <xsd:complexType name="CT_GradientStopList">
1439     <xsd:sequence>
1440         <xsd:element name="gs" type="CT_GradientStop" minOccurs="2" maxOccurs="unbounded"/>
1441     </xsd:sequence>
1442 </xsd:complexType>
1443 <xsd:complexType name="CT_GradientFillProperties">
1444     <xsd:sequence>
1445         <xsd:element name="gsList" type="CT_GradientStopList" minOccurs="0" maxOccurs="1"/>
1446         <xsd:group ref="EG_ShadeProperties" minOccurs="0" maxOccurs="1"/>
1447         <xsd:element name="tileRect" type="CT_RelativeRect" minOccurs="0" maxOccurs="1"/>
1448     </xsd:sequence>
1449     <xsd:attribute name="flip" type="ST_TileFlipMode" use="optional"/>
1450     <xsd:attribute name="rotWithShape" type="xsd:boolean" use="optional"/>
1451 </xsd:complexType>
1452 <xsd:complexType name="CT_TileInfoProperties">
1453     <xsd:attribute name="tx" type="ST_Coordinate" use="optional"/>
1454     <xsd:attribute name="ty" type="ST_Coordinate" use="optional"/>
1455     <xsd:attribute name="sx" type="ST_Percentage" use="optional"/>
1456     <xsd:attribute name="sy" type="ST_Percentage" use="optional"/>
1457     <xsd:attribute name="flip" type="ST_TileFlipMode" use="optional"/>
1458     <xsd:attribute name="align" type="ST_RectAlignment" use="optional"/>
1459 </xsd:complexType>
1460 <xsd:complexType name="CT_StretchInfoProperties">
1461     <xsd:sequence>
1462         <xsd:element name="fillRect" type="CT_RelativeRect" minOccurs="0" maxOccurs="1"/>
1463     </xsd:sequence>
1464 </xsd:complexType>
1465 <xsd:group name="EG_FillModeProperties">

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1466     <xsd:choice>
1467         <xsd:element name="tile" type="CT_TileInfoProperties" minOccurs="1" maxOccurs="1"/>
1468         <xsd:element name="stretch" type="CT_StretchInfoProperties" minOccurs="1" maxOccurs="1"/>
1469     </xsd:choice>
1470 </xsd:group>
1471 <xsd:simpleType name="ST_BlipCompression">
1472     <xsd:restriction base="xsd:token">
1473         <xsd:enumeration value="email"/>
1474         <xsd:enumeration value="screen"/>
1475         <xsd:enumeration value="print"/>
1476         <xsd:enumeration value="hqprint"/>
1477         <xsd:enumeration value="none"/>
1478     </xsd:restriction>
1479 </xsd:simpleType>
1480 <xsd:complexType name="CT_Blip">
1481     <xsd:sequence>
1482         <xsd:choice minOccurs="0" maxOccurs="unbounded">
1483             <xsd:element name="alphaBiLevel" type="CT_AlphaBiLevelEffect" minOccurs="1"
1484                 maxOccurs="1"/>
1485             <xsd:element name="alphaCeiling" type="CT_AlphaCeilingEffect" minOccurs="1"
1486                 maxOccurs="1"/>
1487             <xsd:element name="alphaFloor" type="CT_AlphaFloorEffect" minOccurs="1" maxOccurs="1"/>
1488             <xsd:element name="alphaInv" type="CT_AlphaInverseEffect" minOccurs="1" maxOccurs="1"/>
1489             <xsd:element name="alphaMod" type="CT_AlphaModulateEffect" minOccurs="1"
1490                 maxOccurs="1"/>
1491             <xsd:element name="alphaModFix" type="CT_AlphaModulateFixedEffect" minOccurs="1"
1492                 maxOccurs="1"/>
1493             <xsd:element name="alphaRepl" type="CT_AlphaReplaceEffect" minOccurs="1"
1494                 maxOccurs="1"/>
1495             <xsd:element name="biLevel" type="CT_BiLevelEffect" minOccurs="1" maxOccurs="1"/>
1496             <xsd:element name="blur" type="CT_BlurEffect" minOccurs="1" maxOccurs="1"/>
1497             <xsd:element name="clrChange" type="CT_ColorChangeEffect" minOccurs="1" maxOccurs="1"/>
1498             <xsd:element name="clrRepl" type="CT_ColorReplaceEffect" minOccurs="1" maxOccurs="1"/>
1499             <xsd:element name="duotone" type="CT_DuotoneEffect" minOccurs="1" maxOccurs="1"/>
1500             <xsd:element name="fillOverlay" type="CT_FillOverlayEffect" minOccurs="1"
1501                 maxOccurs="1"/>
1502             <xsd:element name="grayscale" type="CT_GrayscaleEffect" minOccurs="1" maxOccurs="1"/>
1503             <xsd:element name="hsl" type="CT_HSLEffect" minOccurs="1" maxOccurs="1"/>
1504             <xsd:element name="lum" type="CT_LuminanceEffect" minOccurs="1" maxOccurs="1"/>
1505             <xsd:element name="tint" type="CT_TintEffect" minOccurs="1" maxOccurs="1"/>
1506         </xsd:choice>
1507         <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
1508     </xsd:sequence>
1509     <xsd:attributeGroup ref="AG_Blob"/>
1510     <xsd:attribute name="cstate" type="ST_BlipCompression" use="optional" default="none"/>
1511 </xsd:complexType>
1512 <xsd:complexType name="CT_BlipFillProperties">
1513     <xsd:sequence>
1514         <xsd:element name="blip" type="CT_Blip" minOccurs="0" maxOccurs="1"/>
1515         <xsd:element name="srcRect" type="CT_RelativeRect" minOccurs="0" maxOccurs="1"/>
1516         <xsd:group ref="EG_FillModeProperties" minOccurs="0" maxOccurs="1"/>
1517     </xsd:sequence>
1518     <xsd:attribute name="dpi" type="xsd:unsignedInt" use="optional"/>

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1519     <xsd:attribute name="rotWithShape" type="xsd:boolean" use="optional"/>
1520 </xsd:complexType>
1521 <xsd:simpleType name="ST_PresetPatternVal">
1522     <xsd:restriction base="xsd:token">
1523         <xsd:enumeration value="pct5"/>
1524         <xsd:enumeration value="pct10"/>
1525         <xsd:enumeration value="pct20"/>
1526         <xsd:enumeration value="pct25"/>
1527         <xsd:enumeration value="pct30"/>
1528         <xsd:enumeration value="pct40"/>
1529         <xsd:enumeration value="pct50"/>
1530         <xsd:enumeration value="pct60"/>
1531         <xsd:enumeration value="pct70"/>
1532         <xsd:enumeration value="pct75"/>
1533         <xsd:enumeration value="pct80"/>
1534         <xsd:enumeration value="pct90"/>
1535         <xsd:enumeration value="horz"/>
1536         <xsd:enumeration value="vert"/>
1537         <xsd:enumeration value="ltHorz"/>
1538         <xsd:enumeration value="ltVert"/>
1539         <xsd:enumeration value="dkHorz"/>
1540         <xsd:enumeration value="dkVert"/>
1541         <xsd:enumeration value="narHorz"/>
1542         <xsd:enumeration value="narVert"/>
1543         <xsd:enumeration value="dashHorz"/>
1544         <xsd:enumeration value="dashVert"/>
1545         <xsd:enumeration value="cross"/>
1546         <xsd:enumeration value="dnDiag"/>
1547         <xsd:enumeration value="upDiag"/>
1548         <xsd:enumeration value="ltDnDiag"/>
1549         <xsd:enumeration value="ltUpDiag"/>
1550         <xsd:enumeration value="dkDnDiag"/>
1551         <xsd:enumeration value="dkUpDiag"/>
1552         <xsd:enumeration value="wdDnDiag"/>
1553         <xsd:enumeration value="wdUpDiag"/>
1554         <xsd:enumeration value="dashDnDiag"/>
1555         <xsd:enumeration value="dashUpDiag"/>
1556         <xsd:enumeration value="diagCross"/>
1557         <xsd:enumeration value="smCheck"/>
1558         <xsd:enumeration value="lgCheck"/>
1559         <xsd:enumeration value="smGrid"/>
1560         <xsd:enumeration value="lgGrid"/>
1561         <xsd:enumeration value="dotGrid"/>
1562         <xsd:enumeration value="smConfetti"/>
1563         <xsd:enumeration value="lgConfetti"/>
1564         <xsd:enumeration value="horzBrick"/>
1565         <xsd:enumeration value="diagBrick"/>
1566         <xsd:enumeration value="solidDmnd"/>
1567         <xsd:enumeration value="openDmnd"/>
1568         <xsd:enumeration value="dotDmnd"/>
1569         <xsd:enumeration value="plaid"/>
1570         <xsd:enumeration value="sphere"/>
1571         <xsd:enumeration value="weave"/>

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1572     <xsd:enumeration value="divot"/>
1573     <xsd:enumeration value="shingle"/>
1574     <xsd:enumeration value="wave"/>
1575     <xsd:enumeration value="trellis"/>
1576     <xsd:enumeration value="zigZag"/>
1577   </xsd:restriction>
1578 </xsd:simpleType>
1579 <xsd:complexType name="CT_PatternFillProperties">
1580   <xsd:sequence>
1581     <xsd:element name="fgClr" type="CT_Color" minOccurs="0" maxOccurs="1"/>
1582     <xsd:element name="bgClr" type="CT_Color" minOccurs="0" maxOccurs="1"/>
1583   </xsd:sequence>
1584   <xsd:attribute name="prst" type="ST_PresetPatternVal" use="optional"/>
1585 </xsd:complexType>
1586 <xsd:complexType name="CT_GroupFillProperties"/>
1587 <xsd:group name="EG_FillProperties">
1588   <xsd:choice>
1589     <xsd:element name="noFill" type="CT_NoFillProperties" minOccurs="1" maxOccurs="1"/>
1590     <xsd:element name="solidFill" type="CT_SolidColorFillProperties" minOccurs="1"
1591       maxOccurs="1"/>
1592     <xsd:element name="gradFill" type="CT_GradientFillProperties" minOccurs="1"
1593       maxOccurs="1"/>
1594     <xsd:element name="blipFill" type="CT_BlipFillProperties" minOccurs="1" maxOccurs="1"/>
1595     <xsd:element name="pattFill" type="CT_PatternFillProperties" minOccurs="1" maxOccurs="1"/>
1596     <xsd:element name="grpFill" type="CT_GroupFillProperties" minOccurs="1" maxOccurs="1"/>
1597   </xsd:choice>
1598 </xsd:group>
1599 <xsd:complexType name="CT_FillProperties">
1600   <xsd:sequence>
1601     <xsd:group ref="EG_FillProperties" minOccurs="1" maxOccurs="1"/>
1602   </xsd:sequence>
1603 </xsd:complexType>
1604 <xsd:complexType name="CT_FillEffect">
1605   <xsd:sequence>
1606     <xsd:group ref="EG_FillProperties" minOccurs="1" maxOccurs="1"/>
1607   </xsd:sequence>
1608 </xsd:complexType>
1609 <xsd:simpleType name="ST_BlendMode">
1610   <xsd:restriction base="xsd:token">
1611     <xsd:enumeration value="over"/>
1612     <xsd:enumeration value="mult"/>
1613     <xsd:enumeration value="screen"/>
1614     <xsd:enumeration value="darken"/>
1615     <xsd:enumeration value="lighten"/>
1616   </xsd:restriction>
1617 </xsd:simpleType>
1618 <xsd:complexType name="CT_FillOverlayEffect">
1619   <xsd:sequence>
1620     <xsd:group ref="EG_FillProperties" minOccurs="1" maxOccurs="1"/>
1621   </xsd:sequence>
1622   <xsd:attribute name="blend" type="ST_BlendMode" use="required"/>
1623 </xsd:complexType>
1624 <xsd:complexType name="CT_EffectReference">

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1625     <xsd:attribute name="ref" type="xsd:token" use="required"/>
1626 </xsd:complexType>
1627 <xsd:group name="EG_Effect">
1628     <xsd:choice>
1629         <xsd:element name="cont" type="CT_EffectContainer" minOccurs="1" maxOccurs="1"/>
1630         <xsd:element name="effect" type="CT_EffectReference" minOccurs="1" maxOccurs="1"/>
1631         <xsd:element name="alphaBiLevel" type="CT_AlphaBiLevelEffect" minOccurs="1"
1632             maxOccurs="1"/>
1633         <xsd:element name="alphaCeiling" type="CT_AlphaCeilingEffect" minOccurs="1"
1634             maxOccurs="1"/>
1635         <xsd:element name="alphaFloor" type="CT_AlphaFloorEffect" minOccurs="1" maxOccurs="1"/>
1636         <xsd:element name="alphaInv" type="CT_AlphaInverseEffect" minOccurs="1" maxOccurs="1"/>
1637         <xsd:element name="alphaMod" type="CT_AlphaModulateEffect" minOccurs="1" maxOccurs="1"/>
1638         <xsd:element name="alphaModFix" type="CT_AlphaModulateFixedEffect" minOccurs="1"
1639             maxOccurs="1"/>
1640         <xsd:element name="alphaOutset" type="CT_AlphaOutsetEffect" minOccurs="1" maxOccurs="1"/>
1641         <xsd:element name="alphaRepl" type="CT_AlphaReplaceEffect" minOccurs="1" maxOccurs="1"/>
1642         <xsd:element name="biLevel" type="CT_BiLevelEffect" minOccurs="1" maxOccurs="1"/>
1643         <xsd:element name="blend" type="CT_BlendEffect" minOccurs="1" maxOccurs="1"/>
1644         <xsd:element name="blur" type="CT_BlurEffect" minOccurs="1" maxOccurs="1"/>
1645         <xsd:element name="clrChange" type="CT_ColorChangeEffect" minOccurs="1" maxOccurs="1"/>
1646         <xsd:element name="clrRepl" type="CT_ColorReplaceEffect" minOccurs="1" maxOccurs="1"/>
1647         <xsd:element name="duotone" type="CT_DuotoneEffect" minOccurs="1" maxOccurs="1"/>
1648         <xsd:element name="fill" type="CT_FillEffect" minOccurs="1" maxOccurs="1"/>
1649         <xsd:element name="fillOverlay" type="CT_FillOverlayEffect" minOccurs="1" maxOccurs="1"/>
1650         <xsd:element name="glow" type="CT_GlowEffect" minOccurs="1" maxOccurs="1"/>
1651         <xsd:element name="grayscale" type="CT_GrayscaleEffect" minOccurs="1" maxOccurs="1"/>
1652         <xsd:element name="hsl" type="CT_HSLEffect" minOccurs="1" maxOccurs="1"/>
1653         <xsd:element name="innerShdw" type="CT_InnerShadowEffect" minOccurs="1" maxOccurs="1"/>
1654         <xsd:element name="lum" type="CT_LuminanceEffect" minOccurs="1" maxOccurs="1"/>
1655         <xsd:element name="outerShdw" type="CT_OuterShadowEffect" minOccurs="1" maxOccurs="1"/>
1656         <xsd:element name="prstShdw" type="CT_PresetShadowEffect" minOccurs="1" maxOccurs="1"/>
1657         <xsd:element name="reflection" type="CT_ReflectionEffect" minOccurs="1" maxOccurs="1"/>
1658         <xsd:element name="relOff" type="CT_RelativeOffsetEffect" minOccurs="1" maxOccurs="1"/>
1659         <xsd:element name="softEdge" type="CT_SoftEdgesEffect" minOccurs="1" maxOccurs="1"/>
1660         <xsd:element name="tint" type="CT_TintEffect" minOccurs="1" maxOccurs="1"/>
1661         <xsd:element name="xfrm" type="CT_TransformEffect" minOccurs="1" maxOccurs="1"/>
1662     </xsd:choice>
1663 </xsd:group>
1664 <xsd:simpleType name="ST_EffectContainerType">
1665     <xsd:restriction base="xsd:token">
1666         <xsd:enumeration value="sib"/>
1667         <xsd:enumeration value="tree"/>
1668     </xsd:restriction>
1669 </xsd:simpleType>
1670 <xsd:complexType name="CT_EffectContainer">
1671     <xsd:group ref="EG_Effect" minOccurs="0" maxOccurs="unbounded"/>
1672     <xsd:attribute name="type" type="ST_EffectContainerType" use="optional" default="sib"/>
1673     <xsd:attribute name="name" type="xsd:token" use="optional"/>
1674 </xsd:complexType>
1675 <xsd:complexType name="CT_AlphaModulateEffect">
1676     <xsd:sequence>
1677         <xsd:element name="cont" type="CT_EffectContainer" minOccurs="1" maxOccurs="1"/>

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1678     </xsd:sequence>
1679 </xsd:complexType>
1680 <xsd:complexType name="CT_BlendEffect">
1681     <xsd:sequence>
1682         <xsd:element name="cont" type="CT_EffectContainer" minOccurs="1" maxOccurs="1"/>
1683     </xsd:sequence>
1684     <xsd:attribute name="blend" type="ST_BlendMode" use="required"/>
1685 </xsd:complexType>
1686 <xsd:complexType name="CT_EffectList">
1687     <xsd:sequence>
1688         <xsd:element name="blur" type="CT_BlurEffect" minOccurs="0" maxOccurs="1"/>
1689         <xsd:element name="fillOverlay" type="CT_FillOverlayEffect" minOccurs="0" maxOccurs="1"/>
1690         <xsd:element name="glow" type="CT_GlowEffect" minOccurs="0" maxOccurs="1"/>
1691         <xsd:element name="innerShdw" type="CT_InnerShadowEffect" minOccurs="0" maxOccurs="1"/>
1692         <xsd:element name="outerShdw" type="CT_OuterShadowEffect" minOccurs="0" maxOccurs="1"/>
1693         <xsd:element name="prstShdw" type="CT_PresetShadowEffect" minOccurs="0" maxOccurs="1"/>
1694         <xsd:element name="reflection" type="CT_ReflectionEffect" minOccurs="0" maxOccurs="1"/>
1695         <xsd:element name="softEdge" type="CT_SoftEdgesEffect" minOccurs="0" maxOccurs="1"/>
1696     </xsd:sequence>
1697 </xsd:complexType>
1698 <xsd:group name="EG_EffectProperties">
1699     <xsd:choice>
1700         <xsd:element name="effectList" type="CT_EffectList" minOccurs="1" maxOccurs="1"/>
1701         <xsd:element name="effectDag" type="CT_EffectContainer" minOccurs="1" maxOccurs="1"/>
1702     </xsd:choice>
1703 </xsd:group>
1704 <xsd:complexType name="CT_EffectProperties">
1705     <xsd:sequence>
1706         <xsd:group ref="EG_EffectProperties" minOccurs="1" maxOccurs="1"/>
1707     </xsd:sequence>
1708 </xsd:complexType>
1709 <xsd:element name="blip" type="CT_Blip"/>
1710 <xsd:simpleType name="ST_ShapeType">
1711     <xsd:restriction base="xsd:token">
1712         <xsd:enumeration value="line"/>
1713         <xsd:enumeration value="lineInv"/>
1714         <xsd:enumeration value="triangle"/>
1715         <xsd:enumeration value="rtTriangle"/>
1716         <xsd:enumeration value="rect"/>
1717         <xsd:enumeration value="diamond"/>
1718         <xsd:enumeration value="parallelogram"/>
1719         <xsd:enumeration value="trapezoid"/>
1720         <xsd:enumeration value="nonIsoscelesTrapezoid"/>
1721         <xsd:enumeration value="pentagon"/>
1722         <xsd:enumeration value="hexagon"/>
1723         <xsd:enumeration value="heptagon"/>
1724         <xsd:enumeration value="octagon"/>
1725         <xsd:enumeration value="decagon"/>
1726         <xsd:enumeration value="dodecagon"/>
1727         <xsd:enumeration value="star4"/>
1728         <xsd:enumeration value="star5"/>
1729         <xsd:enumeration value="star6"/>
1730         <xsd:enumeration value="star7"/>

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1731 <xsd:enumeration value="star8"/>
1732 <xsd:enumeration value="star10"/>
1733 <xsd:enumeration value="star12"/>
1734 <xsd:enumeration value="star16"/>
1735 <xsd:enumeration value="star24"/>
1736 <xsd:enumeration value="star32"/>
1737 <xsd:enumeration value="roundRect"/>
1738 <xsd:enumeration value="round1Rect"/>
1739 <xsd:enumeration value="round2SameRect"/>
1740 <xsd:enumeration value="round2DiagRect"/>
1741 <xsd:enumeration value="snipRoundRect"/>
1742 <xsd:enumeration value="snip1Rect"/>
1743 <xsd:enumeration value="snip2SameRect"/>
1744 <xsd:enumeration value="snip2DiagRect"/>
1745 <xsd:enumeration value="plaque"/>
1746 <xsd:enumeration value="ellipse"/>
1747 <xsd:enumeration value="teardrop"/>
1748 <xsd:enumeration value="homePlate"/>
1749 <xsd:enumeration value="chevron"/>
1750 <xsd:enumeration value="pieWedge"/>
1751 <xsd:enumeration value="pie"/>
1752 <xsd:enumeration value="blockArc"/>
1753 <xsd:enumeration value="donut"/>
1754 <xsd:enumeration value="noSmoking"/>
1755 <xsd:enumeration value="rightArrow"/>
1756 <xsd:enumeration value="leftArrow"/>
1757 <xsd:enumeration value="upArrow"/>
1758 <xsd:enumeration value="downArrow"/>
1759 <xsd:enumeration value="stripedRightArrow"/>
1760 <xsd:enumeration value="notchedRightArrow"/>
1761 <xsd:enumeration value="bentUpArrow"/>
1762 <xsd:enumeration value="leftRightArrow"/>
1763 <xsd:enumeration value="upDownArrow"/>
1764 <xsd:enumeration value="leftUpArrow"/>
1765 <xsd:enumeration value="leftRightUpArrow"/>
1766 <xsd:enumeration value="quadArrow"/>
1767 <xsd:enumeration value="leftArrowCallout"/>
1768 <xsd:enumeration value="rightArrowCallout"/>
1769 <xsd:enumeration value="upArrowCallout"/>
1770 <xsd:enumeration value="downArrowCallout"/>
1771 <xsd:enumeration value="leftRightArrowCallout"/>
1772 <xsd:enumeration value="upDownArrowCallout"/>
1773 <xsd:enumeration value="quadArrowCallout"/>
1774 <xsd:enumeration value="bentArrow"/>
1775 <xsd:enumeration value="uturnArrow"/>
1776 <xsd:enumeration value="circularArrow"/>
1777 <xsd:enumeration value="leftCircularArrow"/>
1778 <xsd:enumeration value="leftRightCircularArrow"/>
1779 <xsd:enumeration value="curvedRightArrow"/>
1780 <xsd:enumeration value="curvedLeftArrow"/>
1781 <xsd:enumeration value="curvedUpArrow"/>
1782 <xsd:enumeration value="curvedDownArrow"/>
1783 <xsd:enumeration value="swooshArrow"/>

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1784      <xsd:enumeration value="cube"/>
1785      <xsd:enumeration value="can"/>
1786      <xsd:enumeration value="lightningBolt"/>
1787      <xsd:enumeration value="heart"/>
1788      <xsd:enumeration value="sun"/>
1789      <xsd:enumeration value="moon"/>
1790      <xsd:enumeration value="smileyFace"/>
1791      <xsd:enumeration value="irregularSeal1"/>
1792      <xsd:enumeration value="irregularSeal2"/>
1793      <xsd:enumeration value="foldedCorner"/>
1794      <xsd:enumeration value="bevel"/>
1795      <xsd:enumeration value="frame"/>
1796      <xsd:enumeration value="halfFrame"/>
1797      <xsd:enumeration value="corner"/>
1798      <xsd:enumeration value="diagStripe"/>
1799      <xsd:enumeration value="chord"/>
1800      <xsd:enumeration value="arc"/>
1801      <xsd:enumeration value="leftBracket"/>
1802      <xsd:enumeration value="rightBracket"/>
1803      <xsd:enumeration value="leftBrace"/>
1804      <xsd:enumeration value="rightBrace"/>
1805      <xsd:enumeration value="bracketPair"/>
1806      <xsd:enumeration value="bracePair"/>
1807      <xsd:enumeration value="straightConnector1"/>
1808      <xsd:enumeration value="bentConnector2"/>
1809      <xsd:enumeration value="bentConnector3"/>
1810      <xsd:enumeration value="bentConnector4"/>
1811      <xsd:enumeration value="bentConnector5"/>
1812      <xsd:enumeration value="curvedConnector2"/>
1813      <xsd:enumeration value="curvedConnector3"/>
1814      <xsd:enumeration value="curvedConnector4"/>
1815      <xsd:enumeration value="curvedConnector5"/>
1816      <xsd:enumeration value="callout1"/>
1817      <xsd:enumeration value="callout2"/>
1818      <xsd:enumeration value="callout3"/>
1819      <xsd:enumeration value="accentCallout1"/>
1820      <xsd:enumeration value="accentCallout2"/>
1821      <xsd:enumeration value="accentCallout3"/>
1822      <xsd:enumeration value="borderCallout1"/>
1823      <xsd:enumeration value="borderCallout2"/>
1824      <xsd:enumeration value="borderCallout3"/>
1825      <xsd:enumeration value="accentBorderCallout1"/>
1826      <xsd:enumeration value="accentBorderCallout2"/>
1827      <xsd:enumeration value="accentBorderCallout3"/>
1828      <xsd:enumeration value="wedgeRectCallout"/>
1829      <xsd:enumeration value="wedgeRoundRectCallout"/>
1830      <xsd:enumeration value="wedgeEllipseCallout"/>
1831      <xsd:enumeration value="cloudCallout"/>
1832      <xsd:enumeration value="cloud"/>
1833      <xsd:enumeration value="ribbon"/>
1834      <xsd:enumeration value="ribbon2"/>
1835      <xsd:enumeration value="ellipseRibbon"/>
1836      <xsd:enumeration value="ellipseRibbon2"/>

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1837 <xsd:enumeration value="leftRightRibbon"/>
1838 <xsd:enumeration value="verticalScroll"/>
1839 <xsd:enumeration value="horizontalScroll"/>
1840 <xsd:enumeration value="wave"/>
1841 <xsd:enumeration value="doubleWave"/>
1842 <xsd:enumeration value="plus"/>
1843 <xsd:enumeration value="flowChartProcess"/>
1844 <xsd:enumeration value="flowChartDecision"/>
1845 <xsd:enumeration value="flowChartInputOutput"/>
1846 <xsd:enumeration value="flowChartPredefinedProcess"/>
1847 <xsd:enumeration value="flowChartInternalStorage"/>
1848 <xsd:enumeration value="flowChartDocument"/>
1849 <xsd:enumeration value="flowChartMultidocument"/>
1850 <xsd:enumeration value="flowChartTerminator"/>
1851 <xsd:enumeration value="flowChartPreparation"/>
1852 <xsd:enumeration value="flowChartManualInput"/>
1853 <xsd:enumeration value="flowChartManualOperation"/>
1854 <xsd:enumeration value="flowChartConnector"/>
1855 <xsd:enumeration value="flowChartPunchedCard"/>
1856 <xsd:enumeration value="flowChartPunchedTape"/>
1857 <xsd:enumeration value="flowChartSummingJunction"/>
1858 <xsd:enumeration value="flowChartOr"/>
1859 <xsd:enumeration value="flowChartCollate"/>
1860 <xsd:enumeration value="flowChartSort"/>
1861 <xsd:enumeration value="flowChartExtract"/>
1862 <xsd:enumeration value="flowChartMerge"/>
1863 <xsd:enumeration value="flowChartOfflineStorage"/>
1864 <xsd:enumeration value="flowChartOnlineStorage"/>
1865 <xsd:enumeration value="flowChartMagneticTape"/>
1866 <xsd:enumeration value="flowChartMagneticDisk"/>
1867 <xsd:enumeration value="flowChartMagneticDrum"/>
1868 <xsd:enumeration value="flowChartDisplay"/>
1869 <xsd:enumeration value="flowChartDelay"/>
1870 <xsd:enumeration value="flowChartAlternateProcess"/>
1871 <xsd:enumeration value="flowChartOffpageConnector"/>
1872 <xsd:enumeration value="actionButtonBlank"/>
1873 <xsd:enumeration value="actionButtonHome"/>
1874 <xsd:enumeration value="actionButtonHelp"/>
1875 <xsd:enumeration value="actionButtonInformation"/>
1876 <xsd:enumeration value="actionButtonForwardNext"/>
1877 <xsd:enumeration value="actionButtonBackPrevious"/>
1878 <xsd:enumeration value="actionButtonEnd"/>
1879 <xsd:enumeration value="actionButtonBeginning"/>
1880 <xsd:enumeration value="actionButtonReturn"/>
1881 <xsd:enumeration value="actionButtonDocument"/>
1882 <xsd:enumeration value="actionButtonSound"/>
1883 <xsd:enumeration value="actionButtonMovie"/>
1884 <xsd:enumeration value="gear6"/>
1885 <xsd:enumeration value="gear9"/>
1886 <xsd:enumeration value="funnel"/>
1887 <xsd:enumeration value="mathPlus"/>
1888 <xsd:enumeration value="mathMinus"/>
1889 <xsd:enumeration value="mathMultiply"/>

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1890     <xsd:enumeration value="mathDivide"/>
1891     <xsd:enumeration value="mathEqual"/>
1892     <xsd:enumeration value="mathNotEqual"/>
1893     <xsd:enumeration value="cornerTabs"/>
1894     <xsd:enumeration value="squareTabs"/>
1895     <xsd:enumeration value="plaqueTabs"/>
1896     <xsd:enumeration value="chartX"/>
1897     <xsd:enumeration value="chartStar"/>
1898     <xsd:enumeration value="chartPlus"/>
1899 </xsd:restriction>
1900 </xsd:simpleType>
1901 <xsd:simpleType name="ST_TextShapeType">
1902     <xsd:restriction base="xsd:token">
1903         <xsd:enumeration value="textNoShape"/>
1904         <xsd:enumeration value="textPlain"/>
1905         <xsd:enumeration value="textStop"/>
1906         <xsd:enumeration value="textTriangle"/>
1907         <xsd:enumeration value="textTriangleInverted"/>
1908         <xsd:enumeration value="textChevron"/>
1909         <xsd:enumeration value="textChevronInverted"/>
1910         <xsd:enumeration value="textRingInside"/>
1911         <xsd:enumeration value="textRingOutside"/>
1912         <xsd:enumeration value="textArchUp"/>
1913         <xsd:enumeration value="textArchDown"/>
1914         <xsd:enumeration value="textCircle"/>
1915         <xsd:enumeration value="textButton"/>
1916         <xsd:enumeration value="textArchUpPour"/>
1917         <xsd:enumeration value="textArchDownPour"/>
1918         <xsd:enumeration value="textCirclePour"/>
1919         <xsd:enumeration value="textButtonPour"/>
1920         <xsd:enumeration value="textCurveUp"/>
1921         <xsd:enumeration value="textCurveDown"/>
1922         <xsd:enumeration value="textCanUp"/>
1923         <xsd:enumeration value="textCanDown"/>
1924         <xsd:enumeration value="textWave1"/>
1925         <xsd:enumeration value="textWave2"/>
1926         <xsd:enumeration value="textDoubleWave1"/>
1927         <xsd:enumeration value="textWave4"/>
1928         <xsd:enumeration value="textInflate"/>
1929         <xsd:enumeration value="textDeflate"/>
1930         <xsd:enumeration value="textInflateBottom"/>
1931         <xsd:enumeration value="textDeflateBottom"/>
1932         <xsd:enumeration value="textInflateTop"/>
1933         <xsd:enumeration value="textDeflateTop"/>
1934         <xsd:enumeration value="textDeflateInflate"/>
1935         <xsd:enumeration value="textDeflateInflateDeflate"/>
1936         <xsd:enumeration value="textFadeRight"/>
1937         <xsd:enumeration value="textFadeLeft"/>
1938         <xsd:enumeration value="textFadeUp"/>
1939         <xsd:enumeration value="textFadeDown"/>
1940         <xsd:enumeration value="textSlantUp"/>
1941         <xsd:enumeration value="textSlantDown"/>
1942         <xsd:enumeration value="textCascadeUp"/>

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1943     <xsd:enumeration value="textCascadeDown"/>
1944   </xsd:restriction>
1945 </xsd:simpleType>
1946 <xsd:simpleType name="ST_GeomGuideName">
1947   <xsd:restriction base="xsd:token"/>
1948 </xsd:simpleType>
1949 <xsd:simpleType name="ST_GeomGuideFormula">
1950   <xsd:restriction base="xsd:string"/>
1951 </xsd:simpleType>
1952 <xsd:complexType name="CT_GeomGuide">
1953   <xsd:attribute name="name" type="ST_GeomGuideName" use="required"/>
1954   <xsd:attribute name="fm1a" type="ST_GeomGuideFormula" use="required"/>
1955 </xsd:complexType>
1956 <xsd:complexType name="CT_GeomGuideList">
1957   <xsd:sequence>
1958     <xsd:element name="gd" type="CT_GeomGuide" minOccurs="0" maxOccurs="unbounded"/>
1959   </xsd:sequence>
1960 </xsd:complexType>
1961 <xsd:simpleType name="ST_AdjCoordinate">
1962   <xsd:union memberTypes="ST_Coordinate ST_GeomGuideName"/>
1963 </xsd:simpleType>
1964 <xsd:simpleType name="ST_AdjAngle">
1965   <xsd:union memberTypes="ST_Angle ST_GeomGuideName"/>
1966 </xsd:simpleType>
1967 <xsd:complexType name="CT_AdjPoint2D">
1968   <xsd:attribute name="x" type="ST_AdjCoordinate" use="required"/>
1969   <xsd:attribute name="y" type="ST_AdjCoordinate" use="required"/>
1970 </xsd:complexType>
1971 <xsd:complexType name="CT_GeomRect">
1972   <xsd:attribute name="l" type="ST_AdjCoordinate" use="required"/>
1973   <xsd:attribute name="t" type="ST_AdjCoordinate" use="required"/>
1974   <xsd:attribute name="r" type="ST_AdjCoordinate" use="required"/>
1975   <xsd:attribute name="b" type="ST_AdjCoordinate" use="required"/>
1976 </xsd:complexType>
1977 <xsd:complexType name="CT_XYAdjustHandle">
1978   <xsd:sequence>
1979     <xsd:element name="pos" type="CT_AdjPoint2D" minOccurs="1" maxOccurs="1"/>
1980   </xsd:sequence>
1981   <xsd:attribute name="gdRefX" type="ST_GeomGuideName" use="optional"/>
1982   <xsd:attribute name="minX" type="ST_AdjCoordinate" use="optional"/>
1983   <xsd:attribute name="maxX" type="ST_AdjCoordinate" use="optional"/>
1984   <xsd:attribute name="gdRefY" type="ST_GeomGuideName" use="optional"/>
1985   <xsd:attribute name="minY" type="ST_AdjCoordinate" use="optional"/>
1986   <xsd:attribute name="maxY" type="ST_AdjCoordinate" use="optional"/>
1987 </xsd:complexType>
1988 <xsd:complexType name="CT_PolarAdjustHandle">
1989   <xsd:sequence>
1990     <xsd:element name="pos" type="CT_AdjPoint2D" minOccurs="1" maxOccurs="1"/>
1991   </xsd:sequence>
1992   <xsd:attribute name="gdRefR" type="ST_GeomGuideName" use="optional"/>
1993   <xsd:attribute name="minR" type="ST_AdjCoordinate" use="optional"/>
1994   <xsd:attribute name="maxR" type="ST_AdjCoordinate" use="optional"/>
1995   <xsd:attribute name="gdRefAng" type="ST_GeomGuideName" use="optional"/>

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1996     <xsd:attribute name="minAng" type="ST AdjAngle" use="optional"/>
1997     <xsd:attribute name="maxAng" type="ST AdjAngle" use="optional"/>
1998 </xsd:complexType>
1999 <xsd:complexType name="CT_ConnectionSite">
2000     <xsd:sequence>
2001         <xsd:element name="pos" type="CT AdjPoint2D" minOccurs="1" maxOccurs="1"/>
2002     </xsd:sequence>
2003     <xsd:attribute name="ang" type="ST AdjAngle" use="required"/>
2004 </xsd:complexType>
2005 <xsd:complexType name="CT_AdjustHandleList">
2006     <xsd:choice minOccurs="0" maxOccurs="unbounded">
2007         <xsd:element name="ahXY" type="CT XYAdjustHandle" minOccurs="1" maxOccurs="1"/>
2008         <xsd:element name="ahPolar" type="CT PolarAdjustHandle" minOccurs="1" maxOccurs="1"/>
2009     </xsd:choice>
2010 </xsd:complexType>
2011 <xsd:complexType name="CT_ConnectionSiteList">
2012     <xsd:sequence>
2013         <xsd:element name="cxn" type="CT ConnectionSite" minOccurs="0" maxOccurs="unbounded"/>
2014     </xsd:sequence>
2015 </xsd:complexType>
2016 <xsd:complexType name="CT_Connection">
2017     <xsd:attribute name="id" type="ST DrawingElementId" use="required"/>
2018     <xsd:attribute name="idx" type="xsd:unsignedInt" use="required"/>
2019 </xsd:complexType>
2020 <xsd:complexType name="CT_Path2DMoveTo">
2021     <xsd:sequence>
2022         <xsd:element name="pt" type="CT AdjPoint2D" minOccurs="1" maxOccurs="1"/>
2023     </xsd:sequence>
2024 </xsd:complexType>
2025 <xsd:complexType name="CT_Path2DLineTo">
2026     <xsd:sequence>
2027         <xsd:element name="pt" type="CT AdjPoint2D" minOccurs="1" maxOccurs="1"/>
2028     </xsd:sequence>
2029 </xsd:complexType>
2030 <xsd:complexType name="CT_Path2DArcTo">
2031     <xsd:attribute name="wR" type="ST AdjCoordinate" use="required"/>
2032     <xsd:attribute name="hR" type="ST AdjCoordinate" use="required"/>
2033     <xsd:attribute name="stAng" type="ST AdjAngle" use="required"/>
2034     <xsd:attribute name="swAng" type="ST AdjAngle" use="required"/>
2035 </xsd:complexType>
2036 <xsd:complexType name="CT_Path2DQuadBezierTo">
2037     <xsd:sequence>
2038         <xsd:element name="pt" type="CT AdjPoint2D" minOccurs="2" maxOccurs="2"/>
2039     </xsd:sequence>
2040 </xsd:complexType>
2041 <xsd:complexType name="CT_Path2DCubicBezierTo">
2042     <xsd:sequence>
2043         <xsd:element name="pt" type="CT AdjPoint2D" minOccurs="3" maxOccurs="3"/>
2044     </xsd:sequence>
2045 </xsd:complexType>
2046 <xsd:complexType name="CT_Path2DClose"/>
2047 <xsd:simpleType name="ST_PathFillMode">
2048     <xsd:restriction base="xsd:token">

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2049     <xsd:enumeration value="none"/>
2050     <xsd:enumeration value="norm"/>
2051     <xsd:enumeration value="lighten"/>
2052     <xsd:enumeration value="lightenLess"/>
2053     <xsd:enumeration value="darken"/>
2054     <xsd:enumeration value="darkenLess"/>
2055 </xsd:restriction>
2056 </xsd:simpleType>
2057 <xsd:complexType name="CT_Path2D">
2058     <xsd:choice minOccurs="0" maxOccurs="unbounded">
2059         <xsd:element name="close" type="CT_Path2DClose" minOccurs="1" maxOccurs="1"/>
2060         <xsd:element name="moveTo" type="CT_Path2DMoveTo" minOccurs="1" maxOccurs="1"/>
2061         <xsd:element name="lnTo" type="CT_Path2DLineTo" minOccurs="1" maxOccurs="1"/>
2062         <xsd:element name="arcTo" type="CT_Path2DArcTo" minOccurs="1" maxOccurs="1"/>
2063         <xsd:element name="quadBezTo" type="CT_Path2DQuadBezierTo" minOccurs="1" maxOccurs="1"/>
2064         <xsd:element name="cubicBezTo" type="CT_Path2DCubicBezierTo" minOccurs="1" maxOccurs="1"/>
2065     </xsd:choice>
2066     <xsd:attribute name="w" type="ST_PositiveCoordinate" use="optional" default="0"/>
2067     <xsd:attribute name="h" type="ST_PositiveCoordinate" use="optional" default="0"/>
2068     <xsd:attribute name="fill" type="ST_PathFillMode" use="optional" default="norm"/>
2069     <xsd:attribute name="stroke" type="xsd:boolean" use="optional" default="true"/>
2070     <xsd:attribute name="extrusionOk" type="xsd:boolean" use="optional" default="true"/>
2071 </xsd:complexType>
2072 <xsd:complexType name="CT_Path2DList">
2073     <xsd:sequence>
2074         <xsd:element name="path" type="CT_Path2D" minOccurs="0" maxOccurs="unbounded"/>
2075     </xsd:sequence>
2076 </xsd:complexType>
2077 <xsd:complexType name="CT_PresetGeometry2D">
2078     <xsd:sequence>
2079         <xsd:element name="avLst" type="CT_GeomGuideList" minOccurs="0" maxOccurs="1"/>
2080     </xsd:sequence>
2081     <xsd:attribute name="prst" type="ST_ShapeType" use="required"/>
2082 </xsd:complexType>
2083 <xsd:complexType name="CT_PresetTextShape">
2084     <xsd:sequence>
2085         <xsd:element name="avLst" type="CT_GeomGuideList" minOccurs="0" maxOccurs="1"/>
2086     </xsd:sequence>
2087     <xsd:attribute name="prst" type="ST_TextShapeType" use="required"/>
2088 </xsd:complexType>
2089 <xsd:complexType name="CT_CustomGeometry2D">
2090     <xsd:sequence>
2091         <xsd:element name="avLst" type="CT_GeomGuideList" minOccurs="0" maxOccurs="1"/>
2092         <xsd:element name="gdLst" type="CT_GeomGuideList" minOccurs="0" maxOccurs="1"/>
2093         <xsd:element name="ahLst" type="CT_AdjustHandleList" minOccurs="0" maxOccurs="1"/>
2094         <xsd:element name="cxnLst" type="CT_ConnectionSiteList" minOccurs="0" maxOccurs="1"/>
2095         <xsd:element name="rect" type="CT_GeomRect" minOccurs="0" maxOccurs="1"/>
2096         <xsd:element name="pathLst" type="CT_Path2DList" minOccurs="1" maxOccurs="1"/>
2097     </xsd:sequence>
2098 </xsd:complexType>
2099 <xsd:group name="EG_Geometry">
2100     <xsd:choice>
2101         <xsd:element name="custGeom" type="CT_CustomGeometry2D" minOccurs="1" maxOccurs="1"/>

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2102     <xsd:element name="prstGeom" type="CT_PresetGeometry2D" minOccurs="1" maxOccurs="1"/>
2103   </xsd:choice>
2104 </xsd:group>
2105 <xsd:group name="EG_TextGeometry">
2106   <xsd:choice>
2107     <xsd:element name="custGeom" type="CT_CustomGeometry2D" minOccurs="1" maxOccurs="1"/>
2108     <xsd:element name="prstTxWarp" type="CT_PresetTextShape" minOccurs="1" maxOccurs="1"/>
2109   </xsd:choice>
2110 </xsd:group>
2111 <xsd:simpleType name="ST_LineEndType">
2112   <xsd:restriction base="xsd:token">
2113     <xsd:enumeration value="none"/>
2114     <xsd:enumeration value="triangle"/>
2115     <xsd:enumeration value="stealth"/>
2116     <xsd:enumeration value="diamond"/>
2117     <xsd:enumeration value="oval"/>
2118     <xsd:enumeration value="arrow"/>
2119   </xsd:restriction>
2120 </xsd:simpleType>
2121 <xsd:simpleType name="ST_LineEndWidth">
2122   <xsd:restriction base="xsd:token">
2123     <xsd:enumeration value="sm"/>
2124     <xsd:enumeration value="med"/>
2125     <xsd:enumeration value="lg"/>
2126   </xsd:restriction>
2127 </xsd:simpleType>
2128 <xsd:simpleType name="ST_LineEndLength">
2129   <xsd:restriction base="xsd:token">
2130     <xsd:enumeration value="sm"/>
2131     <xsd:enumeration value="med"/>
2132     <xsd:enumeration value="lg"/>
2133   </xsd:restriction>
2134 </xsd:simpleType>
2135 <xsd:complexType name="CT_LineEndProperties">
2136   <xsd:attribute name="type" type="ST_LineEndType" use="optional"/>
2137   <xsd:attribute name="w" type="ST_LineEndWidth" use="optional"/>
2138   <xsd:attribute name="len" type="ST_LineEndLength" use="optional"/>
2139 </xsd:complexType>
2140 <xsd:group name="EG_LineFillProperties">
2141   <xsd:choice>
2142     <xsd:element name="noFill" type="CT_NoFillProperties" minOccurs="1" maxOccurs="1"/>
2143     <xsd:element name="solidFill" type="CT_SolidColorFillProperties" minOccurs="1"
2144       maxOccurs="1"/>
2145     <xsd:element name="gradFill" type="CT_GradientFillProperties" minOccurs="1"
2146       maxOccurs="1"/>
2147     <xsd:element name="pattFill" type="CT_PatternFillProperties" minOccurs="1" maxOccurs="1"/>
2148   </xsd:choice>
2149 </xsd:group>
2150 <xsd:complexType name="CT_LineJoinBevel"/>
2151 <xsd:complexType name="CT_LineJoinRound"/>
2152 <xsd:complexType name="CT_LineJoinMiterProperties">
2153   <xsd:attribute name="lim" type="ST_PositivePercentage" use="optional"/>
2154 </xsd:complexType>

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2155 <xsd:group name="EG_LineJoinProperties">
2156   <xsd:choice>
2157     <xsd:element name="round" type="CT_LineJoinRound" minOccurs="1" maxOccurs="1"/>
2158     <xsd:element name="bevel" type="CT_LineJoinBevel" minOccurs="1" maxOccurs="1"/>
2159     <xsd:element name="miter" type="CT_LineJoinMiterProperties" minOccurs="1" maxOccurs="1"/>
2160   </xsd:choice>
2161 </xsd:group>
2162 <xsd:simpleType name="ST_PresetLineDashVal">
2163   <xsd:restriction base="xsd:token">
2164     <xsd:enumeration value="solid"/>
2165     <xsd:enumeration value="dot"/>
2166     <xsd:enumeration value="dash"/>
2167     <xsd:enumeration value="lgDash"/>
2168     <xsd:enumeration value="dashDot"/>
2169     <xsd:enumeration value="lgDashDot"/>
2170     <xsd:enumeration value="lgDashDotDot"/>
2171     <xsd:enumeration value="sysDash"/>
2172     <xsd:enumeration value="sysDot"/>
2173     <xsd:enumeration value="sysDashDot"/>
2174     <xsd:enumeration value="sysDashDotDot"/>
2175   </xsd:restriction>
2176 </xsd:simpleType>
2177 <xsd:complexType name="CT_PresetLineDashProperties">
2178   <xsd:attribute name="val" type="ST_PresetLineDashVal" use="optional"/>
2179 </xsd:complexType>
2180 <xsd:complexType name="CT_DashStop">
2181   <xsd:attribute name="d" type="ST_PositivePercentage" use="required"/>
2182   <xsd:attribute name="sp" type="ST_PositivePercentage" use="required"/>
2183 </xsd:complexType>
2184 <xsd:complexType name="CT_DashStopList">
2185   <xsd:sequence>
2186     <xsd:element name="ds" type="CT_DashStop" minOccurs="0" maxOccurs="unbounded"/>
2187   </xsd:sequence>
2188 </xsd:complexType>
2189 <xsd:group name="EG_LineDashProperties">
2190   <xsd:choice>
2191     <xsd:element name="prstDash" type="CT_PresetLineDashProperties" minOccurs="1"
2192       maxOccurs="1"/>
2193     <xsd:element name="custDash" type="CT_DashStopList" minOccurs="1" maxOccurs="1"/>
2194   </xsd:choice>
2195 </xsd:group>
2196 <xsd:simpleType name="ST_LineCap">
2197   <xsd:restriction base="xsd:token">
2198     <xsd:enumeration value="rnd"/>
2199     <xsd:enumeration value="sq"/>
2200     <xsd:enumeration value="flat"/>
2201   </xsd:restriction>
2202 </xsd:simpleType>
2203 <xsd:simpleType name="ST_LineWidth">
2204   <xsd:restriction base="ST_Coordinate32Unqualified">
2205     <xsd:minInclusive value="0"/>
2206     <xsd:maxInclusive value="20116800"/>
2207   </xsd:restriction>

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2208 </xsd:simpleType>
2209 <xsd:simpleType name="ST_PenAlignment">
2210   <xsd:restriction base="xsd:token">
2211     <xsd:enumeration value="ctr"/>
2212     <xsd:enumeration value="in"/>
2213   </xsd:restriction>
2214 </xsd:simpleType>
2215 <xsd:simpleType name="ST_CompoundLine">
2216   <xsd:restriction base="xsd:token">
2217     <xsd:enumeration value="sng"/>
2218     <xsd:enumeration value="dbl"/>
2219     <xsd:enumeration value="thickThin"/>
2220     <xsd:enumeration value="thinThick"/>
2221     <xsd:enumeration value="tri"/>
2222   </xsd:restriction>
2223 </xsd:simpleType>
2224 <xsd:complexType name="CT_LineProperties">
2225   <xsd:sequence>
2226     <xsd:group ref="EG_LineFillProperties" minOccurs="0" maxOccurs="1"/>
2227     <xsd:group ref="EG_LineDashProperties" minOccurs="0" maxOccurs="1"/>
2228     <xsd:group ref="EG_LineJoinProperties" minOccurs="0" maxOccurs="1"/>
2229     <xsd:element name="headEnd" type="CT_LineEndProperties" minOccurs="0" maxOccurs="1"/>
2230     <xsd:element name="tailEnd" type="CT_LineEndProperties" minOccurs="0" maxOccurs="1"/>
2231     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
2232   </xsd:sequence>
2233   <xsd:attribute name="w" type="ST_LineWidth" use="optional"/>
2234   <xsd:attribute name="cap" type="ST_LineCap" use="optional"/>
2235   <xsd:attribute name="cmpd" type="ST_CompoundLine" use="optional"/>
2236   <xsd:attribute name="algn" type="ST_PenAlignment" use="optional"/>
2237 </xsd:complexType>
2238 <xsd:simpleType name="ST_ShapeID">
2239   <xsd:restriction base="xsd:token"/>
2240 </xsd:simpleType>
2241 <xsd:complexType name="CT_ShapeProperties">
2242   <xsd:sequence>
2243     <xsd:element name="xfrm" type="CT_Transform2D" minOccurs="0" maxOccurs="1"/>
2244     <xsd:group ref="EG_Geometry" minOccurs="0" maxOccurs="1"/>
2245     <xsd:group ref="EG_FillProperties" minOccurs="0" maxOccurs="1"/>
2246     <xsd:element name="ln" type="CT_LineProperties" minOccurs="0" maxOccurs="1"/>
2247     <xsd:group ref="EG_EffectProperties" minOccurs="0" maxOccurs="1"/>
2248     <xsd:element name="scene3d" type="CT_Scene3D" minOccurs="0" maxOccurs="1"/>
2249     <xsd:element name="sp3d" type="CT_Shape3D" minOccurs="0" maxOccurs="1"/>
2250     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
2251   </xsd:sequence>
2252   <xsd:attribute name="bwMode" type="ST_BlackWhiteMode" use="optional"/>
2253 </xsd:complexType>
2254 <xsd:complexType name="CT_GroupShapeProperties">
2255   <xsd:sequence>
2256     <xsd:element name="xfrm" type="CT_GroupTransform2D" minOccurs="0" maxOccurs="1"/>
2257     <xsd:group ref="EG_FillProperties" minOccurs="0" maxOccurs="1"/>
2258     <xsd:group ref="EG_EffectProperties" minOccurs="0" maxOccurs="1"/>
2259     <xsd:element name="scene3d" type="CT_Scene3D" minOccurs="0" maxOccurs="1"/>
2260     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>

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2261     </xsd:sequence>
2262     <xsd:attribute name="bwMode" type="ST_BlackWhiteMode" use="optional"/>
2263 </xsd:complexType>
2264 <xsd:complexType name="CT_StyleMatrixReference">
2265     <xsd:sequence>
2266         <xsd:group ref="EG_ColorChoice" minOccurs="0" maxOccurs="1"/>
2267     </xsd:sequence>
2268     <xsd:attribute name="idx" type="ST_StyleMatrixColumnIndex" use="required"/>
2269 </xsd:complexType>
2270 <xsd:complexType name="CT_FontReference">
2271     <xsd:sequence>
2272         <xsd:group ref="EG_ColorChoice" minOccurs="0" maxOccurs="1"/>
2273     </xsd:sequence>
2274     <xsd:attribute name="idx" type="ST_FontCollectionIndex" use="required"/>
2275 </xsd:complexType>
2276 <xsd:complexType name="CT_ShapeStyle">
2277     <xsd:sequence>
2278         <xsd:element name="lnRef" type="CT_StyleMatrixReference" minOccurs="1" maxOccurs="1"/>
2279         <xsd:element name="fillRef" type="CT_StyleMatrixReference" minOccurs="1" maxOccurs="1"/>
2280         <xsd:element name="effectRef" type="CT_StyleMatrixReference" minOccurs="1" maxOccurs="1"/>
2281         <xsd:element name="fontRef" type="CT_FontReference" minOccurs="1" maxOccurs="1"/>
2282     </xsd:sequence>
2283 </xsd:complexType>
2284 <xsd:complexType name="CT_DefaultShapeDefinition">
2285     <xsd:sequence>
2286         <xsd:element name="spPr" type="CT_ShapeProperties" minOccurs="1" maxOccurs="1"/>
2287         <xsd:element name="bodyPr" type="CT_TextBodyProperties" minOccurs="1" maxOccurs="1"/>
2288         <xsd:element name="lstStyle" type="CT_TextListStyle" minOccurs="1" maxOccurs="1"/>
2289         <xsd:element name="style" type="CT_ShapeStyle" minOccurs="0" maxOccurs="1"/>
2290         <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
2291     </xsd:sequence>
2292 </xsd:complexType>
2293 <xsd:complexType name="CT_ObjectStyleDefaults">
2294     <xsd:sequence>
2295         <xsd:element name="spDef" type="CT_DefaultShapeDefinition" minOccurs="0" maxOccurs="1"/>
2296         <xsd:element name="lnDef" type="CT_DefaultShapeDefinition" minOccurs="0" maxOccurs="1"/>
2297         <xsd:element name="txDef" type="CT_DefaultShapeDefinition" minOccurs="0" maxOccurs="1"/>
2298         <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
2299     </xsd:sequence>
2300 </xsd:complexType>
2301 <xsd:complexType name="CT_EmptyElement"/>
2302 <xsd:complexType name="CT_ColorMapping">
2303     <xsd:sequence>
2304         <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
2305     </xsd:sequence>
2306     <xsd:attribute name="bg1" type="ST_ColorSchemeIndex" use="required"/>
2307     <xsd:attribute name="tx1" type="ST_ColorSchemeIndex" use="required"/>
2308     <xsd:attribute name="bg2" type="ST_ColorSchemeIndex" use="required"/>
2309     <xsd:attribute name="tx2" type="ST_ColorSchemeIndex" use="required"/>
2310     <xsd:attribute name="accent1" type="ST_ColorSchemeIndex" use="required"/>
2311     <xsd:attribute name="accent2" type="ST_ColorSchemeIndex" use="required"/>
2312     <xsd:attribute name="accent3" type="ST_ColorSchemeIndex" use="required"/>
2313     <xsd:attribute name="accent4" type="ST_ColorSchemeIndex" use="required"/>

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2314     <xsd:attribute name="accent5" type="ST_ColorSchemeIndex" use="required"/>
2315     <xsd:attribute name="accent6" type="ST_ColorSchemeIndex" use="required"/>
2316     <xsd:attribute name="hlink" type="ST_ColorSchemeIndex" use="required"/>
2317     <xsd:attribute name="folHlink" type="ST_ColorSchemeIndex" use="required"/>
2318 </xsd:complexType>
2319 <xsd:complexType name="CT_ColorMappingOverride">
2320     <xsd:sequence>
2321         <xsd:choice minOccurs="1" maxOccurs="1">
2322             <xsd:element name="masterClrMapping" type="CT_EmptyElement"/>
2323             <xsd:element name="overrideClrMapping" type="CT_ColorMapping"/>
2324         </xsd:choice>
2325     </xsd:sequence>
2326 </xsd:complexType>
2327 <xsd:complexType name="CT_ColorSchemeAndMapping">
2328     <xsd:sequence>
2329         <xsd:element name="clrScheme" type="CT_ColorScheme" minOccurs="1" maxOccurs="1"/>
2330         <xsd:element name="clrMap" type="CT_ColorMapping" minOccurs="0" maxOccurs="1"/>
2331     </xsd:sequence>
2332 </xsd:complexType>
2333 <xsd:complexType name="CT_ColorSchemeList">
2334     <xsd:sequence>
2335         <xsd:element name="extraClrScheme" type="CT_ColorSchemeAndMapping" minOccurs="0"
2336             maxOccurs="unbounded"/>
2337     </xsd:sequence>
2338 </xsd:complexType>
2339 <xsd:complexType name="CT_OfficeStyleSheet">
2340     <xsd:sequence>
2341         <xsd:element name="themeElements" type="CT_BaseStyles" minOccurs="1" maxOccurs="1"/>
2342         <xsd:element name="objectDefaults" type="CT_ObjectStyleDefaults" minOccurs="0"
2343             maxOccurs="1"/>
2344         <xsd:element name="extraClrSchemeLst" type="CT_ColorSchemeList" minOccurs="0"
2345             maxOccurs="1"/>
2346         <xsd:element name="custClrLst" type="CT_CustomColorList" minOccurs="0" maxOccurs="1"/>
2347         <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
2348     </xsd:sequence>
2349     <xsd:attribute name="name" type="xsd:string" use="optional" default=""/>
2350 </xsd:complexType>
2351 <xsd:complexType name="CT_BaseStylesOverride">
2352     <xsd:sequence>
2353         <xsd:element name="clrScheme" type="CT_ColorScheme" minOccurs="0" maxOccurs="1"/>
2354         <xsd:element name="fontScheme" type="CT_FontScheme" minOccurs="0" maxOccurs="1"/>
2355         <xsd:element name="fmtScheme" type="CT_StyleMatrix" minOccurs="0" maxOccurs="1"/>
2356     </xsd:sequence>
2357 </xsd:complexType>
2358 <xsd:complexType name="CT_ClipboardStyleSheet">
2359     <xsd:sequence>
2360         <xsd:element name="themeElements" type="CT_BaseStyles" minOccurs="1" maxOccurs="1"/>
2361         <xsd:element name="clrMap" type="CT_ColorMapping" minOccurs="1" maxOccurs="1"/>
2362     </xsd:sequence>
2363 </xsd:complexType>
2364 <xsd:element name="theme" type="CT_OfficeStyleSheet"/>
2365 <xsd:element name="themeOverride" type="CT_BaseStylesOverride"/>
2366 <xsd:element name="themeManager" type="CT_EmptyElement"/>

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2367 <xsd:complexType name="CT_TableCellProperties">
2368   <xsd:sequence>
2369     <xsd:element name="lnL" type="CT_LineProperties" minOccurs="0" maxOccurs="1"/>
2370     <xsd:element name="lnR" type="CT_LineProperties" minOccurs="0" maxOccurs="1"/>
2371     <xsd:element name="lnT" type="CT_LineProperties" minOccurs="0" maxOccurs="1"/>
2372     <xsd:element name="lnB" type="CT_LineProperties" minOccurs="0" maxOccurs="1"/>
2373     <xsd:element name="lnTlToBr" type="CT_LineProperties" minOccurs="0" maxOccurs="1"/>
2374     <xsd:element name="lnBlToTr" type="CT_LineProperties" minOccurs="0" maxOccurs="1"/>
2375     <xsd:element name="cell3D" type="CT_Cell3D" minOccurs="0" maxOccurs="1"/>
2376     <xsd:group ref="EG_FillProperties" minOccurs="0" maxOccurs="1"/>
2377     <xsd:element name="headers" type="CT_Headers" minOccurs="0"/>
2378     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
2379   </xsd:sequence>
2380   <xsd:attribute name="marL" type="ST_Coordinate32" use="optional" default="91440"/>
2381   <xsd:attribute name="marR" type="ST_Coordinate32" use="optional" default="91440"/>
2382   <xsd:attribute name="marT" type="ST_Coordinate32" use="optional" default="45720"/>
2383   <xsd:attribute name="marB" type="ST_Coordinate32" use="optional" default="45720"/>
2384   <xsd:attribute name="vert" type="ST_TextVerticalType" use="optional" default="horz"/>
2385   <xsd:attribute name="anchor" type="ST_TextAnchoringType" use="optional" default="t"/>
2386   <xsd:attribute name="anchorCtr" type="xsd:boolean" use="optional" default="false"/>
2387   <xsd:attribute name="horzOverflow" type="ST_TextHorzOverflowType" use="optional"
2388     default="clip"/>
2389 </xsd:complexType>
2390 <xsd:complexType name="CT_Headers">
2391   <xsd:sequence minOccurs="0" maxOccurs="unbounded">
2392     <xsd:element name="header" type="xsd:string"/>
2393   </xsd:sequence>
2394 </xsd:complexType>
2395 <xsd:complexType name="CT_TableCol">
2396   <xsd:sequence>
2397     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
2398   </xsd:sequence>
2399   <xsd:attribute name="w" type="ST_Coordinate" use="required"/>
2400 </xsd:complexType>
2401 <xsd:complexType name="CT_TableGrid">
2402   <xsd:sequence>
2403     <xsd:element name="gridCol" type="CT_TableCol" minOccurs="0" maxOccurs="unbounded"/>
2404   </xsd:sequence>
2405 </xsd:complexType>
2406 <xsd:complexType name="CT_TableCell">
2407   <xsd:sequence>
2408     <xsd:element name="txBody" type="CT_TextBody" minOccurs="0" maxOccurs="1"/>
2409     <xsd:element name="tcPr" type="CT_TableCellProperties" minOccurs="0" maxOccurs="1"/>
2410     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
2411   </xsd:sequence>
2412   <xsd:attribute name="rowSpan" type="xsd:int" use="optional" default="1"/>
2413   <xsd:attribute name="gridSpan" type="xsd:int" use="optional" default="1"/>
2414   <xsd:attribute name="hMerge" type="xsd:boolean" use="optional" default="false"/>
2415   <xsd:attribute name="vMerge" type="xsd:boolean" use="optional" default="false"/>
2416   <xsd:attribute name="id" type="xsd:string" use="optional"/>
2417 </xsd:complexType>
2418 <xsd:complexType name="CT_TableRow">
2419   <xsd:sequence>

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2420     <xsd:element name="tc" type="CT_TableCell" minOccurs="0" maxOccurs="unbounded"/>
2421     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
2422   </xsd:sequence>
2423   <xsd:attribute name="h" type="ST_Coordinate" use="required"/>
2424 </xsd:complexType>
2425 <xsd:complexType name="CT_TableProperties">
2426   <xsd:sequence>
2427     <xsd:group ref="EG_FillProperties" minOccurs="0" maxOccurs="1"/>
2428     <xsd:group ref="EG_EffectProperties" minOccurs="0" maxOccurs="1"/>
2429     <xsd:choice minOccurs="0" maxOccurs="1">
2430       <xsd:element name="tableStyle" type="CT_TableStyle"/>
2431       <xsd:element name="tableStyleId" type="s:ST_Guid"/>
2432     </xsd:choice>
2433     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
2434   </xsd:sequence>
2435   <xsd:attribute name="rtl" type="xsd:boolean" use="optional" default="false"/>
2436   <xsd:attribute name="firstRow" type="xsd:boolean" use="optional" default="false"/>
2437   <xsd:attribute name="firstCol" type="xsd:boolean" use="optional" default="false"/>
2438   <xsd:attribute name="lastRow" type="xsd:boolean" use="optional" default="false"/>
2439   <xsd:attribute name="lastCol" type="xsd:boolean" use="optional" default="false"/>
2440   <xsd:attribute name="bandRow" type="xsd:boolean" use="optional" default="false"/>
2441   <xsd:attribute name="bandCol" type="xsd:boolean" use="optional" default="false"/>
2442 </xsd:complexType>
2443 <xsd:complexType name="CT_Table">
2444   <xsd:sequence>
2445     <xsd:element name="tblPr" type="CT_TableProperties" minOccurs="0" maxOccurs="1"/>
2446     <xsd:element name="tblGrid" type="CT_TableGrid" minOccurs="1" maxOccurs="1"/>
2447     <xsd:element name="tr" type="CT_TableRow" minOccurs="0" maxOccurs="unbounded"/>
2448   </xsd:sequence>
2449 </xsd:complexType>
2450 <xsd:element name="tbl" type="CT_Table"/>
2451 <xsd:complexType name="CT_Cell3D">
2452   <xsd:sequence>
2453     <xsd:element name="bevel" type="CT_Bevel" minOccurs="1" maxOccurs="1"/>
2454     <xsd:element name="lightRig" type="CT_LightRig" minOccurs="0" maxOccurs="1"/>
2455     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
2456   </xsd:sequence>
2457   <xsd:attribute name="prstMaterial" type="ST_PresetMaterialType" use="optional"
2458     default="plastic"/>
2459 </xsd:complexType>
2460 <xsd:group name="EG_ThemeableFillStyle">
2461   <xsd:choice>
2462     <xsd:element name="fill" type="CT_FillProperties" minOccurs="1" maxOccurs="1"/>
2463     <xsd:element name="fillRef" type="CT_StyleMatrixReference" minOccurs="1" maxOccurs="1"/>
2464   </xsd:choice>
2465 </xsd:group>
2466 <xsd:complexType name="CT_ThemeableLineStyle">
2467   <xsd:choice>
2468     <xsd:element name="ln" type="CT_LineProperties" minOccurs="1" maxOccurs="1"/>
2469     <xsd:element name="lnRef" type="CT_StyleMatrixReference" minOccurs="1" maxOccurs="1"/>
2470   </xsd:choice>
2471 </xsd:complexType>
2472 <xsd:group name="EG_ThemeableEffectStyle">

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2473     <xsd:choice>
2474         <xsd:element name="effect" type="CT_EffectProperties" minOccurs="1" maxOccurs="1"/>
2475         <xsd:element name="effectRef" type="CT_StyleMatrixReference" minOccurs="1" maxOccurs="1"/>
2476     </xsd:choice>
2477 </xsd:group>
2478 <xsd:group name="EG_ThemeableFontStyles">
2479     <xsd:choice>
2480         <xsd:element name="font" type="CT_FontCollection" minOccurs="1" maxOccurs="1"/>
2481         <xsd:element name="fontRef" type="CT_FontReference" minOccurs="1" maxOccurs="1"/>
2482     </xsd:choice>
2483 </xsd:group>
2484 <xsd:simpleType name="ST_OnOffStyleType">
2485     <xsd:restriction base="xsd:token">
2486         <xsd:enumeration value="on"/>
2487         <xsd:enumeration value="off"/>
2488         <xsd:enumeration value="def"/>
2489     </xsd:restriction>
2490 </xsd:simpleType>
2491 <xsd:complexType name="CT_TableStyleTextStyle">
2492     <xsd:sequence>
2493         <xsd:group ref="EG_ThemeableFontStyles" minOccurs="0" maxOccurs="1"/>
2494         <xsd:group ref="EG_ColorChoice" minOccurs="0" maxOccurs="1"/>
2495         <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
2496     </xsd:sequence>
2497     <xsd:attribute name="b" type="ST_OnOffStyleType" use="optional" default="def"/>
2498     <xsd:attribute name="i" type="ST_OnOffStyleType" use="optional" default="def"/>
2499 </xsd:complexType>
2500 <xsd:complexType name="CT_TableCellBorderStyle">
2501     <xsd:sequence>
2502         <xsd:element name="left" type="CT_ThemeableLineStyle" minOccurs="0" maxOccurs="1"/>
2503         <xsd:element name="right" type="CT_ThemeableLineStyle" minOccurs="0" maxOccurs="1"/>
2504         <xsd:element name="top" type="CT_ThemeableLineStyle" minOccurs="0" maxOccurs="1"/>
2505         <xsd:element name="bottom" type="CT_ThemeableLineStyle" minOccurs="0" maxOccurs="1"/>
2506         <xsd:element name="insideH" type="CT_ThemeableLineStyle" minOccurs="0" maxOccurs="1"/>
2507         <xsd:element name="insideV" type="CT_ThemeableLineStyle" minOccurs="0" maxOccurs="1"/>
2508         <xsd:element name="tl2br" type="CT_ThemeableLineStyle" minOccurs="0" maxOccurs="1"/>
2509         <xsd:element name="tr2bl" type="CT_ThemeableLineStyle" minOccurs="0" maxOccurs="1"/>
2510         <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
2511     </xsd:sequence>
2512 </xsd:complexType>
2513 <xsd:complexType name="CT_TableBackgroundStyle">
2514     <xsd:sequence>
2515         <xsd:group ref="EG_ThemeableFillStyle" minOccurs="0" maxOccurs="1"/>
2516         <xsd:group ref="EG_ThemeableEffectStyle" minOccurs="0" maxOccurs="1"/>
2517     </xsd:sequence>
2518 </xsd:complexType>
2519 <xsd:complexType name="CT_TableStyleCellStyle">
2520     <xsd:sequence>
2521         <xsd:element name="tcBdr" type="CT_TableCellBorderStyle" minOccurs="0" maxOccurs="1"/>
2522         <xsd:group ref="EG_ThemeableFillStyle" minOccurs="0" maxOccurs="1"/>
2523         <xsd:element name="cell3D" type="CT_Cell3D" minOccurs="0" maxOccurs="1"/>
2524     </xsd:sequence>
2525 </xsd:complexType>

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2526 <xsd:complexType name="CT_TablePartStyle">
2527   <xsd:sequence>
2528     <xsd:element name="tcTxStyle" type="CT_TableStyleTextStyle" minOccurs="0" maxOccurs="1"/>
2529     <xsd:element name="tcStyle" type="CT_TableStyleCellStyle" minOccurs="0" maxOccurs="1"/>
2530   </xsd:sequence>
2531 </xsd:complexType>
2532 <xsd:complexType name="CT_TableStyle">
2533   <xsd:sequence>
2534     <xsd:element name="tblBg" type="CT_TableBackgroundStyle" minOccurs="0" maxOccurs="1"/>
2535     <xsd:element name="wholeTbl" type="CT_TablePartStyle" minOccurs="0" maxOccurs="1"/>
2536     <xsd:element name="band1H" type="CT_TablePartStyle" minOccurs="0" maxOccurs="1"/>
2537     <xsd:element name="band2H" type="CT_TablePartStyle" minOccurs="0" maxOccurs="1"/>
2538     <xsd:element name="band1V" type="CT_TablePartStyle" minOccurs="0" maxOccurs="1"/>
2539     <xsd:element name="band2V" type="CT_TablePartStyle" minOccurs="0" maxOccurs="1"/>
2540     <xsd:element name="lastCol" type="CT_TablePartStyle" minOccurs="0" maxOccurs="1"/>
2541     <xsd:element name="firstCol" type="CT_TablePartStyle" minOccurs="0" maxOccurs="1"/>
2542     <xsd:element name="lastRow" type="CT_TablePartStyle" minOccurs="0" maxOccurs="1"/>
2543     <xsd:element name="seCell" type="CT_TablePartStyle" minOccurs="0" maxOccurs="1"/>
2544     <xsd:element name="swCell" type="CT_TablePartStyle" minOccurs="0" maxOccurs="1"/>
2545     <xsd:element name="firstRow" type="CT_TablePartStyle" minOccurs="0" maxOccurs="1"/>
2546     <xsd:element name="neCell" type="CT_TablePartStyle" minOccurs="0" maxOccurs="1"/>
2547     <xsd:element name="nwCell" type="CT_TablePartStyle" minOccurs="0" maxOccurs="1"/>
2548     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
2549   </xsd:sequence>
2550   <xsd:attribute name="styleId" type="s:ST_Guid" use="required"/>
2551   <xsd:attribute name="styleName" type="xsd:string" use="required"/>
2552 </xsd:complexType>
2553 <xsd:complexType name="CT_TableStyleList">
2554   <xsd:sequence>
2555     <xsd:element name="tblStyle" type="CT_TableStyle" minOccurs="0" maxOccurs="unbounded"/>
2556   </xsd:sequence>
2557   <xsd:attribute name="def" type="s:ST_Guid" use="required"/>
2558 </xsd:complexType>
2559 <xsd:element name="tblStyleLst" type="CT_TableStyleList"/>
2560 <xsd:complexType name="CT_TextParagraph">
2561   <xsd:sequence>
2562     <xsd:element name="pPr" type="CT_TextParagraphProperties" minOccurs="0" maxOccurs="1"/>
2563     <xsd:group ref="EG_TextRun" minOccurs="0" maxOccurs="unbounded"/>
2564     <xsd:element name="endParaRPr" type="CT_TextCharacterProperties" minOccurs="0"
2565       maxOccurs="1"/>
2566   </xsd:sequence>
2567 </xsd:complexType>
2568 <xsd:simpleType name="ST_TextAnchoringType">
2569   <xsd:restriction base="xsd:token">
2570     <xsd:enumeration value="t"/>
2571     <xsd:enumeration value="ctr"/>
2572     <xsd:enumeration value="b"/>
2573     <xsd:enumeration value="just"/>
2574     <xsd:enumeration value="dist"/>
2575   </xsd:restriction>
2576 </xsd:simpleType>
2577 <xsd:simpleType name="ST_TextVertOverflowType">
2578   <xsd:restriction base="xsd:token">

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2579         <xsd:enumeration value="overflow"/>
2580         <xsd:enumeration value="ellipsis"/>
2581         <xsd:enumeration value="clip"/>
2582     </xsd:restriction>
2583 </xsd:simpleType>
2584 <xsd:simpleType name="ST_TextHorzOverflowType">
2585     <xsd:restriction base="xsd:token">
2586         <xsd:enumeration value="overflow"/>
2587         <xsd:enumeration value="clip"/>
2588     </xsd:restriction>
2589 </xsd:simpleType>
2590 <xsd:simpleType name="ST_TextVerticalType">
2591     <xsd:restriction base="xsd:token">
2592         <xsd:enumeration value="horz"/>
2593         <xsd:enumeration value="vert"/>
2594         <xsd:enumeration value="vert270"/>
2595         <xsd:enumeration value="wordArtVert"/>
2596         <xsd:enumeration value="eaVert"/>
2597         <xsd:enumeration value="mongolianVert"/>
2598         <xsd:enumeration value="wordArtVertRtl"/>
2599     </xsd:restriction>
2600 </xsd:simpleType>
2601 <xsd:simpleType name="ST_TextWrappingType">
2602     <xsd:restriction base="xsd:token">
2603         <xsd:enumeration value="none"/>
2604         <xsd:enumeration value="square"/>
2605     </xsd:restriction>
2606 </xsd:simpleType>
2607 <xsd:simpleType name="ST_TextColumnCount">
2608     <xsd:restriction base="xsd:int">
2609         <xsd:minInclusive value="1"/>
2610         <xsd:maxInclusive value="16"/>
2611     </xsd:restriction>
2612 </xsd:simpleType>
2613 <xsd:complexType name="CT_TextListStyle">
2614     <xsd:sequence>
2615         <xsd:element name="defPPr" type="CT_TextParagraphProperties" minOccurs="0" maxOccurs="1"/>
2616         <xsd:element name="lv11pPr" type="CT_TextParagraphProperties" minOccurs="0"
2617             maxOccurs="1"/>
2618         <xsd:element name="lv12pPr" type="CT_TextParagraphProperties" minOccurs="0"
2619             maxOccurs="1"/>
2620         <xsd:element name="lv13pPr" type="CT_TextParagraphProperties" minOccurs="0"
2621             maxOccurs="1"/>
2622         <xsd:element name="lv14pPr" type="CT_TextParagraphProperties" minOccurs="0"
2623             maxOccurs="1"/>
2624         <xsd:element name="lv15pPr" type="CT_TextParagraphProperties" minOccurs="0"
2625             maxOccurs="1"/>
2626         <xsd:element name="lv16pPr" type="CT_TextParagraphProperties" minOccurs="0"
2627             maxOccurs="1"/>
2628         <xsd:element name="lv17pPr" type="CT_TextParagraphProperties" minOccurs="0"
2629             maxOccurs="1"/>
2630         <xsd:element name="lv18pPr" type="CT_TextParagraphProperties" minOccurs="0"
2631             maxOccurs="1"/>

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2632     <xsd:element name="lv19pPr" type="CT_TextParagraphProperties" minOccurs="0"
2633         maxOccurs="1"/>
2634     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
2635 </xsd:sequence>
2636 </xsd:complexType>
2637 <xsd:simpleType name="ST_TextFontScalePercentOrPercentString">
2638     <xsd:union memberTypes="s:ST_Percentage"/>
2639 </xsd:simpleType>
2640 <xsd:complexType name="CT_TextNormalAutofit">
2641     <xsd:attribute name="fontScale" type="ST_TextFontScalePercentOrPercentString" use="optional"
2642         default="100%"/>
2643     <xsd:attribute name="lnSpcReduction" type="ST_TextSpacingPercentOrPercentString"
2644         use="optional" default="0%"/>
2645 </xsd:complexType>
2646 <xsd:complexType name="CT_TextShapeAutofit"/>
2647 <xsd:complexType name="CT_TextNoAutofit"/>
2648 <xsd:group name="EG_TextAutofit">
2649     <xsd:choice>
2650         <xsd:element name="noAutofit" type="CT_TextNoAutofit"/>
2651         <xsd:element name="normAutofit" type="CT_TextNormalAutofit"/>
2652         <xsd:element name="spAutoFit" type="CT_TextShapeAutofit"/>
2653     </xsd:choice>
2654 </xsd:group>
2655 <xsd:complexType name="CT_TextBodyProperties">
2656     <xsd:sequence>
2657         <xsd:element name="prstTxWarp" type="CT_PresetTextShape" minOccurs="0" maxOccurs="1"/>
2658         <xsd:group ref="EG_TextAutofit" minOccurs="0" maxOccurs="1"/>
2659         <xsd:element name="scene3d" type="CT_Scene3D" minOccurs="0" maxOccurs="1"/>
2660         <xsd:group ref="EG_Text3D" minOccurs="0" maxOccurs="1"/>
2661         <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
2662     </xsd:sequence>
2663     <xsd:attribute name="rot" type="ST_Angle" use="optional"/>
2664     <xsd:attribute name="spcFirstLastPara" type="xsd:boolean" use="optional"/>
2665     <xsd:attribute name="vertOverflow" type="ST_TextVertOverflowType" use="optional"/>
2666     <xsd:attribute name="horzOverflow" type="ST_TextHorzOverflowType" use="optional"/>
2667     <xsd:attribute name="vert" type="ST_TextVerticalType" use="optional"/>
2668     <xsd:attribute name="wrap" type="ST_TextWrappingType" use="optional"/>
2669     <xsd:attribute name="lIns" type="ST_Coordinate32" use="optional"/>
2670     <xsd:attribute name="tIns" type="ST_Coordinate32" use="optional"/>
2671     <xsd:attribute name="rIns" type="ST_Coordinate32" use="optional"/>
2672     <xsd:attribute name="bIns" type="ST_Coordinate32" use="optional"/>
2673     <xsd:attribute name="numCol" type="ST_TextColumnCount" use="optional"/>
2674     <xsd:attribute name="spcCol" type="ST_PositiveCoordinate32" use="optional"/>
2675     <xsd:attribute name="rtlCol" type="xsd:boolean" use="optional"/>
2676     <xsd:attribute name="fromWordArt" type="xsd:boolean" use="optional"/>
2677     <xsd:attribute name="anchor" type="ST_TextAnchoringType" use="optional"/>
2678     <xsd:attribute name="anchorCtr" type="xsd:boolean" use="optional"/>
2679     <xsd:attribute name="forceAA" type="xsd:boolean" use="optional"/>
2680     <xsd:attribute name="upright" type="xsd:boolean" use="optional" default="false"/>
2681     <xsd:attribute name="compatLnSpc" type="xsd:boolean" use="optional"/>
2682 </xsd:complexType>
2683 <xsd:complexType name="CT_TextBody">
2684     <xsd:sequence>

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2685     <xsd:element name="bodyPr" type="CT_TextBodyProperties" minOccurs="1" maxOccurs="1"/>
2686     <xsd:element name="lstStyle" type="CT_TextListStyle" minOccurs="0" maxOccurs="1"/>
2687     <xsd:element name="p" type="CT_TextParagraph" minOccurs="1" maxOccurs="unbounded"/>
2688   </xsd:sequence>
2689 </xsd:complexType>
2690 <xsd:simpleType name="ST_TextBulletStartAtNum">
2691   <xsd:restriction base="xsd:int">
2692     <xsd:minInclusive value="1"/>
2693     <xsd:maxInclusive value="32767"/>
2694   </xsd:restriction>
2695 </xsd:simpleType>
2696 <xsd:simpleType name="ST_TextAutonumberScheme">
2697   <xsd:restriction base="xsd:token">
2698     <xsd:enumeration value="alphaLcParenBoth"/>
2699     <xsd:enumeration value="alphaUcParenBoth"/>
2700     <xsd:enumeration value="alphaLcParenR"/>
2701     <xsd:enumeration value="alphaUcParenR"/>
2702     <xsd:enumeration value="alphaLcPeriod"/>
2703     <xsd:enumeration value="alphaUcPeriod"/>
2704     <xsd:enumeration value="arabicParenBoth"/>
2705     <xsd:enumeration value="arabicParenR"/>
2706     <xsd:enumeration value="arabicPeriod"/>
2707     <xsd:enumeration value="arabicPlain"/>
2708     <xsd:enumeration value="romanLcParenBoth"/>
2709     <xsd:enumeration value="romanUcParenBoth"/>
2710     <xsd:enumeration value="romanLcParenR"/>
2711     <xsd:enumeration value="romanUcParenR"/>
2712     <xsd:enumeration value="romanLcPeriod"/>
2713     <xsd:enumeration value="romanUcPeriod"/>
2714     <xsd:enumeration value="circleNumDbPlain"/>
2715     <xsd:enumeration value="circleNumWdBlackPlain"/>
2716     <xsd:enumeration value="circleNumWdWhitePlain"/>
2717     <xsd:enumeration value="arabicDbPeriod"/>
2718     <xsd:enumeration value="arabicDbPlain"/>
2719     <xsd:enumeration value="ea1ChsPeriod"/>
2720     <xsd:enumeration value="ea1ChsPlain"/>
2721     <xsd:enumeration value="ea1ChtPeriod"/>
2722     <xsd:enumeration value="ea1ChtPlain"/>
2723     <xsd:enumeration value="ea1JpnChsDbPeriod"/>
2724     <xsd:enumeration value="ea1JpnKorPlain"/>
2725     <xsd:enumeration value="ea1JpnKorPeriod"/>
2726     <xsd:enumeration value="arabic1Minus"/>
2727     <xsd:enumeration value="arabic2Minus"/>
2728     <xsd:enumeration value="hebrew2Minus"/>
2729     <xsd:enumeration value="thaiAlphaPeriod"/>
2730     <xsd:enumeration value="thaiAlphaParenR"/>
2731     <xsd:enumeration value="thaiAlphaParenBoth"/>
2732     <xsd:enumeration value="thaiNumPeriod"/>
2733     <xsd:enumeration value="thaiNumParenR"/>
2734     <xsd:enumeration value="thaiNumParenBoth"/>
2735     <xsd:enumeration value="hindiAlphaPeriod"/>
2736     <xsd:enumeration value="hindiNumPeriod"/>
2737     <xsd:enumeration value="hindiNumParenR"/>

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2738     <xsd:enumeration value="hindiAlpha1Period"/>
2739   </xsd:restriction>
2740 </xsd:simpleType>
2741 <xsd:complexType name="CT_TextBulletColorFollowText"/>
2742 <xsd:group name="EG_TextBulletColor">
2743   <xsd:choice>
2744     <xsd:element name="buClrTx" type="CT_TextBulletColorFollowText" minOccurs="1"
2745       maxOccurs="1"/>
2746     <xsd:element name="buClr" type="CT_Color" minOccurs="1" maxOccurs="1"/>
2747   </xsd:choice>
2748 </xsd:group>
2749 <xsd:simpleType name="ST_TextBulletSize">
2750   <xsd:union memberTypes="ST_TextBulletSizePercent"/>
2751 </xsd:simpleType>
2752 <xsd:simpleType name="ST_TextBulletSizePercent">
2753   <xsd:restriction base="xsd:string">
2754     <xsd:pattern value="0*((2[5-9])|([3-9][0-9])|([1-3][0-9][0-9])|400)%"/>
2755   </xsd:restriction>
2756 </xsd:simpleType>
2757 <xsd:complexType name="CT_TextBulletSizeFollowText"/>
2758 <xsd:complexType name="CT_TextBulletSizePercent">
2759   <xsd:attribute name="val" type="ST_TextBulletSizePercent" use="required"/>
2760 </xsd:complexType>
2761 <xsd:complexType name="CT_TextBulletSizePoint">
2762   <xsd:attribute name="val" type="ST_TextFontSize" use="required"/>
2763 </xsd:complexType>
2764 <xsd:group name="EG_TextBulletSize">
2765   <xsd:choice>
2766     <xsd:element name="buSzTx" type="CT_TextBulletSizeFollowText"/>
2767     <xsd:element name="buSzPct" type="CT_TextBulletSizePercent"/>
2768     <xsd:element name="buSzPts" type="CT_TextBulletSizePoint"/>
2769   </xsd:choice>
2770 </xsd:group>
2771 <xsd:complexType name="CT_TextBulletTypefaceFollowText"/>
2772 <xsd:group name="EG_TextBulletTypeface">
2773   <xsd:choice>
2774     <xsd:element name="buFontTx" type="CT_TextBulletTypefaceFollowText"/>
2775     <xsd:element name="buFont" type="CT_TextFont"/>
2776   </xsd:choice>
2777 </xsd:group>
2778 <xsd:complexType name="CT_TextAutonumberBullet">
2779   <xsd:attribute name="type" type="ST_TextAutonumberScheme" use="required"/>
2780   <xsd:attribute name="startAt" type="ST_TextBulletStartAtNum" use="optional" default="1"/>
2781 </xsd:complexType>
2782 <xsd:complexType name="CT_TextCharBullet">
2783   <xsd:attribute name="char" type="xsd:string" use="required"/>
2784 </xsd:complexType>
2785 <xsd:complexType name="CT_TextBlipBullet">
2786   <xsd:sequence>
2787     <xsd:element name="blip" type="CT_Blip" minOccurs="1" maxOccurs="1"/>
2788   </xsd:sequence>
2789 </xsd:complexType>
2790 <xsd:complexType name="CT_TextNoBullet"/>

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2791 <xsd:group name="EG_TextBullet">
2792   <xsd:choice>
2793     <xsd:element name="buNone" type="CT_TextNoBullet"/>
2794     <xsd:element name="buAutoNum" type="CT_TextAutonumberBullet"/>
2795     <xsd:element name="buChar" type="CT_TextCharBullet"/>
2796     <xsd:element name="buBlip" type="CT_TextBlipBullet"/>
2797   </xsd:choice>
2798 </xsd:group>
2799 <xsd:simpleType name="ST_TextPoint">
2800   <xsd:union memberTypes="ST_TextPointUnqualified s:ST_UniversalMeasure"/>
2801 </xsd:simpleType>
2802 <xsd:simpleType name="ST_TextPointUnqualified">
2803   <xsd:restriction base="xsd:int">
2804     <xsd:minInclusive value="-400000"/>
2805     <xsd:maxInclusive value="400000"/>
2806   </xsd:restriction>
2807 </xsd:simpleType>
2808 <xsd:simpleType name="ST_TextNonNegativePoint">
2809   <xsd:restriction base="xsd:int">
2810     <xsd:minInclusive value="0"/>
2811     <xsd:maxInclusive value="400000"/>
2812   </xsd:restriction>
2813 </xsd:simpleType>
2814 <xsd:simpleType name="ST_TextFontSize">
2815   <xsd:restriction base="xsd:int">
2816     <xsd:minInclusive value="100"/>
2817     <xsd:maxInclusive value="400000"/>
2818   </xsd:restriction>
2819 </xsd:simpleType>
2820 <xsd:simpleType name="ST_TextTypeface">
2821   <xsd:restriction base="xsd:string"/>
2822 </xsd:simpleType>
2823 <xsd:simpleType name="ST_PitchFamily">
2824   <xsd:restriction base="xsd:byte">
2825     <xsd:enumeration value="00"/>
2826     <xsd:enumeration value="01"/>
2827     <xsd:enumeration value="02"/>
2828     <xsd:enumeration value="16"/>
2829     <xsd:enumeration value="17"/>
2830     <xsd:enumeration value="18"/>
2831     <xsd:enumeration value="32"/>
2832     <xsd:enumeration value="33"/>
2833     <xsd:enumeration value="34"/>
2834     <xsd:enumeration value="48"/>
2835     <xsd:enumeration value="49"/>
2836     <xsd:enumeration value="50"/>
2837     <xsd:enumeration value="64"/>
2838     <xsd:enumeration value="65"/>
2839     <xsd:enumeration value="66"/>
2840     <xsd:enumeration value="80"/>
2841     <xsd:enumeration value="81"/>
2842     <xsd:enumeration value="82"/>
2843   </xsd:restriction>

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2844 </xsd:simpleType>
2845 <xsd:complexType name="CT_TextFont">
2846   <xsd:attribute name="typeface" type="ST_TextTypeface" use="required"/>
2847   <xsd:attribute name="panose" type="s:ST_Panose" use="optional"/>
2848   <xsd:attribute name="pitchFamily" type="ST_PitchFamily" use="optional" default="0"/>
2849   <xsd:attribute name="charset" type="xsd:byte" use="optional" default="1"/>
2850 </xsd:complexType>
2851 <xsd:simpleType name="ST_TextUnderlineType">
2852   <xsd:restriction base="xsd:token">
2853     <xsd:enumeration value="none"/>
2854     <xsd:enumeration value="words"/>
2855     <xsd:enumeration value="sng"/>
2856     <xsd:enumeration value="dbl"/>
2857     <xsd:enumeration value="heavy"/>
2858     <xsd:enumeration value="dotted"/>
2859     <xsd:enumeration value="dottedHeavy"/>
2860     <xsd:enumeration value="dash"/>
2861     <xsd:enumeration value="dashHeavy"/>
2862     <xsd:enumeration value="dashLong"/>
2863     <xsd:enumeration value="dashLongHeavy"/>
2864     <xsd:enumeration value="dotDash"/>
2865     <xsd:enumeration value="dotDashHeavy"/>
2866     <xsd:enumeration value="dotDotDash"/>
2867     <xsd:enumeration value="dotDotDashHeavy"/>
2868     <xsd:enumeration value="wavy"/>
2869     <xsd:enumeration value="wavyHeavy"/>
2870     <xsd:enumeration value="wavyDb1"/>
2871   </xsd:restriction>
2872 </xsd:simpleType>
2873 <xsd:complexType name="CT_TextUnderlineLineFollowText"/>
2874 <xsd:complexType name="CT_TextUnderlineFillFollowText"/>
2875 <xsd:complexType name="CT_TextUnderlineFillGroupWrapper">
2876   <xsd:group ref="EG_FillProperties" minOccurs="1" maxOccurs="1"/>
2877 </xsd:complexType>
2878 <xsd:group name="EG_TextUnderlineLine">
2879   <xsd:choice>
2880     <xsd:element name="uLnTx" type="CT_TextUnderlineLineFollowText"/>
2881     <xsd:element name="uLn" type="CT_LineProperties" minOccurs="0" maxOccurs="1"/>
2882   </xsd:choice>
2883 </xsd:group>
2884 <xsd:group name="EG_TextUnderlineFill">
2885   <xsd:choice>
2886     <xsd:element name="uFillTx" type="CT_TextUnderlineFillFollowText"/>
2887     <xsd:element name="uFill" type="CT_TextUnderlineFillGroupWrapper"/>
2888   </xsd:choice>
2889 </xsd:group>
2890 <xsd:simpleType name="ST_TextStrikeType">
2891   <xsd:restriction base="xsd:token">
2892     <xsd:enumeration value="noStrike"/>
2893     <xsd:enumeration value="sngStrike"/>
2894     <xsd:enumeration value="dblStrike"/>
2895   </xsd:restriction>
2896 </xsd:simpleType>

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2897 <xsd:simpleType name="ST_TextCapsType">
2898   <xsd:restriction base="xsd:token">
2899     <xsd:enumeration value="none"/>
2900     <xsd:enumeration value="small"/>
2901     <xsd:enumeration value="all"/>
2902   </xsd:restriction>
2903 </xsd:simpleType>
2904 <xsd:complexType name="CT_TextCharacterProperties">
2905   <xsd:sequence>
2906     <xsd:element name="ln" type="CT_LineProperties" minOccurs="0" maxOccurs="1"/>
2907     <xsd:group ref="EG_FillProperties" minOccurs="0" maxOccurs="1"/>
2908     <xsd:group ref="EG_EffectProperties" minOccurs="0" maxOccurs="1"/>
2909     <xsd:element name="highlight" type="CT_Color" minOccurs="0" maxOccurs="1"/>
2910     <xsd:group ref="EG_TextUnderlineLine" minOccurs="0" maxOccurs="1"/>
2911     <xsd:group ref="EG_TextUnderlineFill" minOccurs="0" maxOccurs="1"/>
2912     <xsd:element name="latin" type="CT_TextFont" minOccurs="0" maxOccurs="1"/>
2913     <xsd:element name="ea" type="CT_TextFont" minOccurs="0" maxOccurs="1"/>
2914     <xsd:element name="cs" type="CT_TextFont" minOccurs="0" maxOccurs="1"/>
2915     <xsd:element name="sym" type="CT_TextFont" minOccurs="0" maxOccurs="1"/>
2916     <xsd:element name="hlinkClick" type="CT_Hyperlink" minOccurs="0" maxOccurs="1"/>
2917     <xsd:element name="hlinkMouseOver" type="CT_Hyperlink" minOccurs="0" maxOccurs="1"/>
2918     <xsd:element name="rtl" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
2919     <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
2920   </xsd:sequence>
2921   <xsd:attribute name="kumimoji" type="xsd:boolean" use="optional"/>
2922   <xsd:attribute name="lang" type="s:ST_Lang" use="optional"/>
2923   <xsd:attribute name="altLang" type="s:ST_Lang" use="optional"/>
2924   <xsd:attribute name="sz" type="ST_TextFontSize" use="optional"/>
2925   <xsd:attribute name="b" type="xsd:boolean" use="optional"/>
2926   <xsd:attribute name="i" type="xsd:boolean" use="optional"/>
2927   <xsd:attribute name="u" type="ST_TextUnderlineType" use="optional"/>
2928   <xsd:attribute name="strike" type="ST_TextStrikeType" use="optional"/>
2929   <xsd:attribute name="kern" type="ST_TextNonNegativePoint" use="optional"/>
2930   <xsd:attribute name="cap" type="ST_TextCapsType" use="optional"/>
2931   <xsd:attribute name="spc" type="ST_TextPoint" use="optional"/>
2932   <xsd:attribute name="normalizeH" type="xsd:boolean" use="optional"/>
2933   <xsd:attribute name="baseline" type="ST_Percentage" use="optional"/>
2934   <xsd:attribute name="noProof" type="xsd:boolean" use="optional"/>
2935   <xsd:attribute name="dirty" type="xsd:boolean" use="optional" default="true"/>
2936   <xsd:attribute name="err" type="xsd:boolean" use="optional" default="false"/>
2937   <xsd:attribute name="smtClean" type="xsd:boolean" use="optional" default="true"/>
2938   <xsd:attribute name="smtId" type="xsd:unsignedInt" use="optional" default="0"/>
2939   <xsd:attribute name="bmk" type="xsd:string" use="optional"/>
2940 </xsd:complexType>
2941 <xsd:complexType name="CT_Boolean">
2942   <xsd:attribute name="val" type="s:ST_OnOff" default="0"/>
2943 </xsd:complexType>
2944 <xsd:simpleType name="ST_TextSpacingPoint">
2945   <xsd:restriction base="xsd:int">
2946     <xsd:minInclusive value="0"/>
2947     <xsd:maxInclusive value="158400"/>
2948   </xsd:restriction>
2949 </xsd:simpleType>

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2950 <xsd:simpleType name="ST_TextSpacingPercentOrPercentString">
2951   <xsd:union memberTypes="s:ST_Percentage"/>
2952 </xsd:simpleType>
2953 <xsd:complexType name="CT_TextSpacingPercent">
2954   <xsd:attribute name="val" type="ST_TextSpacingPercentOrPercentString" use="required"/>
2955 </xsd:complexType>
2956 <xsd:complexType name="CT_TextSpacingPoint">
2957   <xsd:attribute name="val" type="ST_TextSpacingPoint" use="required"/>
2958 </xsd:complexType>
2959 <xsd:simpleType name="ST_TextMargin">
2960   <xsd:restriction base="ST_Coordinate32Unqualified">
2961     <xsd:minInclusive value="0"/>
2962     <xsd:maxInclusive value="51206400"/>
2963   </xsd:restriction>
2964 </xsd:simpleType>
2965 <xsd:simpleType name="ST_TextIndent">
2966   <xsd:restriction base="ST_Coordinate32Unqualified">
2967     <xsd:minInclusive value="-51206400"/>
2968     <xsd:maxInclusive value="51206400"/>
2969   </xsd:restriction>
2970 </xsd:simpleType>
2971 <xsd:simpleType name="ST_TextTabAlignType">
2972   <xsd:restriction base="xsd:token">
2973     <xsd:enumeration value="l"/>
2974     <xsd:enumeration value="ctr"/>
2975     <xsd:enumeration value="r"/>
2976     <xsd:enumeration value="dec"/>
2977   </xsd:restriction>
2978 </xsd:simpleType>
2979 <xsd:complexType name="CT_TextTabStop">
2980   <xsd:attribute name="pos" type="ST_Coordinate32" use="optional"/>
2981   <xsd:attribute name="align" type="ST_TextTabAlignType" use="optional"/>
2982 </xsd:complexType>
2983 <xsd:complexType name="CT_TextTabStopList">
2984   <xsd:sequence>
2985     <xsd:element name="tab" type="CT_TextTabStop" minOccurs="0" maxOccurs="32"/>
2986   </xsd:sequence>
2987 </xsd:complexType>
2988 <xsd:complexType name="CT_TextLineBreak">
2989   <xsd:sequence>
2990     <xsd:element name="rPr" type="CT_TextCharacterProperties" minOccurs="0" maxOccurs="1"/>
2991   </xsd:sequence>
2992 </xsd:complexType>
2993 <xsd:complexType name="CT_TextSpacing">
2994   <xsd:choice>
2995     <xsd:element name="spcPct" type="CT_TextSpacingPercent"/>
2996     <xsd:element name="spcPts" type="CT_TextSpacingPoint"/>
2997   </xsd:choice>
2998 </xsd:complexType>
2999 <xsd:simpleType name="ST_TextAlignType">
3000   <xsd:restriction base="xsd:token">
3001     <xsd:enumeration value="l"/>
3002     <xsd:enumeration value="ctr"/>

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3003         <xsd:enumeration value="r"/>
3004         <xsd:enumeration value="just"/>
3005         <xsd:enumeration value="justLow"/>
3006         <xsd:enumeration value="dist"/>
3007         <xsd:enumeration value="thaiDist"/>
3008     </xsd:restriction>
3009 </xsd:simpleType>
3010 <xsd:simpleType name="ST_TextFontAlignType">
3011     <xsd:restriction base="xsd:token">
3012         <xsd:enumeration value="auto"/>
3013         <xsd:enumeration value="t"/>
3014         <xsd:enumeration value="ctr"/>
3015         <xsd:enumeration value="base"/>
3016         <xsd:enumeration value="b"/>
3017     </xsd:restriction>
3018 </xsd:simpleType>
3019 <xsd:simpleType name="ST_TextIndentLevelType">
3020     <xsd:restriction base="xsd:int">
3021         <xsd:minInclusive value="0"/>
3022         <xsd:maxInclusive value="8"/>
3023     </xsd:restriction>
3024 </xsd:simpleType>
3025 <xsd:complexType name="CT_TextParagraphProperties">
3026     <xsd:sequence>
3027         <xsd:element name="lnSpC" type="CT_TextSpacing" minOccurs="0" maxOccurs="1"/>
3028         <xsd:element name="spcBef" type="CT_TextSpacing" minOccurs="0" maxOccurs="1"/>
3029         <xsd:element name="spcAft" type="CT_TextSpacing" minOccurs="0" maxOccurs="1"/>
3030         <xsd:group ref="EG_TextBulletColor" minOccurs="0" maxOccurs="1"/>
3031         <xsd:group ref="EG_TextBulletSize" minOccurs="0" maxOccurs="1"/>
3032         <xsd:group ref="EG_TextBulletTypeface" minOccurs="0" maxOccurs="1"/>
3033         <xsd:group ref="EG_TextBullet" minOccurs="0" maxOccurs="1"/>
3034         <xsd:element name="tabLst" type="CT_TextTabStopList" minOccurs="0" maxOccurs="1"/>
3035         <xsd:element name="defRPr" type="CT_TextCharacterProperties" minOccurs="0" maxOccurs="1"/>
3036         <xsd:element name="extLst" type="CT_OfficeArtExtensionList" minOccurs="0" maxOccurs="1"/>
3037     </xsd:sequence>
3038     <xsd:attribute name="marL" type="ST_TextMargin" use="optional"/>
3039     <xsd:attribute name="marR" type="ST_TextMargin" use="optional"/>
3040     <xsd:attribute name="lvl" type="ST_TextIndentLevelType" use="optional"/>
3041     <xsd:attribute name="indent" type="ST_TextIndent" use="optional"/>
3042     <xsd:attribute name="algn" type="ST_TextAlignType" use="optional"/>
3043     <xsd:attribute name="defTabSz" type="ST_Coordinate32" use="optional"/>
3044     <xsd:attribute name="rtl" type="xsd:boolean" use="optional"/>
3045     <xsd:attribute name="eaLnBrk" type="xsd:boolean" use="optional"/>
3046     <xsd:attribute name="fontAlgn" type="ST_TextFontAlignType" use="optional"/>
3047     <xsd:attribute name="latinLnBrk" type="xsd:boolean" use="optional"/>
3048     <xsd:attribute name="hangingPunct" type="xsd:boolean" use="optional"/>
3049 </xsd:complexType>
3050 <xsd:complexType name="CT_TextField">
3051     <xsd:sequence>
3052         <xsd:element name="rPr" type="CT_TextCharacterProperties" minOccurs="0" maxOccurs="1"/>
3053         <xsd:element name="pPr" type="CT_TextParagraphProperties" minOccurs="0" maxOccurs="1"/>
3054         <xsd:element name="t" type="xsd:string" minOccurs="0" maxOccurs="1"/>
3055     </xsd:sequence>

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3056     <xsd:attribute name="id" type="s:ST_Guid" use="required"/>
3057     <xsd:attribute name="type" type="xsd:string" use="optional"/>
3058   </xsd:complexType>
3059   <xsd:group name="EG_TextRun">
3060     <xsd:choice>
3061       <xsd:element name="r" type="CT_RegularTextRun"/>
3062       <xsd:element name="br" type="CT_TextLineBreak"/>
3063       <xsd:element name="fld" type="CT_TextField"/>
3064     </xsd:choice>
3065   </xsd:group>
3066   <xsd:complexType name="CT_RegularTextRun">
3067     <xsd:sequence>
3068       <xsd:element name="rPr" type="CT_TextCharacterProperties" minOccurs="0" maxOccurs="1"/>
3069       <xsd:element name="t" type="xsd:string" minOccurs="1" maxOccurs="1"/>
3070     </xsd:sequence>
3071   </xsd:complexType>
3072 </xsd:schema>

```

A.4.2 DrawingML – Picture

This schema is available in the file dml-picture.xsd.

```

1  <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
2    xmlns="http://purl.oclc.org/ooxml/drawingml/picture"
3    xmlns:a="http://purl.oclc.org/ooxml/drawingml/main" elementFormDefault="qualified"
4    targetNamespace="http://purl.oclc.org/ooxml/drawingml/picture">
5    <xsd:import namespace="http://purl.oclc.org/ooxml/drawingml/main" schemaLocation="dml-main.xsd"/>
6    <xsd:complexType name="CT_PictureNonVisual">
7      <xsd:sequence>
8        <xsd:element name="cNvPr" type="a:CT_NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
9        <xsd:element name="cNvPicPr" type="a:CT_NonVisualPictureProperties" minOccurs="1"
10          maxOccurs="1"/>
11      </xsd:sequence>
12    </xsd:complexType>
13    <xsd:complexType name="CT_Picture">
14      <xsd:sequence minOccurs="1" maxOccurs="1">
15        <xsd:element name="nvPicPr" type="CT_PictureNonVisual" minOccurs="1" maxOccurs="1"/>
16        <xsd:element name="blipFill" type="a:CT_BlipFillProperties" minOccurs="1" maxOccurs="1"/>
17        <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="1" maxOccurs="1"/>
18      </xsd:sequence>
19    </xsd:complexType>
20    <xsd:element name="pic" type="CT_Picture"/>
21 </xsd:schema>

```

A.4.3 DrawingML - Locked Canvas

This schema is available in the file dml-lockedCanvas.xsd.

```

1  <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
2    xmlns="http://purl.oclc.org/ooxml/drawingml/lockedCanvas"
3    xmlns:a="http://purl.oclc.org/ooxml/drawingml/main"
4    xmlns:r="http://purl.oclc.org/ooxml/officeDocument/relationships" elementFormDefault="qualified"
5    targetNamespace="http://purl.oclc.org/ooxml/drawingml/lockedCanvas">

```



```

6      <xsd:import namespace="http://purl.oclc.org/ooxml/drawingml/main" schemaLocation="dml-main.xsd"/>
7      <xsd:element name="lockedCanvas" type="a:CT_GvmlGroupShape"/>
8  </xsd:schema>

```

A.4.4 DrawingML - WordprocessingML Drawing

This schema is available in the file dml-wordprocessingDrawing.xsd.

```

1  <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
2  xmlns:a="http://purl.oclc.org/ooxml/drawingml/main"
3  xmlns:w="http://purl.oclc.org/ooxml/wordprocessingml/main"
4  xmlns:dpct="http://purl.oclc.org/ooxml/drawingml/picture"
5  xmlns:r="http://purl.oclc.org/ooxml/officeDocument/relationships"
6  xmlns="http://purl.oclc.org/ooxml/drawingml/wordprocessingDrawing"
7  targetNamespace="http://purl.oclc.org/ooxml/drawingml/wordprocessingDrawing"
8  elementFormDefault="qualified">
9
9      <xsd:import namespace="http://purl.oclc.org/ooxml/drawingml/main" schemaLocation="dml-main.xsd"/>
10     <xsd:import schemaLocation="wml.xsd"
11       namespace="http://purl.oclc.org/ooxml/wordprocessingml/main"/>
12     <xsd:import namespace="http://purl.oclc.org/ooxml/drawingml/picture"
13       schemaLocation="dml-picture.xsd"/>
14     <xsd:import namespace="http://purl.oclc.org/ooxml/officeDocument/relationships"
15       schemaLocation="shared-relationshipReference.xsd"/>
16     <xsd:complexType name="CT_EffectExtent">
17       <xsd:attribute name="l" type="a:ST_Coordinate" use="required"/>
18       <xsd:attribute name="t" type="a:ST_Coordinate" use="required"/>
19       <xsd:attribute name="r" type="a:ST_Coordinate" use="required"/>
20       <xsd:attribute name="b" type="a:ST_Coordinate" use="required"/>
21     </xsd:complexType>
22     <xsd:simpleType name="ST_WrapDistance">
23       <xsd:restriction base="xsd:unsignedInt"/>
24     </xsd:simpleType>
25     <xsd:complexType name="CT_Inline">
26       <xsd:sequence>
27         <xsd:element name="extent" type="a:CT_PositiveSize2D"/>
28         <xsd:element name="effectExtent" type="CT_EffectExtent" minOccurs="0"/>
29         <xsd:element name="docPr" type="a:CT_NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
30         <xsd:element name="cNvGraphicFramePr" type="a:CT_NonVisualGraphicFrameProperties"
31           minOccurs="0" maxOccurs="1"/>
32         <xsd:element ref="a:graphic" minOccurs="1" maxOccurs="1"/>
33       </xsd:sequence>
34       <xsd:attribute name="distT" type="ST_WrapDistance" use="optional"/>
35       <xsd:attribute name="distB" type="ST_WrapDistance" use="optional"/>
36       <xsd:attribute name="distL" type="ST_WrapDistance" use="optional"/>
37       <xsd:attribute name="distR" type="ST_WrapDistance" use="optional"/>
38     </xsd:complexType>
39     <xsd:simpleType name="ST_WrapText">
40       <xsd:restriction base="xsd:token">
41         <xsd:enumeration value="bothSides"/>
42         <xsd:enumeration value="left"/>
43         <xsd:enumeration value="right"/>
44         <xsd:enumeration value="largest"/>

```

```

45     </xsd:restriction>
46 </xsd:simpleType>
47 <xsd:complexType name="CT_WrapPath">
48     <xsd:sequence>
49         <xsd:element name="start" type="a:CT_Point2D" minOccurs="1" maxOccurs="1"/>
50         <xsd:element name="lineTo" type="a:CT_Point2D" minOccurs="2" maxOccurs="unbounded"/>
51     </xsd:sequence>
52     <xsd:attribute name="edited" type="xsd:boolean" use="optional"/>
53 </xsd:complexType>
54 <xsd:complexType name="CT_WrapNone"/>
55 <xsd:complexType name="CT_WrapSquare">
56     <xsd:sequence>
57         <xsd:element name="effectExtent" type="CT_EffectExtent" minOccurs="0"/>
58     </xsd:sequence>
59     <xsd:attribute name="wrapText" type="ST_WrapText" use="required"/>
60     <xsd:attribute name="distT" type="ST_WrapDistance" use="optional"/>
61     <xsd:attribute name="distB" type="ST_WrapDistance" use="optional"/>
62     <xsd:attribute name="distL" type="ST_WrapDistance" use="optional"/>
63     <xsd:attribute name="distR" type="ST_WrapDistance" use="optional"/>
64 </xsd:complexType>
65 <xsd:complexType name="CT_WrapTight">
66     <xsd:sequence>
67         <xsd:element name="wrapPolygon" type="CT_WrapPath" minOccurs="1" maxOccurs="1"/>
68     </xsd:sequence>
69     <xsd:attribute name="wrapText" type="ST_WrapText" use="required"/>
70     <xsd:attribute name="distL" type="ST_WrapDistance" use="optional"/>
71     <xsd:attribute name="distR" type="ST_WrapDistance" use="optional"/>
72 </xsd:complexType>
73 <xsd:complexType name="CT_WrapThrough">
74     <xsd:sequence>
75         <xsd:element name="wrapPolygon" type="CT_WrapPath" minOccurs="1" maxOccurs="1"/>
76     </xsd:sequence>
77     <xsd:attribute name="wrapText" type="ST_WrapText" use="required"/>
78     <xsd:attribute name="distL" type="ST_WrapDistance" use="optional"/>
79     <xsd:attribute name="distR" type="ST_WrapDistance" use="optional"/>
80 </xsd:complexType>
81 <xsd:complexType name="CT_WrapTopBottom">
82     <xsd:sequence>
83         <xsd:element name="effectExtent" type="CT_EffectExtent" minOccurs="0"/>
84     </xsd:sequence>
85     <xsd:attribute name="distT" type="ST_WrapDistance" use="optional"/>
86     <xsd:attribute name="distB" type="ST_WrapDistance" use="optional"/>
87 </xsd:complexType>
88 <xsd:group name="EG_WrapType">
89     <xsd:sequence>
90         <xsd:choice minOccurs="1" maxOccurs="1">
91             <xsd:element name="wrapNone" type="CT_WrapNone" minOccurs="1" maxOccurs="1"/>
92             <xsd:element name="wrapSquare" type="CT_WrapSquare" minOccurs="1" maxOccurs="1"/>
93             <xsd:element name="wrapTight" type="CT_WrapTight" minOccurs="1" maxOccurs="1"/>
94             <xsd:element name="wrapThrough" type="CT_WrapThrough" minOccurs="1" maxOccurs="1"/>
95             <xsd:element name="wrapTopAndBottom" type="CT_WrapTopBottom" minOccurs="1"
96                 maxOccurs="1"/>
97         </xsd:choice>

```

```

98     </xsd:sequence>
99 </xsd:group>
100 <xsd:simpleType name="ST_PositionOffset">
101     <xsd:restriction base="xsd:int"/>
102 </xsd:simpleType>
103 <xsd:simpleType name="ST_AlignH">
104     <xsd:restriction base="xsd:token">
105         <xsd:enumeration value="left"/>
106         <xsd:enumeration value="right"/>
107         <xsd:enumeration value="center"/>
108         <xsd:enumeration value="inside"/>
109         <xsd:enumeration value="outside"/>
110     </xsd:restriction>
111 </xsd:simpleType>
112 <xsd:simpleType name="ST_RelFromH">
113     <xsd:restriction base="xsd:token">
114         <xsd:enumeration value="margin"/>
115         <xsd:enumeration value="page"/>
116         <xsd:enumeration value="column"/>
117         <xsd:enumeration value="character"/>
118         <xsd:enumeration value="leftMargin"/>
119         <xsd:enumeration value="rightMargin"/>
120         <xsd:enumeration value="insideMargin"/>
121         <xsd:enumeration value="outsideMargin"/>
122     </xsd:restriction>
123 </xsd:simpleType>
124 <xsd:complexType name="CT_PosH">
125     <xsd:sequence>
126         <xsd:choice minOccurs="1" maxOccurs="1">
127             <xsd:element name="align" type="ST_AlignH" minOccurs="1" maxOccurs="1"/>
128             <xsd:element name="posOffset" type="ST_PositionOffset" minOccurs="1" maxOccurs="1"/>
129         </xsd:choice>
130     </xsd:sequence>
131     <xsd:attribute name="relativeFrom" type="ST_RelFromH" use="required"/>
132 </xsd:complexType>
133 <xsd:simpleType name="ST_AlignV">
134     <xsd:restriction base="xsd:token">
135         <xsd:enumeration value="top"/>
136         <xsd:enumeration value="bottom"/>
137         <xsd:enumeration value="center"/>
138         <xsd:enumeration value="inside"/>
139         <xsd:enumeration value="outside"/>
140     </xsd:restriction>
141 </xsd:simpleType>
142 <xsd:simpleType name="ST_RelFromV">
143     <xsd:restriction base="xsd:token">
144         <xsd:enumeration value="margin"/>
145         <xsd:enumeration value="page"/>
146         <xsd:enumeration value="paragraph"/>
147         <xsd:enumeration value="line"/>
148         <xsd:enumeration value="topMargin"/>
149         <xsd:enumeration value="bottomMargin"/>
150         <xsd:enumeration value="insideMargin"/>

```

```

151     <xsd:enumeration value="outsideMargin"/>
152   </xsd:restriction>
153 </xsd:simpleType>
154 <xsd:complexType name="CT_PosV">
155   <xsd:sequence>
156     <xsd:choice minOccurs="1" maxOccurs="1">
157       <xsd:element name="align" type="ST_AlignV" minOccurs="1" maxOccurs="1"/>
158       <xsd:element name="posOffset" type="ST_PositionOffset" minOccurs="1" maxOccurs="1"/>
159     </xsd:choice>
160   </xsd:sequence>
161   <xsd:attribute name="relativeFrom" type="ST_RelFromV" use="required"/>
162 </xsd:complexType>
163 <xsd:complexType name="CT_Anchor">
164   <xsd:sequence>
165     <xsd:element name="simplePos" type="a:CT_Point2D"/>
166     <xsd:element name="positionH" type="CT_PosH"/>
167     <xsd:element name="positionV" type="CT_PosV"/>
168     <xsd:element name="extent" type="a:CT_PositiveSize2D"/>
169     <xsd:element name="effectExtent" type="CT_EffectExtent" minOccurs="0"/>
170     <xsd:group ref="EG_WrapType"/>
171     <xsd:element name="docPr" type="a:CT_NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
172     <xsd:element name="cNvGraphicFramePr" type="a:CT_NonVisualGraphicFrameProperties"
173       minOccurs="0" maxOccurs="1"/>
174     <xsd:element ref="a:graphic" minOccurs="1" maxOccurs="1"/>
175   </xsd:sequence>
176   <xsd:attribute name="distT" type="ST_WrapDistance" use="optional"/>
177   <xsd:attribute name="distB" type="ST_WrapDistance" use="optional"/>
178   <xsd:attribute name="distL" type="ST_WrapDistance" use="optional"/>
179   <xsd:attribute name="distR" type="ST_WrapDistance" use="optional"/>
180   <xsd:attribute name="simplePos" type="xsd:boolean"/>
181   <xsd:attribute name="relativeHeight" type="xsd:unsignedInt" use="required"/>
182   <xsd:attribute name="behindDoc" type="xsd:boolean" use="required"/>
183   <xsd:attribute name="locked" type="xsd:boolean" use="required"/>
184   <xsd:attribute name="layoutInCell" type="xsd:boolean" use="required"/>
185   <xsd:attribute name="hidden" type="xsd:boolean" use="optional"/>
186   <xsd:attribute name="allowOverlap" type="xsd:boolean" use="required"/>
187 </xsd:complexType>
188 <xsd:complexType name="CT_TxbxContent">
189   <xsd:group ref="w:EG_BlockLevelElts" minOccurs="1" maxOccurs="unbounded"/>
190 </xsd:complexType>
191 <xsd:complexType name="CT_TextboxInfo">
192   <xsd:sequence>
193     <xsd:element name="txbxContent" type="CT_TxbxContent" minOccurs="1" maxOccurs="1"/>
194     <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
195       maxOccurs="1"/>
196   </xsd:sequence>
197   <xsd:attribute name="id" type="xsd:unsignedShort" use="optional" default="0"/>
198 </xsd:complexType>
199 <xsd:complexType name="CT_LinkedTextboxInformation">
200   <xsd:sequence>
201     <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
202       maxOccurs="1"/>
203   </xsd:sequence>

```

```

204     <xsd:attribute name="id" type="xsd:unsignedShort" use="required"/>
205     <xsd:attribute name="seq" type="xsd:unsignedShort" use="required"/>
206 </xsd:complexType>
207 <xsd:complexType name="CT_WordprocessingShape">
208     <xsd:sequence minOccurs="1" maxOccurs="1">
209         <xsd:element name="cNvPr" type="a:CT_NonVisualDrawingProps" minOccurs="0" maxOccurs="1"/>
210         <xsd:choice minOccurs="1" maxOccurs="1">
211             <xsd:element name="cNvSpPr" type="a:CT_NonVisualDrawingShapeProps" minOccurs="1"
212                 maxOccurs="1"/>
213             <xsd:element name="cNvCnPr" type="a:CT_NonVisualConnectorProperties" minOccurs="1"
214                 maxOccurs="1"/>
215         </xsd:choice>
216         <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="1" maxOccurs="1"/>
217         <xsd:element name="style" type="a:CT_ShapeStyle" minOccurs="0" maxOccurs="1"/>
218         <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
219             maxOccurs="1"/>
220         <xsd:choice minOccurs="0" maxOccurs="1">
221             <xsd:element name="txbx" type="CT_TextboxInfo" minOccurs="1" maxOccurs="1"/>
222             <xsd:element name="linkedTxbx" type="CT_LinkedTextboxInformation" minOccurs="1"
223                 maxOccurs="1"/>
224         </xsd:choice>
225         <xsd:element name="bodyPr" type="a:CT_TextBodyProperties" minOccurs="1" maxOccurs="1"/>
226     </xsd:sequence>
227     <xsd:attribute name="normalEastAsianFlow" type="xsd:boolean" use="optional" default="false"/>
228 </xsd:complexType>
229 <xsd:complexType name="CT_GraphicFrame">
230     <xsd:sequence>
231         <xsd:element name="cNvPr" type="a:CT_NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
232         <xsd:element name="cNvFrPr" type="a:CT_NonVisualGraphicFrameProperties" minOccurs="1"
233             maxOccurs="1"/>
234         <xsd:element name="xfrm" type="a:CT_Transform2D" minOccurs="1" maxOccurs="1"/>
235         <xsd:element ref="a:graphic" minOccurs="1" maxOccurs="1"/>
236         <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
237             maxOccurs="1"/>
238     </xsd:sequence>
239 </xsd:complexType>
240 <xsd:complexType name="CT_WordprocessingContentPartNonVisual">
241     <xsd:sequence>
242         <xsd:element name="cNvPr" type="a:CT_NonVisualDrawingProps" minOccurs="0" maxOccurs="1"/>
243         <xsd:element name="cNvContentPartPr" type="a:CT_NonVisualContentPartProperties"
244             minOccurs="0" maxOccurs="1"/>
245     </xsd:sequence>
246 </xsd:complexType>
247 <xsd:complexType name="CT_WordprocessingContentPart">
248     <xsd:sequence>
249         <xsd:element name="nvContentPartPr" type="CT_WordprocessingContentPartNonVisual"
250             minOccurs="0" maxOccurs="1"/>
251         <xsd:element name="xfrm" type="a:CT_Transform2D" minOccurs="0" maxOccurs="1"/>
252         <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
253             maxOccurs="1"/>
254     </xsd:sequence>
255     <xsd:attribute name="bwMode" type="a:ST_BlackWhiteMode" use="optional"/>
256     <xsd:attribute ref="r:id" use="required"/>

```

```

257 </xsd:complexType>
258 <xsd:complexType name="CT_WordprocessingGroup">
259   <xsd:sequence minOccurs="1" maxOccurs="1">
260     <xsd:element name="cNvPr" type="a:CT_NonVisualDrawingProps" minOccurs="0" maxOccurs="1"/>
261     <xsd:element name="cNvGrpSpPr" type="a:CT_NonVisualGroupDrawingShapeProps" minOccurs="1"
262       maxOccurs="1"/>
263     <xsd:element name="grpSpPr" type="a:CT_GroupShapeProperties" minOccurs="1" maxOccurs="1"/>
264     <xsd:choice minOccurs="0" maxOccurs="unbounded">
265       <xsd:element ref="wsp"/>
266       <xsd:element name="grpSp" type="CT_WordprocessingGroup"/>
267       <xsd:element name="graphicFrame" type="CT_GraphicFrame"/>
268       <xsd:element ref="dpct:pic"/>
269       <xsd:element name="contentPart" type="CT_WordprocessingContentPart"/>
270     </xsd:choice>
271     <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
272       maxOccurs="1"/>
273   </xsd:sequence>
274 </xsd:complexType>
275 <xsd:complexType name="CT_WordprocessingCanvas">
276   <xsd:sequence minOccurs="1" maxOccurs="1">
277     <xsd:element name="bg" type="a:CT_BackgroundFormatting" minOccurs="0" maxOccurs="1"/>
278     <xsd:element name="whole" type="a:CT_WholeE2oFormatting" minOccurs="0" maxOccurs="1"/>
279     <xsd:choice minOccurs="0" maxOccurs="unbounded">
280       <xsd:element ref="wsp"/>
281       <xsd:element ref="dpct:pic"/>
282       <xsd:element name="contentPart" type="CT_WordprocessingContentPart"/>
283       <xsd:element ref="wgp"/>
284       <xsd:element name="graphicFrame" type="CT_GraphicFrame"/>
285     </xsd:choice>
286     <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
287       maxOccurs="1"/>
288   </xsd:sequence>
289 </xsd:complexType>
290 <xsd:element name="wpc" type="CT_WordprocessingCanvas"/>
291 <xsd:element name="wgp" type="CT_WordprocessingGroup"/>
292 <xsd:element name="wsp" type="CT_WordprocessingShape"/>
293 <xsd:element name="inline" type="CT Inline"/>
294 <xsd:element name="anchor" type="CT Anchor"/>
295 </xsd:schema>

```

A.4.5 DrawingML - SpreadsheetML Drawing

This schema is available in the file dml-spreadsheetDrawing.xsd.

```

1 <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
2   xmlns:a="http://purl.oclc.org/ooxml/drawingml/main"
3   xmlns="http://purl.oclc.org/ooxml/drawingml/spreadsheetDrawing"
4   xmlns:r="http://purl.oclc.org/ooxml/officeDocument/relationships"
5   targetNamespace="http://purl.oclc.org/ooxml/drawingml/spreadsheetDrawing"
6   elementFormDefault="qualified">
7   <xsd:import namespace="http://purl.oclc.org/ooxml/drawingml/main" schemaLocation="dml-main.xsd"/>
8   <xsd:import schemaLocation="shared-relationshipReference.xsd"
9     namespace="http://purl.oclc.org/ooxml/officeDocument/relationships"/>

```

```

10 <xsd:element name="from" type="CT_Marker"/>
11 <xsd:element name="to" type="CT_Marker"/>
12 <xsd:complexType name="CT_AnchorClientData">
13     <xsd:attribute name="fLocksWithSheet" type="xsd:boolean" use="optional" default="true"/>
14     <xsd:attribute name="fPrintsWithSheet" type="xsd:boolean" use="optional" default="true"/>
15 </xsd:complexType>
16 <xsd:complexType name="CT_ShapeNonVisual">
17     <xsd:sequence>
18         <xsd:element name="cNvPr" type="a:CT_NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
19         <xsd:element name="cNvSpPr" type="a:CT_NonVisualDrawingShapeProps" minOccurs="1"
20             maxOccurs="1"/>
21     </xsd:sequence>
22 </xsd:complexType>
23 <xsd:complexType name="CT_Shape">
24     <xsd:sequence>
25         <xsd:element name="nvSpPr" type="CT_ShapeNonVisual" minOccurs="1" maxOccurs="1"/>
26         <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="1" maxOccurs="1"/>
27         <xsd:element name="style" type="a:CT_ShapeStyle" minOccurs="0" maxOccurs="1"/>
28         <xsd:element name="txBody" type="a:CT_TextBody" minOccurs="0" maxOccurs="1"/>
29     </xsd:sequence>
30     <xsd:attribute name="macro" type="xsd:string" use="optional"/>
31     <xsd:attribute name="textlink" type="xsd:string" use="optional"/>
32     <xsd:attribute name="fLocksText" type="xsd:boolean" use="optional" default="true"/>
33     <xsd:attribute name="fPublished" type="xsd:boolean" use="optional" default="false"/>
34 </xsd:complexType>
35 <xsd:complexType name="CT_ConnectorNonVisual">
36     <xsd:sequence>
37         <xsd:element name="cNvPr" type="a:CT_NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
38         <xsd:element name="cNvCxnSpPr" type="a:CT_NonVisualConnectorProperties" minOccurs="1"
39             maxOccurs="1"/>
40     </xsd:sequence>
41 </xsd:complexType>
42 <xsd:complexType name="CT_Connector">
43     <xsd:sequence>
44         <xsd:element name="nvCxnSpPr" type="CT_ConnectorNonVisual" minOccurs="1" maxOccurs="1"/>
45         <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="1" maxOccurs="1"/>
46         <xsd:element name="style" type="a:CT_ShapeStyle" minOccurs="0" maxOccurs="1"/>
47     </xsd:sequence>
48     <xsd:attribute name="macro" type="xsd:string" use="optional"/>
49     <xsd:attribute name="fPublished" type="xsd:boolean" use="optional" default="false"/>
50 </xsd:complexType>
51 <xsd:complexType name="CT_PictureNonVisual">
52     <xsd:sequence>
53         <xsd:element name="cNvPr" type="a:CT_NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
54         <xsd:element name="cNvPicPr" type="a:CT_NonVisualPictureProperties" minOccurs="1"
55             maxOccurs="1"/>
56     </xsd:sequence>
57 </xsd:complexType>
58 <xsd:complexType name="CT_Picture">
59     <xsd:sequence>
60         <xsd:element name="nvPicPr" type="CT_PictureNonVisual" minOccurs="1" maxOccurs="1"/>
61         <xsd:element name="blipFill" type="a:CT_BlipFillProperties" minOccurs="1" maxOccurs="1"/>
62         <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="1" maxOccurs="1"/>

```

```

63     <xsd:element name="style" type="a:CT_ShapeStyle" minOccurs="0" maxOccurs="1"/>
64   </xsd:sequence>
65   <xsd:attribute name="macro" type="xsd:string" use="optional" default=""/>
66   <xsd:attribute name="fPublished" type="xsd:boolean" use="optional" default="false"/>
67 </xsd:complexType>
68 <xsd:complexType name="CT_GraphicalObjectFrameNonVisual">
69   <xsd:sequence>
70     <xsd:element name="cNvPr" type="a:CT_NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
71     <xsd:element name="cNvGraphicFramePr" type="a:CT_NonVisualGraphicFrameProperties"
72       minOccurs="1" maxOccurs="1"/>
73   </xsd:sequence>
74 </xsd:complexType>
75 <xsd:complexType name="CT_GraphicalObjectFrame">
76   <xsd:sequence>
77     <xsd:element name="nvGraphicFramePr" type="CT_GraphicalObjectFrameNonVisual" minOccurs="1"
78       maxOccurs="1"/>
79     <xsd:element name="xfrm" type="a:CT_Transform2D" minOccurs="1" maxOccurs="1"/>
80     <xsd:element ref="a:graphic" minOccurs="1" maxOccurs="1"/>
81   </xsd:sequence>
82   <xsd:attribute name="macro" type="xsd:string" use="optional"/>
83   <xsd:attribute name="fPublished" type="xsd:boolean" use="optional" default="false"/>
84 </xsd:complexType>
85 <xsd:complexType name="CT_GroupShapeNonVisual">
86   <xsd:sequence>
87     <xsd:element name="cNvPr" type="a:CT_NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
88     <xsd:element name="cNvGrpSpPr" type="a:CT_NonVisualGroupDrawingShapeProps" minOccurs="1"
89       maxOccurs="1"/>
90   </xsd:sequence>
91 </xsd:complexType>
92 <xsd:complexType name="CT_GroupShape">
93   <xsd:sequence>
94     <xsd:element name="nvGrpSpPr" type="CT_GroupShapeNonVisual" minOccurs="1" maxOccurs="1"/>
95     <xsd:element name="grpSpPr" type="a:CT_GroupShapeProperties" minOccurs="1" maxOccurs="1"/>
96     <xsd:choice minOccurs="0" maxOccurs="unbounded">
97       <xsd:element name="sp" type="CT_Shape"/>
98       <xsd:element name="grpSp" type="CT_GroupShape"/>
99       <xsd:element name="graphicFrame" type="CT_GraphicalObjectFrame"/>
100      <xsd:element name="cxnSp" type="CT_Connector"/>
101      <xsd:element name="pic" type="CT_Picture"/>
102    </xsd:choice>
103   </xsd:sequence>
104 </xsd:complexType>
105 <xsd:group name="EG_ObjectChoices">
106   <xsd:sequence>
107     <xsd:choice minOccurs="1" maxOccurs="1">
108       <xsd:element name="sp" type="CT_Shape"/>
109       <xsd:element name="grpSp" type="CT_GroupShape"/>
110       <xsd:element name="graphicFrame" type="CT_GraphicalObjectFrame"/>
111       <xsd:element name="cxnSp" type="CT_Connector"/>
112       <xsd:element name="pic" type="CT_Picture"/>
113       <xsd:element name="contentPart" type="CT_Rel"/>
114     </xsd:choice>
115   </xsd:sequence>

```



```

116 </xsd:group>
117 <xsd:complexType name="CT_Rel">
118   <xsd:attribute ref="r:id" use="required"/>
119 </xsd:complexType>
120 <xsd:simpleType name="ST_ColID">
121   <xsd:restriction base="xsd:int">
122     <xsd:minInclusive value="0"/>
123   </xsd:restriction>
124 </xsd:simpleType>
125 <xsd:simpleType name="ST_RowID">
126   <xsd:restriction base="xsd:int">
127     <xsd:minInclusive value="0"/>
128   </xsd:restriction>
129 </xsd:simpleType>
130 <xsd:complexType name="CT_Marker">
131   <xsd:sequence>
132     <xsd:element name="col" type="ST_ColID"/>
133     <xsd:element name="colOff" type="a:ST_Coordinate"/>
134     <xsd:element name="row" type="ST_RowID"/>
135     <xsd:element name="rowOff" type="a:ST_Coordinate"/>
136   </xsd:sequence>
137 </xsd:complexType>
138 <xsd:simpleType name="ST_EditAs">
139   <xsd:restriction base="xsd:token">
140     <xsd:enumeration value="twoCell"/>
141     <xsd:enumeration value="oneCell"/>
142     <xsd:enumeration value="absolute"/>
143   </xsd:restriction>
144 </xsd:simpleType>
145 <xsd:complexType name="CT_TwoCellAnchor">
146   <xsd:sequence>
147     <xsd:element name="from" type="CT_Marker"/>
148     <xsd:element name="to" type="CT_Marker"/>
149     <xsd:group ref="EG_ObjectChoices"/>
150     <xsd:element name="clientData" type="CT_AnchorClientData" minOccurs="1" maxOccurs="1"/>
151   </xsd:sequence>
152   <xsd:attribute name="editAs" type="ST_EditAs" use="optional" default="twoCell"/>
153 </xsd:complexType>
154 <xsd:complexType name="CT_OneCellAnchor">
155   <xsd:sequence>
156     <xsd:element name="from" type="CT_Marker"/>
157     <xsd:element name="ext" type="a:CT_PositiveSize2D"/>
158     <xsd:group ref="EG_ObjectChoices"/>
159     <xsd:element name="clientData" type="CT_AnchorClientData" minOccurs="1" maxOccurs="1"/>
160   </xsd:sequence>
161 </xsd:complexType>
162 <xsd:complexType name="CT_AbsoluteAnchor">
163   <xsd:sequence>
164     <xsd:element name="pos" type="a:CT_Point2D"/>
165     <xsd:element name="ext" type="a:CT_PositiveSize2D"/>
166     <xsd:group ref="EG_ObjectChoices"/>
167     <xsd:element name="clientData" type="CT_AnchorClientData" minOccurs="1" maxOccurs="1"/>
168   </xsd:sequence>

```

```

169 </xsd:complexType>
170 <xsd:group name="EG_Anchor">
171   <xsd:choice>
172     <xsd:element name="twoCellAnchor" type="CT_TwoCellAnchor"/>
173     <xsd:element name="oneCellAnchor" type="CT_OneCellAnchor"/>
174     <xsd:element name="absoluteAnchor" type="CT_AbsoluteAnchor"/>
175   </xsd:choice>
176 </xsd:group>
177 <xsd:complexType name="CT_Drawing">
178   <xsd:sequence>
179     <xsd:group ref="EG_Anchor" minOccurs="0" maxOccurs="unbounded"/>
180   </xsd:sequence>
181 </xsd:complexType>
182 <xsd:element name="wsDr" type="CT_Drawing"/>
183 </xsd:schema>

```

A.5 DrawingML - Components

A.5.1 DrawingML – Charts

This schema is available in the file dml-chart.xsd.

```

1 <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
2   xmlns:a="http://purl.oclc.org/ooxml/drawingml/main"
3   xmlns:r="http://purl.oclc.org/ooxml/officeDocument/relationships"
4   xmlns="http://purl.oclc.org/ooxml/drawingml/chart"
5   xmlns:cdr="http://purl.oclc.org/ooxml/drawingml/chartDrawing"
6   xmlns:s="http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
7   targetNamespace="http://purl.oclc.org/ooxml/drawingml/chart" elementFormDefault="qualified"
8   attributeFormDefault="unqualified" blockDefault="#all">
9   <xsd:import namespace="http://purl.oclc.org/ooxml/officeDocument/relationships"
10     schemaLocation="shared-relationshipReference.xsd"/>
11   <xsd:import namespace="http://purl.oclc.org/ooxml/drawingml/main" schemaLocation="dml-main.xsd"/>
12   <xsd:import namespace="http://purl.oclc.org/ooxml/drawingml/chartDrawing" schemaLocation="dml-
13     chartDrawing.xsd"/>
14   <xsd:import namespace="http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
15     schemaLocation="shared-commonSimpleTypes.xsd"/>
16   <xsd:complexType name="CT_Boolean">
17     <xsd:attribute name="val" type="xsd:boolean" use="optional" default="true"/>
18   </xsd:complexType>
19   <xsd:complexType name="CT_Double">
20     <xsd:attribute name="val" type="xsd:double" use="required"/>
21   </xsd:complexType>
22   <xsd:complexType name="CT_UnsignedInt">
23     <xsd:attribute name="val" type="xsd:unsignedInt" use="required"/>
24   </xsd:complexType>
25   <xsd:complexType name="CT_RelId">
26     <xsd:attribute ref="r:id" use="required"/>
27   </xsd:complexType>
28   <xsd:complexType name="CT_Extension">
29     <xsd:sequence>
30       <xsd:any processContents="lax"/>
31     </xsd:sequence>

```

```

32     <xsd:attribute name="uri" type="xsd:token"/>
33 </xsd:complexType>
34 <xsd:complexType name="CT_ExtensionList">
35     <xsd:sequence>
36         <xsd:element name="ext" type="CT_Extension" minOccurs="0" maxOccurs="unbounded"/>
37     </xsd:sequence>
38 </xsd:complexType>
39 <xsd:complexType name="CT_NumVal">
40     <xsd:sequence>
41         <xsd:element name="v" type="s:ST_Xstring" minOccurs="1" maxOccurs="1"/>
42     </xsd:sequence>
43     <xsd:attribute name="idx" type="xsd:unsignedInt" use="required"/>
44     <xsd:attribute name="formatCode" type="s:ST_Xstring" use="optional"/>
45 </xsd:complexType>
46 <xsd:complexType name="CT_NumData">
47     <xsd:sequence>
48         <xsd:element name="formatCode" type="s:ST_Xstring" minOccurs="0" maxOccurs="1"/>
49         <xsd:element name="ptCount" type="CT_UnsignedInt" minOccurs="0" maxOccurs="1"/>
50         <xsd:element name="pt" type="CT_NumVal" minOccurs="0" maxOccurs="unbounded"/>
51         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
52     </xsd:sequence>
53 </xsd:complexType>
54 <xsd:complexType name="CT_NumRef">
55     <xsd:sequence>
56         <xsd:element name="f" type="xsd:string" minOccurs="1" maxOccurs="1"/>
57         <xsd:element name="numCache" type="CT_NumData" minOccurs="0" maxOccurs="1"/>
58         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
59     </xsd:sequence>
60 </xsd:complexType>
61 <xsd:complexType name="CT_NumDataSource">
62     <xsd:sequence>
63         <xsd:choice minOccurs="1" maxOccurs="1">
64             <xsd:element name="numRef" type="CT_NumRef" minOccurs="1" maxOccurs="1"/>
65             <xsd:element name="numLit" type="CT_NumData" minOccurs="1" maxOccurs="1"/>
66         </xsd:choice>
67     </xsd:sequence>
68 </xsd:complexType>
69 <xsd:complexType name="CT_StrVal">
70     <xsd:sequence>
71         <xsd:element name="v" type="s:ST_Xstring" minOccurs="1" maxOccurs="1"/>
72     </xsd:sequence>
73     <xsd:attribute name="idx" type="xsd:unsignedInt" use="required"/>
74 </xsd:complexType>
75 <xsd:complexType name="CT_StrData">
76     <xsd:sequence>
77         <xsd:element name="ptCount" type="CT_UnsignedInt" minOccurs="0" maxOccurs="1"/>
78         <xsd:element name="pt" type="CT_StrVal" minOccurs="0" maxOccurs="unbounded"/>
79         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
80     </xsd:sequence>
81 </xsd:complexType>
82 <xsd:complexType name="CT_StrRef">
83     <xsd:sequence>
84         <xsd:element name="f" type="xsd:string" minOccurs="1" maxOccurs="1"/>

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85     <xsd:element name="strCache" type="CT_StrData" minOccurs="0" maxOccurs="1"/>
86     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
87   </xsd:sequence>
88 </xsd:complexType>
89 <xsd:complexType name="CT_Tx">
90   <xsd:sequence>
91     <xsd:choice minOccurs="1" maxOccurs="1">
92       <xsd:element name="strRef" type="CT_StrRef" minOccurs="1" maxOccurs="1"/>
93       <xsd:element name="rich" type="a:CT_TextBody" minOccurs="1" maxOccurs="1"/>
94     </xsd:choice>
95   </xsd:sequence>
96 </xsd:complexType>
97 <xsd:complexType name="CT_TextLanguageID">
98   <xsd:attribute name="val" type="s:ST_Lang" use="required"/>
99 </xsd:complexType>
100 <xsd:complexType name="CT_Lvl">
101   <xsd:sequence>
102     <xsd:element name="pt" type="CT_StrVal" minOccurs="0" maxOccurs="unbounded"/>
103   </xsd:sequence>
104 </xsd:complexType>
105 <xsd:complexType name="CT_MultiLvlStrData">
106   <xsd:sequence>
107     <xsd:element name="ptCount" type="CT_UnsignedInt" minOccurs="0" maxOccurs="1"/>
108     <xsd:element name="lvl" type="CT_Lvl" minOccurs="0" maxOccurs="unbounded"/>
109     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
110   </xsd:sequence>
111 </xsd:complexType>
112 <xsd:complexType name="CT_MultiLvlStrRef">
113   <xsd:sequence>
114     <xsd:element name="f" type="xsd:string" minOccurs="1" maxOccurs="1"/>
115     <xsd:element name="multiLvlStrCache" type="CT_MultiLvlStrData" minOccurs="0"
116       maxOccurs="1"/>
117     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
118   </xsd:sequence>
119 </xsd:complexType>
120 <xsd:complexType name="CT_AxDataSource">
121   <xsd:sequence>
122     <xsd:choice minOccurs="1" maxOccurs="1">
123       <xsd:element name="multiLvlStrRef" type="CT_MultiLvlStrRef" minOccurs="1"
124         maxOccurs="1"/>
125       <xsd:element name="numRef" type="CT_NumRef" minOccurs="1" maxOccurs="1"/>
126       <xsd:element name="numLit" type="CT_NumData" minOccurs="1" maxOccurs="1"/>
127       <xsd:element name="strRef" type="CT_StrRef" minOccurs="1" maxOccurs="1"/>
128       <xsd:element name="strLit" type="CT_StrData" minOccurs="1" maxOccurs="1"/>
129     </xsd:choice>
130   </xsd:sequence>
131 </xsd:complexType>
132 <xsd:complexType name="CT_SerTx">
133   <xsd:sequence>
134     <xsd:choice minOccurs="1" maxOccurs="1">
135       <xsd:element name="strRef" type="CT_StrRef" minOccurs="1" maxOccurs="1"/>
136       <xsd:element name="v" type="s:ST_Xstring" minOccurs="1" maxOccurs="1"/>
137     </xsd:choice>

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```

138     </xsd:sequence>
139 </xsd:complexType>
140 <xsd:simpleType name="ST_LayoutTarget">
141     <xsd:restriction base="xsd:string">
142         <xsd:enumeration value="inner"/>
143         <xsd:enumeration value="outer"/>
144     </xsd:restriction>
145 </xsd:simpleType>
146 <xsd:complexType name="CT_LayoutTarget">
147     <xsd:attribute name="val" type="ST_LayoutTarget" default="outer"/>
148 </xsd:complexType>
149 <xsd:simpleType name="ST_LayoutMode">
150     <xsd:restriction base="xsd:string">
151         <xsd:enumeration value="edge"/>
152         <xsd:enumeration value="factor"/>
153     </xsd:restriction>
154 </xsd:simpleType>
155 <xsd:complexType name="CT_LayoutMode">
156     <xsd:attribute name="val" type="ST_LayoutMode" default="factor"/>
157 </xsd:complexType>
158 <xsd:complexType name="CT_ManualLayout">
159     <xsd:sequence>
160         <xsd:element name="layoutTarget" type="CT_LayoutTarget" minOccurs="0" maxOccurs="1"/>
161         <xsd:element name="xMode" type="CT_LayoutMode" minOccurs="0" maxOccurs="1"/>
162         <xsd:element name="yMode" type="CT_LayoutMode" minOccurs="0" maxOccurs="1"/>
163         <xsd:element name="wMode" type="CT_LayoutMode" minOccurs="0" maxOccurs="1"/>
164         <xsd:element name="hMode" type="CT_LayoutMode" minOccurs="0" maxOccurs="1"/>
165         <xsd:element name="x" type="CT_Double" minOccurs="0" maxOccurs="1"/>
166         <xsd:element name="y" type="CT_Double" minOccurs="0" maxOccurs="1"/>
167         <xsd:element name="w" type="CT_Double" minOccurs="0" maxOccurs="1"/>
168         <xsd:element name="h" type="CT_Double" minOccurs="0" maxOccurs="1"/>
169         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
170     </xsd:sequence>
171 </xsd:complexType>
172 <xsd:complexType name="CT_Layout">
173     <xsd:sequence>
174         <xsd:element name="manualLayout" type="CT_ManualLayout" minOccurs="0" maxOccurs="1"/>
175         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
176     </xsd:sequence>
177 </xsd:complexType>
178 <xsd:complexType name="CT_Title">
179     <xsd:sequence>
180         <xsd:element name="tx" type="CT_Tx" minOccurs="0" maxOccurs="1"/>
181         <xsd:element name="layout" type="CT_Layout" minOccurs="0" maxOccurs="1"/>
182         <xsd:element name="overlay" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
183         <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="0" maxOccurs="1"/>
184         <xsd:element name="txPr" type="a:CT_TextBody" minOccurs="0" maxOccurs="1"/>
185         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
186     </xsd:sequence>
187 </xsd:complexType>
188 <xsd:simpleType name="ST_RotX">
189     <xsd:restriction base="xsd:byte">
190         <xsd:minInclusive value="-90"/>

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191         <xsd:maxInclusive value="90"/>
192     </xsd:restriction>
193 </xsd:simpleType>
194 <xsd:complexType name="CT_RotX">
195     <xsd:attribute name="val" type="ST_RotX" default="0"/>
196 </xsd:complexType>
197 <xsd:simpleType name="ST_HPercent">
198     <xsd:union memberTypes="ST_HPercentWithSymbol"/>
199 </xsd:simpleType>
200 <xsd:simpleType name="ST_HPercentWithSymbol">
201     <xsd:restriction base="xsd:string">
202         <xsd:pattern value="0*(([5-9])|([1-9][0-9])|([1-4][0-9][0-9])|500)%"/>
203     </xsd:restriction>
204 </xsd:simpleType>
205 <xsd:complexType name="CT_HPercent">
206     <xsd:attribute name="val" type="ST_HPercent" default="100%"/>
207 </xsd:complexType>
208 <xsd:simpleType name="ST_RotY">
209     <xsd:restriction base="xsd:unsignedShort">
210         <xsd:minInclusive value="0"/>
211         <xsd:maxInclusive value="360"/>
212     </xsd:restriction>
213 </xsd:simpleType>
214 <xsd:complexType name="CT_RotY">
215     <xsd:attribute name="val" type="ST_RotY" default="0"/>
216 </xsd:complexType>
217 <xsd:simpleType name="ST_DepthPercent">
218     <xsd:union memberTypes="ST_DepthPercentWithSymbol"/>
219 </xsd:simpleType>
220 <xsd:simpleType name="ST_DepthPercentWithSymbol">
221     <xsd:restriction base="xsd:string">
222         <xsd:pattern value="0*(([2-9][0-9])|([1-9][0-9][0-9])|(1[0-9][0-9][0-9])|2000)%"/>
223     </xsd:restriction>
224 </xsd:simpleType>
225 <xsd:complexType name="CT_DepthPercent">
226     <xsd:attribute name="val" type="ST_DepthPercent" default="100"/>
227 </xsd:complexType>
228 <xsd:simpleType name="ST_Perspective">
229     <xsd:restriction base="xsd:unsignedByte">
230         <xsd:minInclusive value="0"/>
231         <xsd:maxInclusive value="240"/>
232     </xsd:restriction>
233 </xsd:simpleType>
234 <xsd:complexType name="CT_Perspective">
235     <xsd:attribute name="val" type="ST_Perspective" default="30"/>
236 </xsd:complexType>
237 <xsd:complexType name="CT_View3D">
238     <xsd:sequence>
239         <xsd:element name="rotX" type="CT_RotX" minOccurs="0" maxOccurs="1"/>
240         <xsd:element name="hPercent" type="CT_HPercent" minOccurs="0" maxOccurs="1"/>
241         <xsd:element name="rotY" type="CT_RotY" minOccurs="0" maxOccurs="1"/>
242         <xsd:element name="depthPercent" type="CT_DepthPercent" minOccurs="0" maxOccurs="1"/>
243         <xsd:element name="rAngAx" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>

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244     <xsd:element name="perspective" type="CT_Perspective" minOccurs="0" maxOccurs="1"/>
245     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
246   </xsd:sequence>
247 </xsd:complexType>
248 <xsd:complexType name="CT_Surface">
249   <xsd:sequence>
250     <xsd:element name="thickness" type="CT_Thickness" minOccurs="0" maxOccurs="1"/>
251     <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="0" maxOccurs="1"/>
252     <xsd:element name="pictureOptions" type="CT_PictureOptions" minOccurs="0" maxOccurs="1"/>
253     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
254   </xsd:sequence>
255 </xsd:complexType>
256 <xsd:simpleType name="ST_Thickness">
257   <xsd:union memberTypes="ST_ThicknessPercent"/>
258 </xsd:simpleType>
259 <xsd:simpleType name="ST_ThicknessPercent">
260   <xsd:restriction base="xsd:string">
261     <xsd:pattern value="([0-9]+)%"/>
262   </xsd:restriction>
263 </xsd:simpleType>
264 <xsd:complexType name="CT_Thickness">
265   <xsd:attribute name="val" type="ST_Thickness" use="required"/>
266 </xsd:complexType>
267 <xsd:complexType name="CT_DTable">
268   <xsd:sequence>
269     <xsd:element name="showHorzBorder" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
270     <xsd:element name="showVertBorder" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
271     <xsd:element name="showOutline" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
272     <xsd:element name="showKeys" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
273     <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="0" maxOccurs="1"/>
274     <xsd:element name="txPr" type="a:CT_TextBody" minOccurs="0" maxOccurs="1"/>
275     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
276   </xsd:sequence>
277 </xsd:complexType>
278 <xsd:simpleType name="ST_GapAmount">
279   <xsd:union memberTypes="ST_GapAmountPercent"/>
280 </xsd:simpleType>
281 <xsd:simpleType name="ST_GapAmountPercent">
282   <xsd:restriction base="xsd:string">
283     <xsd:pattern value="0*(([0-9])|([1-9][0-9])|([1-4][0-9][0-9])|500)%"/>
284   </xsd:restriction>
285 </xsd:simpleType>
286 <xsd:complexType name="CT_GapAmount">
287   <xsd:attribute name="val" type="ST_GapAmount" default="150%"/>
288 </xsd:complexType>
289 <xsd:simpleType name="ST_Overlap">
290   <xsd:union memberTypes="ST_OverlapPercent"/>
291 </xsd:simpleType>
292 <xsd:simpleType name="ST_OverlapPercent">
293   <xsd:restriction base="xsd:string">
294     <xsd:pattern value="(-?0*(([0-9])|([1-9][0-9])|100))%">
295   </xsd:restriction>
296 </xsd:simpleType>

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297 <xsd:complexType name="CT_Overlap">
298   <xsd:attribute name="val" type="ST_Overlap" default="0%"/>
299 </xsd:complexType>
300 <xsd:simpleType name="ST_BubbleScale">
301   <xsd:union memberTypes="ST_BubbleScalePercent"/>
302 </xsd:simpleType>
303 <xsd:simpleType name="ST_BubbleScalePercent">
304   <xsd:restriction base="xsd:string">
305     <xsd:pattern value="0*(([0-9])|([1-9][0-9])|([1-2][0-9][0-9])|300)%"/>
306   </xsd:restriction>
307 </xsd:simpleType>
308 <xsd:complexType name="CT_BubbleScale">
309   <xsd:attribute name="val" type="ST_BubbleScale" default="100%"/>
310 </xsd:complexType>
311 <xsd:simpleType name="ST_SizeRepresents">
312   <xsd:restriction base="xsd:string">
313     <xsd:enumeration value="area"/>
314     <xsd:enumeration value="w"/>
315   </xsd:restriction>
316 </xsd:simpleType>
317 <xsd:complexType name="CT_SizeRepresents">
318   <xsd:attribute name="val" type="ST_SizeRepresents" default="area"/>
319 </xsd:complexType>
320 <xsd:simpleType name="ST_FirstSliceAng">
321   <xsd:restriction base="xsd:unsignedShort">
322     <xsd:minInclusive value="0"/>
323     <xsd:maxInclusive value="360"/>
324   </xsd:restriction>
325 </xsd:simpleType>
326 <xsd:complexType name="CT_FirstSliceAng">
327   <xsd:attribute name="val" type="ST_FirstSliceAng" default="0"/>
328 </xsd:complexType>
329 <xsd:simpleType name="ST_HoleSize">
330   <xsd:union memberTypes="ST_HoleSizePercent"/>
331 </xsd:simpleType>
332 <xsd:simpleType name="ST_HoleSizePercent">
333   <xsd:restriction base="xsd:string">
334     <xsd:pattern value="0*([1-9]|([1-8][0-9])|90)%"/>
335   </xsd:restriction>
336 </xsd:simpleType>
337 <xsd:complexType name="CT_HoleSize">
338   <xsd:attribute name="val" type="ST_HoleSize" default="10%"/>
339 </xsd:complexType>
340 <xsd:simpleType name="ST_SplitType">
341   <xsd:restriction base="xsd:string">
342     <xsd:enumeration value="auto"/>
343     <xsd:enumeration value="cust"/>
344     <xsd:enumeration value="percent"/>
345     <xsd:enumeration value="pos"/>
346     <xsd:enumeration value="val"/>
347   </xsd:restriction>
348 </xsd:simpleType>
349 <xsd:complexType name="CT_SplitType">

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350     <xsd:attribute name="val" type="ST_SplitType" default="auto"/>
351 </xsd:complexType>
352 <xsd:complexType name="CT_CustSplit">
353     <xsd:sequence>
354         <xsd:element name="secondPiePt" type="CT_UnsignedInt" minOccurs="0"
355             maxOccurs="unbounded"/>
356     </xsd:sequence>
357 </xsd:complexType>
358 <xsd:simpleType name="ST_SecondPieSize">
359     <xsd:union memberTypes="ST_SecondPieSizePercent"/>
360 </xsd:simpleType>
361 <xsd:simpleType name="ST_SecondPieSizePercent">
362     <xsd:restriction base="xsd:string">
363         <xsd:pattern value="0*([5-9])|([1-9][0-9])|(1[0-9][0-9])|200)%"/>
364     </xsd:restriction>
365 </xsd:simpleType>
366 <xsd:complexType name="CT_SecondPieSize">
367     <xsd:attribute name="val" type="ST_SecondPieSize" default="75%"/>
368 </xsd:complexType>
369 <xsd:complexType name="CT_NumFmt">
370     <xsd:attribute name="formatCode" type="s:ST_Xstring" use="required"/>
371     <xsd:attribute name="sourceLinked" type="xsd:boolean"/>
372 </xsd:complexType>
373 <xsd:simpleType name="ST_LblAlgn">
374     <xsd:restriction base="xsd:string">
375         <xsd:enumeration value="ctr"/>
376         <xsd:enumeration value="l"/>
377         <xsd:enumeration value="r"/>
378     </xsd:restriction>
379 </xsd:simpleType>
380 <xsd:complexType name="CT_LblAlgn">
381     <xsd:attribute name="val" type="ST_LblAlgn" use="required"/>
382 </xsd:complexType>
383 <xsd:simpleType name="ST_DLblPos">
384     <xsd:restriction base="xsd:string">
385         <xsd:enumeration value="bestFit"/>
386         <xsd:enumeration value="b"/>
387         <xsd:enumeration value="ctr"/>
388         <xsd:enumeration value="inBase"/>
389         <xsd:enumeration value="inEnd"/>
390         <xsd:enumeration value="l"/>
391         <xsd:enumeration value="outEnd"/>
392         <xsd:enumeration value="r"/>
393         <xsd:enumeration value="t"/>
394     </xsd:restriction>
395 </xsd:simpleType>
396 <xsd:complexType name="CT_DLblPos">
397     <xsd:attribute name="val" type="ST_DLblPos" use="required"/>
398 </xsd:complexType>
399 <xsd:group name="EG_DLblShared">
400     <xsd:sequence>
401         <xsd:element name="numFmt" type="CT_NumFmt" minOccurs="0" maxOccurs="1"/>
402         <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="0" maxOccurs="1"/>

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403     <xsd:element name="txPr" type="a:CT_TextBody" minOccurs="0" maxOccurs="1"/>
404     <xsd:element name="dLblPos" type="CT_DLblPos" minOccurs="0" maxOccurs="1"/>
405     <xsd:element name="showLegendKey" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
406     <xsd:element name="showVal" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
407     <xsd:element name="showCatName" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
408     <xsd:element name="showSerName" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
409     <xsd:element name="showPercent" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
410     <xsd:element name="showBubbleSize" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
411     <xsd:element name="separator" type="xsd:string" minOccurs="0" maxOccurs="1"/>
412   </xsd:sequence>
413 </xsd:group>
414 <xsd:group name="Group_DLbl">
415   <xsd:sequence>
416     <xsd:element name="layout" type="CT_Layout" minOccurs="0" maxOccurs="1"/>
417     <xsd:element name="tx" type="CT_Tx" minOccurs="0" maxOccurs="1"/>
418     <xsd:group ref="EG_DLblShared" minOccurs="1" maxOccurs="1"/>
419   </xsd:sequence>
420 </xsd:group>
421 <xsd:complexType name="CT_DLbl">
422   <xsd:sequence>
423     <xsd:element name="idx" type="CT_UnsignedInt" minOccurs="1" maxOccurs="1"/>
424     <xsd:choice>
425       <xsd:element name="delete" type="CT_Boolean" minOccurs="1" maxOccurs="1"/>
426       <xsd:group ref="Group_DLbl" minOccurs="1" maxOccurs="1"/>
427     </xsd:choice>
428     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
429   </xsd:sequence>
430 </xsd:complexType>
431 <xsd:group name="Group_DLbls">
432   <xsd:sequence>
433     <xsd:group ref="EG_DLblShared" minOccurs="1" maxOccurs="1"/>
434     <xsd:element name="showLeaderLines" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
435     <xsd:element name="leaderLines" type="CT_ChartLines" minOccurs="0" maxOccurs="1"/>
436   </xsd:sequence>
437 </xsd:group>
438 <xsd:complexType name="CT_DLbls">
439   <xsd:sequence>
440     <xsd:element name="dLbl" type="CT_DLbl" minOccurs="0" maxOccurs="unbounded"/>
441     <xsd:choice>
442       <xsd:element name="delete" type="CT_Boolean" minOccurs="1" maxOccurs="1"/>
443       <xsd:group ref="Group_DLbls" minOccurs="1" maxOccurs="1"/>
444     </xsd:choice>
445     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
446   </xsd:sequence>
447 </xsd:complexType>
448 <xsd:simpleType name="ST_MarkerStyle">
449   <xsd:restriction base="xsd:string">
450     <xsd:enumeration value="circle"/>
451     <xsd:enumeration value="dash"/>
452     <xsd:enumeration value="diamond"/>
453     <xsd:enumeration value="dot"/>
454     <xsd:enumeration value="none"/>
455     <xsd:enumeration value="picture"/>

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456         <xsd:enumeration value="plus"/>
457         <xsd:enumeration value="square"/>
458         <xsd:enumeration value="star"/>
459         <xsd:enumeration value="triangle"/>
460         <xsd:enumeration value="x"/>
461         <xsd:enumeration value="auto"/>
462     </xsd:restriction>
463 </xsd:simpleType>
464 <xsd:complexType name="CT_MarkerStyle">
465     <xsd:attribute name="val" type="ST_MarkerStyle" use="required"/>
466 </xsd:complexType>
467 <xsd:simpleType name="ST_MarkerSize">
468     <xsd:restriction base="xsd:unsignedByte">
469         <xsd:minInclusive value="2"/>
470         <xsd:maxInclusive value="72"/>
471     </xsd:restriction>
472 </xsd:simpleType>
473 <xsd:complexType name="CT_MarkerSize">
474     <xsd:attribute name="val" type="ST_MarkerSize" default="5"/>
475 </xsd:complexType>
476 <xsd:complexType name="CT_Marker">
477     <xsd:sequence>
478         <xsd:element name="symbol" type="CT_MarkerStyle" minOccurs="0" maxOccurs="1"/>
479         <xsd:element name="size" type="CT_MarkerSize" minOccurs="0" maxOccurs="1"/>
480         <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="0" maxOccurs="1"/>
481         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
482     </xsd:sequence>
483 </xsd:complexType>
484 <xsd:complexType name="CT_DPt">
485     <xsd:sequence>
486         <xsd:element name="idx" type="CT_UnsignedInt" minOccurs="1" maxOccurs="1"/>
487         <xsd:element name="invertIfNegative" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
488         <xsd:element name="marker" type="CT_Marker" minOccurs="0" maxOccurs="1"/>
489         <xsd:element name="bubble3D" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
490         <xsd:element name="explosion" type="CT_UnsignedInt" minOccurs="0" maxOccurs="1"/>
491         <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="0" maxOccurs="1"/>
492         <xsd:element name="pictureOptions" type="CT_PictureOptions" minOccurs="0" maxOccurs="1"/>
493         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
494     </xsd:sequence>
495 </xsd:complexType>
496 <xsd:simpleType name="ST_TrendlineType">
497     <xsd:restriction base="xsd:string">
498         <xsd:enumeration value="exp"/>
499         <xsd:enumeration value="linear"/>
500         <xsd:enumeration value="log"/>
501         <xsd:enumeration value="movingAvg"/>
502         <xsd:enumeration value="poly"/>
503         <xsd:enumeration value="power"/>
504     </xsd:restriction>
505 </xsd:simpleType>
506 <xsd:complexType name="CT_TrendlineType">
507     <xsd:attribute name="val" type="ST_TrendlineType" default="linear"/>
508 </xsd:complexType>

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509 <xsd:simpleType name="ST_Order">
510   <xsd:restriction base="xsd:unsignedByte">
511     <xsd:minInclusive value="2"/>
512     <xsd:maxInclusive value="6"/>
513   </xsd:restriction>
514 </xsd:simpleType>
515 <xsd:complexType name="CT_Order">
516   <xsd:attribute name="val" type="ST_Order" default="2"/>
517 </xsd:complexType>
518 <xsd:simpleType name="ST_Period">
519   <xsd:restriction base="xsd:unsignedInt">
520     <xsd:minInclusive value="2"/>
521   </xsd:restriction>
522 </xsd:simpleType>
523 <xsd:complexType name="CT_Period">
524   <xsd:attribute name="val" type="ST_Period" default="2"/>
525 </xsd:complexType>
526 <xsd:complexType name="CT_TrendlineLbl">
527   <xsd:sequence>
528     <xsd:element name="layout" type="CT_Layout" minOccurs="0" maxOccurs="1"/>
529     <xsd:element name="tx" type="CT_Tx" minOccurs="0" maxOccurs="1"/>
530     <xsd:element name="numFmt" type="CT_NumFmt" minOccurs="0" maxOccurs="1"/>
531     <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="0" maxOccurs="1"/>
532     <xsd:element name="txPr" type="a:CT_TextBody" minOccurs="0" maxOccurs="1"/>
533     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
534   </xsd:sequence>
535 </xsd:complexType>
536 <xsd:complexType name="CT_Trendline">
537   <xsd:sequence>
538     <xsd:element name="name" type="xsd:string" minOccurs="0" maxOccurs="1"/>
539     <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="0" maxOccurs="1"/>
540     <xsd:element name="trendlineType" type="CT_TrendlineType" minOccurs="1" maxOccurs="1"/>
541     <xsd:element name="order" type="CT_Order" minOccurs="0" maxOccurs="1"/>
542     <xsd:element name="period" type="CT_Period" minOccurs="0" maxOccurs="1"/>
543     <xsd:element name="forward" type="CT_Double" minOccurs="0" maxOccurs="1"/>
544     <xsd:element name="backward" type="CT_Double" minOccurs="0" maxOccurs="1"/>
545     <xsd:element name="intercept" type="CT_Double" minOccurs="0" maxOccurs="1"/>
546     <xsd:element name="dispRSqr" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
547     <xsd:element name="dispEq" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
548     <xsd:element name="trendlineLbl" type="CT_TrendlineLbl" minOccurs="0" maxOccurs="1"/>
549     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
550   </xsd:sequence>
551 </xsd:complexType>
552 <xsd:simpleType name="ST_ErrDir">
553   <xsd:restriction base="xsd:string">
554     <xsd:enumeration value="x"/>
555     <xsd:enumeration value="y"/>
556   </xsd:restriction>
557 </xsd:simpleType>
558 <xsd:complexType name="CT_ErrDir">
559   <xsd:attribute name="val" type="ST_ErrDir" use="required"/>
560 </xsd:complexType>
561 <xsd:simpleType name="ST_ErrBarType">

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562     <xsd:restriction base="xsd:string">
563         <xsd:enumeration value="both"/>
564         <xsd:enumeration value="minus"/>
565         <xsd:enumeration value="plus"/>
566     </xsd:restriction>
567 </xsd:simpleType>
568 <xsd:complexType name="CT_ErrBarType">
569     <xsd:attribute name="val" type="ST_ErrBarType" default="both"/>
570 </xsd:complexType>
571 <xsd:simpleType name="ST_ErrValType">
572     <xsd:restriction base="xsd:string">
573         <xsd:enumeration value="cust"/>
574         <xsd:enumeration value="fixedVal"/>
575         <xsd:enumeration value="percentage"/>
576         <xsd:enumeration value="stdDev"/>
577         <xsd:enumeration value="stdErr"/>
578     </xsd:restriction>
579 </xsd:simpleType>
580 <xsd:complexType name="CT_ErrValType">
581     <xsd:attribute name="val" type="ST_ErrValType" default="fixedVal"/>
582 </xsd:complexType>
583 <xsd:complexType name="CT_ErrBars">
584     <xsd:sequence>
585         <xsd:element name="errDir" type="CT_ErrDir" minOccurs="0" maxOccurs="1"/>
586         <xsd:element name="errBarType" type="CT_ErrBarType" minOccurs="1" maxOccurs="1"/>
587         <xsd:element name="errValType" type="CT_ErrValType" minOccurs="1" maxOccurs="1"/>
588         <xsd:element name="noEndCap" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
589         <xsd:element name="plus" type="CT_NumDataSource" minOccurs="0" maxOccurs="1"/>
590         <xsd:element name="minus" type="CT_NumDataSource" minOccurs="0" maxOccurs="1"/>
591         <xsd:element name="val" type="CT_Double" minOccurs="0" maxOccurs="1"/>
592         <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="0" maxOccurs="1"/>
593         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
594     </xsd:sequence>
595 </xsd:complexType>
596 <xsd:complexType name="CT_UpDownBar">
597     <xsd:sequence>
598         <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="0" maxOccurs="1"/>
599     </xsd:sequence>
600 </xsd:complexType>
601 <xsd:complexType name="CT_UpDownBars">
602     <xsd:sequence>
603         <xsd:element name="gapWidth" type="CT_GapAmount" minOccurs="0" maxOccurs="1"/>
604         <xsd:element name="upBars" type="CT_UpDownBar" minOccurs="0" maxOccurs="1"/>
605         <xsd:element name="downBars" type="CT_UpDownBar" minOccurs="0" maxOccurs="1"/>
606         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
607     </xsd:sequence>
608 </xsd:complexType>
609 <xsd:group name="EG_SerShared">
610     <xsd:sequence>
611         <xsd:element name="idx" type="CT_UnsignedInt" minOccurs="1" maxOccurs="1"/>
612         <xsd:element name="order" type="CT_UnsignedInt" minOccurs="1" maxOccurs="1"/>
613         <xsd:element name="tx" type="CT_SerTx" minOccurs="0" maxOccurs="1"/>
614         <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="0" maxOccurs="1"/>

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615     </xsd:sequence>
616 </xsd:group>
617 <xsd:complexType name="CT_LineSer">
618     <xsd:sequence>
619         <xsd:group ref="EG_SerShared" minOccurs="1" maxOccurs="1"/>
620         <xsd:element name="marker" type="CT_Marker" minOccurs="0" maxOccurs="1"/>
621         <xsd:element name="dPt" type="CT_DPt" minOccurs="0" maxOccurs="unbounded"/>
622         <xsd:element name="dLbls" type="CT_DLbls" minOccurs="0" maxOccurs="1"/>
623         <xsd:element name="trendline" type="CT_Trendline" minOccurs="0" maxOccurs="unbounded"/>
624         <xsd:element name="errBars" type="CT_ErrBars" minOccurs="0" maxOccurs="1"/>
625         <xsd:element name="cat" type="CT_AxDataSource" minOccurs="0" maxOccurs="1"/>
626         <xsd:element name="val" type="CT_NumDataSource" minOccurs="0" maxOccurs="1"/>
627         <xsd:element name="smooth" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
628         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
629     </xsd:sequence>
630 </xsd:complexType>
631 <xsd:complexType name="CT_ScatterSer">
632     <xsd:sequence>
633         <xsd:group ref="EG_SerShared" minOccurs="1" maxOccurs="1"/>
634         <xsd:element name="marker" type="CT_Marker" minOccurs="0" maxOccurs="1"/>
635         <xsd:element name="dPt" type="CT_DPt" minOccurs="0" maxOccurs="unbounded"/>
636         <xsd:element name="dLbls" type="CT_DLbls" minOccurs="0" maxOccurs="1"/>
637         <xsd:element name="trendline" type="CT_Trendline" minOccurs="0" maxOccurs="unbounded"/>
638         <xsd:element name="errBars" type="CT_ErrBars" minOccurs="0" maxOccurs="2"/>
639         <xsd:element name="xVal" type="CT_AxDataSource" minOccurs="0" maxOccurs="1"/>
640         <xsd:element name="yVal" type="CT_NumDataSource" minOccurs="0" maxOccurs="1"/>
641         <xsd:element name="smooth" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
642         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
643     </xsd:sequence>
644 </xsd:complexType>
645 <xsd:complexType name="CT_RadarSer">
646     <xsd:sequence>
647         <xsd:group ref="EG_SerShared" minOccurs="1" maxOccurs="1"/>
648         <xsd:element name="marker" type="CT_Marker" minOccurs="0" maxOccurs="1"/>
649         <xsd:element name="dPt" type="CT_DPt" minOccurs="0" maxOccurs="unbounded"/>
650         <xsd:element name="dLbls" type="CT_DLbls" minOccurs="0" maxOccurs="1"/>
651         <xsd:element name="cat" type="CT_AxDataSource" minOccurs="0" maxOccurs="1"/>
652         <xsd:element name="val" type="CT_NumDataSource" minOccurs="0" maxOccurs="1"/>
653         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
654     </xsd:sequence>
655 </xsd:complexType>
656 <xsd:complexType name="CT_BarSer">
657     <xsd:sequence>
658         <xsd:group ref="EG_SerShared" minOccurs="1" maxOccurs="1"/>
659         <xsd:element name="invertIfNegative" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
660         <xsd:element name="pictureOptions" type="CT_PictureOptions" minOccurs="0" maxOccurs="1"/>
661         <xsd:element name="dPt" type="CT_DPt" minOccurs="0" maxOccurs="unbounded"/>
662         <xsd:element name="dLbls" type="CT_DLbls" minOccurs="0" maxOccurs="1"/>
663         <xsd:element name="trendline" type="CT_Trendline" minOccurs="0" maxOccurs="unbounded"/>
664         <xsd:element name="errBars" type="CT_ErrBars" minOccurs="0" maxOccurs="1"/>
665         <xsd:element name="cat" type="CT_AxDataSource" minOccurs="0" maxOccurs="1"/>
666         <xsd:element name="val" type="CT_NumDataSource" minOccurs="0" maxOccurs="1"/>
667         <xsd:element name="shape" type="CT_Shape" minOccurs="0" maxOccurs="1"/>

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668     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
669   </xsd:sequence>
670 </xsd:complexType>
671 <xsd:complexType name="CT_AreaSer">
672   <xsd:sequence>
673     <xsd:group ref="EG_SerShared" minOccurs="1" maxOccurs="1"/>
674     <xsd:element name="pictureOptions" type="CT_PictureOptions" minOccurs="0" maxOccurs="1"/>
675     <xsd:element name="dPt" type="CT_DPt" minOccurs="0" maxOccurs="unbounded"/>
676     <xsd:element name="dLbls" type="CT_DLbLs" minOccurs="0" maxOccurs="1"/>
677     <xsd:element name="trendline" type="CT_Trendline" minOccurs="0" maxOccurs="unbounded"/>
678     <xsd:element name="errBars" type="CT_ErrBars" minOccurs="0" maxOccurs="2"/>
679     <xsd:element name="cat" type="CT_AxDataSource" minOccurs="0" maxOccurs="1"/>
680     <xsd:element name="val" type="CT_NumDataSource" minOccurs="0" maxOccurs="1"/>
681     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
682   </xsd:sequence>
683 </xsd:complexType>
684 <xsd:complexType name="CT_PieSer">
685   <xsd:sequence>
686     <xsd:group ref="EG_SerShared" minOccurs="1" maxOccurs="1"/>
687     <xsd:element name="explosion" type="CT_UnsignedInt" minOccurs="0" maxOccurs="1"/>
688     <xsd:element name="dPt" type="CT_DPt" minOccurs="0" maxOccurs="unbounded"/>
689     <xsd:element name="dLbls" type="CT_DLbLs" minOccurs="0" maxOccurs="1"/>
690     <xsd:element name="cat" type="CT_AxDataSource" minOccurs="0" maxOccurs="1"/>
691     <xsd:element name="val" type="CT_NumDataSource" minOccurs="0" maxOccurs="1"/>
692     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
693   </xsd:sequence>
694 </xsd:complexType>
695 <xsd:complexType name="CT_BubbleSer">
696   <xsd:sequence>
697     <xsd:group ref="EG_SerShared" minOccurs="1" maxOccurs="1"/>
698     <xsd:element name="invertIfNegative" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
699     <xsd:element name="dPt" type="CT_DPt" minOccurs="0" maxOccurs="unbounded"/>
700     <xsd:element name="dLbls" type="CT_DLbLs" minOccurs="0" maxOccurs="1"/>
701     <xsd:element name="trendline" type="CT_Trendline" minOccurs="0" maxOccurs="unbounded"/>
702     <xsd:element name="errBars" type="CT_ErrBars" minOccurs="0" maxOccurs="2"/>
703     <xsd:element name="xVal" type="CT_AxDataSource" minOccurs="0" maxOccurs="1"/>
704     <xsd:element name="yVal" type="CT_NumDataSource" minOccurs="0" maxOccurs="1"/>
705     <xsd:element name="bubbleSize" type="CT_NumDataSource" minOccurs="0" maxOccurs="1"/>
706     <xsd:element name="bubble3D" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
707     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
708   </xsd:sequence>
709 </xsd:complexType>
710 <xsd:complexType name="CT_SurfaceSer">
711   <xsd:sequence>
712     <xsd:group ref="EG_SerShared" minOccurs="1" maxOccurs="1"/>
713     <xsd:element name="cat" type="CT_AxDataSource" minOccurs="0" maxOccurs="1"/>
714     <xsd:element name="val" type="CT_NumDataSource" minOccurs="0" maxOccurs="1"/>
715     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
716   </xsd:sequence>
717 </xsd:complexType>
718 <xsd:simpleType name="ST_Grouping">
719   <xsd:restriction base="xsd:string">
720     <xsd:enumeration value="percentStacked"/>

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721     <xsd:enumeration value="standard"/>
722     <xsd:enumeration value="stacked"/>
723   </xsd:restriction>
724 </xsd:simpleType>
725 <xsd:complexType name="CT_Grouping">
726   <xsd:attribute name="val" type="ST_Grouping" default="standard"/>
727 </xsd:complexType>
728 <xsd:complexType name="CT_ChartLines">
729   <xsd:sequence>
730     <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="0" maxOccurs="1"/>
731   </xsd:sequence>
732 </xsd:complexType>
733 <xsd:group name="EG_LineChartShared">
734   <xsd:sequence>
735     <xsd:element name="grouping" type="CT_Grouping" minOccurs="1" maxOccurs="1"/>
736     <xsd:element name="varyColors" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
737     <xsd:element name="ser" type="CT_LineSer" minOccurs="0" maxOccurs="unbounded"/>
738     <xsd:element name="dLbls" type="CT_DLbls" minOccurs="0" maxOccurs="1"/>
739     <xsd:element name="dropLines" type="CT_ChartLines" minOccurs="0" maxOccurs="1"/>
740   </xsd:sequence>
741 </xsd:group>
742 <xsd:complexType name="CT_LineChart">
743   <xsd:sequence>
744     <xsd:group ref="EG_LineChartShared" minOccurs="1" maxOccurs="1"/>
745     <xsd:element name="hiLowLines" type="CT_ChartLines" minOccurs="0" maxOccurs="1"/>
746     <xsd:element name="upDownBars" type="CT_UpDownBars" minOccurs="0" maxOccurs="1"/>
747     <xsd:element name="marker" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
748     <xsd:element name="smooth" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
749     <xsd:element name="axId" type="CT_UnsignedInt" minOccurs="2" maxOccurs="2"/>
750     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
751   </xsd:sequence>
752 </xsd:complexType>
753 <xsd:complexType name="CT_Line3DChart">
754   <xsd:sequence>
755     <xsd:group ref="EG_LineChartShared" minOccurs="1" maxOccurs="1"/>
756     <xsd:element name="gapDepth" type="CT_GapAmount" minOccurs="0" maxOccurs="1"/>
757     <xsd:element name="axId" type="CT_UnsignedInt" minOccurs="3" maxOccurs="3"/>
758     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
759   </xsd:sequence>
760 </xsd:complexType>
761 <xsd:complexType name="CT_StockChart">
762   <xsd:sequence>
763     <xsd:element name="ser" type="CT_LineSer" minOccurs="3" maxOccurs="4"/>
764     <xsd:element name="dLbls" type="CT_DLbls" minOccurs="0" maxOccurs="1"/>
765     <xsd:element name="dropLines" type="CT_ChartLines" minOccurs="0" maxOccurs="1"/>
766     <xsd:element name="hiLowLines" type="CT_ChartLines" minOccurs="0" maxOccurs="1"/>
767     <xsd:element name="upDownBars" type="CT_UpDownBars" minOccurs="0" maxOccurs="1"/>
768     <xsd:element name="axId" type="CT_UnsignedInt" minOccurs="2" maxOccurs="2"/>
769     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
770   </xsd:sequence>
771 </xsd:complexType>
772 <xsd:simpleType name="ST_ScatterStyle">
773   <xsd:restriction base="xsd:string">

```



```

774         <xsd:enumeration value="none"/>
775         <xsd:enumeration value="line"/>
776         <xsd:enumeration value="lineMarker"/>
777         <xsd:enumeration value="marker"/>
778         <xsd:enumeration value="smooth"/>
779         <xsd:enumeration value="smoothMarker"/>
780     </xsd:restriction>
781 </xsd:simpleType>
782 <xsd:complexType name="CT_ScatterStyle">
783     <xsd:attribute name="val" type="ST_ScatterStyle" default="marker"/>
784 </xsd:complexType>
785 <xsd:complexType name="CT_ScatterChart">
786     <xsd:sequence>
787         <xsd:element name="scatterStyle" type="CT_ScatterStyle" minOccurs="1" maxOccurs="1"/>
788         <xsd:element name="varyColors" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
789         <xsd:element name="ser" type="CT_ScatterSer" minOccurs="0" maxOccurs="unbounded"/>
790         <xsd:element name="dLbls" type="CT_DLbls" minOccurs="0" maxOccurs="1"/>
791         <xsd:element name="axId" type="CT_UnsignedInt" minOccurs="2" maxOccurs="2"/>
792         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
793     </xsd:sequence>
794 </xsd:complexType>
795 <xsd:simpleType name="ST_RadarStyle">
796     <xsd:restriction base="xsd:string">
797         <xsd:enumeration value="standard"/>
798         <xsd:enumeration value="marker"/>
799         <xsd:enumeration value="filled"/>
800     </xsd:restriction>
801 </xsd:simpleType>
802 <xsd:complexType name="CT_RadarStyle">
803     <xsd:attribute name="val" type="ST_RadarStyle" default="standard"/>
804 </xsd:complexType>
805 <xsd:complexType name="CT_RadarChart">
806     <xsd:sequence>
807         <xsd:element name="radarStyle" type="CT_RadarStyle" minOccurs="1" maxOccurs="1"/>
808         <xsd:element name="varyColors" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
809         <xsd:element name="ser" type="CT_RadarSer" minOccurs="0" maxOccurs="unbounded"/>
810         <xsd:element name="dLbls" type="CT_DLbls" minOccurs="0" maxOccurs="1"/>
811         <xsd:element name="axId" type="CT_UnsignedInt" minOccurs="2" maxOccurs="2"/>
812         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
813     </xsd:sequence>
814 </xsd:complexType>
815 <xsd:simpleType name="ST_BarGrouping">
816     <xsd:restriction base="xsd:string">
817         <xsd:enumeration value="percentStacked"/>
818         <xsd:enumeration value="clustered"/>
819         <xsd:enumeration value="standard"/>
820         <xsd:enumeration value="stacked"/>
821     </xsd:restriction>
822 </xsd:simpleType>
823 <xsd:complexType name="CT_BarGrouping">
824     <xsd:attribute name="val" type="ST_BarGrouping" default="clustered"/>
825 </xsd:complexType>
826 <xsd:simpleType name="ST_BarDir">

```

```

827     <xsd:restriction base="xsd:string">
828         <xsd:enumeration value="bar"/>
829         <xsd:enumeration value="col"/>
830     </xsd:restriction>
831 </xsd:simpleType>
832 <xsd:complexType name="CT_BarDir">
833     <xsd:attribute name="val" type="ST_BarDir" default="col"/>
834 </xsd:complexType>
835 <xsd:simpleType name="ST_Shape">
836     <xsd:restriction base="xsd:string">
837         <xsd:enumeration value="cone"/>
838         <xsd:enumeration value="coneToMax"/>
839         <xsd:enumeration value="box"/>
840         <xsd:enumeration value="cylinder"/>
841         <xsd:enumeration value="pyramid"/>
842         <xsd:enumeration value="pyramidToMax"/>
843     </xsd:restriction>
844 </xsd:simpleType>
845 <xsd:complexType name="CT_Shape">
846     <xsd:attribute name="val" type="ST_Shape" default="box"/>
847 </xsd:complexType>
848 <xsd:group name="EG_BarChartShared">
849     <xsd:sequence>
850         <xsd:element name="barDir" type="CT_BarDir" minOccurs="1" maxOccurs="1"/>
851         <xsd:element name="grouping" type="CT_BarGrouping" minOccurs="0" maxOccurs="1"/>
852         <xsd:element name="varyColors" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
853         <xsd:element name="ser" type="CT_BarSer" minOccurs="0" maxOccurs="unbounded"/>
854         <xsd:element name="dLbls" type="CT_DLbls" minOccurs="0" maxOccurs="1"/>
855     </xsd:sequence>
856 </xsd:group>
857 <xsd:complexType name="CT_BarChart">
858     <xsd:sequence>
859         <xsd:group ref="EG_BarChartShared" minOccurs="1" maxOccurs="1"/>
860         <xsd:element name="gapWidth" type="CT_GapAmount" minOccurs="0" maxOccurs="1"/>
861         <xsd:element name="overlap" type="CT_Overlap" minOccurs="0" maxOccurs="1"/>
862         <xsd:element name="serLines" type="CT_ChartLines" minOccurs="0" maxOccurs="unbounded"/>
863         <xsd:element name="axId" type="CT_UnsignedInt" minOccurs="2" maxOccurs="2"/>
864         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
865     </xsd:sequence>
866 </xsd:complexType>
867 <xsd:complexType name="CT_Bar3DChart">
868     <xsd:sequence>
869         <xsd:group ref="EG_BarChartShared" minOccurs="1" maxOccurs="1"/>
870         <xsd:element name="gapWidth" type="CT_GapAmount" minOccurs="0" maxOccurs="1"/>
871         <xsd:element name="gapDepth" type="CT_GapAmount" minOccurs="0" maxOccurs="1"/>
872         <xsd:element name="shape" type="CT_Shape" minOccurs="0" maxOccurs="1"/>
873         <xsd:element name="axId" type="CT_UnsignedInt" minOccurs="2" maxOccurs="3"/>
874         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
875     </xsd:sequence>
876 </xsd:complexType>
877 <xsd:group name="EG_AreaChartShared">
878     <xsd:sequence>
879         <xsd:element name="grouping" type="CT_Grouping" minOccurs="0" maxOccurs="1"/>

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880     <xsd:element name="varyColors" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
881     <xsd:element name="ser" type="CT_AreaSer" minOccurs="0" maxOccurs="unbounded"/>
882     <xsd:element name="dLbls" type="CT_DLbls" minOccurs="0" maxOccurs="1"/>
883     <xsd:element name="dropLines" type="CT_ChartLines" minOccurs="0" maxOccurs="1"/>
884   </xsd:sequence>
885 </xsd:group>
886 <xsd:complexType name="CT_AreaChart">
887   <xsd:sequence>
888     <xsd:group ref="EG_AreaChartShared" minOccurs="1" maxOccurs="1"/>
889     <xsd:element name="axId" type="CT_UnsignedInt" minOccurs="2" maxOccurs="2"/>
890     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
891   </xsd:sequence>
892 </xsd:complexType>
893 <xsd:complexType name="CT_Area3DChart">
894   <xsd:sequence>
895     <xsd:group ref="EG_AreaChartShared" minOccurs="1" maxOccurs="1"/>
896     <xsd:element name="gapDepth" type="CT_GapAmount" minOccurs="0" maxOccurs="1"/>
897     <xsd:element name="axId" type="CT_UnsignedInt" minOccurs="2" maxOccurs="3"/>
898     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
899   </xsd:sequence>
900 </xsd:complexType>
901 <xsd:group name="EG_PieChartShared">
902   <xsd:sequence>
903     <xsd:element name="varyColors" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
904     <xsd:element name="ser" type="CT_PieSer" minOccurs="0" maxOccurs="unbounded"/>
905     <xsd:element name="dLbls" type="CT_DLbls" minOccurs="0" maxOccurs="1"/>
906   </xsd:sequence>
907 </xsd:group>
908 <xsd:complexType name="CT_PieChart">
909   <xsd:sequence>
910     <xsd:group ref="EG_PieChartShared" minOccurs="1" maxOccurs="1"/>
911     <xsd:element name="firstSliceAng" type="CT_FirstSliceAng" minOccurs="0" maxOccurs="1"/>
912     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
913   </xsd:sequence>
914 </xsd:complexType>
915 <xsd:complexType name="CT_Pie3DChart">
916   <xsd:sequence>
917     <xsd:group ref="EG_PieChartShared" minOccurs="1" maxOccurs="1"/>
918     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
919   </xsd:sequence>
920 </xsd:complexType>
921 <xsd:complexType name="CT_DoughnutChart">
922   <xsd:sequence>
923     <xsd:group ref="EG_PieChartShared" minOccurs="1" maxOccurs="1"/>
924     <xsd:element name="firstSliceAng" type="CT_FirstSliceAng" minOccurs="0" maxOccurs="1"/>
925     <xsd:element name="holeSize" type="CT_HoleSize" minOccurs="0" maxOccurs="1"/>
926     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
927   </xsd:sequence>
928 </xsd:complexType>
929 <xsd:simpleType name="ST_OfPieType">
930   <xsd:restriction base="xsd:string">
931     <xsd:enumeration value="pie"/>
932     <xsd:enumeration value="bar"/>

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933     </xsd:restriction>
934 </xsd:simpleType>
935 <xsd:complexType name="CT_OfPieType">
936     <xsd:attribute name="val" type="ST_OfPieType" default="pie"/>
937 </xsd:complexType>
938 <xsd:complexType name="CT_OfPieChart">
939     <xsd:sequence>
940         <xsd:element name="ofPieType" type="CT_OfPieType" minOccurs="1" maxOccurs="1"/>
941         <xsd:group ref="EG_PieChartShared" minOccurs="1" maxOccurs="1"/>
942         <xsd:element name="gapWidth" type="CT_GapAmount" minOccurs="0" maxOccurs="1"/>
943         <xsd:element name="splitType" type="CT_SplitType" minOccurs="0" maxOccurs="1"/>
944         <xsd:element name="splitPos" type="CT_Double" minOccurs="0" maxOccurs="1"/>
945         <xsd:element name="custSplit" type="CT_CustSplit" minOccurs="0" maxOccurs="1"/>
946         <xsd:element name="secondPieSize" type="CT_SecondPieSize" minOccurs="0" maxOccurs="1"/>
947         <xsd:element name="serLines" type="CT_ChartLines" minOccurs="0" maxOccurs="unbounded"/>
948         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
949     </xsd:sequence>
950 </xsd:complexType>
951 <xsd:complexType name="CT_BubbleChart">
952     <xsd:sequence>
953         <xsd:element name="varyColors" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
954         <xsd:element name="ser" type="CT_BubbleSer" minOccurs="0" maxOccurs="unbounded"/>
955         <xsd:element name="dLbls" type="CT_DLbls" minOccurs="0" maxOccurs="1"/>
956         <xsd:element name="bubble3D" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
957         <xsd:element name="bubbleScale" type="CT_BubbleScale" minOccurs="0" maxOccurs="1"/>
958         <xsd:element name="showNegBubbles" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
959         <xsd:element name="sizeRepresents" type="CT_SizeRepresents" minOccurs="0" maxOccurs="1"/>
960         <xsd:element name="axId" type="CT_UnsignedInt" minOccurs="2" maxOccurs="2"/>
961         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
962     </xsd:sequence>
963 </xsd:complexType>
964 <xsd:complexType name="CT_BandFmt">
965     <xsd:sequence>
966         <xsd:element name="idx" type="CT_UnsignedInt" minOccurs="1" maxOccurs="1"/>
967         <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="0" maxOccurs="1"/>
968     </xsd:sequence>
969 </xsd:complexType>
970 <xsd:complexType name="CT_BandFmts">
971     <xsd:sequence>
972         <xsd:element name="bandFmt" type="CT_BandFmt" minOccurs="0" maxOccurs="unbounded"/>
973     </xsd:sequence>
974 </xsd:complexType>
975 <xsd:group name="EG_SurfaceChartShared">
976     <xsd:sequence>
977         <xsd:element name="wireframe" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
978         <xsd:element name="ser" type="CT_SurfaceSer" minOccurs="0" maxOccurs="unbounded"/>
979         <xsd:element name="bandFmts" type="CT_BandFmts" minOccurs="0" maxOccurs="1"/>
980     </xsd:sequence>
981 </xsd:group>
982 <xsd:complexType name="CT_SurfaceChart">
983     <xsd:sequence>
984         <xsd:group ref="EG_SurfaceChartShared" minOccurs="1" maxOccurs="1"/>
985         <xsd:element name="axId" type="CT_UnsignedInt" minOccurs="2" maxOccurs="3"/>

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986         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
987     </xsd:sequence>
988 </xsd:complexType>
989 <xsd:complexType name="CT_Surface3DChart">
990     <xsd:sequence>
991         <xsd:group ref="EG_SurfaceChartShared" minOccurs="1" maxOccurs="1"/>
992         <xsd:element name="axId" type="CT_UnsignedInt" minOccurs="3" maxOccurs="3"/>
993         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
994     </xsd:sequence>
995 </xsd:complexType>
996 <xsd:simpleType name="ST_AxPos">
997     <xsd:restriction base="xsd:string">
998         <xsd:enumeration value="b"/>
999         <xsd:enumeration value="l"/>
1000         <xsd:enumeration value="r"/>
1001         <xsd:enumeration value="t"/>
1002     </xsd:restriction>
1003 </xsd:simpleType>
1004 <xsd:complexType name="CT_AxPos">
1005     <xsd:attribute name="val" type="ST_AxPos" use="required"/>
1006 </xsd:complexType>
1007 <xsd:simpleType name="ST_Crosses">
1008     <xsd:restriction base="xsd:string">
1009         <xsd:enumeration value="autoZero"/>
1010         <xsd:enumeration value="max"/>
1011         <xsd:enumeration value="min"/>
1012     </xsd:restriction>
1013 </xsd:simpleType>
1014 <xsd:complexType name="CT_Crosses">
1015     <xsd:attribute name="val" type="ST_Crosses" use="required"/>
1016 </xsd:complexType>
1017 <xsd:simpleType name="ST_CrossBetween">
1018     <xsd:restriction base="xsd:string">
1019         <xsd:enumeration value="between"/>
1020         <xsd:enumeration value="midCat"/>
1021     </xsd:restriction>
1022 </xsd:simpleType>
1023 <xsd:complexType name="CT_CrossBetween">
1024     <xsd:attribute name="val" type="ST_CrossBetween" use="required"/>
1025 </xsd:complexType>
1026 <xsd:simpleType name="ST_TickMark">
1027     <xsd:restriction base="xsd:string">
1028         <xsd:enumeration value="cross"/>
1029         <xsd:enumeration value="in"/>
1030         <xsd:enumeration value="none"/>
1031         <xsd:enumeration value="out"/>
1032     </xsd:restriction>
1033 </xsd:simpleType>
1034 <xsd:complexType name="CT_TickMark">
1035     <xsd:attribute name="val" type="ST_TickMark" default="cross"/>
1036 </xsd:complexType>
1037 <xsd:simpleType name="ST_TickLblPos">
1038     <xsd:restriction base="xsd:string">

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1039         <xsd:enumeration value="high"/>
1040         <xsd:enumeration value="low"/>
1041         <xsd:enumeration value="nextTo"/>
1042         <xsd:enumeration value="none"/>
1043     </xsd:restriction>
1044 </xsd:simpleType>
1045 <xsd:complexType name="CT_TickLblPos">
1046     <xsd:attribute name="val" type="ST_TickLblPos" default="nextTo"/>
1047 </xsd:complexType>
1048 <xsd:simpleType name="ST_Skip">
1049     <xsd:restriction base="xsd:unsignedInt">
1050         <xsd:minInclusive value="1"/>
1051     </xsd:restriction>
1052 </xsd:simpleType>
1053 <xsd:complexType name="CT_Skip">
1054     <xsd:attribute name="val" type="ST_Skip" use="required"/>
1055 </xsd:complexType>
1056 <xsd:simpleType name="ST_TimeUnit">
1057     <xsd:restriction base="xsd:string">
1058         <xsd:enumeration value="days"/>
1059         <xsd:enumeration value="months"/>
1060         <xsd:enumeration value="years"/>
1061     </xsd:restriction>
1062 </xsd:simpleType>
1063 <xsd:complexType name="CT_TimeUnit">
1064     <xsd:attribute name="val" type="ST_TimeUnit" default="days"/>
1065 </xsd:complexType>
1066 <xsd:simpleType name="ST_AxisUnit">
1067     <xsd:restriction base="xsd:double">
1068         <xsd:minExclusive value="0"/>
1069     </xsd:restriction>
1070 </xsd:simpleType>
1071 <xsd:complexType name="CT_AxisUnit">
1072     <xsd:attribute name="val" type="ST_AxisUnit" use="required"/>
1073 </xsd:complexType>
1074 <xsd:simpleType name="ST_BuiltInUnit">
1075     <xsd:restriction base="xsd:string">
1076         <xsd:enumeration value="hundreds"/>
1077         <xsd:enumeration value="thousands"/>
1078         <xsd:enumeration value="tenThousands"/>
1079         <xsd:enumeration value="hundredThousands"/>
1080         <xsd:enumeration value="millions"/>
1081         <xsd:enumeration value="tenMillions"/>
1082         <xsd:enumeration value="hundredMillions"/>
1083         <xsd:enumeration value="billions"/>
1084         <xsd:enumeration value="trillions"/>
1085     </xsd:restriction>
1086 </xsd:simpleType>
1087 <xsd:complexType name="CT_BuiltInUnit">
1088     <xsd:attribute name="val" type="ST_BuiltInUnit" default="thousands"/>
1089 </xsd:complexType>
1090 <xsd:simpleType name="ST_PictureFormat">
1091     <xsd:restriction base="xsd:string">

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1092         <xsd:enumeration value="stretch"/>
1093         <xsd:enumeration value="stack"/>
1094         <xsd:enumeration value="stackScale"/>
1095     </xsd:restriction>
1096 </xsd:simpleType>
1097 <xsd:complexType name="CT_PictureFormat">
1098     <xsd:attribute name="val" type="ST_PictureFormat" use="required"/>
1099 </xsd:complexType>
1100 <xsd:simpleType name="ST_PictureStackUnit">
1101     <xsd:restriction base="xsd:double">
1102         <xsd:minExclusive value="0"/>
1103     </xsd:restriction>
1104 </xsd:simpleType>
1105 <xsd:complexType name="CT_PictureStackUnit">
1106     <xsd:attribute name="val" type="ST_PictureStackUnit" use="required"/>
1107 </xsd:complexType>
1108 <xsd:complexType name="CT_PictureOptions">
1109     <xsd:sequence>
1110         <xsd:element name="applyToFront" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
1111         <xsd:element name="applyToSides" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
1112         <xsd:element name="applyToEnd" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
1113         <xsd:element name="pictureFormat" type="CT_PictureFormat" minOccurs="0" maxOccurs="1"/>
1114         <xsd:element name="pictureStackUnit" type="CT_PictureStackUnit" minOccurs="0"
1115             maxOccurs="1"/>
1116     </xsd:sequence>
1117 </xsd:complexType>
1118 <xsd:complexType name="CT_DispUnitsLbl">
1119     <xsd:sequence>
1120         <xsd:element name="layout" type="CT_Layout" minOccurs="0" maxOccurs="1"/>
1121         <xsd:element name="tx" type="CT_Tx" minOccurs="0" maxOccurs="1"/>
1122         <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="0" maxOccurs="1"/>
1123         <xsd:element name="txPr" type="a:CT_TextBody" minOccurs="0" maxOccurs="1"/>
1124     </xsd:sequence>
1125 </xsd:complexType>
1126 <xsd:complexType name="CT_DispUnits">
1127     <xsd:sequence>
1128         <xsd:choice>
1129             <xsd:element name="custUnit" type="CT_Double" minOccurs="1" maxOccurs="1"/>
1130             <xsd:element name="builtInUnit" type="CT_BuiltInUnit" minOccurs="1" maxOccurs="1"/>
1131         </xsd:choice>
1132         <xsd:element name="dispUnitsLbl" type="CT_DispUnitsLbl" minOccurs="0" maxOccurs="1"/>
1133         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1134     </xsd:sequence>
1135 </xsd:complexType>
1136 <xsd:simpleType name="ST_Orientation">
1137     <xsd:restriction base="xsd:string">
1138         <xsd:enumeration value="maxMin"/>
1139         <xsd:enumeration value="minMax"/>
1140     </xsd:restriction>
1141 </xsd:simpleType>
1142 <xsd:complexType name="CT_Orientation">
1143     <xsd:attribute name="val" type="ST_Orientation" default="minMax"/>
1144 </xsd:complexType>

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1145 <xsd:simpleType name="ST_LogBase">
1146   <xsd:restriction base="xsd:double">
1147     <xsd:minInclusive value="2"/>
1148     <xsd:maxInclusive value="1000"/>
1149   </xsd:restriction>
1150 </xsd:simpleType>
1151 <xsd:complexType name="CT_LogBase">
1152   <xsd:attribute name="val" type="ST_LogBase" use="required"/>
1153 </xsd:complexType>
1154 <xsd:complexType name="CT_Scaling">
1155   <xsd:sequence>
1156     <xsd:element name="logBase" type="CT_LogBase" minOccurs="0" maxOccurs="1"/>
1157     <xsd:element name="orientation" type="CT_Orientation" minOccurs="0" maxOccurs="1"/>
1158     <xsd:element name="max" type="CT_Double" minOccurs="0" maxOccurs="1"/>
1159     <xsd:element name="min" type="CT_Double" minOccurs="0" maxOccurs="1"/>
1160     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1161   </xsd:sequence>
1162 </xsd:complexType>
1163 <xsd:simpleType name="ST_LblOffset">
1164   <xsd:union memberTypes="ST_LblOffsetPercent"/>
1165 </xsd:simpleType>
1166 <xsd:simpleType name="ST_LblOffsetPercent">
1167   <xsd:restriction base="xsd:string">
1168     <xsd:pattern value="0*(([0-9])|([1-9][0-9])|([1-9][0-9][0-9])|1000)%"/>
1169   </xsd:restriction>
1170 </xsd:simpleType>
1171 <xsd:complexType name="CT_LblOffset">
1172   <xsd:attribute name="val" type="ST_LblOffset" default="100%"/>
1173 </xsd:complexType>
1174 <xsd:group name="EG_AxShared">
1175   <xsd:sequence>
1176     <xsd:element name="axId" type="CT_UnsignedInt" minOccurs="1" maxOccurs="1"/>
1177     <xsd:element name="scaling" type="CT_Scaling" minOccurs="1" maxOccurs="1"/>
1178     <xsd:element name="delete" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
1179     <xsd:element name="axPos" type="CT_AxPos" minOccurs="1" maxOccurs="1"/>
1180     <xsd:element name="majorGridlines" type="CT_ChartLines" minOccurs="0" maxOccurs="1"/>
1181     <xsd:element name="minorGridlines" type="CT_ChartLines" minOccurs="0" maxOccurs="1"/>
1182     <xsd:element name="title" type="CT_Title" minOccurs="0" maxOccurs="1"/>
1183     <xsd:element name="numFmt" type="CT_NumFmt" minOccurs="0" maxOccurs="1"/>
1184     <xsd:element name="majorTickMark" type="CT_TickMark" minOccurs="0" maxOccurs="1"/>
1185     <xsd:element name="minorTickMark" type="CT_TickMark" minOccurs="0" maxOccurs="1"/>
1186     <xsd:element name="tickLblPos" type="CT_TickLblPos" minOccurs="0" maxOccurs="1"/>
1187     <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="0" maxOccurs="1"/>
1188     <xsd:element name="txPr" type="a:CT_TextBody" minOccurs="0" maxOccurs="1"/>
1189     <xsd:element name="crossAx" type="CT_UnsignedInt" minOccurs="1" maxOccurs="1"/>
1190     <xsd:choice minOccurs="0" maxOccurs="1">
1191       <xsd:element name="crosses" type="CT_Crosses" minOccurs="1" maxOccurs="1"/>
1192       <xsd:element name="crossesAt" type="CT_Double" minOccurs="1" maxOccurs="1"/>
1193     </xsd:choice>
1194   </xsd:sequence>
1195 </xsd:group>
1196 <xsd:complexType name="CT_CatAx">
1197   <xsd:sequence>

```



```

1198     <xsd:group ref="EG_AxShared" minOccurs="1" maxOccurs="1"/>
1199     <xsd:element name="auto" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
1200     <xsd:element name="lblAlign" type="CT_LblAlign" minOccurs="0" maxOccurs="1"/>
1201     <xsd:element name="lblOffset" type="CT_LblOffset" minOccurs="0" maxOccurs="1"/>
1202     <xsd:element name="tickLblSkip" type="CT_Skip" minOccurs="0" maxOccurs="1"/>
1203     <xsd:element name="tickMarkSkip" type="CT_Skip" minOccurs="0" maxOccurs="1"/>
1204     <xsd:element name="noMultiLvlLbl" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
1205     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1206   </xsd:sequence>
1207 </xsd:complexType>
1208 <xsd:complexType name="CT_DateAx">
1209   <xsd:sequence>
1210     <xsd:group ref="EG_AxShared" minOccurs="1" maxOccurs="1"/>
1211     <xsd:element name="auto" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
1212     <xsd:element name="lblOffset" type="CT_LblOffset" minOccurs="0" maxOccurs="1"/>
1213     <xsd:element name="baseTimeUnit" type="CT_TimeUnit" minOccurs="0" maxOccurs="1"/>
1214     <xsd:element name="majorUnit" type="CT_AxisUnit" minOccurs="0" maxOccurs="1"/>
1215     <xsd:element name="majorTimeUnit" type="CT_TimeUnit" minOccurs="0" maxOccurs="1"/>
1216     <xsd:element name="minorUnit" type="CT_AxisUnit" minOccurs="0" maxOccurs="1"/>
1217     <xsd:element name="minorTimeUnit" type="CT_TimeUnit" minOccurs="0" maxOccurs="1"/>
1218     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1219   </xsd:sequence>
1220 </xsd:complexType>
1221 <xsd:complexType name="CT_SerAx">
1222   <xsd:sequence>
1223     <xsd:group ref="EG_AxShared" minOccurs="1" maxOccurs="1"/>
1224     <xsd:element name="tickLblSkip" type="CT_Skip" minOccurs="0" maxOccurs="1"/>
1225     <xsd:element name="tickMarkSkip" type="CT_Skip" minOccurs="0" maxOccurs="1"/>
1226     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1227   </xsd:sequence>
1228 </xsd:complexType>
1229 <xsd:complexType name="CT_ValAx">
1230   <xsd:sequence>
1231     <xsd:group ref="EG_AxShared" minOccurs="1" maxOccurs="1"/>
1232     <xsd:element name="crossBetween" type="CT_CrossBetween" minOccurs="0" maxOccurs="1"/>
1233     <xsd:element name="majorUnit" type="CT_AxisUnit" minOccurs="0" maxOccurs="1"/>
1234     <xsd:element name="minorUnit" type="CT_AxisUnit" minOccurs="0" maxOccurs="1"/>
1235     <xsd:element name="dispUnits" type="CT_DispUnits" minOccurs="0" maxOccurs="1"/>
1236     <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1237   </xsd:sequence>
1238 </xsd:complexType>
1239 <xsd:complexType name="CT_PlotArea">
1240   <xsd:sequence>
1241     <xsd:element name="layout" type="CT_Layout" minOccurs="0" maxOccurs="1"/>
1242     <xsd:choice minOccurs="1" maxOccurs="unbounded">
1243       <xsd:element name="areaChart" type="CT_AreaChart" minOccurs="1" maxOccurs="1"/>
1244       <xsd:element name="area3DChart" type="CT_Area3DChart" minOccurs="1" maxOccurs="1"/>
1245       <xsd:element name="lineChart" type="CT_LineChart" minOccurs="1" maxOccurs="1"/>
1246       <xsd:element name="line3DChart" type="CT_Line3DChart" minOccurs="1" maxOccurs="1"/>
1247       <xsd:element name="stockChart" type="CT_StockChart" minOccurs="1" maxOccurs="1"/>
1248       <xsd:element name="radarChart" type="CT_RadarChart" minOccurs="1" maxOccurs="1"/>
1249       <xsd:element name="scatterChart" type="CT_ScatterChart" minOccurs="1" maxOccurs="1"/>
1250       <xsd:element name="pieChart" type="CT_PieChart" minOccurs="1" maxOccurs="1"/>

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1251     <xsd:element name="pie3DChart" type="CT_Pie3DChart" minOccurs="1" maxOccurs="1"/>
1252     <xsd:element name="doughnutChart" type="CT_DoughnutChart" minOccurs="1" maxOccurs="1"/>
1253     <xsd:element name="barChart" type="CT_BarChart" minOccurs="1" maxOccurs="1"/>
1254     <xsd:element name="bar3DChart" type="CT_Bar3DChart" minOccurs="1" maxOccurs="1"/>
1255     <xsd:element name="ofPieChart" type="CT_OfPieChart" minOccurs="1" maxOccurs="1"/>
1256     <xsd:element name="surfaceChart" type="CT_SurfaceChart" minOccurs="1" maxOccurs="1"/>
1257     <xsd:element name="surface3DChart" type="CT_Surface3DChart" minOccurs="1"
1258         maxOccurs="1"/>
1259     <xsd:element name="bubbleChart" type="CT_BubbleChart" minOccurs="1" maxOccurs="1"/>
1260 </xsd:choice>
1261 <xsd:choice minOccurs="0" maxOccurs="unbounded">
1262     <xsd:element name="valAx" type="CT_ValAx" minOccurs="1" maxOccurs="1"/>
1263     <xsd:element name="catAx" type="CT_CatAx" minOccurs="1" maxOccurs="1"/>
1264     <xsd:element name="dateAx" type="CT_DateAx" minOccurs="1" maxOccurs="1"/>
1265     <xsd:element name="serAx" type="CT_SerAx" minOccurs="1" maxOccurs="1"/>
1266 </xsd:choice>
1267 <xsd:element name="dTable" type="CT_DTable" minOccurs="0" maxOccurs="1"/>
1268 <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="0" maxOccurs="1"/>
1269 <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1270 </xsd:sequence>
1271 </xsd:complexType>
1272 <xsd:complexType name="CT_PivotFmt">
1273     <xsd:sequence>
1274         <xsd:element name="idx" type="CT_UnsignedInt" minOccurs="1" maxOccurs="1"/>
1275         <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="0" maxOccurs="1"/>
1276         <xsd:element name="txPr" type="a:CT_TextBody" minOccurs="0" maxOccurs="1"/>
1277         <xsd:element name="marker" type="CT_Marker" minOccurs="0" maxOccurs="1"/>
1278         <xsd:element name="dLbl" type="CT_DLbl" minOccurs="0" maxOccurs="1"/>
1279         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1280     </xsd:sequence>
1281 </xsd:complexType>
1282 <xsd:complexType name="CT_PivotFmts">
1283     <xsd:sequence>
1284         <xsd:element name="pivotFmt" type="CT_PivotFmt" minOccurs="0" maxOccurs="unbounded"/>
1285     </xsd:sequence>
1286 </xsd:complexType>
1287 <xsd:simpleType name="ST_LegendPos">
1288     <xsd:restriction base="xsd:string">
1289         <xsd:enumeration value="b"/>
1290         <xsd:enumeration value="tr"/>
1291         <xsd:enumeration value="l"/>
1292         <xsd:enumeration value="r"/>
1293         <xsd:enumeration value="t"/>
1294     </xsd:restriction>
1295 </xsd:simpleType>
1296 <xsd:complexType name="CT_LegendPos">
1297     <xsd:attribute name="val" type="ST_LegendPos" default="r"/>
1298 </xsd:complexType>
1299 <xsd:group name="EG_LegendEntryData">
1300     <xsd:sequence>
1301         <xsd:element name="txPr" type="a:CT_TextBody" minOccurs="0" maxOccurs="1"/>
1302     </xsd:sequence>
1303 </xsd:group>

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1304 <xsd:complexType name="CT_LegendEntry">
1305   <xsd:sequence>
1306     <xsd:element name="idx" type="CT UnsignedInt" minOccurs="1" maxOccurs="1"/>
1307     <xsd:choice>
1308       <xsd:element name="delete" type="CT Boolean" minOccurs="1" maxOccurs="1"/>
1309       <xsd:group ref="EG_LegendEntryData" minOccurs="1" maxOccurs="1"/>
1310     </xsd:choice>
1311     <xsd:element name="extLst" type="CT ExtensionList" minOccurs="0" maxOccurs="1"/>
1312   </xsd:sequence>
1313 </xsd:complexType>
1314 <xsd:complexType name="CT_Legend">
1315   <xsd:sequence>
1316     <xsd:element name="legendPos" type="CT LegendPos" minOccurs="0" maxOccurs="1"/>
1317     <xsd:element name="legendEntry" type="CT LegendEntry" minOccurs="0"
1318       maxOccurs="unbounded"/>
1319     <xsd:element name="layout" type="CT Layout" minOccurs="0" maxOccurs="1"/>
1320     <xsd:element name="overlay" type="CT Boolean" minOccurs="0" maxOccurs="1"/>
1321     <xsd:element name="spPr" type="a:CT ShapeProperties" minOccurs="0" maxOccurs="1"/>
1322     <xsd:element name="txPr" type="a:CT TextBody" minOccurs="0" maxOccurs="1"/>
1323     <xsd:element name="extLst" type="CT ExtensionList" minOccurs="0" maxOccurs="1"/>
1324   </xsd:sequence>
1325 </xsd:complexType>
1326 <xsd:simpleType name="ST_DisbBlanksAs">
1327   <xsd:restriction base="xsd:string">
1328     <xsd:enumeration value="span"/>
1329     <xsd:enumeration value="gap"/>
1330     <xsd:enumeration value="zero"/>
1331   </xsd:restriction>
1332 </xsd:simpleType>
1333 <xsd:complexType name="CT_DisbBlanksAs">
1334   <xsd:attribute name="val" type="ST_DisbBlanksAs" default="zero"/>
1335 </xsd:complexType>
1336 <xsd:complexType name="CT_Chart">
1337   <xsd:sequence>
1338     <xsd:element name="title" type="CT Title" minOccurs="0" maxOccurs="1"/>
1339     <xsd:element name="autoTitleDeleted" type="CT Boolean" minOccurs="0" maxOccurs="1"/>
1340     <xsd:element name="pivotFmts" type="CT PivotFmts" minOccurs="0" maxOccurs="1"/>
1341     <xsd:element name="view3D" type="CT View3D" minOccurs="0" maxOccurs="1"/>
1342     <xsd:element name="floor" type="CT Surface" minOccurs="0" maxOccurs="1"/>
1343     <xsd:element name="sideWall" type="CT Surface" minOccurs="0" maxOccurs="1"/>
1344     <xsd:element name="backWall" type="CT Surface" minOccurs="0" maxOccurs="1"/>
1345     <xsd:element name="plotArea" type="CT PlotArea" minOccurs="1" maxOccurs="1"/>
1346     <xsd:element name="legend" type="CT Legend" minOccurs="0" maxOccurs="1"/>
1347     <xsd:element name="plotVisOnly" type="CT Boolean" minOccurs="0" maxOccurs="1"/>
1348     <xsd:element name="disbBlanksAs" type="CT DisbBlanksAs" minOccurs="0" maxOccurs="1"/>
1349     <xsd:element name="showDLblsOverMax" type="CT Boolean" minOccurs="0" maxOccurs="1"/>
1350     <xsd:element name="extLst" type="CT ExtensionList" minOccurs="0" maxOccurs="1"/>
1351   </xsd:sequence>
1352 </xsd:complexType>
1353 <xsd:simpleType name="ST_Style">
1354   <xsd:restriction base="xsd:unsignedByte">
1355     <xsd:minInclusive value="1"/>
1356     <xsd:maxInclusive value="48"/>

```

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1357     </xsd:restriction>
1358 </xsd:simpleType>
1359 <xsd:complexType name="CT_Style">
1360     <xsd:attribute name="val" type="ST_Style" use="required"/>
1361 </xsd:complexType>
1362 <xsd:complexType name="CT_PivotSource">
1363     <xsd:sequence>
1364         <xsd:element name="name" type="s:ST_Xstring" minOccurs="1" maxOccurs="1"/>
1365         <xsd:element name="fmtId" type="CT_UnsignedInt" minOccurs="1" maxOccurs="1"/>
1366         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="unbounded"/>
1367     </xsd:sequence>
1368 </xsd:complexType>
1369 <xsd:complexType name="CT_Protection">
1370     <xsd:sequence>
1371         <xsd:element name="chartObject" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
1372         <xsd:element name="data" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
1373         <xsd:element name="formatting" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
1374         <xsd:element name="selection" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
1375         <xsd:element name="userInterface" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
1376     </xsd:sequence>
1377 </xsd:complexType>
1378 <xsd:complexType name="CT_HeaderFooter">
1379     <xsd:sequence>
1380         <xsd:element name="oddHeader" type="s:ST_Xstring" minOccurs="0" maxOccurs="1"/>
1381         <xsd:element name="oddFooter" type="s:ST_Xstring" minOccurs="0" maxOccurs="1"/>
1382         <xsd:element name="evenHeader" type="s:ST_Xstring" minOccurs="0" maxOccurs="1"/>
1383         <xsd:element name="evenFooter" type="s:ST_Xstring" minOccurs="0" maxOccurs="1"/>
1384         <xsd:element name="firstHeader" type="s:ST_Xstring" minOccurs="0" maxOccurs="1"/>
1385         <xsd:element name="firstFooter" type="s:ST_Xstring" minOccurs="0" maxOccurs="1"/>
1386     </xsd:sequence>
1387     <xsd:attribute name="alignWithMargins" type="xsd:boolean" default="true"/>
1388     <xsd:attribute name="differentOddEven" type="xsd:boolean" default="false"/>
1389     <xsd:attribute name="differentFirst" type="xsd:boolean" default="false"/>
1390 </xsd:complexType>
1391 <xsd:complexType name="CT_PageMargins">
1392     <xsd:attribute name="l" type="xsd:double" use="required"/>
1393     <xsd:attribute name="r" type="xsd:double" use="required"/>
1394     <xsd:attribute name="t" type="xsd:double" use="required"/>
1395     <xsd:attribute name="b" type="xsd:double" use="required"/>
1396     <xsd:attribute name="header" type="xsd:double" use="required"/>
1397     <xsd:attribute name="footer" type="xsd:double" use="required"/>
1398 </xsd:complexType>
1399 <xsd:simpleType name="ST_PageSetupOrientation">
1400     <xsd:restriction base="xsd:string">
1401         <xsd:enumeration value="default"/>
1402         <xsd:enumeration value="portrait"/>
1403         <xsd:enumeration value="landscape"/>
1404     </xsd:restriction>
1405 </xsd:simpleType>
1406 <xsd:complexType name="CT_ExternalData">
1407     <xsd:sequence>
1408         <xsd:element name="autoUpdate" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
1409     </xsd:sequence>

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1410     <xsd:attribute ref="r:id" use="required"/>
1411 </xsd:complexType>
1412 <xsd:complexType name="CT_PageSetup">
1413     <xsd:attribute name="paperSize" type="xsd:unsignedInt" use="optional" default="1"/>
1414     <xsd:attribute name="paperHeight" type="s:ST_PositiveUniversalMeasure" use="optional"/>
1415     <xsd:attribute name="paperWidth" type="s:ST_PositiveUniversalMeasure" use="optional"/>
1416     <xsd:attribute name="firstPageNumber" type="xsd:unsignedInt" use="optional" default="1"/>
1417     <xsd:attribute name="orientation" type="ST_PageSetupOrientation" use="optional"
1418         default="default"/>
1419     <xsd:attribute name="blackAndWhite" type="xsd:boolean" use="optional" default="false"/>
1420     <xsd:attribute name="draft" type="xsd:boolean" use="optional" default="false"/>
1421     <xsd:attribute name="useFirstPageNumber" type="xsd:boolean" use="optional" default="false"/>
1422     <xsd:attribute name="horizontalDpi" type="xsd:int" use="optional" default="600"/>
1423     <xsd:attribute name="verticalDpi" type="xsd:int" use="optional" default="600"/>
1424     <xsd:attribute name="copies" type="xsd:unsignedInt" use="optional" default="1"/>
1425 </xsd:complexType>
1426 <xsd:complexType name="CT_PrintSettings">
1427     <xsd:sequence>
1428         <xsd:element name="headerFooter" type="CT_HeaderFooter" minOccurs="0" maxOccurs="1"/>
1429         <xsd:element name="pageMargins" type="CT_PageMargins" minOccurs="0" maxOccurs="1"/>
1430         <xsd:element name="pageSetup" type="CT_PageSetup" minOccurs="0" maxOccurs="1"/>
1431     </xsd:sequence>
1432 </xsd:complexType>
1433 <xsd:complexType name="CT_ChartSpace">
1434     <xsd:sequence>
1435         <xsd:element name="date1904" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
1436         <xsd:element name="lang" type="CT_TextLanguageID" minOccurs="0" maxOccurs="1"/>
1437         <xsd:element name="roundedCorners" type="CT_Boolean" minOccurs="0" maxOccurs="1"/>
1438         <xsd:element name="style" type="CT_Style" minOccurs="0" maxOccurs="1"/>
1439         <xsd:element name="clrMapOvr" type="a:CT_ColorMapping" minOccurs="0" maxOccurs="1"/>
1440         <xsd:element name="pivotSource" type="CT_PivotSource" minOccurs="0" maxOccurs="1"/>
1441         <xsd:element name="protection" type="CT_Protection" minOccurs="0" maxOccurs="1"/>
1442         <xsd:element name="chart" type="CT_Chart" minOccurs="1" maxOccurs="1"/>
1443         <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="0" maxOccurs="1"/>
1444         <xsd:element name="txPr" type="a:CT_TextBody" minOccurs="0" maxOccurs="1"/>
1445         <xsd:element name="externalData" type="CT_ExternalData" minOccurs="0" maxOccurs="1"/>
1446         <xsd:element name="printSettings" type="CT_PrintSettings" minOccurs="0" maxOccurs="1"/>
1447         <xsd:element name="userShapes" type="CT_RelId" minOccurs="0" maxOccurs="1"/>
1448         <xsd:element name="extLst" type="CT_ExtensionList" minOccurs="0" maxOccurs="1"/>
1449     </xsd:sequence>
1450 </xsd:complexType>
1451 <xsd:element name="chartSpace" type="CT_ChartSpace"/>
1452 <xsd:element name="userShapes" type="cdr:CT_Drawing"/>
1453 <xsd:element name="chart" type="CT_RelId"/>
1454 </xsd:schema>

```

A.5.2 DrawingML - Chart Drawings

This schema is available in the file dml-chartDrawing.xsd.

```

1 <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
2   xmlns:a="http://purl.oclc.org/ooxml/drawingml/main"

```

```

3  xmlns="http://purl.oclc.org/ooxml/drawingml/chartDrawing"
4  targetNamespace="http://purl.oclc.org/ooxml/drawingml/chartDrawing" elementFormDefault="qualified">
5    <xsd:import namespace="http://purl.oclc.org/ooxml/drawingml/main" schemaLocation="dml-main.xsd"/>
6    <xsd:complexType name="CT_ShapeNonVisual">
7      <xsd:sequence>
8        <xsd:element name="cNvPr" type="a:CT NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
9        <xsd:element name="cNvSpPr" type="a:CT NonVisualDrawingShapeProps" minOccurs="1"
10          maxOccurs="1"/>
11      </xsd:sequence>
12    </xsd:complexType>
13    <xsd:complexType name="CT_Shape">
14      <xsd:sequence>
15        <xsd:element name="nvSpPr" type="CT ShapeNonVisual" minOccurs="1" maxOccurs="1"/>
16        <xsd:element name="spPr" type="a:CT ShapeProperties" minOccurs="1" maxOccurs="1"/>
17        <xsd:element name="style" type="a:CT ShapeStyle" minOccurs="0" maxOccurs="1"/>
18        <xsd:element name="txBody" type="a:CT TextBody" minOccurs="0" maxOccurs="1"/>
19      </xsd:sequence>
20      <xsd:attribute name="macro" type="xsd:string" use="optional"/>
21      <xsd:attribute name="textlink" type="xsd:string" use="optional"/>
22      <xsd:attribute name="fLocksText" type="xsd:boolean" use="optional" default="true"/>
23      <xsd:attribute name="fPublished" type="xsd:boolean" use="optional" default="false"/>
24    </xsd:complexType>
25    <xsd:complexType name="CT_ConnectorNonVisual">
26      <xsd:sequence>
27        <xsd:element name="cNvPr" type="a:CT NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
28        <xsd:element name="cNvCxnSpPr" type="a:CT NonVisualConnectorProperties" minOccurs="1"
29          maxOccurs="1"/>
30      </xsd:sequence>
31    </xsd:complexType>
32    <xsd:complexType name="CT_Connector">
33      <xsd:sequence>
34        <xsd:element name="nvCxnSpPr" type="CT ConnectorNonVisual" minOccurs="1" maxOccurs="1"/>
35        <xsd:element name="spPr" type="a:CT ShapeProperties" minOccurs="1" maxOccurs="1"/>
36        <xsd:element name="style" type="a:CT ShapeStyle" minOccurs="0" maxOccurs="1"/>
37      </xsd:sequence>
38      <xsd:attribute name="macro" type="xsd:string" use="optional"/>
39      <xsd:attribute name="fPublished" type="xsd:boolean" use="optional" default="false"/>
40    </xsd:complexType>
41    <xsd:complexType name="CT_PictureNonVisual">
42      <xsd:sequence>
43        <xsd:element name="cNvPr" type="a:CT NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
44        <xsd:element name="cNvPicPr" type="a:CT NonVisualPictureProperties" minOccurs="1"
45          maxOccurs="1"/>
46      </xsd:sequence>
47    </xsd:complexType>
48    <xsd:complexType name="CT_Picture">
49      <xsd:sequence>
50        <xsd:element name="nvPicPr" type="CT PictureNonVisual" minOccurs="1" maxOccurs="1"/>
51        <xsd:element name="blipFill" type="a:CT BlipFillProperties" minOccurs="1" maxOccurs="1"/>
52        <xsd:element name="spPr" type="a:CT ShapeProperties" minOccurs="1" maxOccurs="1"/>
53        <xsd:element name="style" type="a:CT ShapeStyle" minOccurs="0" maxOccurs="1"/>
54      </xsd:sequence>
55      <xsd:attribute name="macro" type="xsd:string" use="optional" default=""/>

```

```

56     <xsd:attribute name="fPublished" type="xsd:boolean" use="optional" default="false"/>
57 </xsd:complexType>
58 <xsd:complexType name="CT_GraphicFrameNonVisual">
59     <xsd:sequence>
60         <xsd:element name="cNvPr" type="a:CT_NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
61         <xsd:element name="cNvGraphicFramePr" type="a:CT_NonVisualGraphicFrameProperties"
62             minOccurs="1" maxOccurs="1"/>
63     </xsd:sequence>
64 </xsd:complexType>
65 <xsd:complexType name="CT_GraphicFrame">
66     <xsd:sequence>
67         <xsd:element name="nvGraphicFramePr" type="CT_GraphicFrameNonVisual" minOccurs="1"
68             maxOccurs="1"/>
69         <xsd:element name="xfrm" type="a:CT_Transform2D" minOccurs="1" maxOccurs="1"/>
70         <xsd:element ref="a:graphic" minOccurs="1" maxOccurs="1"/>
71     </xsd:sequence>
72     <xsd:attribute name="macro" type="xsd:string" use="optional"/>
73     <xsd:attribute name="fPublished" type="xsd:boolean" use="optional" default="false"/>
74 </xsd:complexType>
75 <xsd:complexType name="CT_GroupShapeNonVisual">
76     <xsd:sequence>
77         <xsd:element name="cNvPr" type="a:CT_NonVisualDrawingProps" minOccurs="1" maxOccurs="1"/>
78         <xsd:element name="cNvGrpSpPr" type="a:CT_NonVisualGroupDrawingShapeProps" minOccurs="1"
79             maxOccurs="1"/>
80     </xsd:sequence>
81 </xsd:complexType>
82 <xsd:complexType name="CT_GroupShape">
83     <xsd:sequence>
84         <xsd:element name="nvGrpSpPr" type="CT_GroupShapeNonVisual" minOccurs="1" maxOccurs="1"/>
85         <xsd:element name="grpSpPr" type="a:CT_GroupShapeProperties" minOccurs="1" maxOccurs="1"/>
86         <xsd:choice minOccurs="0" maxOccurs="unbounded">
87             <xsd:element name="sp" type="CT_Shape"/>
88             <xsd:element name="grpSp" type="CT_GroupShape"/>
89             <xsd:element name="graphicFrame" type="CT_GraphicFrame"/>
90             <xsd:element name="cxnSp" type="CT_Connector"/>
91             <xsd:element name="pic" type="CT_Picture"/>
92         </xsd:choice>
93     </xsd:sequence>
94 </xsd:complexType>
95 <xsd:group name="EG_ObjectChoices">
96     <xsd:sequence>
97         <xsd:choice minOccurs="1" maxOccurs="1">
98             <xsd:element name="sp" type="CT_Shape"/>
99             <xsd:element name="grpSp" type="CT_GroupShape"/>
100             <xsd:element name="graphicFrame" type="CT_GraphicFrame"/>
101             <xsd:element name="cxnSp" type="CT_Connector"/>
102             <xsd:element name="pic" type="CT_Picture"/>
103         </xsd:choice>
104     </xsd:sequence>
105 </xsd:group>
106 <xsd:simpleType name="ST_MarkerCoordinate">
107     <xsd:restriction base="xsd:double">
108         <xsd:minInclusive value="0.0"/>

```

```

109         <xsd:maxInclusive value="1.0"/>
110     </xsd:restriction>
111 </xsd:simpleType>
112 <xsd:complexType name="CT_Marker">
113     <xsd:sequence>
114         <xsd:element name="x" type="ST_MarkerCoordinate" minOccurs="1" maxOccurs="1"/>
115         <xsd:element name="y" type="ST_MarkerCoordinate" minOccurs="1" maxOccurs="1"/>
116     </xsd:sequence>
117 </xsd:complexType>
118 <xsd:complexType name="CT_RelSizeAnchor">
119     <xsd:sequence>
120         <xsd:element name="from" type="CT_Marker"/>
121         <xsd:element name="to" type="CT_Marker"/>
122         <xsd:group ref="EG_ObjectChoices"/>
123     </xsd:sequence>
124 </xsd:complexType>
125 <xsd:complexType name="CT_AbsSizeAnchor">
126     <xsd:sequence>
127         <xsd:element name="from" type="CT_Marker"/>
128         <xsd:element name="ext" type="a:CT_PositiveSize2D"/>
129         <xsd:group ref="EG_ObjectChoices"/>
130     </xsd:sequence>
131 </xsd:complexType>
132 <xsd:group name="EG_Anchor">
133     <xsd:choice>
134         <xsd:element name="relSizeAnchor" type="CT_RelSizeAnchor"/>
135         <xsd:element name="absSizeAnchor" type="CT_AbsSizeAnchor"/>
136     </xsd:choice>
137 </xsd:group>
138 <xsd:complexType name="CT_Drawing">
139     <xsd:sequence>
140         <xsd:group ref="EG_Anchor" minOccurs="0" maxOccurs="unbounded"/>
141     </xsd:sequence>
142 </xsd:complexType>
143 </xsd:schema>

```

A.5.3 DrawingML – Diagrams

This schema is available in the file dml-diagram.xsd.

```

1 <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
2   xmlns="http://purl.oclc.org/ooxml/drawingml/diagram"
3   xmlns:a="http://purl.oclc.org/ooxml/drawingml/main"
4   xmlns:r="http://purl.oclc.org/ooxml/officeDocument/relationships"
5   xmlns:s="http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
6   targetNamespace="http://purl.oclc.org/ooxml/drawingml/diagram" elementFormDefault="qualified"
7   attributeFormDefault="unqualified">
8     <xsd:import namespace="http://purl.oclc.org/ooxml/officeDocument/relationships"
9       schemaLocation="shared-relationshipReference.xsd"/>
10    <xsd:import namespace="http://purl.oclc.org/ooxml/drawingml/main" schemaLocation="dml-main.xsd"/>
11    <xsd:import namespace="http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
12      schemaLocation="shared-commonSimpleTypes.xsd"/>
13    <xsd:complexType name="CT_CTName">

```



```

14     <xsd:attribute name="lang" type="xsd:string" use="optional" default=""/>
15     <xsd:attribute name="val" type="xsd:string" use="required"/>
16 </xsd:complexType>
17 <xsd:complexType name="CT_CTDescription">
18     <xsd:attribute name="lang" type="xsd:string" use="optional" default=""/>
19     <xsd:attribute name="val" type="xsd:string" use="required"/>
20 </xsd:complexType>
21 <xsd:complexType name="CT_CTCategory">
22     <xsd:attribute name="type" type="xsd:anyURI" use="required"/>
23     <xsd:attribute name="pri" type="xsd:unsignedInt" use="required"/>
24 </xsd:complexType>
25 <xsd:complexType name="CT_CTCategories">
26     <xsd:sequence minOccurs="0" maxOccurs="unbounded">
27         <xsd:element name="cat" type="CT_CTCategory" minOccurs="0" maxOccurs="unbounded"/>
28     </xsd:sequence>
29 </xsd:complexType>
30 <xsd:simpleType name="ST_ClrAppMethod">
31     <xsd:restriction base="xsd:token">
32         <xsd:enumeration value="span"/>
33         <xsd:enumeration value="cycle"/>
34         <xsd:enumeration value="repeat"/>
35     </xsd:restriction>
36 </xsd:simpleType>
37 <xsd:simpleType name="ST_HueDir">
38     <xsd:restriction base="xsd:token">
39         <xsd:enumeration value="cw"/>
40         <xsd:enumeration value="ccw"/>
41     </xsd:restriction>
42 </xsd:simpleType>
43 <xsd:complexType name="CT_Colors">
44     <xsd:sequence>
45         <xsd:group ref="a:EG_ColorChoice" minOccurs="0" maxOccurs="unbounded"/>
46     </xsd:sequence>
47     <xsd:attribute name="meth" type="ST_ClrAppMethod" use="optional" default="span"/>
48     <xsd:attribute name="hueDir" type="ST_HueDir" use="optional" default="cw"/>
49 </xsd:complexType>
50 <xsd:complexType name="CT_CTStyleLabel">
51     <xsd:sequence>
52         <xsd:element name="fillClrLst" type="CT_Colors" minOccurs="0" maxOccurs="1"/>
53         <xsd:element name="linClrLst" type="CT_Colors" minOccurs="0" maxOccurs="1"/>
54         <xsd:element name="effectClrLst" type="CT_Colors" minOccurs="0" maxOccurs="1"/>
55         <xsd:element name="txLinClrLst" type="CT_Colors" minOccurs="0" maxOccurs="1"/>
56         <xsd:element name="txFillClrLst" type="CT_Colors" minOccurs="0" maxOccurs="1"/>
57         <xsd:element name="txEffectClrLst" type="CT_Colors" minOccurs="0" maxOccurs="1"/>
58         <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
59             maxOccurs="1"/>
60     </xsd:sequence>
61     <xsd:attribute name="name" type="xsd:string" use="required"/>
62 </xsd:complexType>
63 <xsd:complexType name="CT_ColorTransform">
64     <xsd:sequence>
65         <xsd:element name="title" type="CT_CTName" minOccurs="0" maxOccurs="unbounded"/>
66         <xsd:element name="desc" type="CT_CTDescription" minOccurs="0" maxOccurs="unbounded"/>

```

```

67      <xsd:element name="catLst" type="CT_CTCategories" minOccurs="0"/>
68      <xsd:element name="styleLbl" type="CT_CTStyleLabel" minOccurs="0" maxOccurs="unbounded"/>
69      <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
70          maxOccurs="1"/>
71  </xsd:sequence>
72  <xsd:attribute name="uniqueId" type="xsd:string" use="optional" default=""/>
73  <xsd:attribute name="minVer" type="xsd:string" use="optional" />
74 </xsd:complexType>
75 <xsd:element name="colorsDef" type="CT_ColorTransform"/>
76 <xsd:complexType name="CT_ColorTransformHeader">
77     <xsd:sequence>
78         <xsd:element name="title" type="CT_CTName" minOccurs="1" maxOccurs="unbounded"/>
79         <xsd:element name="desc" type="CT_CTDescription" minOccurs="1" maxOccurs="unbounded"/>
80         <xsd:element name="catLst" type="CT_CTCategories" minOccurs="0"/>
81         <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
82             maxOccurs="1"/>
83     </xsd:sequence>
84     <xsd:attribute name="uniqueId" type="xsd:string" use="required"/>
85     <xsd:attribute name="minVer" type="xsd:string" use="optional" />
86     <xsd:attribute name="resId" type="xsd:int" use="optional" default="0"/>
87 </xsd:complexType>
88 <xsd:element name="colorsDefHdr" type="CT_ColorTransformHeader"/>
89 <xsd:complexType name="CT_ColorTransformHeaderLst">
90     <xsd:sequence>
91         <xsd:element name="colorsDefHdr" type="CT_ColorTransformHeader" minOccurs="0"
92             maxOccurs="unbounded"/>
93     </xsd:sequence>
94 </xsd:complexType>
95 <xsd:element name="colorsDefHdrLst" type="CT_ColorTransformHeaderLst"/>
96 <xsd:simpleType name="ST_PtType">
97     <xsd:restriction base="xsd:token">
98         <xsd:enumeration value="node"/>
99         <xsd:enumeration value="asst"/>
100        <xsd:enumeration value="doc"/>
101        <xsd:enumeration value="pres"/>
102        <xsd:enumeration value="parTrans"/>
103        <xsd:enumeration value="sibTrans"/>
104    </xsd:restriction>
105 </xsd:simpleType>
106 <xsd:complexType name="CT_Pt">
107     <xsd:sequence>
108         <xsd:element name="prSet" type="CT_ElemPropSet" minOccurs="0" maxOccurs="1"/>
109         <xsd:element name="spPr" type="a:CT_ShapeProperties" minOccurs="0" maxOccurs="1"/>
110         <xsd:element name="t" type="a:CT_TextBody" minOccurs="0" maxOccurs="1"/>
111         <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
112             maxOccurs="1"/>
113     </xsd:sequence>
114     <xsd:attribute name="modelId" type="ST_ModelId" use="required"/>
115     <xsd:attribute name="type" type="ST_PtType" use="optional" default="node"/>
116     <xsd:attribute name="cxnId" type="ST_ModelId" use="optional" default="0"/>
117 </xsd:complexType>
118 <xsd:complexType name="CT_PtList">
119     <xsd:sequence>

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```

120     <xsd:element name="pt" type="CT_Pt" minOccurs="0" maxOccurs="unbounded"/>
121   </xsd:sequence>
122 </xsd:complexType>
123 <xsd:simpleType name="ST_CxnType">
124   <xsd:restriction base="xsd:token">
125     <xsd:enumeration value="parOf"/>
126     <xsd:enumeration value="presOf"/>
127     <xsd:enumeration value="presParOf"/>
128     <xsd:enumeration value="unknownRelationship"/>
129   </xsd:restriction>
130 </xsd:simpleType>
131 <xsd:complexType name="CT_Cxn">
132   <xsd:sequence>
133     <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
134       maxOccurs="1"/>
135   </xsd:sequence>
136   <xsd:attribute name="modelId" type="ST_ModelId" use="required"/>
137   <xsd:attribute name="type" type="ST_CxnType" use="optional" default="parOf"/>
138   <xsd:attribute name="srcId" type="ST_ModelId" use="required"/>
139   <xsd:attribute name="destId" type="ST_ModelId" use="required"/>
140   <xsd:attribute name="srcOrd" type="xsd:unsignedInt" use="required"/>
141   <xsd:attribute name="destOrd" type="xsd:unsignedInt" use="required"/>
142   <xsd:attribute name="parTransId" type="ST_ModelId" use="optional" default="0"/>
143   <xsd:attribute name="sibTransId" type="ST_ModelId" use="optional" default="0"/>
144   <xsd:attribute name="presId" type="xsd:string" use="optional" default=""/>
145 </xsd:complexType>
146 <xsd:complexType name="CT_CxnList">
147   <xsd:sequence>
148     <xsd:element name="cxn" type="CT_Cxn" minOccurs="0" maxOccurs="unbounded"/>
149   </xsd:sequence>
150 </xsd:complexType>
151 <xsd:complexType name="CT_DataModel">
152   <xsd:sequence>
153     <xsd:element name="ptLst" type="CT_PtList"/>
154     <xsd:element name="cxnLst" type="CT_CxnList" minOccurs="0" maxOccurs="1"/>
155     <xsd:element name="bg" type="a:CT_BackgroundFormatting" minOccurs="0"/>
156     <xsd:element name="whole" type="a:CT_WholeE2oFormatting" minOccurs="0"/>
157     <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
158       maxOccurs="1"/>
159   </xsd:sequence>
160 </xsd:complexType>
161 <xsd:element name="dataModel" type="CT_DataModel"/>
162 <xsd:attributeGroup name="AG_IteratorAttributes">
163   <xsd:attribute name="axis" type="ST_AxisTypes" use="optional" default="none"/>
164   <xsd:attribute name="ptType" type="ST_ElementTypes" use="optional" default="all"/>
165   <xsd:attribute name="hideLastTrans" type="ST_Booleans" use="optional" default="true"/>
166   <xsd:attribute name="st" type="ST_Ints" use="optional" default="1"/>
167   <xsd:attribute name="cnt" type="ST_UnsignedInts" use="optional" default="0"/>
168   <xsd:attribute name="step" type="ST_Ints" use="optional" default="1"/>
169 </xsd:attributeGroup>
170 <xsd:attributeGroup name="AG_ConstraintAttributes">
171   <xsd:attribute name="type" type="ST_ConstraintType" use="required"/>
172   <xsd:attribute name="for" type="ST_ConstraintRelationship" use="optional" default="self"/>

```

```

173     <xsd:attribute name="forName" type="xsd:string" use="optional" default=""/>
174     <xsd:attribute name="ptType" type="ST_ElementType" use="optional" default="all"/>
175 </xsd:attributeGroup>
176 <xsd:attributeGroup name="AG_ConstraintRefAttributes">
177     <xsd:attribute name="refType" type="ST_ConstraintType" use="optional" default="none"/>
178     <xsd:attribute name="refFor" type="ST_ConstraintRelationship" use="optional" default="self"/>
179     <xsd:attribute name="refForName" type="xsd:string" use="optional" default=""/>
180     <xsd:attribute name="refPtType" type="ST_ElementType" use="optional" default="all"/>
181 </xsd:attributeGroup>
182 <xsd:complexType name="CT_Constraint">
183     <xsd:sequence>
184         <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
185             maxOccurs="1"/>
186     </xsd:sequence>
187     <xsd:attributeGroup ref="AG_ConstraintAttributes"/>
188     <xsd:attributeGroup ref="AG_ConstraintRefAttributes"/>
189     <xsd:attribute name="op" type="ST_BoolOperator" use="optional" default="none"/>
190     <xsd:attribute name="val" type="xsd:double" use="optional" default="0"/>
191     <xsd:attribute name="fact" type="xsd:double" use="optional" default="1"/>
192 </xsd:complexType>
193 <xsd:complexType name="CT_Constraints">
194     <xsd:sequence>
195         <xsd:element name="constr" type="CT_Constraint" minOccurs="0" maxOccurs="unbounded"/>
196     </xsd:sequence>
197 </xsd:complexType>
198 <xsd:complexType name="CT_NumericRule">
199     <xsd:sequence>
200         <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
201             maxOccurs="1"/>
202     </xsd:sequence>
203     <xsd:attributeGroup ref="AG_ConstraintAttributes"/>
204     <xsd:attribute name="val" type="xsd:double" use="optional" default="NaN"/>
205     <xsd:attribute name="fact" type="xsd:double" use="optional" default="NaN"/>
206     <xsd:attribute name="max" type="xsd:double" use="optional" default="NaN"/>
207 </xsd:complexType>
208 <xsd:complexType name="CT_Rules">
209     <xsd:sequence>
210         <xsd:element name="rule" type="CT_NumericRule" minOccurs="0" maxOccurs="unbounded"/>
211     </xsd:sequence>
212 </xsd:complexType>
213 <xsd:complexType name="CT_PresentationOf">
214     <xsd:sequence>
215         <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
216             maxOccurs="1"/>
217     </xsd:sequence>
218     <xsd:attributeGroup ref="AG_IteratorAttributes"/>
219 </xsd:complexType>
220 <xsd:simpleType name="ST_LayoutShapeType" final="restriction">
221     <xsd:union memberTypes="a:ST_ShapeType ST_OutputShapeType"/>
222 </xsd:simpleType>
223 <xsd:simpleType name="ST_Index1">
224     <xsd:restriction base="xsd:unsignedInt">
225         <xsd:minInclusive value="1"/>

```

```

226     </xsd:restriction>
227 </xsd:simpleType>
228 <xsd:complexType name="CT_Adj">
229     <xsd:attribute name="idx" type="ST_Index1" use="required"/>
230     <xsd:attribute name="val" type="xsd:double" use="required"/>
231 </xsd:complexType>
232 <xsd:complexType name="CT_AdjLst">
233     <xsd:sequence>
234         <xsd:element name="adj" type="CT_Adj" minOccurs="0" maxOccurs="unbounded"/>
235     </xsd:sequence>
236 </xsd:complexType>
237 <xsd:complexType name="CT_Shape">
238     <xsd:sequence>
239         <xsd:element name="adjLst" type="CT_AdjLst" minOccurs="0" maxOccurs="1"/>
240         <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
241             maxOccurs="1"/>
242     </xsd:sequence>
243     <xsd:attribute name="rot" type="xsd:double" use="optional" default="0"/>
244     <xsd:attribute name="type" type="ST_LayoutShapeType" use="optional" default="none"/>
245     <xsd:attribute ref="r:blip" use="optional"/>
246     <xsd:attribute name="zOrderOff" type="xsd:int" use="optional" default="0"/>
247     <xsd:attribute name="hideGeom" type="xsd:boolean" use="optional" default="false"/>
248     <xsd:attribute name="lkTxEntry" type="xsd:boolean" use="optional" default="false"/>
249     <xsd:attribute name="blipPhldr" type="xsd:boolean" use="optional" default="false"/>
250 </xsd:complexType>
251 <xsd:complexType name="CT_Parameter">
252     <xsd:attribute name="type" type="ST_ParameterId" use="required"/>
253     <xsd:attribute name="val" type="ST_ParameterVal" use="required"/>
254 </xsd:complexType>
255 <xsd:complexType name="CT_Algorithm">
256     <xsd:sequence>
257         <xsd:element name="param" type="CT_Parameter" minOccurs="0" maxOccurs="unbounded"/>
258         <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
259             maxOccurs="1"/>
260     </xsd:sequence>
261     <xsd:attribute name="type" type="ST_AlgorithmType" use="required"/>
262     <xsd:attribute name="rev" type="xsd:unsignedInt" use="optional" default="0"/>
263 </xsd:complexType>
264 <xsd:complexType name="CT_LayoutNode">
265     <xsd:choice minOccurs="0" maxOccurs="unbounded">
266         <xsd:element name="alg" type="CT_Algorithm" minOccurs="0" maxOccurs="1"/>
267         <xsd:element name="shape" type="CT_Shape" minOccurs="0" maxOccurs="1"/>
268         <xsd:element name="presOf" type="CT_PresentationOf" minOccurs="0" maxOccurs="1"/>
269         <xsd:element name="constrLst" type="CT_Constraints" minOccurs="0" maxOccurs="1"/>
270         <xsd:element name="ruleLst" type="CT_Rules" minOccurs="0" maxOccurs="1"/>
271         <xsd:element name="varLst" type="CT_LayoutVariablePropertySet" minOccurs="0"
272             maxOccurs="1"/>
273         <xsd:element name="forEach" type="CT_ForEach"/>
274         <xsd:element name="layoutNode" type="CT_LayoutNode"/>
275         <xsd:element name="choose" type="CT_Choose"/>
276         <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
277             maxOccurs="1"/>
278     </xsd:choice>

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```

279     <xsd:attribute name="name" type="xsd:string" use="optional" default=""/>
280     <xsd:attribute name="styleLbl" type="xsd:string" use="optional" default=""/>
281     <xsd:attribute name="chOrder" type="ST_ChildOrderType" use="optional" default="b"/>
282     <xsd:attribute name="moveWith" type="xsd:string" use="optional" default=""/>
283 </xsd:complexType>
284 <xsd:complexType name="CT_ForEach">
285     <xsd:choice minOccurs="0" maxOccurs="unbounded">
286         <xsd:element name="alg" type="CT_Algorithm" minOccurs="0" maxOccurs="1"/>
287         <xsd:element name="shape" type="CT_Shape" minOccurs="0" maxOccurs="1"/>
288         <xsd:element name="presOf" type="CT_PresentationOf" minOccurs="0" maxOccurs="1"/>
289         <xsd:element name="constrLst" type="CT_Constraints" minOccurs="0" maxOccurs="1"/>
290         <xsd:element name="ruleLst" type="CT_Rules" minOccurs="0" maxOccurs="1"/>
291         <xsd:element name="forEach" type="CT_ForEach"/>
292         <xsd:element name="layoutNode" type="CT_LayoutNode"/>
293         <xsd:element name="choose" type="CT_Choose"/>
294         <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
295             maxOccurs="1"/>
296     </xsd:choice>
297     <xsd:attribute name="name" type="xsd:string" use="optional" default=""/>
298     <xsd:attribute name="ref" type="xsd:string" use="optional" default=""/>
299     <xsd:attributeGroup ref="AG_IteratorAttributes"/>
300 </xsd:complexType>
301 <xsd:complexType name="CT_When">
302     <xsd:choice minOccurs="0" maxOccurs="unbounded">
303         <xsd:element name="alg" type="CT_Algorithm" minOccurs="0" maxOccurs="1"/>
304         <xsd:element name="shape" type="CT_Shape" minOccurs="0" maxOccurs="1"/>
305         <xsd:element name="presOf" type="CT_PresentationOf" minOccurs="0" maxOccurs="1"/>
306         <xsd:element name="constrLst" type="CT_Constraints" minOccurs="0" maxOccurs="1"/>
307         <xsd:element name="ruleLst" type="CT_Rules" minOccurs="0" maxOccurs="1"/>
308         <xsd:element name="forEach" type="CT_ForEach"/>
309         <xsd:element name="layoutNode" type="CT_LayoutNode"/>
310         <xsd:element name="choose" type="CT_Choose"/>
311         <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
312             maxOccurs="1"/>
313     </xsd:choice>
314     <xsd:attribute name="name" type="xsd:string" use="optional" default=""/>
315     <xsd:attributeGroup ref="AG_IteratorAttributes"/>
316     <xsd:attribute name="func" type="ST_FunctionType" use="required"/>
317     <xsd:attribute name="arg" type="ST_FunctionArgument" use="optional" default="none"/>
318     <xsd:attribute name="op" type="ST_FunctionOperator" use="required"/>
319     <xsd:attribute name="val" type="ST_FunctionValue" use="required"/>
320 </xsd:complexType>
321 <xsd:complexType name="CT_Otherwise">
322     <xsd:choice minOccurs="0" maxOccurs="unbounded">
323         <xsd:element name="alg" type="CT_Algorithm" minOccurs="0" maxOccurs="1"/>
324         <xsd:element name="shape" type="CT_Shape" minOccurs="0" maxOccurs="1"/>
325         <xsd:element name="presOf" type="CT_PresentationOf" minOccurs="0" maxOccurs="1"/>
326         <xsd:element name="constrLst" type="CT_Constraints" minOccurs="0" maxOccurs="1"/>
327         <xsd:element name="ruleLst" type="CT_Rules" minOccurs="0" maxOccurs="1"/>
328         <xsd:element name="forEach" type="CT_ForEach"/>
329         <xsd:element name="layoutNode" type="CT_LayoutNode"/>
330         <xsd:element name="choose" type="CT_Choose"/>

```

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331         <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
332             maxOccurs="1"/>
333     </xsd:choice>
334     <xsd:attribute name="name" type="xsd:string" use="optional" default=""/>
335 </xsd:complexType>
336 <xsd:complexType name="CT_Choose">
337     <xsd:sequence>
338         <xsd:element name="if" type="CT_When" maxOccurs="unbounded"/>
339         <xsd:element name="else" type="CT_Otherwise" minOccurs="0"/>
340     </xsd:sequence>
341     <xsd:attribute name="name" type="xsd:string" use="optional" default=""/>
342 </xsd:complexType>
343 <xsd:complexType name="CT_SampleData">
344     <xsd:sequence>
345         <xsd:element name="dataModel" type="CT_DataModel" minOccurs="0"/>
346     </xsd:sequence>
347     <xsd:attribute name="useDef" type="xsd:boolean" use="optional" default="false"/>
348 </xsd:complexType>
349 <xsd:complexType name="CT_Category">
350     <xsd:attribute name="type" type="xsd:anyURI" use="required"/>
351     <xsd:attribute name="pri" type="xsd:unsignedInt" use="required"/>
352 </xsd:complexType>
353 <xsd:complexType name="CT_Categories">
354     <xsd:sequence>
355         <xsd:element name="cat" type="CT_Category" minOccurs="0" maxOccurs="unbounded"/>
356     </xsd:sequence>
357 </xsd:complexType>
358 <xsd:complexType name="CT_Name">
359     <xsd:attribute name="lang" type="xsd:string" use="optional" default=""/>
360     <xsd:attribute name="val" type="xsd:string" use="required"/>
361 </xsd:complexType>
362 <xsd:complexType name="CT_Description">
363     <xsd:attribute name="lang" type="xsd:string" use="optional" default=""/>
364     <xsd:attribute name="val" type="xsd:string" use="required"/>
365 </xsd:complexType>
366 <xsd:complexType name="CT_DiagramDefinition">
367     <xsd:sequence>
368         <xsd:element name="title" type="CT_Name" minOccurs="0" maxOccurs="unbounded"/>
369         <xsd:element name="desc" type="CT_Description" minOccurs="0" maxOccurs="unbounded"/>
370         <xsd:element name="catLst" type="CT_Categories" minOccurs="0"/>
371         <xsd:element name="sampData" type="CT_SampleData" minOccurs="0"/>
372         <xsd:element name="styleData" type="CT_SampleData" minOccurs="0"/>
373         <xsd:element name="clrData" type="CT_SampleData" minOccurs="0"/>
374         <xsd:element name="layoutNode" type="CT_LayoutNode"/>
375         <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
376             maxOccurs="1"/>
377     </xsd:sequence>
378     <xsd:attribute name="uniqueId" type="xsd:string" use="optional" default=""/>
379     <xsd:attribute name="minVer" type="xsd:string" use="optional" />
380     <xsd:attribute name="defStyle" type="xsd:string" use="optional" default=""/>
381 </xsd:complexType>
382 <xsd:element name="layoutDef" type="CT_DiagramDefinition"/>
383 <xsd:complexType name="CT_DiagramDefinitionHeader">

```

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384     <xsd:sequence>
385         <xsd:element name="title" type="CT_Name" minOccurs="1" maxOccurs="unbounded"/>
386         <xsd:element name="desc" type="CT_Description" minOccurs="1" maxOccurs="unbounded"/>
387         <xsd:element name="catLst" type="CT_Categories" minOccurs="0"/>
388         <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
389             maxOccurs="1"/>
390     </xsd:sequence>
391     <xsd:attribute name="uniqueId" type="xsd:string" use="required"/>
392     <xsd:attribute name="minVer" type="xsd:string" use="optional" />
393     <xsd:attribute name="defStyle" type="xsd:string" use="optional" default=""/>
394     <xsd:attribute name="resId" type="xsd:int" use="optional" default="0"/>
395 </xsd:complexType>
396 <xsd:element name="layoutDefHdr" type="CT_DiagramDefinitionHeader"/>
397 <xsd:complexType name="CT_DiagramDefinitionHeaderLst">
398     <xsd:sequence>
399         <xsd:element name="layoutDefHdr" type="CT_DiagramDefinitionHeader" minOccurs="0"
400             maxOccurs="unbounded"/>
401     </xsd:sequence>
402 </xsd:complexType>
403 <xsd:element name="layoutDefHdrLst" type="CT_DiagramDefinitionHeaderLst"/>
404 <xsd:complexType name="CT_RelIds">
405     <xsd:attribute ref="r:dm" use="required"/>
406     <xsd:attribute ref="r:lo" use="required"/>
407     <xsd:attribute ref="r:qs" use="required"/>
408     <xsd:attribute ref="r:cs" use="required"/>
409 </xsd:complexType>
410 <xsd:element name="relIds" type="CT_RelIds"/>
411 <xsd:simpleType name="ST_ParameterVal">
412     <xsd:union memberTypes="ST_DiagramHorizontalAlignment ST_VerticalAlignment ST_ChildDirection
413         ST_ChildAlignment ST_SecondaryChildAlignment ST_LinearDirection ST_SecondaryLinearDirection
414         ST_StartingElement ST_BendPoint ST_ConnectorRouting ST_ArrowheadStyle ST_ConnectorDimension
415         ST_RotationPath ST_CenterShapeMapping ST_NodeHorizontalAlignment ST_NodeVerticalAlignment
416         ST_FallbackDimension ST_TextDirection ST_PyramidAccentPosition ST_PyramidAccentTextMargin
417         ST_TextBlockDirection ST_TextAnchorHorizontal ST_TextAnchorVertical ST_DiagramTextAlignment
418         ST_AutoTextRotation ST_GrowDirection ST_FlowDirection ST_ContinueDirection ST_Breakpoint
419         ST_Offset ST_HierarchyAlignment xsd:int xsd:double xsd:boolean xsd:string
420         ST_ConnectorPoint"/>
421 </xsd:simpleType>
422 <xsd:simpleType name="ST_ModelId">
423     <xsd:union memberTypes="xsd:int s:ST_Guid"/>
424 </xsd:simpleType>
425 <xsd:simpleType name="ST_PrSetCustVal">
426     <xsd:union memberTypes="s:ST_Percentage"/>
427 </xsd:simpleType>
428 <xsd:complexType name="CT_ElemPropSet">
429     <xsd:sequence>
430         <xsd:element name="presLayoutVars" type="CT_LayoutVariablePropertySet" minOccurs="0"
431             maxOccurs="1"/>
432         <xsd:element name="style" type="a:CT_ShapeStyle" minOccurs="0" maxOccurs="1"/>
433     </xsd:sequence>
434     <xsd:attribute name="presAssocID" type="ST_ModelId" use="optional"/>
435     <xsd:attribute name="presName" type="xsd:string" use="optional"/>
436     <xsd:attribute name="presStyleLbl" type="xsd:string" use="optional"/>

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437 <xsd:attribute name="presStyleIdx" type="xsd:int" use="optional"/>
438 <xsd:attribute name="presStyleCnt" type="xsd:int" use="optional"/>
439 <xsd:attribute name="loTypeId" type="xsd:string" use="optional"/>
440 <xsd:attribute name="loCatId" type="xsd:string" use="optional"/>
441 <xsd:attribute name="qsTypeId" type="xsd:string" use="optional"/>
442 <xsd:attribute name="qsCatId" type="xsd:string" use="optional"/>
443 <xsd:attribute name="csTypeId" type="xsd:string" use="optional"/>
444 <xsd:attribute name="csCatId" type="xsd:string" use="optional"/>
445 <xsd:attribute name="coherent3DOff" type="xsd:boolean" use="optional"/>
446 <xsd:attribute name="phldrT" type="xsd:string" use="optional"/>
447 <xsd:attribute name="phldr" type="xsd:boolean" use="optional"/>
448 <xsd:attribute name="custAng" type="xsd:int" use="optional"/>
449 <xsd:attribute name="custFlipVert" type="xsd:boolean" use="optional"/>
450 <xsd:attribute name="custFlipHor" type="xsd:boolean" use="optional"/>
451 <xsd:attribute name="custSzX" type="xsd:int" use="optional"/>
452 <xsd:attribute name="custSzY" type="xsd:int" use="optional"/>
453 <xsd:attribute name="custScaleX" type="ST_PrSetCustVal" use="optional"/>
454 <xsd:attribute name="custScaleY" type="ST_PrSetCustVal" use="optional"/>
455 <xsd:attribute name="custT" type="xsd:boolean" use="optional"/>
456 <xsd:attribute name="custLinFactX" type="ST_PrSetCustVal" use="optional"/>
457 <xsd:attribute name="custLinFactY" type="ST_PrSetCustVal" use="optional"/>
458 <xsd:attribute name="custLinFactNeighborX" type="ST_PrSetCustVal" use="optional"/>
459 <xsd:attribute name="custLinFactNeighborY" type="ST_PrSetCustVal" use="optional"/>
460 <xsd:attribute name="custRadScaleRad" type="ST_PrSetCustVal" use="optional"/>
461 <xsd:attribute name="custRadScaleInc" type="ST_PrSetCustVal" use="optional"/>
462 </xsd:complexType>
463 <xsd:simpleType name="ST_Direction" final="restriction">
464 <xsd:restriction base="xsd:token">
465 <xsd:enumeration value="norm"/>
466 <xsd:enumeration value="rev"/>
467 </xsd:restriction>
468 </xsd:simpleType>
469 <xsd:simpleType name="ST_HierBranchStyle" final="restriction">
470 <xsd:restriction base="xsd:token">
471 <xsd:enumeration value="l"/>
472 <xsd:enumeration value="r"/>
473 <xsd:enumeration value="hang"/>
474 <xsd:enumeration value="std"/>
475 <xsd:enumeration value="init"/>
476 </xsd:restriction>
477 </xsd:simpleType>
478 <xsd:simpleType name="ST_AnimOneStr" final="restriction">
479 <xsd:restriction base="xsd:token">
480 <xsd:enumeration value="none"/>
481 <xsd:enumeration value="one"/>
482 <xsd:enumeration value="branch"/>
483 </xsd:restriction>
484 </xsd:simpleType>
485 <xsd:simpleType name="ST_AnimLvlStr" final="restriction">
486 <xsd:restriction base="xsd:token">
487 <xsd:enumeration value="none"/>
488 <xsd:enumeration value="lvl"/>
489 <xsd:enumeration value="ctr"/>

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490     </xsd:restriction>
491 </xsd:simpleType>
492 <xsd:complexType name="CT_OrgChart">
493     <xsd:attribute name="val" type="xsd:boolean" default="false" use="optional"/>
494 </xsd:complexType>
495 <xsd:simpleType name="ST_NodeCount">
496     <xsd:restriction base="xsd:int">
497         <xsd:minInclusive value="-1"/>
498     </xsd:restriction>
499 </xsd:simpleType>
500 <xsd:complexType name="CT_ChildMax">
501     <xsd:attribute name="val" type="ST_NodeCount" default="-1" use="optional"/>
502 </xsd:complexType>
503 <xsd:complexType name="CT_ChildPref">
504     <xsd:attribute name="val" type="ST_NodeCount" default="-1" use="optional"/>
505 </xsd:complexType>
506 <xsd:complexType name="CT_BulletEnabled">
507     <xsd:attribute name="val" type="xsd:boolean" default="false" use="optional"/>
508 </xsd:complexType>
509 <xsd:complexType name="CT_Direction">
510     <xsd:attribute name="val" type="ST_Direction" default="norm" use="optional"/>
511 </xsd:complexType>
512 <xsd:complexType name="CT_HierBranchStyle">
513     <xsd:attribute name="val" type="ST_HierBranchStyle" default="std" use="optional"/>
514 </xsd:complexType>
515 <xsd:complexType name="CT_AnimOne">
516     <xsd:attribute name="val" type="ST_AnimOneStr" default="one" use="optional"/>
517 </xsd:complexType>
518 <xsd:complexType name="CT_AnimLvl">
519     <xsd:attribute name="val" type="ST_AnimLvlStr" default="none" use="optional"/>
520 </xsd:complexType>
521 <xsd:simpleType name="ST_ResizeHandlesStr" final="restriction">
522     <xsd:restriction base="xsd:token">
523         <xsd:enumeration value="exact"/>
524         <xsd:enumeration value="rel"/>
525     </xsd:restriction>
526 </xsd:simpleType>
527 <xsd:complexType name="CT_ResizeHandles">
528     <xsd:attribute name="val" type="ST_ResizeHandlesStr" default="rel" use="optional"/>
529 </xsd:complexType>
530 <xsd:complexType name="CT_LayoutVariablePropertySet">
531     <xsd:sequence>
532         <xsd:element name="orgChart" type="CT_OrgChart" minOccurs="0" maxOccurs="1"/>
533         <xsd:element name="chMax" type="CT_ChildMax" minOccurs="0" maxOccurs="1"/>
534         <xsd:element name="chPref" type="CT_ChildPref" minOccurs="0" maxOccurs="1"/>
535         <xsd:element name="bulletEnabled" type="CT_BulletEnabled" minOccurs="0" maxOccurs="1"/>
536         <xsd:element name="dir" type="CT_Direction" minOccurs="0" maxOccurs="1"/>
537         <xsd:element name="hierBranch" type="CT_HierBranchStyle" minOccurs="0" maxOccurs="1"/>
538         <xsd:element name="animOne" type="CT_AnimOne" minOccurs="0" maxOccurs="1"/>
539         <xsd:element name="animLvl" type="CT_AnimLvl" minOccurs="0" maxOccurs="1"/>
540         <xsd:element name="resizeHandles" type="CT_ResizeHandles" minOccurs="0" maxOccurs="1"/>
541     </xsd:sequence>
542 </xsd:complexType>

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543 <xsd:complexType name="CT_SDName">
544   <xsd:attribute name="lang" type="xsd:string" use="optional" default=""/>
545   <xsd:attribute name="val" type="xsd:string" use="required"/>
546 </xsd:complexType>
547 <xsd:complexType name="CT_SDDescription">
548   <xsd:attribute name="lang" type="xsd:string" use="optional" default=""/>
549   <xsd:attribute name="val" type="xsd:string" use="required"/>
550 </xsd:complexType>
551 <xsd:complexType name="CT_SDCategory">
552   <xsd:attribute name="type" type="xsd:anyURI" use="required"/>
553   <xsd:attribute name="pri" type="xsd:unsignedInt" use="required"/>
554 </xsd:complexType>
555 <xsd:complexType name="CT_SDCategories">
556   <xsd:sequence minOccurs="0" maxOccurs="unbounded">
557     <xsd:element name="cat" type="CT_SDCategory" minOccurs="0" maxOccurs="unbounded"/>
558   </xsd:sequence>
559 </xsd:complexType>
560 <xsd:complexType name="CT_TextProps">
561   <xsd:sequence>
562     <xsd:group ref="a:EG_Text3D" minOccurs="0" maxOccurs="1"/>
563   </xsd:sequence>
564 </xsd:complexType>
565 <xsd:complexType name="CT_StyleLabel">
566   <xsd:sequence>
567     <xsd:element name="scene3d" type="a:CT_Scene3D" minOccurs="0" maxOccurs="1"/>
568     <xsd:element name="sp3d" type="a:CT_Shape3D" minOccurs="0" maxOccurs="1"/>
569     <xsd:element name="txPr" type="CT_TextProps" minOccurs="0" maxOccurs="1"/>
570     <xsd:element name="style" type="a:CT_ShapeStyle" minOccurs="0" maxOccurs="1"/>
571     <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
572       maxOccurs="1"/>
573   </xsd:sequence>
574   <xsd:attribute name="name" type="xsd:string" use="required"/>
575 </xsd:complexType>
576 <xsd:complexType name="CT_StyleDefinition">
577   <xsd:sequence>
578     <xsd:element name="title" type="CT_SDName" minOccurs="0" maxOccurs="unbounded"/>
579     <xsd:element name="desc" type="CT_SDDescription" minOccurs="0" maxOccurs="unbounded"/>
580     <xsd:element name="catLst" type="CT_SDCategories" minOccurs="0"/>
581     <xsd:element name="scene3d" type="a:CT_Scene3D" minOccurs="0" maxOccurs="1"/>
582     <xsd:element name="styleLbl" type="CT_StyleLabel" minOccurs="1" maxOccurs="unbounded"/>
583     <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
584       maxOccurs="1"/>
585   </xsd:sequence>
586   <xsd:attribute name="uniqueId" type="xsd:string" use="optional" default=""/>
587   <xsd:attribute name="minVer" type="xsd:string" use="optional" />
588 </xsd:complexType>
589 <xsd:element name="styleDef" type="CT_StyleDefinition"/>
590 <xsd:complexType name="CT_StyleDefinitionHeader">
591   <xsd:sequence>
592     <xsd:element name="title" type="CT_SDName" minOccurs="1" maxOccurs="unbounded"/>
593     <xsd:element name="desc" type="CT_SDDescription" minOccurs="1" maxOccurs="unbounded"/>
594     <xsd:element name="catLst" type="CT_SDCategories" minOccurs="0"/>

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```

595     <xsd:element name="extLst" type="a:CT_OfficeArtExtensionList" minOccurs="0"
596       maxOccurs="1"/>
597   </xsd:sequence>
598   <xsd:attribute name="uniqueId" type="xsd:string" use="required"/>
599   <xsd:attribute name="minVer" type="xsd:string" use="optional" />
600   <xsd:attribute name="resId" type="xsd:int" use="optional" default="0"/>
601 </xsd:complexType>
602 <xsd:element name="styleDefHdr" type="CT_StyleDefinitionHeader"/>
603 <xsd:complexType name="CT_StyleDefinitionHeaderLst">
604   <xsd:sequence>
605     <xsd:element name="styleDefHdr" type="CT_StyleDefinitionHeader" minOccurs="0"
606       maxOccurs="unbounded"/>
607   </xsd:sequence>
608 </xsd:complexType>
609 <xsd:element name="styleDefHdrLst" type="CT_StyleDefinitionHeaderLst"/>
610 <xsd:simpleType name="ST_AlgorithmType" final="restriction">
611   <xsd:restriction base="xsd:token">
612     <xsd:enumeration value="composite"/>
613     <xsd:enumeration value="conn"/>
614     <xsd:enumeration value="cycle"/>
615     <xsd:enumeration value="hierChild"/>
616     <xsd:enumeration value="hierRoot"/>
617     <xsd:enumeration value="pyra"/>
618     <xsd:enumeration value="lin"/>
619     <xsd:enumeration value="sp"/>
620     <xsd:enumeration value="tx"/>
621     <xsd:enumeration value="snake"/>
622   </xsd:restriction>
623 </xsd:simpleType>
624 <xsd:simpleType name="ST_AxisType" final="restriction">
625   <xsd:restriction base="xsd:token">
626     <xsd:enumeration value="self"/>
627     <xsd:enumeration value="ch"/>
628     <xsd:enumeration value="des"/>
629     <xsd:enumeration value="desOrSelf"/>
630     <xsd:enumeration value="par"/>
631     <xsd:enumeration value="ancst"/>
632     <xsd:enumeration value="ancstOrSelf"/>
633     <xsd:enumeration value="followSib"/>
634     <xsd:enumeration value="precedSib"/>
635     <xsd:enumeration value="follow"/>
636     <xsd:enumeration value="preced"/>
637     <xsd:enumeration value="root"/>
638     <xsd:enumeration value="none"/>
639   </xsd:restriction>
640 </xsd:simpleType>
641 <xsd:simpleType name="ST_AxisTypes">
642   <xsd:list itemType="ST_AxisType"/>
643 </xsd:simpleType>
644 <xsd:simpleType name="ST_BoolOperator" final="restriction">
645   <xsd:restriction base="xsd:token">
646     <xsd:enumeration value="none"/>
647     <xsd:enumeration value="equ"/>

```

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648         <xsd:enumeration value="gte"/>
649         <xsd:enumeration value="lte"/>
650     </xsd:restriction>
651 </xsd:simpleType>
652 <xsd:simpleType name="ST_ChildOrderType" final="restriction">
653     <xsd:restriction base="xsd:token">
654         <xsd:enumeration value="b"/>
655         <xsd:enumeration value="t"/>
656     </xsd:restriction>
657 </xsd:simpleType>
658 <xsd:simpleType name="ST_ConstraintType" final="restriction">
659     <xsd:restriction base="xsd:token">
660         <xsd:enumeration value="none"/>
661         <xsd:enumeration value="alignOff"/>
662         <xsd:enumeration value="begMarg"/>
663         <xsd:enumeration value="bendDist"/>
664         <xsd:enumeration value="begPad"/>
665         <xsd:enumeration value="b"/>
666         <xsd:enumeration value="bMarg"/>
667         <xsd:enumeration value="bOff"/>
668         <xsd:enumeration value="ctrX"/>
669         <xsd:enumeration value="ctrXOff"/>
670         <xsd:enumeration value="ctrY"/>
671         <xsd:enumeration value="ctrYOff"/>
672         <xsd:enumeration value="connDist"/>
673         <xsd:enumeration value="diam"/>
674         <xsd:enumeration value="endMarg"/>
675         <xsd:enumeration value="endPad"/>
676         <xsd:enumeration value="h"/>
677         <xsd:enumeration value="hArH"/>
678         <xsd:enumeration value="hOff"/>
679         <xsd:enumeration value="l"/>
680         <xsd:enumeration value="lMarg"/>
681         <xsd:enumeration value="lOff"/>
682         <xsd:enumeration value="r"/>
683         <xsd:enumeration value="rMarg"/>
684         <xsd:enumeration value="rOff"/>
685         <xsd:enumeration value="primFontSz"/>
686         <xsd:enumeration value="pyraAcctRatio"/>
687         <xsd:enumeration value="secFontSz"/>
688         <xsd:enumeration value="sibSp"/>
689         <xsd:enumeration value="secSibSp"/>
690         <xsd:enumeration value="sp"/>
691         <xsd:enumeration value="stemThick"/>
692         <xsd:enumeration value="t"/>
693         <xsd:enumeration value="tMarg"/>
694         <xsd:enumeration value="tOff"/>
695         <xsd:enumeration value="userA"/>
696         <xsd:enumeration value="userB"/>
697         <xsd:enumeration value="userC"/>
698         <xsd:enumeration value="userD"/>
699         <xsd:enumeration value="userE"/>
700         <xsd:enumeration value="userF"/>

```

```

701         <xsd:enumeration value="userG"/>
702         <xsd:enumeration value="userH"/>
703         <xsd:enumeration value="userI"/>
704         <xsd:enumeration value="userJ"/>
705         <xsd:enumeration value="userK"/>
706         <xsd:enumeration value="userL"/>
707         <xsd:enumeration value="userM"/>
708         <xsd:enumeration value="userN"/>
709         <xsd:enumeration value="userO"/>
710         <xsd:enumeration value="userP"/>
711         <xsd:enumeration value="userQ"/>
712         <xsd:enumeration value="userR"/>
713         <xsd:enumeration value="userS"/>
714         <xsd:enumeration value="userT"/>
715         <xsd:enumeration value="userU"/>
716         <xsd:enumeration value="userV"/>
717         <xsd:enumeration value="userW"/>
718         <xsd:enumeration value="userX"/>
719         <xsd:enumeration value="userY"/>
720         <xsd:enumeration value="userZ"/>
721         <xsd:enumeration value="w"/>
722         <xsd:enumeration value="wArH"/>
723         <xsd:enumeration value="wOff"/>
724     </xsd:restriction>
725 </xsd:simpleType>
726 <xsd:simpleType name="ST_ConstraintRelationship" final="restriction">
727     <xsd:restriction base="xsd:token">
728         <xsd:enumeration value="self"/>
729         <xsd:enumeration value="ch"/>
730         <xsd:enumeration value="des"/>
731     </xsd:restriction>
732 </xsd:simpleType>
733 <xsd:simpleType name="ST_ElementType" final="restriction">
734     <xsd:restriction base="xsd:token">
735         <xsd:enumeration value="all"/>
736         <xsd:enumeration value="doc"/>
737         <xsd:enumeration value="node"/>
738         <xsd:enumeration value="norm"/>
739         <xsd:enumeration value="nonNorm"/>
740         <xsd:enumeration value="asst"/>
741         <xsd:enumeration value="nonAsst"/>
742         <xsd:enumeration value="parTrans"/>
743         <xsd:enumeration value="pres"/>
744         <xsd:enumeration value="sibTrans"/>
745     </xsd:restriction>
746 </xsd:simpleType>
747 <xsd:simpleType name="ST_ElementTypes">
748     <xsd:list itemType="ST_ElementType"/>
749 </xsd:simpleType>
750 <xsd:simpleType name="ST_ParameterId" final="restriction">
751     <xsd:restriction base="xsd:token">
752         <xsd:enumeration value="horzAlign"/>
753         <xsd:enumeration value="vertAlign"/>

```

```

754      <xsd:enumeration value="chDir"/>
755      <xsd:enumeration value="chAlign"/>
756      <xsd:enumeration value="secChAlign"/>
757      <xsd:enumeration value="linDir"/>
758      <xsd:enumeration value="secLinDir"/>
759      <xsd:enumeration value="stElem"/>
760      <xsd:enumeration value="bendPt"/>
761      <xsd:enumeration value="connRout"/>
762      <xsd:enumeration value="begSty"/>
763      <xsd:enumeration value="endSty"/>
764      <xsd:enumeration value="dim"/>
765      <xsd:enumeration value="rotPath"/>
766      <xsd:enumeration value="ctrShpMap"/>
767      <xsd:enumeration value="nodeHorzAlign"/>
768      <xsd:enumeration value="nodeVertAlign"/>
769      <xsd:enumeration value="fallback"/>
770      <xsd:enumeration value="txDir"/>
771      <xsd:enumeration value="pyraAcctPos"/>
772      <xsd:enumeration value="pyraAcctTxMar"/>
773      <xsd:enumeration value="txBldir"/>
774      <xsd:enumeration value="txAnchorHorz"/>
775      <xsd:enumeration value="txAnchorVert"/>
776      <xsd:enumeration value="txAnchorHorzCh"/>
777      <xsd:enumeration value="txAnchorVertCh"/>
778      <xsd:enumeration value="parTxLTRAlign"/>
779      <xsd:enumeration value="parTxRTLAlign"/>
780      <xsd:enumeration value="shpTxLTRAlignCh"/>
781      <xsd:enumeration value="shpTxRTLAlignCh"/>
782      <xsd:enumeration value="autoTxRot"/>
783      <xsd:enumeration value="grDir"/>
784      <xsd:enumeration value="flowDir"/>
785      <xsd:enumeration value="contDir"/>
786      <xsd:enumeration value="bkpt"/>
787      <xsd:enumeration value="off"/>
788      <xsd:enumeration value="hierAlign"/>
789      <xsd:enumeration value="bkPtFixedVal"/>
790      <xsd:enumeration value="stBulletLvl"/>
791      <xsd:enumeration value="stAng"/>
792      <xsd:enumeration value="spanAng"/>
793      <xsd:enumeration value="ar"/>
794      <xsd:enumeration value="lnSpPar"/>
795      <xsd:enumeration value="lnSpAfParP"/>
796      <xsd:enumeration value="lnSpCh"/>
797      <xsd:enumeration value="lnSpAfChP"/>
798      <xsd:enumeration value="rtShortDist"/>
799      <xsd:enumeration value="alignTx"/>
800      <xsd:enumeration value="pyraLvlNode"/>
801      <xsd:enumeration value="pyraAcctBkgdNode"/>
802      <xsd:enumeration value="pyraAcctTxNode"/>
803      <xsd:enumeration value="srcNode"/>
804      <xsd:enumeration value="dstNode"/>
805      <xsd:enumeration value="begPts"/>
806      <xsd:enumeration value="endPts"/>

```

```

807     </xsd:restriction>
808 </xsd:simpleType>
809 <xsd:simpleType name="ST_Ints">
810     <xsd:list itemType="xsd:int"/>
811 </xsd:simpleType>
812 <xsd:simpleType name="ST_UnsignedInts">
813     <xsd:list itemType="xsd:unsignedInt"/>
814 </xsd:simpleType>
815 <xsd:simpleType name="ST_Booleans">
816     <xsd:list itemType="xsd:boolean"/>
817 </xsd:simpleType>
818 <xsd:simpleType name="ST_FunctionType" final="restriction">
819     <xsd:restriction base="xsd:token">
820         <xsd:enumeration value="cnt"/>
821         <xsd:enumeration value="pos"/>
822         <xsd:enumeration value="revPos"/>
823         <xsd:enumeration value="posEven"/>
824         <xsd:enumeration value="posOdd"/>
825         <xsd:enumeration value="var"/>
826         <xsd:enumeration value="depth"/>
827         <xsd:enumeration value="maxDepth"/>
828     </xsd:restriction>
829 </xsd:simpleType>
830 <xsd:simpleType name="ST_FunctionOperator" final="restriction">
831     <xsd:restriction base="xsd:token">
832         <xsd:enumeration value="equ"/>
833         <xsd:enumeration value="neq"/>
834         <xsd:enumeration value="gt"/>
835         <xsd:enumeration value="lt"/>
836         <xsd:enumeration value="gte"/>
837         <xsd:enumeration value="lte"/>
838     </xsd:restriction>
839 </xsd:simpleType>
840 <xsd:simpleType name="ST_DiagramHorizontalAlignment" final="restriction">
841     <xsd:restriction base="xsd:token">
842         <xsd:enumeration value="l"/>
843         <xsd:enumeration value="ctr"/>
844         <xsd:enumeration value="r"/>
845         <xsd:enumeration value="none"/>
846     </xsd:restriction>
847 </xsd:simpleType>
848 <xsd:simpleType name="ST_VerticalAlignment" final="restriction">
849     <xsd:restriction base="xsd:token">
850         <xsd:enumeration value="t"/>
851         <xsd:enumeration value="mid"/>
852         <xsd:enumeration value="b"/>
853         <xsd:enumeration value="none"/>
854     </xsd:restriction>
855 </xsd:simpleType>
856 <xsd:simpleType name="ST_ChildDirection" final="restriction">
857     <xsd:restriction base="xsd:token">
858         <xsd:enumeration value="horz"/>
859         <xsd:enumeration value="vert"/>

```



```

860     </xsd:restriction>
861 </xsd:simpleType>
862 <xsd:simpleType name="ST_ChildAlignment" final="restriction">
863     <xsd:restriction base="xsd:token">
864         <xsd:enumeration value="t"/>
865         <xsd:enumeration value="b"/>
866         <xsd:enumeration value="l"/>
867         <xsd:enumeration value="r"/>
868     </xsd:restriction>
869 </xsd:simpleType>
870 <xsd:simpleType name="ST_SecondaryChildAlignment" final="restriction">
871     <xsd:restriction base="xsd:token">
872         <xsd:enumeration value="none"/>
873         <xsd:enumeration value="t"/>
874         <xsd:enumeration value="b"/>
875         <xsd:enumeration value="l"/>
876         <xsd:enumeration value="r"/>
877     </xsd:restriction>
878 </xsd:simpleType>
879 <xsd:simpleType name="ST_LinearDirection" final="restriction">
880     <xsd:restriction base="xsd:token">
881         <xsd:enumeration value="fromL"/>
882         <xsd:enumeration value="fromR"/>
883         <xsd:enumeration value="fromT"/>
884         <xsd:enumeration value="fromB"/>
885     </xsd:restriction>
886 </xsd:simpleType>
887 <xsd:simpleType name="ST_SecondaryLinearDirection" final="restriction">
888     <xsd:restriction base="xsd:token">
889         <xsd:enumeration value="none"/>
890         <xsd:enumeration value="fromL"/>
891         <xsd:enumeration value="fromR"/>
892         <xsd:enumeration value="fromT"/>
893         <xsd:enumeration value="fromB"/>
894     </xsd:restriction>
895 </xsd:simpleType>
896 <xsd:simpleType name="ST_StartingElement" final="restriction">
897     <xsd:restriction base="xsd:token">
898         <xsd:enumeration value="node"/>
899         <xsd:enumeration value="trans"/>
900     </xsd:restriction>
901 </xsd:simpleType>
902 <xsd:simpleType name="ST_RotationPath" final="restriction">
903     <xsd:restriction base="xsd:token">
904         <xsd:enumeration value="none"/>
905         <xsd:enumeration value="alongPath"/>
906     </xsd:restriction>
907 </xsd:simpleType>
908 <xsd:simpleType name="ST_CenterShapeMapping" final="restriction">
909     <xsd:restriction base="xsd:token">
910         <xsd:enumeration value="none"/>
911         <xsd:enumeration value="fNode"/>
912     </xsd:restriction>

```

```

913 </xsd:simpleType>
914 <xsd:simpleType name="ST_BendPoint" final="restriction">
915   <xsd:restriction base="xsd:token">
916     <xsd:enumeration value="beg"/>
917     <xsd:enumeration value="def"/>
918     <xsd:enumeration value="end"/>
919   </xsd:restriction>
920 </xsd:simpleType>
921 <xsd:simpleType name="ST_ConnectorRouting" final="restriction">
922   <xsd:restriction base="xsd:token">
923     <xsd:enumeration value="stra"/>
924     <xsd:enumeration value="bend"/>
925     <xsd:enumeration value="curve"/>
926     <xsd:enumeration value="longCurve"/>
927   </xsd:restriction>
928 </xsd:simpleType>
929 <xsd:simpleType name="ST_ArrowheadStyle" final="restriction">
930   <xsd:restriction base="xsd:token">
931     <xsd:enumeration value="auto"/>
932     <xsd:enumeration value="arr"/>
933     <xsd:enumeration value="noArr"/>
934   </xsd:restriction>
935 </xsd:simpleType>
936 <xsd:simpleType name="ST_ConnectorDimension" final="restriction">
937   <xsd:restriction base="xsd:token">
938     <xsd:enumeration value="1D"/>
939     <xsd:enumeration value="2D"/>
940     <xsd:enumeration value="cust"/>
941   </xsd:restriction>
942 </xsd:simpleType>
943 <xsd:simpleType name="ST_ConnectorPoint" final="restriction">
944   <xsd:restriction base="xsd:token">
945     <xsd:enumeration value="auto"/>
946     <xsd:enumeration value="bCtr"/>
947     <xsd:enumeration value="ctr"/>
948     <xsd:enumeration value="midL"/>
949     <xsd:enumeration value="midR"/>
950     <xsd:enumeration value="tCtr"/>
951     <xsd:enumeration value="bL"/>
952     <xsd:enumeration value="bR"/>
953     <xsd:enumeration value="tL"/>
954     <xsd:enumeration value="tR"/>
955     <xsd:enumeration value="radial"/>
956   </xsd:restriction>
957 </xsd:simpleType>
958 <xsd:simpleType name="ST_NodeHorizontalAlignment" final="restriction">
959   <xsd:restriction base="xsd:token">
960     <xsd:enumeration value="l"/>
961     <xsd:enumeration value="ctr"/>
962     <xsd:enumeration value="r"/>
963   </xsd:restriction>
964 </xsd:simpleType>
965 <xsd:simpleType name="ST_NodeVerticalAlignment" final="restriction">

```

```

966     <xsd:restriction base="xsd:token">
967         <xsd:enumeration value="t"/>
968         <xsd:enumeration value="mid"/>
969         <xsd:enumeration value="b"/>
970     </xsd:restriction>
971 </xsd:simpleType>
972 <xsd:simpleType name="ST_FallbackDimension" final="restriction">
973     <xsd:restriction base="xsd:token">
974         <xsd:enumeration value="1D"/>
975         <xsd:enumeration value="2D"/>
976     </xsd:restriction>
977 </xsd:simpleType>
978 <xsd:simpleType name="ST_TextDirection" final="restriction">
979     <xsd:restriction base="xsd:token">
980         <xsd:enumeration value="fromT"/>
981         <xsd:enumeration value="fromB"/>
982     </xsd:restriction>
983 </xsd:simpleType>
984 <xsd:simpleType name="ST_PyramidAccentPosition" final="restriction">
985     <xsd:restriction base="xsd:token">
986         <xsd:enumeration value="bef"/>
987         <xsd:enumeration value="aft"/>
988     </xsd:restriction>
989 </xsd:simpleType>
990 <xsd:simpleType name="ST_PyramidAccentTextMargin" final="restriction">
991     <xsd:restriction base="xsd:token">
992         <xsd:enumeration value="step"/>
993         <xsd:enumeration value="stack"/>
994     </xsd:restriction>
995 </xsd:simpleType>
996 <xsd:simpleType name="ST_TextBlockDirection" final="restriction">
997     <xsd:restriction base="xsd:token">
998         <xsd:enumeration value="horz"/>
999         <xsd:enumeration value="vert"/>
1000     </xsd:restriction>
1001 </xsd:simpleType>
1002 <xsd:simpleType name="ST_TextAnchorHorizontal" final="restriction">
1003     <xsd:restriction base="xsd:token">
1004         <xsd:enumeration value="none"/>
1005         <xsd:enumeration value="ctr"/>
1006     </xsd:restriction>
1007 </xsd:simpleType>
1008 <xsd:simpleType name="ST_TextAnchorVertical" final="restriction">
1009     <xsd:restriction base="xsd:token">
1010         <xsd:enumeration value="t"/>
1011         <xsd:enumeration value="mid"/>
1012         <xsd:enumeration value="b"/>
1013     </xsd:restriction>
1014 </xsd:simpleType>
1015 <xsd:simpleType name="ST_DiagramTextAlignment" final="restriction">
1016     <xsd:restriction base="xsd:token">
1017         <xsd:enumeration value="l"/>
1018         <xsd:enumeration value="ctr"/>

```

```

1019         <xsd:enumeration value="r"/>
1020     </xsd:restriction>
1021 </xsd:simpleType>
1022 <xsd:simpleType name="ST_AutoTextRotation" final="restriction">
1023     <xsd:restriction base="xsd:token">
1024         <xsd:enumeration value="none"/>
1025         <xsd:enumeration value="upr"/>
1026         <xsd:enumeration value="grav"/>
1027     </xsd:restriction>
1028 </xsd:simpleType>
1029 <xsd:simpleType name="ST_GrowDirection" final="restriction">
1030     <xsd:restriction base="xsd:token">
1031         <xsd:enumeration value="tL"/>
1032         <xsd:enumeration value="tR"/>
1033         <xsd:enumeration value="bL"/>
1034         <xsd:enumeration value="bR"/>
1035     </xsd:restriction>
1036 </xsd:simpleType>
1037 <xsd:simpleType name="ST_FlowDirection" final="restriction">
1038     <xsd:restriction base="xsd:token">
1039         <xsd:enumeration value="row"/>
1040         <xsd:enumeration value="col"/>
1041     </xsd:restriction>
1042 </xsd:simpleType>
1043 <xsd:simpleType name="ST_ContinueDirection" final="restriction">
1044     <xsd:restriction base="xsd:token">
1045         <xsd:enumeration value="revDir"/>
1046         <xsd:enumeration value="sameDir"/>
1047     </xsd:restriction>
1048 </xsd:simpleType>
1049 <xsd:simpleType name="ST_Breakpoint" final="restriction">
1050     <xsd:restriction base="xsd:token">
1051         <xsd:enumeration value="endCnv"/>
1052         <xsd:enumeration value="bal"/>
1053         <xsd:enumeration value="fixed"/>
1054     </xsd:restriction>
1055 </xsd:simpleType>
1056 <xsd:simpleType name="ST_Offset" final="restriction">
1057     <xsd:restriction base="xsd:token">
1058         <xsd:enumeration value="ctr"/>
1059         <xsd:enumeration value="off"/>
1060     </xsd:restriction>
1061 </xsd:simpleType>
1062 <xsd:simpleType name="ST_HierarchyAlignment" final="restriction">
1063     <xsd:restriction base="xsd:token">
1064         <xsd:enumeration value="tL"/>
1065         <xsd:enumeration value="tR"/>
1066         <xsd:enumeration value="tCtrCh"/>
1067         <xsd:enumeration value="tCtrDes"/>
1068         <xsd:enumeration value="bL"/>
1069         <xsd:enumeration value="bR"/>
1070         <xsd:enumeration value="bCtrCh"/>
1071         <xsd:enumeration value="bCtrDes"/>

```

```

1072     <xsd:enumeration value="lT"/>
1073     <xsd:enumeration value="lB"/>
1074     <xsd:enumeration value="lCtrCh"/>
1075     <xsd:enumeration value="lCtrDes"/>
1076     <xsd:enumeration value="rT"/>
1077     <xsd:enumeration value="rB"/>
1078     <xsd:enumeration value="rCtrCh"/>
1079     <xsd:enumeration value="rCtrDes"/>
1080   </xsd:restriction>
1081 </xsd:simpleType>
1082 <xsd:simpleType name="ST_FunctionValue" final="restriction">
1083   <xsd:union memberTypes="xsd:int xsd:boolean ST_Direction ST_HierBranchStyle ST_AnimOneStr
1084     ST_AnimLvlStr ST_ResizeHandlesStr"/>
1085 </xsd:simpleType>
1086 <xsd:simpleType name="ST_VariableType" final="restriction">
1087   <xsd:restriction base="xsd:token">
1088     <xsd:enumeration value="none"/>
1089     <xsd:enumeration value="orgChart"/>
1090     <xsd:enumeration value="chMax"/>
1091     <xsd:enumeration value="chPref"/>
1092     <xsd:enumeration value="bulEnabled"/>
1093     <xsd:enumeration value="dir"/>
1094     <xsd:enumeration value="hierBranch"/>
1095     <xsd:enumeration value="animOne"/>
1096     <xsd:enumeration value="animLvl"/>
1097     <xsd:enumeration value="resizeHandles"/>
1098   </xsd:restriction>
1099 </xsd:simpleType>
1100 <xsd:simpleType name="ST_FunctionArgument" final="restriction">
1101   <xsd:union memberTypes="ST_VariableType"/>
1102 </xsd:simpleType>
1103 <xsd:simpleType name="ST_OutputShapeType" final="restriction">
1104   <xsd:restriction base="xsd:token">
1105     <xsd:enumeration value="none"/>
1106     <xsd:enumeration value="conn"/>
1107   </xsd:restriction>
1108 </xsd:simpleType>
1109 </xsd:schema>

```

A.6 Shared MLs

A.6.1 Math

This schema is available in the file shared-math.xsd.

```

1 <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
2   xmlns="http://purl.oclc.org/ooxml/officeDocument/math"
3   xmlns:m="http://purl.oclc.org/ooxml/officeDocument/math"
4   xmlns:w="http://purl.oclc.org/ooxml/wordprocessingml/main"
5   xmlns:s="http://purl.oclc.org/ooxml/officeDocument/sharedTypes" elementFormDefault="qualified"
6   attributeFormDefault="qualified" blockDefault="#all"
7   targetNamespace="http://purl.oclc.org/ooxml/officeDocument/math">

```

```

8      <xsd:import namespace="http://purl.oclc.org/ooxml/wordprocessingml/main"
9          schemaLocation="wml.xsd"/>
10     <xsd:import namespace="http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
11         schemaLocation="shared-commonSimpleTypes.xsd"/>
12     <xsd:import namespace="http://www.w3.org/XML/1998/namespace"/>
13     <xsd:simpleType name="ST_Integer255">
14         <xsd:restriction base="xsd:integer">
15             <xsd:minInclusive value="1"/>
16             <xsd:maxInclusive value="255"/>
17         </xsd:restriction>
18     </xsd:simpleType>
19     <xsd:complexType name="CT_Integer255">
20         <xsd:attribute name="val" type="ST_Integer255" use="required"/>
21     </xsd:complexType>
22     <xsd:simpleType name="ST_Integer2">
23         <xsd:restriction base="xsd:integer">
24             <xsd:minInclusive value="-2"/>
25             <xsd:maxInclusive value="2"/>
26         </xsd:restriction>
27     </xsd:simpleType>
28     <xsd:complexType name="CT_Integer2">
29         <xsd:attribute name="val" type="ST_Integer2" use="required"/>
30     </xsd:complexType>
31     <xsd:simpleType name="ST_SpacingRule">
32         <xsd:restriction base="xsd:integer">
33             <xsd:minInclusive value="0"/>
34             <xsd:maxInclusive value="4"/>
35         </xsd:restriction>
36     </xsd:simpleType>
37     <xsd:complexType name="CT_SpacingRule">
38         <xsd:attribute name="val" type="ST_SpacingRule" use="required"/>
39     </xsd:complexType>
40     <xsd:simpleType name="ST_UnSignedInteger">
41         <xsd:restriction base="xsd:unsignedInt"/>
42     </xsd:simpleType>
43     <xsd:complexType name="CT_UnSignedInteger">
44         <xsd:attribute name="val" type="ST_UnSignedInteger" use="required"/>
45     </xsd:complexType>
46     <xsd:simpleType name="ST_Char">
47         <xsd:restriction base="xsd:string">
48             <xsd:maxLength value="1"/>
49         </xsd:restriction>
50     </xsd:simpleType>
51     <xsd:complexType name="CT_Char">
52         <xsd:attribute name="val" type="ST_Char" use="required"/>
53     </xsd:complexType>
54     <xsd:complexType name="CT_OnOff">
55         <xsd:attribute name="val" type="s:ST_OnOff"/>
56     </xsd:complexType>
57     <xsd:complexType name="CT_String">
58         <xsd:attribute name="val" type="s:ST_String"/>
59     </xsd:complexType>
60     <xsd:complexType name="CT_XAlign">

```

```

61     <xsd:attribute name="val" type="s:ST_XAlign" use="required"/>
62 </xsd:complexType>
63 <xsd:complexType name="CT_YAlign">
64     <xsd:attribute name="val" type="s:ST_YAlign" use="required"/>
65 </xsd:complexType>
66 <xsd:simpleType name="ST_Shp">
67     <xsd:restriction base="xsd:string">
68         <xsd:enumeration value="centered"/>
69         <xsd:enumeration value="match"/>
70     </xsd:restriction>
71 </xsd:simpleType>
72 <xsd:complexType name="CT_Shp">
73     <xsd:attribute name="val" type="ST_Shp" use="required"/>
74 </xsd:complexType>
75 <xsd:simpleType name="ST_FType">
76     <xsd:restriction base="xsd:string">
77         <xsd:enumeration value="bar"/>
78         <xsd:enumeration value="skw"/>
79         <xsd:enumeration value="lin"/>
80         <xsd:enumeration value="noBar"/>
81     </xsd:restriction>
82 </xsd:simpleType>
83 <xsd:complexType name="CT_FType">
84     <xsd:attribute name="val" type="ST_FType" use="required"/>
85 </xsd:complexType>
86 <xsd:simpleType name="ST_LimLoc">
87     <xsd:restriction base="xsd:string">
88         <xsd:enumeration value="undOvr"/>
89         <xsd:enumeration value="subSup"/>
90     </xsd:restriction>
91 </xsd:simpleType>
92 <xsd:complexType name="CT_LimLoc">
93     <xsd:attribute name="val" type="ST_LimLoc" use="required"/>
94 </xsd:complexType>
95 <xsd:simpleType name="ST_TopBot">
96     <xsd:restriction base="xsd:string">
97         <xsd:enumeration value="top"/>
98         <xsd:enumeration value="bot"/>
99     </xsd:restriction>
100 </xsd:simpleType>
101 <xsd:complexType name="CT_TopBot">
102     <xsd:attribute name="val" type="ST_TopBot" use="required"/>
103 </xsd:complexType>
104 <xsd:simpleType name="ST_Script">
105     <xsd:restriction base="xsd:string">
106         <xsd:enumeration value="roman"/>
107         <xsd:enumeration value="script"/>
108         <xsd:enumeration value="fraktur"/>
109         <xsd:enumeration value="double-struck"/>
110         <xsd:enumeration value="sans-serif"/>
111         <xsd:enumeration value="monospace"/>
112     </xsd:restriction>
113 </xsd:simpleType>

```

```

114 <xsd:complexType name="CT_Script">
115   <xsd:attribute name="val" type="ST_Script"/>
116 </xsd:complexType>
117 <xsd:simpleType name="ST_Style">
118   <xsd:restriction base="xsd:string">
119     <xsd:enumeration value="p"/>
120     <xsd:enumeration value="b"/>
121     <xsd:enumeration value="i"/>
122     <xsd:enumeration value="bi"/>
123   </xsd:restriction>
124 </xsd:simpleType>
125 <xsd:complexType name="CT_Style">
126   <xsd:attribute name="val" type="ST_Style"/>
127 </xsd:complexType>
128 <xsd:complexType name="CT_ManualBreak">
129   <xsd:attribute name="alnAt" type="ST_Integer255"/>
130 </xsd:complexType>
131 <xsd:group name="EG_ScriptStyle">
132   <xsd:sequence>
133     <xsd:element name="scr" minOccurs="0" type="CT_Script"/>
134     <xsd:element name="sty" minOccurs="0" type="CT_Style"/>
135   </xsd:sequence>
136 </xsd:group>
137 <xsd:complexType name="CT_RPR">
138   <xsd:sequence>
139     <xsd:element name="lit" minOccurs="0" type="CT_OnOff"/>
140     <xsd:choice>
141       <xsd:element name="nor" minOccurs="0" type="CT_OnOff"/>
142       <xsd:sequence>
143         <xsd:group ref="EG_ScriptStyle"/>
144       </xsd:sequence>
145     </xsd:choice>
146     <xsd:element name="brk" minOccurs="0" type="CT_ManualBreak"/>
147     <xsd:element name="aln" minOccurs="0" type="CT_OnOff"/>
148   </xsd:sequence>
149 </xsd:complexType>
150 <xsd:complexType name="CT_Text">
151   <xsd:simpleContent>
152     <xsd:extension base="s:ST_String">
153       <xsd:attribute ref="xml:space" use="optional"/>
154     </xsd:extension>
155   </xsd:simpleContent>
156 </xsd:complexType>
157 <xsd:complexType name="CT_R">
158   <xsd:sequence>
159     <xsd:element name="rPr" type="CT_RPR" minOccurs="0"/>
160     <xsd:group ref="w:EG_RPr" minOccurs="0"/>
161     <xsd:choice minOccurs="0" maxOccurs="unbounded">
162       <xsd:group ref="w:EG_RunInnerContent"/>
163       <xsd:element name="t" type="CT_Text" minOccurs="0"/>
164     </xsd:choice>
165   </xsd:sequence>
166 </xsd:complexType>

```



```

167 <xsd:complexType name="CT_CtrlPr">
168   <xsd:sequence>
169     <xsd:group ref="w:EG_RPrMath" minOccurs="0"/>
170   </xsd:sequence>
171 </xsd:complexType>
172 <xsd:complexType name="CT_AccPr">
173   <xsd:sequence>
174     <xsd:element name="chr" type="CT_Char" minOccurs="0"/>
175     <xsd:element name="ctrlPr" type="CT_CtrlPr" minOccurs="0"/>
176   </xsd:sequence>
177 </xsd:complexType>
178 <xsd:complexType name="CT_Acc">
179   <xsd:sequence>
180     <xsd:element name="accPr" type="CT_AccPr" minOccurs="0"/>
181     <xsd:element name="e" type="CT_OMathArg"/>
182   </xsd:sequence>
183 </xsd:complexType>
184 <xsd:complexType name="CT_BarPr">
185   <xsd:sequence>
186     <xsd:element name="pos" type="CT_TopBot" minOccurs="0"/>
187     <xsd:element name="ctrlPr" type="CT_CtrlPr" minOccurs="0"/>
188   </xsd:sequence>
189 </xsd:complexType>
190 <xsd:complexType name="CT_Bar">
191   <xsd:sequence>
192     <xsd:element name="barPr" type="CT_BarPr" minOccurs="0"/>
193     <xsd:element name="e" type="CT_OMathArg"/>
194   </xsd:sequence>
195 </xsd:complexType>
196 <xsd:complexType name="CT_BoxPr">
197   <xsd:sequence>
198     <xsd:element name="opEmu" type="CT_OnOff" minOccurs="0"/>
199     <xsd:element name="noBreak" type="CT_OnOff" minOccurs="0"/>
200     <xsd:element name="diff" type="CT_OnOff" minOccurs="0"/>
201     <xsd:element name="brk" type="CT_ManualBreak" minOccurs="0"/>
202     <xsd:element name="aln" type="CT_OnOff" minOccurs="0"/>
203     <xsd:element name="ctrlPr" type="CT_CtrlPr" minOccurs="0"/>
204   </xsd:sequence>
205 </xsd:complexType>
206 <xsd:complexType name="CT_Box">
207   <xsd:sequence>
208     <xsd:element name="boxPr" type="CT_BoxPr" minOccurs="0"/>
209     <xsd:element name="e" type="CT_OMathArg"/>
210   </xsd:sequence>
211 </xsd:complexType>
212 <xsd:complexType name="CT_BorderBoxPr">
213   <xsd:sequence>
214     <xsd:element name="hideTop" type="CT_OnOff" minOccurs="0"/>
215     <xsd:element name="hideBot" type="CT_OnOff" minOccurs="0"/>
216     <xsd:element name="hideLeft" type="CT_OnOff" minOccurs="0"/>
217     <xsd:element name="hideRight" type="CT_OnOff" minOccurs="0"/>
218     <xsd:element name="strikeH" type="CT_OnOff" minOccurs="0"/>
219     <xsd:element name="strikeV" type="CT_OnOff" minOccurs="0"/>

```

```

220     <xsd:element name="strikeBLTR" type="CT_OnOff" minOccurs="0"/>
221     <xsd:element name="strikeTLBR" type="CT_OnOff" minOccurs="0"/>
222     <xsd:element name="ctrlPr" type="CT_CtrlPr" minOccurs="0"/>
223   </xsd:sequence>
224 </xsd:complexType>
225 <xsd:complexType name="CT_BoundingBox">
226   <xsd:sequence>
227     <xsd:element name="borderBoxPr" type="CT_BoundingBoxPr" minOccurs="0"/>
228     <xsd:element name="e" type="CT_OMathArg"/>
229   </xsd:sequence>
230 </xsd:complexType>
231 <xsd:complexType name="CT_DPr">
232   <xsd:sequence>
233     <xsd:element name="begChr" type="CT_Char" minOccurs="0"/>
234     <xsd:element name="sepChr" type="CT_Char" minOccurs="0"/>
235     <xsd:element name="endChr" type="CT_Char" minOccurs="0"/>
236     <xsd:element name="grow" type="CT_OnOff" minOccurs="0"/>
237     <xsd:element name="shp" type="CT_Shp" minOccurs="0"/>
238     <xsd:element name="ctrlPr" type="CT_CtrlPr" minOccurs="0"/>
239   </xsd:sequence>
240 </xsd:complexType>
241 <xsd:complexType name="CT_D">
242   <xsd:sequence>
243     <xsd:element name="dPr" type="CT_DPr" minOccurs="0"/>
244     <xsd:element name="e" type="CT_OMathArg" maxOccurs="unbounded"/>
245   </xsd:sequence>
246 </xsd:complexType>
247 <xsd:complexType name="CT_EqArrPr">
248   <xsd:sequence>
249     <xsd:element name="baseJc" type="CT_YAlign" minOccurs="0"/>
250     <xsd:element name="maxDist" type="CT_OnOff" minOccurs="0"/>
251     <xsd:element name="objDist" type="CT_OnOff" minOccurs="0"/>
252     <xsd:element name="rSpRule" type="CT_SpacingRule" minOccurs="0"/>
253     <xsd:element name="rSp" type="CT_UnSignedInteger" minOccurs="0"/>
254     <xsd:element name="ctrlPr" type="CT_CtrlPr" minOccurs="0"/>
255   </xsd:sequence>
256 </xsd:complexType>
257 <xsd:complexType name="CT_EqArr">
258   <xsd:sequence>
259     <xsd:element name="eqArrPr" type="CT_EqArrPr" minOccurs="0"/>
260     <xsd:element name="e" type="CT_OMathArg" maxOccurs="unbounded"/>
261   </xsd:sequence>
262 </xsd:complexType>
263 <xsd:complexType name="CT_FPr">
264   <xsd:sequence>
265     <xsd:element name="type" type="CT_FType" minOccurs="0"/>
266     <xsd:element name="ctrlPr" type="CT_CtrlPr" minOccurs="0"/>
267   </xsd:sequence>
268 </xsd:complexType>
269 <xsd:complexType name="CT_F">
270   <xsd:sequence>
271     <xsd:element name="fPr" type="CT_FPr" minOccurs="0"/>
272     <xsd:element name="num" type="CT_OMathArg"/>

```

```

273     <xsd:element name="den" type="CT_OMathArg"/>
274   </xsd:sequence>
275 </xsd:complexType>
276 <xsd:complexType name="CT_FuncPr">
277   <xsd:sequence>
278     <xsd:element name="ctrlPr" type="CT_CtrlPr" minOccurs="0"/>
279   </xsd:sequence>
280 </xsd:complexType>
281 <xsd:complexType name="CT_Func">
282   <xsd:sequence>
283     <xsd:element name="funcPr" type="CT_FuncPr" minOccurs="0"/>
284     <xsd:element name="fName" type="CT_OMathArg"/>
285     <xsd:element name="e" type="CT_OMathArg"/>
286   </xsd:sequence>
287 </xsd:complexType>
288 <xsd:complexType name="CT_GroupChrPr">
289   <xsd:sequence>
290     <xsd:element name="chr" type="CT_Char" minOccurs="0"/>
291     <xsd:element name="pos" type="CT_TopBot" minOccurs="0"/>
292     <xsd:element name="vertJc" type="CT_TopBot" minOccurs="0"/>
293     <xsd:element name="ctrlPr" type="CT_CtrlPr" minOccurs="0"/>
294   </xsd:sequence>
295 </xsd:complexType>
296 <xsd:complexType name="CT_GroupChr">
297   <xsd:sequence>
298     <xsd:element name="groupChrPr" type="CT_GroupChrPr" minOccurs="0"/>
299     <xsd:element name="e" type="CT_OMathArg"/>
300   </xsd:sequence>
301 </xsd:complexType>
302 <xsd:complexType name="CT_LimLowPr">
303   <xsd:sequence>
304     <xsd:element name="ctrlPr" type="CT_CtrlPr" minOccurs="0"/>
305   </xsd:sequence>
306 </xsd:complexType>
307 <xsd:complexType name="CT_LimLow">
308   <xsd:sequence>
309     <xsd:element name="limLowPr" type="CT_LimLowPr" minOccurs="0"/>
310     <xsd:element name="e" type="CT_OMathArg"/>
311     <xsd:element name="lim" type="CT_OMathArg"/>
312   </xsd:sequence>
313 </xsd:complexType>
314 <xsd:complexType name="CT_LimUppPr">
315   <xsd:sequence>
316     <xsd:element name="ctrlPr" type="CT_CtrlPr" minOccurs="0"/>
317   </xsd:sequence>
318 </xsd:complexType>
319 <xsd:complexType name="CT_LimUpp">
320   <xsd:sequence>
321     <xsd:element name="limUppPr" type="CT_LimUppPr" minOccurs="0"/>
322     <xsd:element name="e" type="CT_OMathArg"/>
323     <xsd:element name="lim" type="CT_OMathArg"/>
324   </xsd:sequence>
325 </xsd:complexType>

```

```

326 <xsd:complexType name="CT_MCPPr">
327   <xsd:sequence>
328     <xsd:element name="count" type="CT_Integer255" minOccurs="0"/>
329     <xsd:element name="mcJc" type="CT_XAlign" minOccurs="0"/>
330   </xsd:sequence>
331 </xsd:complexType>
332 <xsd:complexType name="CT_MC">
333   <xsd:sequence>
334     <xsd:element name="mcPr" type="CT_MCPPr" minOccurs="0"/>
335   </xsd:sequence>
336 </xsd:complexType>
337 <xsd:complexType name="CT_MCS">
338   <xsd:sequence>
339     <xsd:element name="mc" type="CT_MC" maxOccurs="unbounded"/>
340   </xsd:sequence>
341 </xsd:complexType>
342 <xsd:complexType name="CT_MPr">
343   <xsd:sequence>
344     <xsd:element name="baseJc" type="CT_YAlign" minOccurs="0"/>
345     <xsd:element name="plcHide" type="CT_OnOff" minOccurs="0"/>
346     <xsd:element name="rSpRule" type="CT_SpacingRule" minOccurs="0"/>
347     <xsd:element name="cGpRule" type="CT_SpacingRule" minOccurs="0"/>
348     <xsd:element name="rSp" type="CT_UnSignedInteger" minOccurs="0"/>
349     <xsd:element name="cSp" type="CT_UnSignedInteger" minOccurs="0"/>
350     <xsd:element name="cGp" type="CT_UnSignedInteger" minOccurs="0"/>
351     <xsd:element name="mcs" type="CT_MCS" minOccurs="0"/>
352     <xsd:element name="ctrlPr" type="CT_CtrlPr" minOccurs="0"/>
353   </xsd:sequence>
354 </xsd:complexType>
355 <xsd:complexType name="CT_MR">
356   <xsd:sequence>
357     <xsd:element name="e" type="CT_OMathArg" maxOccurs="unbounded"/>
358   </xsd:sequence>
359 </xsd:complexType>
360 <xsd:complexType name="CT_M">
361   <xsd:sequence>
362     <xsd:element name="mPr" type="CT_MPr" minOccurs="0"/>
363     <xsd:element name="mr" type="CT_MR" maxOccurs="unbounded"/>
364   </xsd:sequence>
365 </xsd:complexType>
366 <xsd:complexType name="CT_NaryPr">
367   <xsd:sequence>
368     <xsd:element name="chr" type="CT_Char" minOccurs="0"/>
369     <xsd:element name="limLoc" type="CT_LimLoc" minOccurs="0"/>
370     <xsd:element name="grow" type="CT_OnOff" minOccurs="0"/>
371     <xsd:element name="subHide" type="CT_OnOff" minOccurs="0"/>
372     <xsd:element name="supHide" type="CT_OnOff" minOccurs="0"/>
373     <xsd:element name="ctrlPr" type="CT_CtrlPr" minOccurs="0"/>
374   </xsd:sequence>
375 </xsd:complexType>
376 <xsd:complexType name="CT_Nary">
377   <xsd:sequence>
378     <xsd:element name="naryPr" type="CT_NaryPr" minOccurs="0"/>

```

```

379     <xsd:element name="sub" type="CT_OMathArg"/>
380     <xsd:element name="sup" type="CT_OMathArg"/>
381     <xsd:element name="e" type="CT_OMathArg"/>
382   </xsd:sequence>
383 </xsd:complexType>
384 <xsd:complexType name="CT_PhantPr">
385   <xsd:sequence>
386     <xsd:element name="show" type="CT_OnOff" minOccurs="0"/>
387     <xsd:element name="zeroWid" type="CT_OnOff" minOccurs="0"/>
388     <xsd:element name="zeroAsc" type="CT_OnOff" minOccurs="0"/>
389     <xsd:element name="zeroDesc" type="CT_OnOff" minOccurs="0"/>
390     <xsd:element name="transp" type="CT_OnOff" minOccurs="0"/>
391     <xsd:element name="ctrlPr" type="CT_CtrlPr" minOccurs="0"/>
392   </xsd:sequence>
393 </xsd:complexType>
394 <xsd:complexType name="CT_Phant">
395   <xsd:sequence>
396     <xsd:element name="phantPr" type="CT_PhantPr" minOccurs="0"/>
397     <xsd:element name="e" type="CT_OMathArg"/>
398   </xsd:sequence>
399 </xsd:complexType>
400 <xsd:complexType name="CT_RadPr">
401   <xsd:sequence>
402     <xsd:element name="degHide" type="CT_OnOff" minOccurs="0"/>
403     <xsd:element name="ctrlPr" type="CT_CtrlPr" minOccurs="0"/>
404   </xsd:sequence>
405 </xsd:complexType>
406 <xsd:complexType name="CT_Rad">
407   <xsd:sequence>
408     <xsd:element name="radPr" type="CT_RadPr" minOccurs="0"/>
409     <xsd:element name="deg" type="CT_OMathArg"/>
410     <xsd:element name="e" type="CT_OMathArg"/>
411   </xsd:sequence>
412 </xsd:complexType>
413 <xsd:complexType name="CT_SPrePr">
414   <xsd:sequence>
415     <xsd:element name="ctrlPr" type="CT_CtrlPr" minOccurs="0"/>
416   </xsd:sequence>
417 </xsd:complexType>
418 <xsd:complexType name="CT_SPre">
419   <xsd:sequence>
420     <xsd:element name="sPrePr" type="CT_SPrePr" minOccurs="0"/>
421     <xsd:element name="sub" type="CT_OMathArg"/>
422     <xsd:element name="sup" type="CT_OMathArg"/>
423     <xsd:element name="e" type="CT_OMathArg"/>
424   </xsd:sequence>
425 </xsd:complexType>
426 <xsd:complexType name="CT_SSubPr">
427   <xsd:sequence>
428     <xsd:element name="ctrlPr" type="CT_CtrlPr" minOccurs="0"/>
429   </xsd:sequence>
430 </xsd:complexType>
431 <xsd:complexType name="CT_SSub">

```

```

432     <xsd:sequence>
433         <xsd:element name="sSubPr" type="CT_SSubPr" minOccurs="0"/>
434         <xsd:element name="e" type="CT_OMathArg"/>
435         <xsd:element name="sub" type="CT_OMathArg"/>
436     </xsd:sequence>
437 </xsd:complexType>
438 <xsd:complexType name="CT_SSubSupPr">
439     <xsd:sequence>
440         <xsd:element name="alnScr" type="CT_OnOff" minOccurs="0"/>
441         <xsd:element name="ctrlPr" type="CT_CtrlPr" minOccurs="0"/>
442     </xsd:sequence>
443 </xsd:complexType>
444 <xsd:complexType name="CT_SSubSup">
445     <xsd:sequence>
446         <xsd:element name="sSubSupPr" type="CT_SSubSupPr" minOccurs="0"/>
447         <xsd:element name="e" type="CT_OMathArg"/>
448         <xsd:element name="sub" type="CT_OMathArg"/>
449         <xsd:element name="sup" type="CT_OMathArg"/>
450     </xsd:sequence>
451 </xsd:complexType>
452 <xsd:complexType name="CT_SSupPr">
453     <xsd:sequence>
454         <xsd:element name="ctrlPr" type="CT_CtrlPr" minOccurs="0"/>
455     </xsd:sequence>
456 </xsd:complexType>
457 <xsd:complexType name="CT_SSup">
458     <xsd:sequence>
459         <xsd:element name="sSupPr" type="CT_SSupPr" minOccurs="0"/>
460         <xsd:element name="e" type="CT_OMathArg"/>
461         <xsd:element name="sup" type="CT_OMathArg"/>
462     </xsd:sequence>
463 </xsd:complexType>
464 <xsd:group name="EG_OMathMathElements">
465     <xsd:choice>
466         <xsd:element name="acc" type="CT_Acc"/>
467         <xsd:element name="bar" type="CT_Bar"/>
468         <xsd:element name="box" type="CT_Box"/>
469         <xsd:element name="borderBox" type="CT_BorderBox"/>
470         <xsd:element name="d" type="CT_D"/>
471         <xsd:element name="eqArr" type="CT_EqArr"/>
472         <xsd:element name="f" type="CT_F"/>
473         <xsd:element name="func" type="CT_Func"/>
474         <xsd:element name="groupChr" type="CT_GroupChr"/>
475         <xsd:element name="limLow" type="CT_LimLow"/>
476         <xsd:element name="limUpp" type="CT_LimUpp"/>
477         <xsd:element name="m" type="CT_M"/>
478         <xsd:element name="nary" type="CT_Nary"/>
479         <xsd:element name="phant" type="CT_Phant"/>
480         <xsd:element name="rad" type="CT_Rad"/>
481         <xsd:element name="sPre" type="CT_SPre"/>
482         <xsd:element name="sSub" type="CT_SSub"/>
483         <xsd:element name="sSubSup" type="CT_SSubSup"/>
484         <xsd:element name="sSup" type="CT_SSup"/>

```

```

485     <xsd:element name="r" type="CT_R"/>
486   </xsd:choice>
487 </xsd:group>
488 <xsd:group name="EG_OMathElements">
489   <xsd:choice>
490     <xsd:group ref="EG_OMathMathElements"/>
491     <xsd:group ref="w:EG_PContentMath"/>
492   </xsd:choice>
493 </xsd:group>
494 <xsd:complexType name="CT_OMathArgPr">
495   <xsd:sequence>
496     <xsd:element name="argSz" type="CT_Integer2" minOccurs="0"/>
497   </xsd:sequence>
498 </xsd:complexType>
499 <xsd:complexType name="CT_OMathArg">
500   <xsd:sequence>
501     <xsd:element name="argPr" type="CT_OMathArgPr" minOccurs="0"/>
502     <xsd:group ref="EG_OMathElements" minOccurs="0" maxOccurs="unbounded"/>
503     <xsd:element name="ctrlPr" type="CT_CtrlPr" minOccurs="0"/>
504   </xsd:sequence>
505 </xsd:complexType>
506 <xsd:simpleType name="ST_Jc">
507   <xsd:restriction base="xsd:string">
508     <xsd:enumeration value="left"/>
509     <xsd:enumeration value="right"/>
510     <xsd:enumeration value="center"/>
511     <xsd:enumeration value="centerGroup"/>
512   </xsd:restriction>
513 </xsd:simpleType>
514 <xsd:complexType name="CT_OMathJc">
515   <xsd:attribute name="val" type="ST_Jc"/>
516 </xsd:complexType>
517 <xsd:complexType name="CT_OMathParaPr">
518   <xsd:sequence>
519     <xsd:element name="jc" type="CT_OMathJc" minOccurs="0"/>
520   </xsd:sequence>
521 </xsd:complexType>
522 <xsd:complexType name="CT_TwipsMeasure">
523   <xsd:attribute name="val" type="s:ST_TwipsMeasure" use="required"/>
524 </xsd:complexType>
525 <xsd:simpleType name="ST_BreakBin">
526   <xsd:restriction base="xsd:string">
527     <xsd:enumeration value="before"/>
528     <xsd:enumeration value="after"/>
529     <xsd:enumeration value="repeat"/>
530   </xsd:restriction>
531 </xsd:simpleType>
532 <xsd:complexType name="CT_BreakBin">
533   <xsd:attribute name="val" type="ST_BreakBin"/>
534 </xsd:complexType>
535 <xsd:simpleType name="ST_BreakBinSub">
536   <xsd:restriction base="xsd:string">
537     <xsd:enumeration value="--"/>

```

```

538     <xsd:enumeration value="-+"/>
539     <xsd:enumeration value="+-"/>
540   </xsd:restriction>
541 </xsd:simpleType>
542 <xsd:complexType name="CT_BreakBinSub">
543   <xsd:attribute name="val" type="ST_BreakBinSub"/>
544 </xsd:complexType>
545 <xsd:complexType name="CT_MathPr">
546   <xsd:sequence>
547     <xsd:element name="mathFont" type="CT_String" minOccurs="0"/>
548     <xsd:element name="brkBin" type="CT_BreakBin" minOccurs="0"/>
549     <xsd:element name="brkBinSub" type="CT_BreakBinSub" minOccurs="0"/>
550     <xsd:element name="smallFrac" type="CT_OnOff" minOccurs="0"/>
551     <xsd:element name="dispDef" type="CT_OnOff" minOccurs="0"/>
552     <xsd:element name="lMargin" type="CT_TwipsMeasure" minOccurs="0"/>
553     <xsd:element name="rMargin" type="CT_TwipsMeasure" minOccurs="0"/>
554     <xsd:element name="defJc" type="CT_OMathJc" minOccurs="0"/>
555     <xsd:element name="preSp" type="CT_TwipsMeasure" minOccurs="0"/>
556     <xsd:element name="postSp" type="CT_TwipsMeasure" minOccurs="0"/>
557     <xsd:element name="interSp" type="CT_TwipsMeasure" minOccurs="0"/>
558     <xsd:element name="intraSp" type="CT_TwipsMeasure" minOccurs="0"/>
559     <xsd:choice minOccurs="0">
560       <xsd:element name="wrapIndent" type="CT_TwipsMeasure"/>
561       <xsd:element name="wrapRight" type="CT_OnOff"/>
562     </xsd:choice>
563     <xsd:element name="intLim" type="CT_LimLoc" minOccurs="0"/>
564     <xsd:element name="naryLim" type="CT_LimLoc" minOccurs="0"/>
565   </xsd:sequence>
566 </xsd:complexType>
567 <xsd:element name="mathPr" type="CT_MathPr"/>
568 <xsd:complexType name="CT_OMathPara">
569   <xsd:sequence>
570     <xsd:element name="oMathParaPr" type="CT_OMathParaPr" minOccurs="0"/>
571     <xsd:element name="oMath" type="CT_OMath" maxOccurs="unbounded"/>
572   </xsd:sequence>
573 </xsd:complexType>
574 <xsd:complexType name="CT_OMath">
575   <xsd:sequence>
576     <xsd:group ref="EG_OMathElements" minOccurs="0" maxOccurs="unbounded"/>
577   </xsd:sequence>
578 </xsd:complexType>
579 <xsd:element name="oMathPara" type="CT_OMathPara"/>
580 <xsd:element name="oMath" type="CT_OMath"/>
581 </xsd:schema>

```

A.6.2 Extended Properties

This schema is available in the file `shared-documentPropertiesExtended.xsd`.

```

1 <xsd:schema xmlns="http://purl.oclc.org/ooxml/officeDocument/extendedProperties"
2   xmlns:xsd="http://www.w3.org/2001/XMLSchema"
3   xmlns:vt="http://purl.oclc.org/ooxml/officeDocument/docPropsVTypes"

```



```

4 targetNamespace="http://purl.oclc.org/ooxml/officeDocument/extendedProperties"
5 elementFormDefault="qualified" blockDefault="#all">
6   <xsd:import namespace="http://purl.oclc.org/ooxml/officeDocument/docPropsVTypes"
7     schemaLocation="shared-documentPropertiesVariantTypes.xsd"/>
8   <xsd:element name="Properties" type="CT_Properties"/>
9   <xsd:complexType name="CT_Properties">
10     <xsd:all>
11       <xsd:element name="Template" minOccurs="0" maxOccurs="1" type="xsd:string"/>
12       <xsd:element name="Manager" minOccurs="0" maxOccurs="1" type="xsd:string"/>
13       <xsd:element name="Company" minOccurs="0" maxOccurs="1" type="xsd:string"/>
14       <xsd:element name="Pages" minOccurs="0" maxOccurs="1" type="xsd:int"/>
15       <xsd:element name="Words" minOccurs="0" maxOccurs="1" type="xsd:int"/>
16       <xsd:element name="Characters" minOccurs="0" maxOccurs="1" type="xsd:int"/>
17       <xsd:element name="PresentationFormat" minOccurs="0" maxOccurs="1" type="xsd:string"/>
18       <xsd:element name="Lines" minOccurs="0" maxOccurs="1" type="xsd:int"/>
19       <xsd:element name="Paragraphs" minOccurs="0" maxOccurs="1" type="xsd:int"/>
20       <xsd:element name="Slides" minOccurs="0" maxOccurs="1" type="xsd:int"/>
21       <xsd:element name="Notes" minOccurs="0" maxOccurs="1" type="xsd:int"/>
22       <xsd:element name="TotalTime" minOccurs="0" maxOccurs="1" type="xsd:int"/>
23       <xsd:element name="HiddenSlides" minOccurs="0" maxOccurs="1" type="xsd:int"/>
24       <xsd:element name="MMClips" minOccurs="0" maxOccurs="1" type="xsd:int"/>
25       <xsd:element name="ScaleCrop" minOccurs="0" maxOccurs="1" type="xsd:boolean"/>
26       <xsd:element name="HeadingPairs" minOccurs="0" maxOccurs="1" type="CT_VectorVariant"/>
27       <xsd:element name="TitlesOfParts" minOccurs="0" maxOccurs="1" type="CT_VectorLpstr"/>
28       <xsd:element name="LinksUpToDate" minOccurs="0" maxOccurs="1" type="xsd:boolean"/>
29       <xsd:element name="CharactersWithSpaces" minOccurs="0" maxOccurs="1" type="xsd:int"/>
30       <xsd:element name="SharedDoc" minOccurs="0" maxOccurs="1" type="xsd:boolean"/>
31       <xsd:element name="HyperlinkBase" minOccurs="0" maxOccurs="1" type="xsd:string"/>
32       <xsd:element name="HLinks" minOccurs="0" maxOccurs="1" type="CT_VectorVariant"/>
33       <xsd:element name="HyperlinksChanged" minOccurs="0" maxOccurs="1" type="xsd:boolean"/>
34       <xsd:element name="DigSig" minOccurs="0" maxOccurs="1" type="CT_DigSigBlob"/>
35       <xsd:element name="Application" minOccurs="0" maxOccurs="1" type="xsd:string"/>
36       <xsd:element name="AppVersion" minOccurs="0" maxOccurs="1" type="xsd:string"/>
37       <xsd:element name="DocSecurity" minOccurs="0" maxOccurs="1" type="xsd:int"/>
38     </xsd:all>
39   </xsd:complexType>
40   <xsd:complexType name="CT_VectorVariant">
41     <xsd:sequence minOccurs="1" maxOccurs="1">
42       <xsd:element ref="vt:vector"/>
43     </xsd:sequence>
44   </xsd:complexType>
45   <xsd:complexType name="CT_VectorLpstr">
46     <xsd:sequence minOccurs="1" maxOccurs="1">
47       <xsd:element ref="vt:vector"/>
48     </xsd:sequence>
49   </xsd:complexType>
50   <xsd:complexType name="CT_DigSigBlob">
51     <xsd:sequence minOccurs="1" maxOccurs="1">
52       <xsd:element ref="vt:blob"/>
53     </xsd:sequence>
54   </xsd:complexType>
55 </xsd:schema>

```

A.6.3 Custom Properties

This schema is available in the file shared-documentPropertiesCustom.xsd.

```

1 <xsd:schema xmlns="http://purl.oclc.org/ooxml/officeDocument/customProperties"
2   xmlns:xsd="http://www.w3.org/2001/XMLSchema"
3   xmlns:vt="http://purl.oclc.org/ooxml/officeDocument/docPropsVTypes"
4   xmlns:s="http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
5   targetNamespace="http://purl.oclc.org/ooxml/officeDocument/customProperties" blockDefault="#all"
6   elementFormDefault="qualified">
7   <xsd:import namespace="http://purl.oclc.org/ooxml/officeDocument/docPropsVTypes"
8     schemaLocation="shared-documentPropertiesVariantTypes.xsd"/>
9   <xsd:import namespace="http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
10     schemaLocation="shared-commonSimpleTypes.xsd"/>
11   <xsd:element name="Properties" type="CT_Properties"/>
12   <xsd:complexType name="CT_Properties">
13     <xsd:sequence>
14       <xsd:element name="property" minOccurs="0" maxOccurs="unbounded" type="CT_Property"/>
15     </xsd:sequence>
16   </xsd:complexType>
17   <xsd:complexType name="CT_Property">
18     <xsd:choice minOccurs="1" maxOccurs="1">
19       <xsd:element ref="vt:vector"/>
20       <xsd:element ref="vt:array"/>
21       <xsd:element ref="vt:blob"/>
22       <xsd:element ref="vt:oblob"/>
23       <xsd:element ref="vt:empty"/>
24       <xsd:element ref="vt:null"/>
25       <xsd:element ref="vt:i1"/>
26       <xsd:element ref="vt:i2"/>
27       <xsd:element ref="vt:i4"/>
28       <xsd:element ref="vt:i8"/>
29       <xsd:element ref="vt:int"/>
30       <xsd:element ref="vt:ui1"/>
31       <xsd:element ref="vt:ui2"/>
32       <xsd:element ref="vt:ui4"/>
33       <xsd:element ref="vt:ui8"/>
34       <xsd:element ref="vt:uint"/>
35       <xsd:element ref="vt:r4"/>
36       <xsd:element ref="vt:r8"/>
37       <xsd:element ref="vt:decimal"/>
38       <xsd:element ref="vt:lpstr"/>
39       <xsd:element ref="vt:lpwstr"/>
40       <xsd:element ref="vt:bstr"/>
41       <xsd:element ref="vt:date"/>
42       <xsd:element ref="vt:filetime"/>
43       <xsd:element ref="vt:bool"/>
44       <xsd:element ref="vt:cy"/>
45       <xsd:element ref="vt:error"/>
46       <xsd:element ref="vt:stream"/>
47       <xsd:element ref="vt:ostream"/>
48       <xsd:element ref="vt:storage"/>
49       <xsd:element ref="vt:ostorage"/>

```

```

50     <xsd:element ref="vt:vstream"/>
51     <xsd:element ref="vt:clsid"/>
52 </xsd:choice>
53 <xsd:attribute name="fmtid" use="required" type="s:ST_Guid"/>
54 <xsd:attribute name="pid" use="required" type="xsd:int"/>
55 <xsd:attribute name="name" use="optional" type="xsd:string"/>
56 <xsd:attribute name="linkTarget" use="optional" type="xsd:string"/>
57 </xsd:complexType>
58 </xsd:schema>

```

A.6.4 Variant Types

This schema is available in the file shared-documentPropertiesVariantTypes.xsd.

```

1 <xsd:schema xmlns="http://purl.oclc.org/ooxml/officeDocument/docPropsVTypes"
2   xmlns:xsd="http://www.w3.org/2001/XMLSchema"
3   xmlns:s="http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
4   targetNamespace="http://purl.oclc.org/ooxml/officeDocument/docPropsVTypes" blockDefault="#all"
5   elementFormDefault="qualified">
6   <xsd:import namespace="http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
7     schemaLocation="shared-commonSimpleTypes.xsd"/>
8   <xsd:simpleType name="ST_VectorBaseType">
9     <xsd:restriction base="xsd:string">
10       <xsd:enumeration value="variant"/>
11       <xsd:enumeration value="i1"/>
12       <xsd:enumeration value="i2"/>
13       <xsd:enumeration value="i4"/>
14       <xsd:enumeration value="i8"/>
15       <xsd:enumeration value="ui1"/>
16       <xsd:enumeration value="ui2"/>
17       <xsd:enumeration value="ui4"/>
18       <xsd:enumeration value="ui8"/>
19       <xsd:enumeration value="r4"/>
20       <xsd:enumeration value="r8"/>
21       <xsd:enumeration value="lpstr"/>
22       <xsd:enumeration value="lpwstr"/>
23       <xsd:enumeration value="bstr"/>
24       <xsd:enumeration value="date"/>
25       <xsd:enumeration value="filetime"/>
26       <xsd:enumeration value="bool"/>
27       <xsd:enumeration value="cy"/>
28       <xsd:enumeration value="error"/>
29       <xsd:enumeration value="clsid"/>
30     </xsd:restriction>
31   </xsd:simpleType>
32   <xsd:simpleType name="ST_ArrayBaseType">
33     <xsd:restriction base="xsd:string">
34       <xsd:enumeration value="variant"/>
35       <xsd:enumeration value="i1"/>
36       <xsd:enumeration value="i2"/>
37       <xsd:enumeration value="i4"/>
38       <xsd:enumeration value="int"/>
39       <xsd:enumeration value="ui1"/>

```

```

40      <xsd:enumeration value="ui2"/>
41      <xsd:enumeration value="ui4"/>
42      <xsd:enumeration value="uint"/>
43      <xsd:enumeration value="r4"/>
44      <xsd:enumeration value="r8"/>
45      <xsd:enumeration value="decimal"/>
46      <xsd:enumeration value="bstr"/>
47      <xsd:enumeration value="date"/>
48      <xsd:enumeration value="bool"/>
49      <xsd:enumeration value="cy"/>
50      <xsd:enumeration value="error"/>
51    </xsd:restriction>
52  </xsd:simpleType>
53  <xsd:simpleType name="ST_Cy">
54    <xsd:restriction base="xsd:string">
55      <xsd:pattern value="\s*[0-9]*\.[0-9]{4}\s*" />
56    </xsd:restriction>
57  </xsd:simpleType>
58  <xsd:simpleType name="ST_Error">
59    <xsd:restriction base="xsd:string">
60      <xsd:pattern value="\s*0x[0-9A-Za-z]{8}\s*" />
61    </xsd:restriction>
62  </xsd:simpleType>
63  <xsd:complexType name="CT_Empty"/>
64  <xsd:complexType name="CT_Null"/>
65  <xsd:complexType name="CT_Vector">
66    <xsd:choice minOccurs="1" maxOccurs="unbounded">
67      <xsd:element ref="variant"/>
68      <xsd:element ref="i1"/>
69      <xsd:element ref="i2"/>
70      <xsd:element ref="i4"/>
71      <xsd:element ref="i8"/>
72      <xsd:element ref="ui1"/>
73      <xsd:element ref="ui2"/>
74      <xsd:element ref="ui4"/>
75      <xsd:element ref="ui8"/>
76      <xsd:element ref="r4"/>
77      <xsd:element ref="r8"/>
78      <xsd:element ref="lpstr"/>
79      <xsd:element ref="lpwstr"/>
80      <xsd:element ref="bstr"/>
81      <xsd:element ref="date"/>
82      <xsd:element ref="filetime"/>
83      <xsd:element ref="bool"/>
84      <xsd:element ref="cy"/>
85      <xsd:element ref="error"/>
86      <xsd:element ref="clsid"/>
87    </xsd:choice>
88    <xsd:attribute name="baseType" type="ST_VectorBaseType" use="required"/>
89    <xsd:attribute name="size" type="xsd:unsignedInt" use="required"/>
90  </xsd:complexType>
91  <xsd:complexType name="CT_Array">
92    <xsd:choice minOccurs="1" maxOccurs="unbounded">

```

```

93         <xsd:element ref="variant"/>
94         <xsd:element ref="i1"/>
95         <xsd:element ref="i2"/>
96         <xsd:element ref="i4"/>
97         <xsd:element ref="int"/>
98         <xsd:element ref="ui1"/>
99         <xsd:element ref="ui2"/>
100        <xsd:element ref="ui4"/>
101        <xsd:element ref="uint"/>
102        <xsd:element ref="r4"/>
103        <xsd:element ref="r8"/>
104        <xsd:element ref="decimal"/>
105        <xsd:element ref="bstr"/>
106        <xsd:element ref="date"/>
107        <xsd:element ref="bool"/>
108        <xsd:element ref="error"/>
109        <xsd:element ref="cy"/>
110    </xsd:choice>
111    <xsd:attribute name="lBounds" type="xsd:int" use="required"/>
112    <xsd:attribute name="uBounds" type="xsd:int" use="required"/>
113    <xsd:attribute name="baseType" type="ST_ArrayBaseType" use="required"/>
114</xsd:complexType>
115<xsd:complexType name="CT_Variant">
116    <xsd:choice minOccurs="1" maxOccurs="1">
117        <xsd:element ref="variant"/>
118        <xsd:element ref="vector"/>
119        <xsd:element ref="array"/>
120        <xsd:element ref="blob"/>
121        <xsd:element ref="oblob"/>
122        <xsd:element ref="empty"/>
123        <xsd:element ref="null"/>
124        <xsd:element ref="i1"/>
125        <xsd:element ref="i2"/>
126        <xsd:element ref="i4"/>
127        <xsd:element ref="i8"/>
128        <xsd:element ref="int"/>
129        <xsd:element ref="ui1"/>
130        <xsd:element ref="ui2"/>
131        <xsd:element ref="ui4"/>
132        <xsd:element ref="ui8"/>
133        <xsd:element ref="uint"/>
134        <xsd:element ref="r4"/>
135        <xsd:element ref="r8"/>
136        <xsd:element ref="decimal"/>
137        <xsd:element ref="lpstr"/>
138        <xsd:element ref="lpwstr"/>
139        <xsd:element ref="bstr"/>
140        <xsd:element ref="date"/>
141        <xsd:element ref="filetime"/>
142        <xsd:element ref="bool"/>
143        <xsd:element ref="cy"/>
144        <xsd:element ref="error"/>
145        <xsd:element ref="stream"/>

```

```

146         <xsd:element ref="ostream"/>
147         <xsd:element ref="storage"/>
148         <xsd:element ref="ostorage"/>
149         <xsd:element ref="vstream"/>
150         <xsd:element ref="clsid"/>
151     </xsd:choice>
152 </xsd:complexType>
153 <xsd:complexType name="CT_Vstream">
154     <xsd:simpleContent>
155         <xsd:extension base="xsd:base64Binary">
156             <xsd:attribute name="version" type="s:ST_Guid"/>
157         </xsd:extension>
158     </xsd:simpleContent>
159 </xsd:complexType>
160 <xsd:element name="variant" type="CT_Variant"/>
161 <xsd:element name="vector" type="CT_Vector"/>
162 <xsd:element name="array" type="CT_Array"/>
163 <xsd:element name="blob" type="xsd:base64Binary"/>
164 <xsd:element name="oblob" type="xsd:base64Binary"/>
165 <xsd:element name="empty" type="CT_Empty"/>
166 <xsd:element name="null" type="CT_Null"/>
167 <xsd:element name="i1" type="xsd:byte"/>
168 <xsd:element name="i2" type="xsd:short"/>
169 <xsd:element name="i4" type="xsd:int"/>
170 <xsd:element name="i8" type="xsd:long"/>
171 <xsd:element name="int" type="xsd:int"/>
172 <xsd:element name="ui1" type="xsd:unsignedByte"/>
173 <xsd:element name="ui2" type="xsd:unsignedShort"/>
174 <xsd:element name="ui4" type="xsd:unsignedInt"/>
175 <xsd:element name="ui8" type="xsd:unsignedLong"/>
176 <xsd:element name="uint" type="xsd:unsignedInt"/>
177 <xsd:element name="r4" type="xsd:float"/>
178 <xsd:element name="r8" type="xsd:double"/>
179 <xsd:element name="decimal" type="xsd:decimal"/>
180 <xsd:element name="lpstr" type="xsd:string"/>
181 <xsd:element name="lpwstr" type="xsd:string"/>
182 <xsd:element name="bstr" type="xsd:string"/>
183 <xsd:element name="date" type="xsd:dateTime"/>
184 <xsd:element name="filetime" type="xsd:dateTime"/>
185 <xsd:element name="bool" type="xsd:boolean"/>
186 <xsd:element name="cy" type="ST_Cy"/>
187 <xsd:element name="error" type="ST_Error"/>
188 <xsd:element name="stream" type="xsd:base64Binary"/>
189 <xsd:element name="ostream" type="xsd:base64Binary"/>
190 <xsd:element name="storage" type="xsd:base64Binary"/>
191 <xsd:element name="ostorage" type="xsd:base64Binary"/>
192 <xsd:element name="vstream" type="CT_Vstream"/>
193 <xsd:element name="clsid" type="s:ST_Guid"/>
194 </xsd:schema>

```

A.6.5 Custom XML Data Properties

This schema is available in the file shared-customXmlDataProperties.xsd.

```

1 <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
2   xmlns="http://purl.oclc.org/ooxml/officeDocument/customXml"
3   xmlns:s="http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
4   targetNamespace="http://purl.oclc.org/ooxml/officeDocument/customXml" elementFormDefault="qualified"
5   attributeFormDefault="qualified" blockDefault="#all">
6   <xsd:import namespace="http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
7     schemaLocation="shared-commonSimpleTypes.xsd"/>
8   <xsd:complexType name="CT_DatastoreSchemaRef">
9     <xsd:attribute name="uri" type="xsd:string" use="required"/>
10  </xsd:complexType>
11  <xsd:complexType name="CT_DatastoreSchemaRefs">
12    <xsd:sequence>
13      <xsd:element name="schemaRef" type="CT_DatastoreSchemaRef" minOccurs="0"
14        maxOccurs="unbounded"/>
15    </xsd:sequence>
16  </xsd:complexType>
17  <xsd:complexType name="CT_DatastoreItem">
18    <xsd:sequence>
19      <xsd:element name="schemaRefs" type="CT_DatastoreSchemaRefs" minOccurs="0"/>
20    </xsd:sequence>
21    <xsd:attribute name="itemID" type="s:ST_Guid" use="required"/>
22  </xsd:complexType>
23  <xsd:element name="datastoreItem" type="CT_DatastoreItem"/>
24 </xsd:schema>

```

A.6.6 Bibliography

This schema is available in the file shared-bibliography.xsd.

```

1 <xsd:schema xmlns="http://purl.oclc.org/ooxml/officeDocument/bibliography"
2   xmlns:xsd="http://www.w3.org/2001/XMLSchema"
3   xmlns:s="http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
4   targetNamespace="http://purl.oclc.org/ooxml/officeDocument/bibliography"
5   elementFormDefault="qualified">
6   <xsd:import namespace="http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
7     schemaLocation="shared-commonSimpleTypes.xsd"/>
8   <xsd:simpleType name="ST_SourceType">
9     <xsd:restriction base="s:ST_String">
10      <xsd:enumeration value="ArticleInAPeriodical"/>
11      <xsd:enumeration value="Book"/>
12      <xsd:enumeration value="BookSection"/>
13      <xsd:enumeration value="JournalArticle"/>
14      <xsd:enumeration value="ConferenceProceedings"/>
15      <xsd:enumeration value="Report"/>
16      <xsd:enumeration value="SoundRecording"/>
17      <xsd:enumeration value="Performance"/>
18      <xsd:enumeration value="Art"/>
19      <xsd:enumeration value="DocumentFromInternetSite"/>
20      <xsd:enumeration value="InternetSite"/>
21      <xsd:enumeration value="Film"/>
22      <xsd:enumeration value="Interview"/>
23      <xsd:enumeration value="Patent"/>
24      <xsd:enumeration value="ElectronicSource"/>

```

```

25         <xsd:enumeration value="Case"/>
26         <xsd:enumeration value="Misc"/>
27     </xsd:restriction>
28 </xsd:simpleType>
29 <xsd:complexType name="CT_NamelistType">
30     <xsd:sequence>
31         <xsd:element name="Person" type="CT_PersonType" minOccurs="1" maxOccurs="unbounded"/>
32     </xsd:sequence>
33 </xsd:complexType>
34 <xsd:complexType name="CT_PersonType">
35     <xsd:sequence>
36         <xsd:element name="Last" type="s:ST String" minOccurs="0" maxOccurs="unbounded"/>
37         <xsd:element name="First" type="s:ST String" minOccurs="0" maxOccurs="unbounded"/>
38         <xsd:element name="Middle" type="s:ST String" minOccurs="0" maxOccurs="unbounded"/>
39     </xsd:sequence>
40 </xsd:complexType>
41 <xsd:complexType name="CT_NameType">
42     <xsd:sequence>
43         <xsd:element name="NameList" type="CT_NamelistType" minOccurs="1" maxOccurs="1"/>
44     </xsd:sequence>
45 </xsd:complexType>
46 <xsd:complexType name="CT_NameOrCorporateType">
47     <xsd:sequence>
48         <xsd:choice minOccurs="0" maxOccurs="1">
49             <xsd:element name="NameList" type="CT_NamelistType" minOccurs="1" maxOccurs="1"/>
50             <xsd:element name="Corporate" minOccurs="1" maxOccurs="1" type="s:ST String"/>
51         </xsd:choice>
52     </xsd:sequence>
53 </xsd:complexType>
54 <xsd:complexType name="CT_AuthorType">
55     <xsd:sequence>
56         <xsd:choice minOccurs="0" maxOccurs="unbounded">
57             <xsd:element name="Artist" type="CT_NameType"/>
58             <xsd:element name="Author" type="CT_NameOrCorporateType"/>
59             <xsd:element name="BookAuthor" type="CT_NameType"/>
60             <xsd:element name="Compiler" type="CT_NameType"/>
61             <xsd:element name="Composer" type="CT_NameType"/>
62             <xsd:element name="Conductor" type="CT_NameType"/>
63             <xsd:element name="Counsel" type="CT_NameType"/>
64             <xsd:element name="Director" type="CT_NameType"/>
65             <xsd:element name="Editor" type="CT_NameType"/>
66             <xsd:element name="Interviewee" type="CT_NameType"/>
67             <xsd:element name="Interviewer" type="CT_NameType"/>
68             <xsd:element name="Inventor" type="CT_NameType"/>
69             <xsd:element name="Performer" type="CT_NameOrCorporateType"/>
70             <xsd:element name="ProducerName" type="CT_NameType"/>
71             <xsd:element name="Translator" type="CT_NameType"/>
72             <xsd:element name="Writer" type="CT_NameType"/>
73         </xsd:choice>
74     </xsd:sequence>
75 </xsd:complexType>
76 <xsd:complexType name="CT_SourceType">
77     <xsd:sequence>

```



```

78 <xsd:choice minOccurs="0" maxOccurs="unbounded">
79   <xsd:element name="AbbreviatedCaseNumber" type="s:ST_String"/>
80   <xsd:element name="AlbumTitle" type="s:ST_String"/>
81   <xsd:element name="Author" type="CT_AuthorType"/>
82   <xsd:element name="BookTitle" type="s:ST_String"/>
83   <xsd:element name="Broadcaster" type="s:ST_String"/>
84   <xsd:element name="BroadcastTitle" type="s:ST_String"/>
85   <xsd:element name="CaseNumber" type="s:ST_String"/>
86   <xsd:element name="ChapterNumber" type="s:ST_String"/>
87   <xsd:element name="City" type="s:ST_String"/>
88   <xsd:element name="Comments" type="s:ST_String"/>
89   <xsd:element name="ConferenceName" type="s:ST_String"/>
90   <xsd:element name="CountryRegion" type="s:ST_String"/>
91   <xsd:element name="Court" type="s:ST_String"/>
92   <xsd:element name="Day" type="s:ST_String"/>
93   <xsd:element name="DayAccessed" type="s:ST_String"/>
94   <xsd:element name="Department" type="s:ST_String"/>
95   <xsd:element name="Distributor" type="s:ST_String"/>
96   <xsd:element name="Edition" type="s:ST_String"/>
97   <xsd:element name="Guid" type="s:ST_String"/>
98   <xsd:element name="Institution" type="s:ST_String"/>
99   <xsd:element name="InternetSiteTitle" type="s:ST_String"/>
100  <xsd:element name="Issue" type="s:ST_String"/>
101  <xsd:element name="JournalName" type="s:ST_String"/>
102  <xsd:element name="LCID" type="s:ST_Lang"/>
103  <xsd:element name="Medium" type="s:ST_String"/>
104  <xsd:element name="Month" type="s:ST_String"/>
105  <xsd:element name="MonthAccessed" type="s:ST_String"/>
106  <xsd:element name="NumberVolumes" type="s:ST_String"/>
107  <xsd:element name="Pages" type="s:ST_String"/>
108  <xsd:element name="PatentNumber" type="s:ST_String"/>
109  <xsd:element name="PeriodicalTitle" type="s:ST_String"/>
110  <xsd:element name="ProductionCompany" type="s:ST_String"/>
111  <xsd:element name="PublicationTitle" type="s:ST_String"/>
112  <xsd:element name="Publisher" type="s:ST_String"/>
113  <xsd:element name="RecordingNumber" type="s:ST_String"/>
114  <xsd:element name="RefOrder" type="s:ST_String"/>
115  <xsd:element name="Reporter" type="s:ST_String"/>
116  <xsd:element name="SourceType" type="ST_SourceType"/>
117  <xsd:element name="ShortTitle" type="s:ST_String"/>
118  <xsd:element name="StandardNumber" type="s:ST_String"/>
119  <xsd:element name="StateProvince" type="s:ST_String"/>
120  <xsd:element name="Station" type="s:ST_String"/>
121  <xsd:element name="Tag" type="s:ST_String"/>
122  <xsd:element name="Theater" type="s:ST_String"/>
123  <xsd:element name="ThesisType" type="s:ST_String"/>
124  <xsd:element name="Title" type="s:ST_String"/>
125  <xsd:element name="Type" type="s:ST_String"/>
126  <xsd:element name="URL" type="s:ST_String"/>
127  <xsd:element name="Version" type="s:ST_String"/>
128  <xsd:element name="Volume" type="s:ST_String"/>
129  <xsd:element name="Year" type="s:ST_String"/>
130  <xsd:element name="YearAccessed" type="s:ST_String"/>

```

```

131     </xsd:choice>
132   </xsd:sequence>
133 </xsd:complexType>
134 <xsd:element name="Sources" type="CT_Sources"/>
135 <xsd:complexType name="CT_Sources">
136   <xsd:sequence>
137     <xsd:element name="Source" type="CT_SourceType" minOccurs="0" maxOccurs="unbounded"/>
138   </xsd:sequence>
139   <xsd:attribute name="SelectedStyle" type="s:ST_String"/>
140   <xsd:attribute name="StyleName" type="s:ST_String"/>
141   <xsd:attribute name="URI" type="s:ST_String"/>
142 </xsd:complexType>
143 </xsd:schema>

```

A.6.7 Additional Characteristics

This schema is available in the file shared-additionalCharacteristics.xsd.

```

1 <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
2   xmlns="http://purl.oclc.org/ooxml/officeDocument/characteristics"
3   targetNamespace="http://purl.oclc.org/ooxml/officeDocument/characteristics"
4   elementFormDefault="qualified">
5   <xsd:complexType name="CT_AdditionalCharacteristics">
6     <xsd:sequence>
7       <xsd:element name="characteristic" type="CT_Characteristic" minOccurs="0"
8         maxOccurs="unbounded"/>
9     </xsd:sequence>
10  </xsd:complexType>
11  <xsd:complexType name="CT_Characteristic">
12    <xsd:attribute name="name" type="xsd:string" use="required"/>
13    <xsd:attribute name="relation" type="ST_Relation" use="required"/>
14    <xsd:attribute name="val" type="xsd:string" use="required"/>
15    <xsd:attribute name="vocabulary" type="xsd:anyURI" use="optional"/>
16  </xsd:complexType>
17  <xsd:simpleType name="ST_Relation">
18    <xsd:restriction base="xsd:string">
19      <xsd:enumeration value="ge"/>
20      <xsd:enumeration value="le"/>
21      <xsd:enumeration value="gt"/>
22      <xsd:enumeration value="lt"/>
23      <xsd:enumeration value="eq"/>
24    </xsd:restriction>
25  </xsd:simpleType>
26  <xsd:element name="additionalCharacteristics" type="CT_AdditionalCharacteristics"/>
27 </xsd:schema>

```

A.6.8 Office Document Relationships

This schema is available in the file shared-relationshipReference.xsd.

```

1 <xsd:schema xmlns="http://purl.oclc.org/ooxml/officeDocument/relationships"
2   xmlns:r="http://purl.oclc.org/ooxml/officeDocument/relationships"

```

```

3  xmlns:xsd="http://www.w3.org/2001/XMLSchema" elementFormDefault="qualified"
4  targetNamespace="http://purl.oclc.org/ooxml/officeDocument/relationships" blockDefault="#all">
5    <xsd:simpleType name="ST_RelationshipId">
6      <xsd:restriction base="xsd:string"/>
7    </xsd:simpleType>
8    <xsd:attribute name="id" type="ST_RelationshipId"/>
9    <xsd:attribute name="embed" type="ST_RelationshipId"/>
10   <xsd:attribute name="link" type="ST_RelationshipId"/>
11   <xsd:attribute name="dm" type="ST_RelationshipId" default=""/>
12   <xsd:attribute name="lo" type="ST_RelationshipId" default=""/>
13   <xsd:attribute name="qs" type="ST_RelationshipId" default=""/>
14   <xsd:attribute name="cs" type="ST_RelationshipId" default=""/>
15   <xsd:attribute name="blip" type="ST_RelationshipId" default=""/>
16   <xsd:attribute name="pict" type="ST_RelationshipId"/>
17   <xsd:attribute name="href" type="ST_RelationshipId"/>
18   <xsd:attribute name="topLeft" type="ST_RelationshipId"/>
19   <xsd:attribute name="topRight" type="ST_RelationshipId"/>
20   <xsd:attribute name="bottomLeft" type="ST_RelationshipId"/>
21   <xsd:attribute name="bottomRight" type="ST_RelationshipId"/>
22 </xsd:schema>

```

A.6.9 Shared Simple Types

This schema is available in the file shared-commonSimpleTypes.xsd.

```

1  <xsd:schema xmlns="http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
2    xmlns:xsd="http://www.w3.org/2001/XMLSchema"
3    targetNamespace="http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
4    elementFormDefault="qualified">
5    <xsd:simpleType name="ST_Lang">
6      <xsd:restriction base="xsd:string"/>
7    </xsd:simpleType>
8    <xsd:simpleType name="ST_HexColorRGB">
9      <xsd:restriction base="xsd:hexBinary">
10        <xsd:length value="3" fixed="true"/>
11      </xsd:restriction>
12    </xsd:simpleType>
13    <xsd:simpleType name="ST_Panose">
14      <xsd:restriction base="xsd:hexBinary">
15        <xsd:length value="10"/>
16      </xsd:restriction>
17    </xsd:simpleType>
18    <xsd:simpleType name="ST_CalendarType">
19      <xsd:restriction base="xsd:string">
20        <xsd:enumeration value="gregorian"/>
21        <xsd:enumeration value="gregorianUs"/>
22        <xsd:enumeration value="gregorianMeFrench"/>
23        <xsd:enumeration value="gregorianArabic"/>
24        <xsd:enumeration value="hijri"/>
25        <xsd:enumeration value="hebrew"/>
26        <xsd:enumeration value="taiwan"/>
27        <xsd:enumeration value="japan"/>
28        <xsd:enumeration value="thai"/>

```

```

29         <xsd:enumeration value="korea"/>
30         <xsd:enumeration value="saka"/>
31         <xsd:enumeration value="gregorianXlitEnglish"/>
32         <xsd:enumeration value="gregorianXlitFrench"/>
33         <xsd:enumeration value="none"/>
34     </xsd:restriction>
35 </xsd:simpleType>
36 <xsd:simpleType name="ST_Guid">
37     <xsd:restriction base="xsd:token">
38         <xsd:pattern value="\{[0-9A-F]{8}-[0-9A-F]{4}-[0-9A-F]{4}-[0-9A-F]{4}-[0-9A-F]{12}\}" />
39     </xsd:restriction>
40 </xsd:simpleType>
41 <xsd:simpleType name="ST_OnOff">
42     <xs:union memberTypes="xsd:boolean"/>
43 </xsd:simpleType>
44 <xsd:simpleType name="ST_String">
45     <xsd:restriction base="xsd:string"/>
46 </xsd:simpleType>
47 <xsd:simpleType name="ST_XmlName">
48     <xsd:restriction base="xsd:NCName">
49         <xsd:minLength value="1"/>
50         <xsd:maxLength value="255"/>
51     </xsd:restriction>
52 </xsd:simpleType>
53 <xsd:simpleType name="ST_UnsignedDecimalNumber">
54     <xsd:restriction base="xsd:unsignedLong"/>
55 </xsd:simpleType>
56 <xsd:simpleType name="ST_TwipsMeasure">
57     <xsd:union memberTypes="ST_UnsignedDecimalNumber ST_PositiveUniversalMeasure"/>
58 </xsd:simpleType>
59 <xsd:simpleType name="ST_VerticalAlignRun">
60     <xsd:restriction base="xsd:string">
61         <xsd:enumeration value="baseline"/>
62         <xsd:enumeration value="superscript"/>
63         <xsd:enumeration value="subscript"/>
64     </xsd:restriction>
65 </xsd:simpleType>
66 <xsd:simpleType name="ST_Xstring">
67     <xsd:restriction base="xsd:string"/>
68 </xsd:simpleType>
69 <xsd:simpleType name="ST_XAlign">
70     <xsd:restriction base="xsd:string">
71         <xsd:enumeration value="left"/>
72         <xsd:enumeration value="center"/>
73         <xsd:enumeration value="right"/>
74         <xsd:enumeration value="inside"/>
75         <xsd:enumeration value="outside"/>
76     </xsd:restriction>
77 </xsd:simpleType>
78 <xsd:simpleType name="ST_YAlign">
79     <xsd:restriction base="xsd:string">
80         <xsd:enumeration value="inline"/>
81         <xsd:enumeration value="top"/>

```

```

82         <xsd:enumeration value="center"/>
83         <xsd:enumeration value="bottom"/>
84         <xsd:enumeration value="inside"/>
85         <xsd:enumeration value="outside"/>
86     </xsd:restriction>
87 </xsd:simpleType>
88 <xsd:simpleType name="ST_ConformanceClass">
89     <xsd:restriction base="xsd:string">
90         <xsd:enumeration value="strict"/>
91         <xsd:enumeration value="transitional"/>
92     </xsd:restriction>
93 </xsd:simpleType>
94 <xsd:simpleType name="ST_UniversalMeasure">
95     <xsd:restriction base="xsd:string">
96         <xsd:pattern value="-?[0-9]+(\.[0-9]+)?(mm|cm|in|pt|pc|pi)"/>
97     </xsd:restriction>
98 </xsd:simpleType>
99 <xsd:simpleType name="ST_PositiveUniversalMeasure">
100     <xsd:restriction base="ST_UniversalMeasure">
101         <xsd:pattern value="[0-9]+(\.[0-9]+)?(mm|cm|in|pt|pc|pi)"/>
102     </xsd:restriction>
103 </xsd:simpleType>
104 <xsd:simpleType name="ST_Percentage">
105     <xsd:restriction base="xsd:string">
106         <xsd:pattern value="-?[0-9]+(\.[0-9]+)?%/>
107     </xsd:restriction>
108 </xsd:simpleType>
109 <xsd:simpleType name="ST_FixedPercentage">
110     <xsd:restriction base="ST_Percentage">
111         <xsd:pattern value="-?((100)|([0-9][0-9]?))(\.[0-9][0-9]?)?%/>
112     </xsd:restriction>
113 </xsd:simpleType>
114 <xsd:simpleType name="ST_PositivePercentage">
115     <xsd:restriction base="ST_Percentage">
116         <xsd:pattern value="[0-9]+(\.[0-9]+)?%/>
117     </xsd:restriction>
118 </xsd:simpleType>
119 <xsd:simpleType name="ST_PositiveFixedPercentage">
120     <xsd:restriction base="ST_Percentage">
121         <xsd:pattern value="((100)|([0-9][0-9]?))(\.[0-9][0-9]?)?%/>
122     </xsd:restriction>
123 </xsd:simpleType>
124 </xsd:schema>

```

A.7 Custom XML Schema References

This schema is available in the file `shared-customXmlSchemaProperties.xsd`.

```

1 <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema"
2   xmlns="http://purl.oclc.org/ooxml/schemaLibrary/main"
3   targetNamespace="http://purl.oclc.org/ooxml/schemaLibrary/main" attributeFormDefault="qualified"
4   elementFormDefault="qualified">
5   <xsd:complexType name="CT_Schema">

```

```
6      <xsd:attribute name="uri" type="xsd:string" default=""/>
7      <xsd:attribute name="manifestLocation" type="xsd:string"/>
8      <xsd:attribute name="schemaLocation" type="xsd:string"/>
9      <xsd:attribute name="schemaLanguage" type="xsd:token"/>
10     </xsd:complexType>
11     <xsd:complexType name="CT_SchemaLibrary">
12       <xsd:sequence>
13         <xsd:element name="schema" type="CT_Schema" minOccurs="0" maxOccurs="unbounded"/>
14       </xsd:sequence>
15     </xsd:complexType>
16     <xsd:element name="schemaLibrary" type="CT_SchemaLibrary"/>
17 </xsd:schema>
```

Annex B.

(informative)

Schemas – RELAX NG

This clause is informative.

This Office Open XML specification includes a family of schemas defined using the RELAX NG syntax. The definitions of these schemas follow below, and they also reside in an accompanying file named OfficeOpenXML-RELAXNG-Strict.zip, which is distributed in electronic form.

If discrepancies exist between the RELAX NG version of a schema and its corresponding XML Schema, the XML Schema is the definitive version.

The RELAX NG schemas in this annex are generated automatically from the corresponding W3C XML Schema schemas in Annex A, namespace prefix mapping in Annex D, Root Element Locations in Annex K, and then hand-edited.

There are important differences between the RELAX NG schemas and XSD schemas. This annex clarifies differences in schema organizations and those in expressed constraints.

1. Regarding schema organization:

There is a RELAX NG schema (DrawingML_Chart.rnc, for example) dedicated to each OPC part (DrawingML Chart, for example). That RELAX NG schema includes all RELAX NG schema modules such as dml-chart.rnc. However, there are no such W3C XML Schema schemas dedicated to each OPC part. Some schema modules in W3C XML Schema import other schema modules. There is a RELAX NG schema xml.rnc, which captures xml:lang, xml:space, xml:base, and xml:id. However, there are no such W3C XML Schema schemas.

2. Differences in expressed constraints:

The RELAX NG schemas specify root elements of each OPC part, while the XSD schemas do not. For example, DrawingML_Chart.rnc specifies that the root element of the OPC part DrawingML Chart is a chartSpace element.

The RELAX NG schemas do not specify default values, while the XSD schemas do. For example, dml-chart.rnc does not specify a default value for the attribute val in dchrt_CT_Boolean, but merely provides a comment about the default value. Meanwhile, dml-chart.xsd specifies true as the default value of this attribute in CT_Boolean.

The RELAX NG schemas mimic minOccurs="0", minOccurs="1", maxOccurs="1", and maxOccurs="unbounded" in XSD schemas exactly, but do not mimic minOccurs="32" or maxOccurs="256". Such minOccurs and maxOccurs are loosely simulated by + or *. For example,

dml-chart.xsd specifies `maxOccurs="2"` for the element `errBars` in `CT_ScatterSer`, while `dml-chart.rnc` specifies `*` for this element in `dchrt_CT_ScatterSer`.

The RELAX NG schemas use the `&` operator for allowing different elements without specifying constraints on their sequences, but it is not always possible to use the `xsd:all` construct in W3C XML Schema. For example, `wml.rnc` uses the `&` operator in `w_EG_RPrBase`, but `wml.xsd` does not use `xsd:all` in `EG_RPrBase`.

B.1 WordprocessingML

This schema is available in the file `wml.rnc`.

```

1 namespace m =
2   "http://purl.oclc.org/ooxml/officeDocument/math"
3 namespace o = "urn:schemas-microsoft-com:office:office"
4 namespace r =
5   "http://purl.oclc.org/ooxml/officeDocument/relationships"
6 namespace s =
7   "http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
8 namespace sl =
9   "http://purl.oclc.org/ooxml/schemalibrary/main"
10 namespace v = "urn:schemas-microsoft-com:vml"
11 default namespace w =
12   "http://purl.oclc.org/ooxml/wordprocessingml/main"
13 namespace w10 = "urn:schemas-microsoft-com:office:word"
14 namespace wp =
15   "http://purl.oclc.org/ooxml/drawingml/wordprocessingDrawing"
16 namespace x = "urn:schemas-microsoft-com:office:excel"
17
18 w_CT_Empty = empty
19 w_CT_OnOff = attribute w:val { s_ST_OnOff }?
20 w_ST_LongHexNumber = xsd:hexBinary { length = "4" }
21 w_CT_LongHexNumber = attribute w:val { w_ST_LongHexNumber }
22 w_ST_ShortHexNumber = xsd:hexBinary { length = "2" }
23 w_ST_UcharHexNumber = xsd:hexBinary { length = "1" }
24 w_CT_Charset = attribute w:characterSet { s_ST_String }?
25 w_ST_DecimalNumberOrPercent = s_ST_Percentage
26 w_ST_DecimalNumber = xsd:integer
27 w_CT_DecimalNumber = attribute w:val { w_ST_DecimalNumber }
28 w_CT_UnsignedDecimalNumber =
29   attribute w:val { s_ST_UnsignedDecimalNumber }
30 w_CT_DecimalNumberOrPrecent =
31   attribute w:val { w_ST_DecimalNumberOrPercent }
32 w_CT_TwipsMeasure = attribute w:val { s_ST_TwipsMeasure }
33 w_ST_SignedTwipsMeasure = xsd:integer | s_ST_UniversalMeasure
34 w_CT_SignedTwipsMeasure = attribute w:val { w_ST_SignedTwipsMeasure }
35 w_ST_PixelsMeasure = s_ST_UnsignedDecimalNumber
36 w_CT_PixelsMeasure = attribute w:val { w_ST_PixelsMeasure }
37 w_ST_HpsMeasure =
38   s_ST_UnsignedDecimalNumber | s_ST_PositiveUniversalMeasure
39 w_CT_HpsMeasure = attribute w:val { w_ST_HpsMeasure }
40 w_ST_SignedHpsMeasure = xsd:integer | s_ST_UniversalMeasure
41 w_CT_SignedHpsMeasure = attribute w:val { w_ST_SignedHpsMeasure }

```



```

42 w_ST_DateTime = xsd:dateTime
43 w_ST_MacroName = xsd:string { maxLength = "33" }
44 w_CT_MacroName = attribute w:val { w_ST_MacroName }
45 w_ST_EighthPointMeasure = s_ST_UnsignedDecimalNumber
46 w_ST_PointMeasure = s_ST_UnsignedDecimalNumber
47 w_CT_String = attribute w:val { s_ST_String }
48 w_ST_TextScale = w_ST_TextScalePercent
49 w_ST_TextScalePercent = xsd:string { pattern = "0*(600|([0-5]?[0-9]?[0-9]))%" }
50
51 w_CT_TextScale = attribute w:val { w_ST_TextScale }?
52 w_ST_HighlightColor =
53     string "black"
54     | string "blue"
55     | string "cyan"
56     | string "green"
57     | string "magenta"
58     | string "red"
59     | string "yellow"
60     | string "white"
61     | string "darkBlue"
62     | string "darkCyan"
63     | string "darkGreen"
64     | string "darkMagenta"
65     | string "darkRed"
66     | string "darkYellow"
67     | string "darkGray"
68     | string "lightGray"
69     | string "none"
70 w_CT_Highlight = attribute w:val { w_ST_HighlightColor }
71 w_ST_HexColorAuto = string "auto"
72 w_ST_HexColor = w_ST_HexColorAuto | s_ST_HexColorRGB
73 w_CT_Color =
74     attribute w:val { w_ST_HexColor },
75     attribute w:themeColor { w_ST_ThemeColor }?,
76     attribute w:themeTint { w_ST_UcharHexNumber }?,
77     attribute w:themeShade { w_ST_UcharHexNumber }?
78 w_CT_Lang = attribute w:val { s_ST_Lang }
79 w_CT_Guid = attribute w:val { s_ST_Guid }?
80 w_ST_Underline =
81     string "single"
82     | string "words"
83     | string "double"
84     | string "thick"
85     | string "dotted"
86     | string "dottedHeavy"
87     | string "dash"
88     | string "dashedHeavy"
89     | string "dashLong"
90     | string "dashLongHeavy"
91     | string "dotDash"
92     | string "dashDotHeavy"
93     | string "dotDotDash"
94     | string "dashDotDotHeavy"

```

```

95 | string "wave"
96 | string "wavyHeavy"
97 | string "wavyDouble"
98 | string "none"
99 w_CT_Underline =
100   attribute w:val { w_ST_Underline }?,
101   attribute w:color { w_ST_HexColor }?,
102   attribute w:themeColor { w_ST_ThemeColor }?,
103   attribute w:themeTint { w_ST_UcharHexNumber }?,
104   attribute w:themeShade { w_ST_UcharHexNumber }?
105 w_ST_TextEffect =
106   string "blinkBackground"
107   | string "lights"
108   | string "antsBlack"
109   | string "antsRed"
110   | string "shimmer"
111   | string "sparkle"
112   | string "none"
113 w_CT_TextEffect = attribute w:val { w_ST_TextEffect }
114 w_ST_Border =
115   string "nil"
116   | string "none"
117   | string "single"
118   | string "thick"
119   | string "double"
120   | string "dotted"
121   | string "dashed"
122   | string "dotDash"
123   | string "dotDotDash"
124   | string "triple"
125   | string "thinThickSmallGap"
126   | string "thickThinSmallGap"
127   | string "thinThickThinSmallGap"
128   | string "thinThickMediumGap"
129   | string "thickThinMediumGap"
130   | string "thinThickThinMediumGap"
131   | string "thinThickLargeGap"
132   | string "thickThinLargeGap"
133   | string "thinThickThinLargeGap"
134   | string "wave"
135   | string "doubleWave"
136   | string "dashSmallGap"
137   | string "dashDotStroked"
138   | string "threeDEmboss"
139   | string "threeDEngrave"
140   | string "outset"
141   | string "inset"
142   | string "apples"
143   | string "archedScallops"
144   | string "babyPacifier"
145   | string "babyRattle"
146   | string "balloons3Colors"
147   | string "balloonsHotAir"

```

```

148 | string "basicBlackDashes"
149 | string "basicBlackDots"
150 | string "basicBlackSquares"
151 | string "basicThinLines"
152 | string "basicWhiteDashes"
153 | string "basicWhiteDots"
154 | string "basicWhiteSquares"
155 | string "basicWideInline"
156 | string "basicWideMidline"
157 | string "basicWideOutline"
158 | string "bats"
159 | string "birds"
160 | string "birdsFlight"
161 | string "cabins"
162 | string "cakeSlice"
163 | string "candyCorn"
164 | string "celticKnotwork"
165 | string "certificateBanner"
166 | string "chainLink"
167 | string "champagneBottle"
168 | string "checkedBarBlack"
169 | string "checkedBarColor"
170 | string "checkered"
171 | string "christmasTree"
172 | string "circlesLines"
173 | string "circlesRectangles"
174 | string "classicalWave"
175 | string "clocks"
176 | string "compass"
177 | string "confetti"
178 | string "confettiGrays"
179 | string "confettiOutline"
180 | string "confettiStreamers"
181 | string "confettiWhite"
182 | string "cornerTriangles"
183 | string "couponCutoutDashes"
184 | string "couponCutoutDots"
185 | string "crazyMaze"
186 | string "creaturesButterfly"
187 | string "creaturesFish"
188 | string "creaturesInsects"
189 | string "creaturesLadyBug"
190 | string "crossStitch"
191 | string "cup"
192 | string "decoArch"
193 | string "decoArchColor"
194 | string "decoBlocks"
195 | string "diamondsGray"
196 | string "doubleD"
197 | string "doubleDiamonds"
198 | string "earth1"
199 | string "earth2"
200 | string "earth3"

```

201	string "eclipsingSquares1"
202	string "eclipsingSquares2"
203	string "eggsBlack"
204	string "fans"
205	string "film"
206	string "firecrackers"
207	string "flowersBlockPrint"
208	string "flowersDaisies"
209	string "flowersModern1"
210	string "flowersModern2"
211	string "flowersPansy"
212	string "flowersRedRose"
213	string "flowersRoses"
214	string "flowersTeacup"
215	string "flowersTiny"
216	string "gems"
217	string "gingerbreadMan"
218	string "gradient"
219	string "handmade1"
220	string "handmade2"
221	string "heartBalloon"
222	string "heartGray"
223	string "hearts"
224	string "heebieJeebies"
225	string "holly"
226	string "houseFunky"
227	string "hypnotic"
228	string "iceCreamCones"
229	string "lightBulb"
230	string "lightning1"
231	string "lightning2"
232	string "mapPins"
233	string "mapleLeaf"
234	string "mapleMuffins"
235	string "marquee"
236	string "marqueeToothed"
237	string "moons"
238	string "mosaic"
239	string "musicNotes"
240	string "northwest"
241	string "ovals"
242	string "packages"
243	string "palmsBlack"
244	string "palmsColor"
245	string "paperClips"
246	string "papyrus"
247	string "partyFavor"
248	string "partyGlass"
249	string "pencils"
250	string "people"
251	string "peopleWaving"
252	string "peopleHats"
253	string "poinsettias"

```

254 | string "postageStamp"
255 | string "pumpkin1"
256 | string "pushPinNote2"
257 | string "pushPinNote1"
258 | string "pyramids"
259 | string "pyramidsAbove"
260 | string "quadrants"
261 | string "rings"
262 | string "safari"
263 | string "sawtooth"
264 | string "sawtoothGray"
265 | string "scaredCat"
266 | string "seattle"
267 | string "shadowedSquares"
268 | string "sharksTeeth"
269 | string "shorebirdTracks"
270 | string "skyrocket"
271 | string "snowflakeFancy"
272 | string "snowflakes"
273 | string "sombbrero"
274 | string "southwest"
275 | string "stars"
276 | string "starsTop"
277 | string "stars3d"
278 | string "starsBlack"
279 | string "starsShadowed"
280 | string "sun"
281 | string "swirligig"
282 | string "tornPaper"
283 | string "tornPaperBlack"
284 | string "trees"
285 | string "triangleParty"
286 | string "triangles"
287 | string "triangle1"
288 | string "triangle2"
289 | string "triangleCircle1"
290 | string "triangleCircle2"
291 | string "shapes1"
292 | string "shapes2"
293 | string "twistedLines1"
294 | string "twistedLines2"
295 | string "vine"
296 | string "waveline"
297 | string "weavingAngles"
298 | string "weavingBraid"
299 | string "weavingRibbon"
300 | string "weavingStrips"
301 | string "whiteFlowers"
302 | string "woodwork"
303 | string "xIllusions"
304 | string "zanyTriangles"
305 | string "zigZag"
306 | string "zigZagStitch"

```

```

307 | string "custom"
308 w_CT_Border =
309   attribute w:val { w_ST_Border },
310   attribute w:color { w_ST_HexColor }?,
311   attribute w:themeColor { w_ST_ThemeColor }?,
312   attribute w:themeTint { w_ST_UcharHexNumber }?,
313   attribute w:themeShade { w_ST_UcharHexNumber }?,
314   attribute w:sz { w_ST_EighthPointMeasure }?,
315   attribute w:space { w_ST_PointMeasure }?,
316   attribute w:shadow { s_ST_OnOff }?,
317   attribute w:frame { s_ST_OnOff }?
318 w_ST_Shd =
319   string "nil"
320   | string "clear"
321   | string "solid"
322   | string "horzStripe"
323   | string "vertStripe"
324   | string "reverseDiagStripe"
325   | string "diagStripe"
326   | string "horzCross"
327   | string "diagCross"
328   | string "thinHorzStripe"
329   | string "thinVertStripe"
330   | string "thinReverseDiagStripe"
331   | string "thinDiagStripe"
332   | string "thinHorzCross"
333   | string "thinDiagCross"
334   | string "pct5"
335   | string "pct10"
336   | string "pct12"
337   | string "pct15"
338   | string "pct20"
339   | string "pct25"
340   | string "pct30"
341   | string "pct35"
342   | string "pct37"
343   | string "pct40"
344   | string "pct45"
345   | string "pct50"
346   | string "pct55"
347   | string "pct60"
348   | string "pct62"
349   | string "pct65"
350   | string "pct70"
351   | string "pct75"
352   | string "pct80"
353   | string "pct85"
354   | string "pct87"
355   | string "pct90"
356   | string "pct95"
357 w_CT_Shd =
358   attribute w:val { w_ST_Shd },
359   attribute w:color { w_ST_HexColor }?,

```

```

360 attribute w:themeColor { w_ST_ThemeColor }?,
361 attribute w:themeTint { w_ST_UcharHexNumber }?,
362 attribute w:themeShade { w_ST_UcharHexNumber }?,
363 attribute w:fill { w_ST_HexColor }?,
364 attribute w:themeFill { w_ST_ThemeColor }?,
365 attribute w:themeFillTint { w_ST_UcharHexNumber }?,
366 attribute w:themeFillShade { w_ST_UcharHexNumber }?
367 w_CT_VerticalAlignRun = attribute w:val { s_ST_VerticalAlignRun }
368 w_CT_FitText =
369   attribute w:val { s_ST_TwipsMeasure },
370   attribute w:id { w_ST_DecimalNumber }?
371 w_ST_Em =
372   string "none"
373   | string "dot"
374   | string "comma"
375   | string "circle"
376   | string "underDot"
377 w_CT_Em = attribute w:val { w_ST_Em }
378 w_CT_Language =
379   attribute w:val { s_ST_Lang }?,
380   attribute w:eastAsia { s_ST_Lang }?,
381   attribute w:bidirectional { s_ST_Lang }?
382 w_ST_CombineBrackets =
383   string "none"
384   | string "round"
385   | string "square"
386   | string "angle"
387   | string "curly"
388 w_CT_EastAsianLayout =
389   attribute w:id { w_ST_DecimalNumber }?,
390   attribute w:combine { s_ST_OnOff }?,
391   attribute w:combineBrackets { w_ST_CombineBrackets }?,
392   attribute w:vertical { s_ST_OnOff }?,
393   attribute w:verticalCompress { s_ST_OnOff }?
394 w_ST_HeightRule = string "auto" | string "exact" | string "atLeast"
395 w_ST_Wrap =
396   string "auto"
397   | string "notBeside"
398   | string "around"
399   | string "tight"
400   | string "through"
401   | string "none"
402 w_ST_VAnchor = string "text" | string "margin" | string "page"
403 w_ST_HAnchor = string "text" | string "margin" | string "page"
404 w_ST_DropCap = string "none" | string "drop" | string "margin"
405 w_CT_FramePr =
406   attribute w:dropCap { w_ST_DropCap }?,
407   attribute w:lines { w_ST_DecimalNumber }?,
408   attribute w:w { s_ST_TwipsMeasure }?,
409   attribute w:h { s_ST_TwipsMeasure }?,
410   attribute w:vSpace { s_ST_TwipsMeasure }?,
411   attribute w:hSpace { s_ST_TwipsMeasure }?,
412   attribute w:wrap { w_ST_Wrap }?,

```

```

413     attribute w:hAnchor { w_ST_HAnchor }?,
414     attribute w:vAnchor { w_ST_VAnchor }?,
415     attribute w:x { w_ST_SignedTwipsMeasure }?,
416     attribute w:xAlign { s_ST_XAlign }?,
417     attribute w:y { w_ST_SignedTwipsMeasure }?,
418     attribute w:yAlign { s_ST_YAlign }?,
419     attribute w:hRule { w_ST_HeightRule }?,
420     attribute w:anchorLock { s_ST_OnOff }?
421 w_ST_TabJc =
422     string "clear"
423     | string "start"
424     | string "center"
425     | string "end"
426     | string "decimal"
427     | string "bar"
428     | string "num"
429 w_ST_TabTlc =
430     string "none"
431     | string "dot"
432     | string "hyphen"
433     | string "underscore"
434     | string "heavy"
435     | string "middleDot"
436 w_CT_TabStop =
437     attribute w:val { w_ST_TabJc },
438     attribute w:leader { w_ST_TabTlc }?,
439     attribute w:pos { w_ST_SignedTwipsMeasure }
440 w_ST_LineSpacingRule = string "auto" | string "exact" | string "atLeast"
441 w_CT_Spacing =
442     attribute w:before { s_ST_TwipsMeasure }?,
443     attribute w:beforeLines { w_ST_DecimalNumber }?,
444     attribute w:beforeAutospacing { s_ST_OnOff }?,
445     attribute w:after { s_ST_TwipsMeasure }?,
446     attribute w:afterLines { w_ST_DecimalNumber }?,
447     attribute w:afterAutospacing { s_ST_OnOff }?,
448     attribute w:line { w_ST_SignedTwipsMeasure }?,
449     attribute w:lineRule { w_ST_LineSpacingRule }?
450 w_CT_Ind =
451     attribute w:start { w_ST_SignedTwipsMeasure }?,
452     attribute w:startChars { w_ST_DecimalNumber }?,
453     attribute w:end { w_ST_SignedTwipsMeasure }?,
454     attribute w:endChars { w_ST_DecimalNumber }?,
455     attribute w:hanging { s_ST_TwipsMeasure }?,
456     attribute w:hangingChars { w_ST_DecimalNumber }?,
457     attribute w:firstLine { s_ST_TwipsMeasure }?,
458     attribute w:firstLineChars { w_ST_DecimalNumber }?
459 w_ST_Jc =
460     string "start"
461     | string "center"
462     | string "end"
463     | string "both"
464     | string "mediumKashida"
465     | string "distribute"

```



```

466 | string "numTab"
467 | string "highKashida"
468 | string "lowKashida"
469 | string "thaiDistribute"
470 w_ST_JcTable = string "center" | string "end" | string "start"
471 w_CT_Jc = attribute w:val { w_ST_Jc }
472 w_CT_JcTable = attribute w:val { w_ST_JcTable }
473 w_ST_View =
474     string "none"
475     | string "print"
476     | string "outline"
477     | string "masterPages"
478     | string "normal"
479     | string "web"
480 w_CT_View = attribute w:val { w_ST_View }
481 w_ST_Zoom =
482     string "none"
483     | string "fullPage"
484     | string "bestFit"
485     | string "textFit"
486 w_CT_Zoom =
487     attribute w:val { w_ST_Zoom }?,
488     attribute w:percent { w_ST_DecimalNumberOrPercent }
489 w_CT_WritingStyle =
490     attribute w:lang { s_ST_Lang },
491     attribute w:vendorID { s_ST_String },
492     attribute w:dllVersion { s_ST_String },
493     attribute w:nlCheck { s_ST_OnOff }?,
494     attribute w:checkStyle { s_ST_OnOff },
495     attribute w:appName { s_ST_String }
496 w_ST_Proof = string "clean" | string "dirty"
497 w_CT_Proof =
498     attribute w:spelling { w_ST_Proof }?,
499     attribute w:grammar { w_ST_Proof }?
500 w_ST_DocType = xsd:string
501 w_CT_DocType = attribute w:val { w_ST_DocType }
502 w_ST_DocProtect =
503     string "none"
504     | string "readOnly"
505     | string "comments"
506     | string "trackedChanges"
507     | string "forms"
508 w_AG_Password =
509     attribute w:algorithmName { s_ST_String }?,
510     attribute w:hashValue { xsd:base64Binary }?,
511     attribute w:saltValue { xsd:base64Binary }?,
512     attribute w:spinCount { w_ST_DecimalNumber }?
513 w_CT_DocProtect =
514     attribute w:edit { w_ST_DocProtect }?,
515     attribute w:formatting { s_ST_OnOff }?,
516     attribute w:enforcement { s_ST_OnOff }?,
517     w_AG_Password
518 w_ST_MailMergeDocType =

```

```

519     string "catalog"
520     | string "envelopes"
521     | string "mailingLabels"
522     | string "formLetters"
523     | string "email"
524     | string "fax"
525 w_CT_MailMergeDocType = attribute w:val { w_ST_MailMergeDocType }
526 w_ST_MailMergeDataType = xsd:string
527 w_CT_MailMergeDataType = attribute w:val { w_ST_MailMergeDataType }
528 w_ST_MailMergeDest =
529     string "newDocument"
530     | string "printer"
531     | string "email"
532     | string "fax"
533 w_CT_MailMergeDest = attribute w:val { w_ST_MailMergeDest }
534 w_ST_MailMergeOdsoFMDFieldType = string "null" | string "dbColumn"
535 w_CT_MailMergeOdsoFMDFieldType =
536     attribute w:val { w_ST_MailMergeOdsoFMDFieldType }
537 w_CT_TrackChangesView =
538     attribute w:markup { s_ST_OnOff }?,
539     attribute w:comments { s_ST_OnOff }?,
540     attribute w:insDel { s_ST_OnOff }?,
541     attribute w:formatting { s_ST_OnOff }?,
542     attribute w:inkAnnotations { s_ST_OnOff }?
543 w_CT_Kinsoku =
544     attribute w:lang { s_ST_Lang },
545     attribute w:val { s_ST_String }
546 w_ST_TextDirection =
547     string "tb"
548     | string "rl"
549     | string "lr"
550     | string "tbV"
551     | string "rlV"
552     | string "lrV"
553 w_CT_TextDirection = attribute w:val { w_ST_TextDirection }
554 w_ST_TextAlignment =
555     string "top"
556     | string "center"
557     | string "baseline"
558     | string "bottom"
559     | string "auto"
560 w_CT_TextAlignment = attribute w:val { w_ST_TextAlignment }
561 w_ST_DisplacedByCustomXml = string "next" | string "prev"
562 w_ST_AnnotationVMerge = string "cont" | string "rest"
563 w_CT_Markup = attribute w:id { w_ST_DecimalNumber }
564 w_CT_TrackChange =
565     w_CT_Markup,
566     attribute w:author { s_ST_String },
567     attribute w:date { w_ST_DateTime }?
568 w_CT_CellMergeTrackChange =
569     w_CT_TrackChange,
570     attribute w:vMerge { w_ST_AnnotationVMerge }?,
571     attribute w:vMergeOrig { w_ST_AnnotationVMerge }?

```

```

572 w_CT_TrackChangeRange =
573     w_CT_TrackChange,
574     attribute w:displacedByCustomXml { w_ST_DisplacedByCustomXml }?
575 w_CT_MarkupRange =
576     w_CT_Markup,
577     attribute w:displacedByCustomXml { w_ST_DisplacedByCustomXml }?
578 w_CT_BookmarkRange =
579     w_CT_MarkupRange,
580     attribute w:colFirst { w_ST_DecimalNumber }?,
581     attribute w:colLast { w_ST_DecimalNumber }?
582 w_CT_Bookmark =
583     w_CT_BookmarkRange,
584     attribute w:name { s_ST_String }
585 w_CT_MoveBookmark =
586     w_CT_Bookmark,
587     attribute w:author { s_ST_String },
588     attribute w:date { w_ST_DateTime }
589 w_CT_Comment =
590     w_CT_TrackChange,
591     w_EG_BlockLevelElts*,
592     attribute w:initials { s_ST_String }?
593 w_CT_TblPrExChange =
594     w_CT_TrackChange,
595     element tblPrEx { w_CT_TblPrExBase }
596 w_CT_TcPrChange =
597     w_CT_TrackChange,
598     element tcPr { w_CT_TcPrInner }
599 w_CT_TrPrChange =
600     w_CT_TrackChange,
601     element trPr { w_CT_TrPrBase }
602 w_CT_TblGridChange =
603     w_CT_Markup,
604     element tblGrid { w_CT_TblGridBase }
605 w_CT_TblPrChange =
606     w_CT_TrackChange,
607     element tblPr { w_CT_TblPrBase }
608 w_CT_SectPrChange =
609     w_CT_TrackChange,
610     element sectPr { w_CT_SectPrBase }?
611 w_CT_PPrChange =
612     w_CT_TrackChange,
613     element pPr { w_CT_PPrBase }
614 w_CT_RPrChange =
615     w_CT_TrackChange,
616     element rPr { w_CT_RPrOriginal }
617 w_CT_ParaRPrChange =
618     w_CT_TrackChange,
619     element rPr { w_CT_ParaRPrOriginal }
620 w_CT_RunTrackChange =
621     w_CT_TrackChange, (w_EG_ContentRunContent | m_EG_OMathMathElements)*
622 w_EG_PContentMath = w_EG_PContentBase* | w_EG_ContentRunContentBase*
623 w_EG_PContentBase =
624     element customXml { w_CT_CustomXmlRun }

```

```

625 | element fldSimple { w_CT_SimpleField }*
626 | element hyperlink { w_CT_Hyperlink }
627 w_EG_ContentRunContentBase =
628   element smartTag { w_CT_SmartTagRun }
629   | element sdt { w_CT_SdtRun }
630   | w_EG_RunLevelElts*
631 w_EG_CellMarkupElements =
632   element cellIns { w_CT_TrackChange }?
633   | element cellDel { w_CT_TrackChange }?
634   | element cellMerge { w_CT_CellMergeTrackChange }?
635 w_EG_RangeMarkupElements =
636   element bookmarkStart { w_CT_Bookmark }
637   | element bookmarkEnd { w_CT_MarkupRange }
638   | element moveFromRangeStart { w_CT_MoveBookmark }
639   | element moveFromRangeEnd { w_CT_MarkupRange }
640   | element moveToRangeStart { w_CT_MoveBookmark }
641   | element moveToRangeEnd { w_CT_MarkupRange }
642   | element commentRangeStart { w_CT_MarkupRange }
643   | element commentRangeEnd { w_CT_MarkupRange }
644   | element customXmlInsRangeStart { w_CT_TrackChange }
645   | element customXmlInsRangeEnd { w_CT_Markup }
646   | element customXmlDelRangeStart { w_CT_TrackChange }
647   | element customXmlDelRangeEnd { w_CT_Markup }
648   | element customXmlMoveFromRangeStart { w_CT_TrackChange }
649   | element customXmlMoveFromRangeEnd { w_CT_Markup }
650   | element customXmlMoveToRangeStart { w_CT_TrackChange }
651   | element customXmlMoveToRangeEnd { w_CT_Markup }
652 w_CT_NumPr =
653   element ilvl { w_CT_DecimalNumber }?,
654   element numId { w_CT_DecimalNumber }?,
655   element ins { w_CT_TrackChange }?
656 w_CT_PBdr =
657   element top { w_CT_Border }?,
658   element left { w_CT_Border }?,
659   element bottom { w_CT_Border }?,
660   element right { w_CT_Border }?,
661   element between { w_CT_Border }?,
662   element bar { w_CT_Border }?
663 w_CT_Tabs = element tab { w_CT_TabStop }+
664 w_ST_TextboxTightWrap =
665   string "none"
666   | string "allLines"
667   | string "firstAndLastLine"
668   | string "firstLineOnly"
669   | string "lastLineOnly"
670 w_CT_TextboxTightWrap = attribute w:val { w_ST_TextboxTightWrap }
671 w_CT_PPr =
672   w_CT_PPrBase,
673   element rPr { w_CT_ParaRPr }?,
674   element sectPr { w_CT_SectPr }?,
675   element pPrChange { w_CT_PPrChange }?
676 w_CT_PPrBase =
677   element pStyle { w_CT_String }?,

```

```

678     element keepNext { w_CT_OnOff }?,
679     element keepLines { w_CT_OnOff }?,
680     element pageBreakBefore { w_CT_OnOff }?,
681     element framePr { w_CT_FramePr }?,
682     element widowControl { w_CT_OnOff }?,
683     element numPr { w_CT_NumPr }?,
684     element suppressLineNumbers { w_CT_OnOff }?,
685     element pBdr { w_CT_PBdr }?,
686     element shd { w_CT_Shds }?,
687     element tabs { w_CT_Tabs }?,
688     element suppressAutoHyphens { w_CT_OnOff }?,
689     element kinsoku { w_CT_OnOff }?,
690     element wordWrap { w_CT_OnOff }?,
691     element overflowPunct { w_CT_OnOff }?,
692     element topLinePunct { w_CT_OnOff }?,
693     element autoSpaceDE { w_CT_OnOff }?,
694     element autoSpaceDN { w_CT_OnOff }?,
695     element bidi { w_CT_OnOff }?,
696     element adjustRightInd { w_CT_OnOff }?,
697     element snapToGrid { w_CT_OnOff }?,
698     element spacing { w_CT_Spacing }?,
699     element ind { w_CT_Ind }?,
700     element contextualSpacing { w_CT_OnOff }?,
701     element mirrorIndents { w_CT_OnOff }?,
702     element suppressOverlap { w_CT_OnOff }?,
703     element jc { w_CT_Jc }?,
704     element textDirection { w_CT_TextDirection }?,
705     element textAlignment { w_CT_TextAlignment }?,
706     element textboxTightWrap { w_CT_TextboxTightWrap }?,
707     element outlineLvl { w_CT_DecimalNumber }?,
708     element divId { w_CT_DecimalNumber }?,
709     element cnfStyle { w_CT_Cnf }?
710 w_CT_PPrGeneral =
711     w_CT_PPrBase,
712     element pPrChange { w_CT_PPrChange }?
713 w_CT_Control =
714     attribute w:name { s_ST_String }?,
715     attribute w:shapeid { s_ST_String }?,
716     r_id?
717 w_CT_Background =
718     attribute w:color { w_ST_HexColor }?,
719     attribute w:themeColor { w_ST_ThemeColor }?,
720     attribute w:themeTint { w_ST_UcharHexNumber }?,
721     attribute w:themeShade { w_ST_UcharHexNumber }?,
722     element drawing { w_CT_Drawing }?
723 w_CT_Rel = r_id
724 w_CT_Object =
725     attribute w:dxaOrig { s_ST_TwipsMeasure }?,
726     attribute w:dyaOrig { s_ST_TwipsMeasure }?,
727     element drawing { w_CT_Drawing }?,
728     (element control { w_CT_Control }
729     | element objectLink { w_CT_ObjectLink }
730     | element objectEmbed { w_CT_ObjectEmbed }

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731 | element movie { w_CT_Rel })?
732 w_CT_ObjectEmbed =
733   attribute w:drawAspect { w_ST_ObjectDrawAspect }?,
734   r_id,
735   attribute w:progId { s_ST_String }?,
736   attribute w:shapeId { s_ST_String }?,
737   attribute w:fieldCodes { s_ST_String }?
738 w_ST_ObjectDrawAspect = string "content" | string "icon"
739 w_CT_ObjectLink =
740   w_CT_ObjectEmbed,
741   attribute w:updateMode { w_ST_ObjectUpdateMode },
742   attribute w:lockedField { s_ST_OnOff }?
743 w_ST_ObjectUpdateMode = string "always" | string "onCall"
744 w_CT_Drawing = (wp_anchor? | wp_inline?)+
745 w_CT_SimpleField =
746   attribute w:instr { s_ST_String },
747   attribute w:fldLock { s_ST_OnOff }?,
748   attribute w:dirty { s_ST_OnOff }?,
749   w_EG_PContent*
750 w_ST_FldCharType = string "begin" | string "separate" | string "end"
751 w_ST_InfoTextType = string "text" | string "autoText"
752 w_ST_FFHelpTextVal = xsd:string { maxLength = "256" }
753 w_ST_FFStatusTextVal = xsd:string { maxLength = "140" }
754 w_ST_FFName = xsd:string { maxLength = "65" }
755 w_ST_FFTextType =
756   string "regular"
757   | string "number"
758   | string "date"
759   | string "currentTime"
760   | string "currentDate"
761   | string "calculated"
762 w_CT_FFTextType = attribute w:val { w_ST_FFTextType }
763 w_CT_FFName = attribute w:val { w_ST_FFName }?
764 w_CT_FldChar =
765   attribute w:fldCharType { w_ST_FldCharType },
766   attribute w:fldLock { s_ST_OnOff }?,
767   attribute w:dirty { s_ST_OnOff }?,
768   (element ffData { w_CT_FFData }?)
769 w_CT_Hyperlink =
770   attribute w:tgtFrame { s_ST_String }?,
771   attribute w:tooltip { s_ST_String }?,
772   attribute w:docLocation { s_ST_String }?,
773   attribute w:history { s_ST_OnOff }?,
774   attribute w:anchor { s_ST_String }?,
775   r_id?,
776   w_EG_PContent*
777 w_CT_FFData =
778   (element name { w_CT_FFName }
779   | element label { w_CT_DecimalNumber }?
780   | element tabIndex { w_CT_UnsignedDecimalNumber }?
781   | element enabled { w_CT_OnOff }
782   | element calcOnExit { w_CT_OnOff }
783   | element entryMacro { w_CT_MacroName }?)

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784 | element exitMacro { w_CT_MacroName }?
785 | element helpText { w_CT_FFHelpText }?
786 | element statusText { w_CT_FFStatusText }?
787 | (element checkBox { w_CT_FFCheckBox }
788 |   | element ddList { w_CT_FFDDLList }
789 |   | element textInput { w_CT_FFTextInput }))+
790 w_CT_FFHelpText =
791   attribute w:type { w_ST_InfoTextType }?,
792   attribute w:val { w_ST_FFHelpTextVal }?
793 w_CT_FFStatusText =
794   attribute w:type { w_ST_InfoTextType }?,
795   attribute w:val { w_ST_FFStatusTextVal }?
796 w_CT_FFCheckBox =
797   (element size { w_CT_HpsMeasure }
798   | element sizeAuto { w_CT_OnOff })),
799   element default { w_CT_OnOff }?,
800   element checked { w_CT_OnOff }?
801 w_CT_FFDDLList =
802   element result { w_CT_DecimalNumber }?,
803   element default { w_CT_DecimalNumber }?,
804   element listEntry { w_CT_String }*
805 w_CT_FFTextInput =
806   element type { w_CT_FFTextType }?,
807   element default { w_CT_String }?,
808   element maxLength { w_CT_DecimalNumber }?,
809   element format { w_CT_String }?
810 w_ST_SectionMark =
811   string "nextPage"
812   | string "nextColumn"
813   | string "continuous"
814   | string "evenPage"
815   | string "oddPage"
816 w_CT_SectType = attribute w:val { w_ST_SectionMark }?
817 w_CT_PaperSource =
818   attribute w:first { w_ST_DecimalNumber }?,
819   attribute w:other { w_ST_DecimalNumber }?
820 w_ST_NumberFormat =
821   string "decimal"
822   | string "upperRoman"
823   | string "lowerRoman"
824   | string "upperLetter"
825   | string "lowerLetter"
826   | string "ordinal"
827   | string "cardinalText"
828   | string "ordinalText"
829   | string "hex"
830   | string "chicago"
831   | string "ideographDigital"
832   | string "japaneseCounting"
833   | string "aiueo"
834   | string "iroha"
835   | string "decimalFullWidth"
836   | string "decimalHalfWidth"

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837 | string "japaneseLegal"
838 | string "japaneseDigitalTenThousand"
839 | string "decimalEnclosedCircle"
840 | string "decimalFullWidth2"
841 | string "aiueoFullWidth"
842 | string "irohaFullWidth"
843 | string "decimalZero"
844 | string "bullet"
845 | string "ganada"
846 | string "chosung"
847 | string "decimalEnclosedFullstop"
848 | string "decimalEnclosedParen"
849 | string "decimalEnclosedCircleChinese"
850 | string "ideographEnclosedCircle"
851 | string "ideographTraditional"
852 | string "ideographZodiac"
853 | string "ideographZodiacTraditional"
854 | string "taiwaneseCounting"
855 | string "ideographLegalTraditional"
856 | string "taiwaneseCountingThousand"
857 | string "taiwaneseDigital"
858 | string "chineseCounting"
859 | string "chineseLegalSimplified"
860 | string "chineseCountingThousand"
861 | string "koreanDigital"
862 | string "koreanCounting"
863 | string "koreanLegal"
864 | string "koreanDigital2"
865 | string "vietnameseCounting"
866 | string "russianLower"
867 | string "russianUpper"
868 | string "none"
869 | string "numberInDash"
870 | string "hebrew1"
871 | string "hebrew2"
872 | string "arabicAlpha"
873 | string "arabicAbjad"
874 | string "hindiVowels"
875 | string "hindiConsonants"
876 | string "hindiNumbers"
877 | string "hindiCounting"
878 | string "thaiLetters"
879 | string "thaiNumbers"
880 | string "thaiCounting"
881 | string "bahtText"
882 | string "dollarText"
883 | string "custom"
884 w_ST_PageOrientation = string "portrait" | string "landscape"
885 w_CT_PageSz =
886   attribute w:w { s_ST_TwipsMeasure }?,
887   attribute w:h { s_ST_TwipsMeasure }?,
888   attribute w:orient { w_ST_PageOrientation }?,
889   attribute w:code { w_ST_DecimalNumber }?

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890 w_CT_PageMar =
891     attribute w:top { w_ST_SignedTwipsMeasure },
892     attribute w:right { s_ST_TwipsMeasure },
893     attribute w:bottom { w_ST_SignedTwipsMeasure },
894     attribute w:left { s_ST_TwipsMeasure },
895     attribute w:header { s_ST_TwipsMeasure },
896     attribute w:footer { s_ST_TwipsMeasure },
897     attribute w:gutter { s_ST_TwipsMeasure }
898 w_ST_PageBorderZOrder = string "front" | string "back"
899 w_ST_PageBorderDisplay =
900     string "allPages" | string "firstPage" | string "notFirstPage"
901 w_ST_PageBorderOffset = string "page" | string "text"
902 w_CT_PageBorders =
903     attribute w:zOrder { w_ST_PageBorderZOrder }?,
904     attribute w:display { w_ST_PageBorderDisplay }?,
905     attribute w:offsetFrom { w_ST_PageBorderOffset }?,
906     element top { w_CT_TopPageBorder }?,
907     element left { w_CT_PageBorder }?,
908     element bottom { w_CT_BottomPageBorder }?,
909     element right { w_CT_PageBorder }?
910 w_CT_PageBorder = w_CT_Border, r_id?
911 w_CT_BottomPageBorder = w_CT_PageBorder, r_bottomLeft?, r_bottomRight?
912 w_CT_TopPageBorder = w_CT_PageBorder, r_topLeft?, r_topRight?
913 w_ST_ChapterSep =
914     string "hyphen"
915     | string "period"
916     | string "colon"
917     | string "emDash"
918     | string "enDash"
919 w_ST_LineNumberRestart =
920     string "newPage" | string "newSection" | string "continuous"
921 w_CT_LineNumber =
922     attribute w:countBy { w_ST_DecimalNumber }?,
923     attribute w:start { w_ST_DecimalNumber }?,
924     attribute w:distance { s_ST_TwipsMeasure }?,
925     attribute w:restart { w_ST_LineNumberRestart }?
926 w_CT_PageNumber =
927     attribute w:fmt { w_ST_NumberFormat }?,
928     attribute w:start { w_ST_DecimalNumber }?,
929     attribute w:chapStyle { w_ST_DecimalNumber }?,
930     attribute w:chapSep { w_ST_ChapterSep }?
931 w_CT_Column =
932     attribute w:w { s_ST_TwipsMeasure }?,
933     attribute w:space { s_ST_TwipsMeasure }?
934 w_CT_Columns =
935     attribute w:equalWidth { s_ST_OnOff }?,
936     attribute w:space { s_ST_TwipsMeasure }?,
937     attribute w:num { w_ST_DecimalNumber }?,
938     attribute w:sep { s_ST_OnOff }?,
939     element col { w_CT_Column }*
940 w_ST_VerticalJc =
941     string "top" | string "center" | string "both" | string "bottom"
942 w_CT_VerticalJc = attribute w:val { w_ST_VerticalJc }

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943 w_ST_DocGrid =
944     string "default"
945     | string "lines"
946     | string "linesAndChars"
947     | string "snapToChars"
948 w_CT_DocGrid =
949     attribute w:type { w_ST_DocGrid }?,
950     attribute w:linePitch { w_ST_DecimalNumber }?,
951     attribute w:charSpace { w_ST_DecimalNumber }?
952 w_ST_HdrFtr = string "even" | string "default" | string "first"
953 w_ST_FtnEdn =
954     string "normal"
955     | string "separator"
956     | string "continuationSeparator"
957     | string "continuationNotice"
958 w_CT_HdrFtrRef =
959     w_CT_Rel,
960     attribute w:type { w_ST_HdrFtr }
961 w_EG_HdrFtrReferences =
962     element headerReference { w_CT_HdrFtrRef }?
963     | element footerReference { w_CT_HdrFtrRef }?
964 w_CT_HdrFtr = w_EG_BlockLevelElts+
965 w_EG_SectPrContents =
966     element footnotePr { w_CT_FtnProps }?,
967     element endnotePr { w_CT_EdnProps }?,
968     element type { w_CT_SectType }?,
969     element pgSz { w_CT_PageSz }?,
970     element pgMar { w_CT_PageMar }?,
971     element paperSrc { w_CT_PaperSource }?,
972     element pgBorders { w_CT_PageBorders }?,
973     element lnNumType { w_CT_LineNumber }?,
974     element pgNumType { w_CT_PageNumber }?,
975     element cols { w_CT_Columns }?,
976     element formProt { w_CT_OnOff }?,
977     element vAlign { w_CT_VerticalJc }?,
978     element noEndnote { w_CT_OnOff }?,
979     element titlePg { w_CT_OnOff }?,
980     element textDirection { w_CT_TextDirection }?,
981     element bidi { w_CT_OnOff }?,
982     element rtlGutter { w_CT_OnOff }?,
983     element docGrid { w_CT_DocGrid }?,
984     element printerSettings { w_CT_Rel }?
985 w_AG_SectPrAttributes =
986     attribute w:rsidRPr { w_ST_LongHexNumber }?,
987     attribute w:rsidDel { w_ST_LongHexNumber }?,
988     attribute w:rsidR { w_ST_LongHexNumber }?,
989     attribute w:rsidSect { w_ST_LongHexNumber }?
990 w_CT_SectPrBase = w_AG_SectPrAttributes, w_EG_SectPrContents?
991 w_CT_SectPr =
992     w_AG_SectPrAttributes,
993     w_EG_HdrFtrReferences*,
994     w_EG_SectPrContents?,
995     element sectPrChange { w_CT_SectPrChange }?

```

```

996 w_ST_BrType = string "page" | string "column" | string "textWrapping"
997 w_ST_BrClear =
998     string "none" | string "left" | string "right" | string "all"
999 w_CT_Br =
1000     attribute w:type { w_ST_BrType }?,
1001     attribute w:clear { w_ST_BrClear }?
1002 w_ST_PTabAlignment = string "left" | string "center" | string "right"
1003 w_ST_PTabRelativeTo = string "margin" | string "indent"
1004 w_ST_PTabLeader =
1005     string "none"
1006     | string "dot"
1007     | string "hyphen"
1008     | string "underscore"
1009     | string "middleDot"
1010 w_CT_PTab =
1011     attribute w:alignment { w_ST_PTabAlignment },
1012     attribute w:relativeTo { w_ST_PTabRelativeTo },
1013     attribute w:leader { w_ST_PTabLeader }
1014 w_CT_Sym =
1015     attribute w:font { s_ST_String }?,
1016     attribute w:char { w_ST_ShortHexNumber }?
1017 w_ST_ProofErr =
1018     string "spellStart"
1019     | string "spellEnd"
1020     | string "gramStart"
1021     | string "gramEnd"
1022 w_CT_ProofErr = attribute w:type { w_ST_ProofErr }
1023 w_ST_EdGrp =
1024     string "none"
1025     | string "everyone"
1026     | string "administrators"
1027     | string "contributors"
1028     | string "editors"
1029     | string "owners"
1030     | string "current"
1031 w_CT_Perm =
1032     attribute w:id { s_ST_String },
1033     attribute w:displacedByCustomXml { w_ST_DisplacedByCustomXml }?
1034 w_CT_PermStart =
1035     w_CT_Perm,
1036     attribute w:edGrp { w_ST_EdGrp }?,
1037     attribute w:ed { s_ST_String }?,
1038     attribute w:colFirst { w_ST_DecimalNumber }?,
1039     attribute w:colLast { w_ST_DecimalNumber }?
1040 w_CT_Text = s_ST_String, xml_space?
1041 w_EG_RunInnerContent =
1042     element br { w_CT_Br }
1043     | element t { w_CT_Text }
1044     | element contentPart { w_CT_Rel }
1045     | element delText { w_CT_Text }
1046     | element instrText { w_CT_Text }
1047     | element delInstrText { w_CT_Text }
1048     | element noBreakHyphen { w_CT_Empty }

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1049 | element softHyphen { w_CT_Empty }?
1050 | element dayShort { w_CT_Empty }?
1051 | element monthShort { w_CT_Empty }?
1052 | element yearShort { w_CT_Empty }?
1053 | element dayLong { w_CT_Empty }?
1054 | element monthLong { w_CT_Empty }?
1055 | element yearLong { w_CT_Empty }?
1056 | element annotationRef { w_CT_Empty }?
1057 | element footnoteRef { w_CT_Empty }?
1058 | element endnoteRef { w_CT_Empty }?
1059 | element separator { w_CT_Empty }?
1060 | element continuationSeparator { w_CT_Empty }?
1061 | element sym { w_CT_Sym }?
1062 | element pgNum { w_CT_Empty }?
1063 | element cr { w_CT_Empty }?
1064 | element tab { w_CT_Empty }?
1065 | element object { w_CT_Object }
1066 | element fldChar { w_CT_FldChar }
1067 | element ruby { w_CT_Ruby }
1068 | element footnoteReference { w_CT_FtnEdnRef }
1069 | element endnoteReference { w_CT_FtnEdnRef }
1070 | element commentReference { w_CT_Markup }
1071 | element drawing { w_CT_Drawing }
1072 | element ptab { w_CT_PTab }?
1073 | element lastRenderedPageBreak { w_CT_Empty }?
1074 w_CT_R =
1075   attribute w:rsidRPr { w_ST_LongHexNumber }?,
1076   attribute w:rsidDel { w_ST_LongHexNumber }?,
1077   attribute w:rsidR { w_ST_LongHexNumber }?,
1078   w_EG_RPr?,
1079   w_EG_RunInnerContent*
1080 w_ST_Hint = string "default" | string "eastAsia" | string "cs"
1081 w_ST_Theme =
1082   string "majorEastAsia"
1083   | string "majorBidi"
1084   | string "majorAscii"
1085   | string "majorHAnsi"
1086   | string "minorEastAsia"
1087   | string "minorBidi"
1088   | string "minorAscii"
1089   | string "minorHAnsi"
1090 w_CT_Fonts =
1091   attribute w:hint { w_ST_Hint }?,
1092   attribute w:ascii { s_ST_String }?,
1093   attribute w:hAnsi { s_ST_String }?,
1094   attribute w:eastAsia { s_ST_String }?,
1095   attribute w:cs { s_ST_String }?,
1096   attribute w:asciiTheme { w_ST_Theme }?,
1097   attribute w:hAnsiTheme { w_ST_Theme }?,
1098   attribute w:eastAsiaTheme { w_ST_Theme }?,
1099   attribute w:cstheme { w_ST_Theme }?
1100 w_EG_RPrBase =
1101   element rStyle { w_CT_String }?&

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1102 element rFonts { w_CT_Fonts }?&
1103 element b { w_CT_OnOff }?&
1104 element bCs { w_CT_OnOff }?&
1105 element i { w_CT_OnOff }?&
1106 element iCs { w_CT_OnOff }?&
1107 element caps { w_CT_OnOff }?&
1108 element smallCaps { w_CT_OnOff }?&
1109 element strike { w_CT_OnOff }?&
1110 element dstrike { w_CT_OnOff }?&
1111 element outline { w_CT_OnOff }?&
1112 element shadow { w_CT_OnOff }?&
1113 element emboss { w_CT_OnOff }?&
1114 element imprint { w_CT_OnOff }?&
1115 element noProof { w_CT_OnOff }?&
1116 element snapToGrid { w_CT_OnOff }?&
1117 element vanish { w_CT_OnOff }?&
1118 element webHidden { w_CT_OnOff }?&
1119 element color { w_CT_Color }?&
1120 element spacing { w_CT_SignedTwipsMeasure }?&
1121 element w { w_CT_TextScale }?&
1122 element kern { w_CT_HpsMeasure }?&
1123 element position { w_CT_SignedHpsMeasure }?&
1124 element sz { w_CT_HpsMeasure }?&
1125 element szCs { w_CT_HpsMeasure }?&
1126 element highlight { w_CT_Highlight }?&
1127 element u { w_CT_Underline }?&
1128 element effect { w_CT_TextEffect }?&
1129 element bdr { w_CT_Border }?&
1130 element shd { w_CT_Shadow }?&
1131 element fitText { w_CT_FitText }?&
1132 element vertAlign { w_CT_VerticalAlignRun }?&
1133 element rtl { w_CT_OnOff }?&
1134 element cs { w_CT_OnOff }?&
1135 element em { w_CT_Em }?&
1136 element lang { w_CT_Language }?&
1137 element eastAsianLayout { w_CT_EastAsianLayout }?&
1138 element specVanish { w_CT_OnOff }?&
1139 element oMath { w_CT_OnOff }?
1140 w_EG_RPrContent =
1141   w_EG_RPrBase?,
1142   element rPrChange { w_CT_RPrChange }?
1143 w_CT_RPr = w_EG_RPrContent?
1144 w_EG_RPr = element rPr { w_CT_RPr }?
1145 w_EG_RPrMath =
1146   w_EG_RPr
1147   | element ins { w_CT_MathCtrlIns }
1148   | element del { w_CT_MathCtrlDel }
1149 w_CT_MathCtrlIns =
1150   w_CT_TrackChange,
1151   (element del { w_CT_RPrChange }
1152    | element rPr { w_CT_RPr })?
1153 w_CT_MathCtrlDel =
1154   w_CT_TrackChange,

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1155 (element rPr { w_CT_RPr })?
1156 w_CT_RPrOriginal = w_EG_RPrBase*
1157 w_CT_ParaRPrOriginal = w_EG_ParaRPrTrackChanges?, w_EG_RPrBase*
1158 w_CT_ParaRPr =
1159     w_EG_ParaRPrTrackChanges?,
1160     w_EG_RPrBase?,
1161     element rPrChange { w_CT_ParaRPrChange }?
1162 w_EG_ParaRPrTrackChanges =
1163     element ins { w_CT_TrackChange }?,
1164     element del { w_CT_TrackChange }?,
1165     element moveFrom { w_CT_TrackChange }?,
1166     element moveTo { w_CT_TrackChange }?
1167 w_CT_AltChunk =
1168     r_id?,
1169     element altChunkPr { w_CT_AltChunkPr }?
1170 w_CT_AltChunkPr = element matchSrc { w_CT_OnOff }?
1171 w_ST_RubyAlign =
1172     string "center"
1173     | string "distributeLetter"
1174     | string "distributeSpace"
1175     | string "left"
1176     | string "right"
1177     | string "rightVertical"
1178 w_CT_RubyAlign = attribute w:val { w_ST_RubyAlign }
1179 w_CT_RubyPr =
1180     element rubyAlign { w_CT_RubyAlign },
1181     element hps { w_CT_HpsMeasure },
1182     element hpsRaise { w_CT_HpsMeasure },
1183     element hpsBaseText { w_CT_HpsMeasure },
1184     element lid { w_CT_Lang },
1185     element dirty { w_CT_OnOff }?
1186 w_EG_RubyContent =
1187     element r { w_CT_R }
1188     | w_EG_RunLevelElts*
1189 w_CT_RubyContent = w_EG_RubyContent*
1190 w_CT_Ruby =
1191     element rubyPr { w_CT_RubyPr },
1192     element rt { w_CT_RubyContent },
1193     element rubyBase { w_CT_RubyContent }
1194 w_ST_Lock =
1195     string "sdtLocked"
1196     | string "contentLocked"
1197     | string "unlocked"
1198     | string "sdtContentLocked"
1199 w_CT_Lock = attribute w:val { w_ST_Lock }?
1200 w_CT_SdtListItem =
1201     attribute w:displayText { s_ST_String }?,
1202     attribute w:value { s_ST_String }?
1203 w_ST_SdtDateMappingType =
1204     string "text" | string "date" | string "dateTime"
1205 w_CT_SdtDateMappingType = attribute w:val { w_ST_SdtDateMappingType }?
1206 w_CT_CalendarType = attribute w:val { s_ST_CalendarType }?
1207 w_CT_SdtDate =

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1208     attribute w:fullDate { w_ST_DateTime }?,
1209     element dateFormat { w_CT_String }?,
1210     element lid { w_CT_Lang }?,
1211     element storeMappedDataAs { w_CT_SdtDateMappingType }?,
1212     element calendar { w_CT_CalendarType }?
1213 w_CT_SdtComboBox =
1214     attribute w:lastValue { s_ST_String }?,
1215     element listItem { w_CT_SdtListItem }*
1216 w_CT_SdtDocPart =
1217     element docPartGallery { w_CT_String }?,
1218     element docPartCategory { w_CT_String }?,
1219     element docPartUnique { w_CT_OnOff }?
1220 w_CT_SdtDropDownList =
1221     attribute w:lastValue { s_ST_String }?,
1222     element listItem { w_CT_SdtListItem }*
1223 w_CT_Placeholder = element docPart { w_CT_String }
1224 w_CT_SdtText = attribute w:multiline { s_ST_OnOff }?
1225 w_CT_DataBinding =
1226     attribute w:prefixMappings { s_ST_String }?,
1227     attribute w:xpath { s_ST_String },
1228     attribute w:storeItemID { s_ST_String }
1229 w_CT_SdtPr =
1230     element rPr { w_CT_RPr }?,
1231     element alias { w_CT_String }?,
1232     element tag { w_CT_String }?,
1233     element id { w_CT_DecimalNumber }?,
1234     element lock { w_CT_Lock }?,
1235     element placeholder { w_CT_Placeholder }?,
1236     element temporary { w_CT_OnOff }?,
1237     element showingPlcHdr { w_CT_OnOff }?,
1238     element dataBinding { w_CT_DataBinding }?,
1239     element label { w_CT_DecimalNumber }?,
1240     element tabIndex { w_CT_UnsignedDecimalNumber }?,
1241     (element equation { w_CT_Empty }
1242     | element comboBox { w_CT_SdtComboBox }
1243     | element date { w_CT_SdtDate }
1244     | element docPartObj { w_CT_SdtDocPart }
1245     | element docPartList { w_CT_SdtDocPart }
1246     | element dropDownList { w_CT_SdtDropDownList }
1247     | element picture { w_CT_Empty }
1248     | element richText { w_CT_Empty }
1249     | element text { w_CT_SdtText }
1250     | element citation { w_CT_Empty }
1251     | element group { w_CT_Empty }
1252     | element bibliography { w_CT_Empty })?
1253 w_CT_SdtEndPr = (element rPr { w_CT_RPr }?)+
1254 w_EG_ContentRunContent =
1255     element customXml { w_CT_CustomXmlRun }
1256     | element smartTag { w_CT_SmartTagRun }
1257     | element sdt { w_CT_SdtRun }
1258     | element dir { w_CT_DirContentRun }
1259     | element bdo { w_CT_BdoContentRun }
1260     | element r { w_CT_R }

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1261 | w_EG_RunLevelElts*
1262 w_CT_DirContentRun =
1263   attribute w:val { w_ST_Direction }?,
1264   w_EG_PContent*
1265 w_CT_BdoContentRun =
1266   attribute w:val { w_ST_Direction }?,
1267   w_EG_PContent*
1268 w_ST_Direction = string "ltr" | string "rtl"
1269 w_CT_SdtContentRun = w_EG_PContent*
1270 w_EG_ContentBlockContent =
1271   element customXml { w_CT_CustomXmlBlock }
1272   | element sdt { w_CT_SdtBlock }
1273   | element p { w_CT_P }*
1274   | element tbl { w_CT_Tbl }*
1275   | w_EG_RunLevelElts*
1276 w_CT_SdtContentBlock = w_EG_ContentBlockContent*
1277 w_EG_ContentRowContent =
1278   element tr { w_CT_Row }*
1279   | element customXml { w_CT_CustomXmlRow }
1280   | element sdt { w_CT_SdtRow }
1281   | w_EG_RunLevelElts*
1282 w_CT_SdtContentRow = w_EG_ContentRowContent*
1283 w_EG_ContentCellContent =
1284   element tc { w_CT_Tc }*
1285   | element customXml { w_CT_CustomXmlCell }
1286   | element sdt { w_CT_SdtCell }
1287   | w_EG_RunLevelElts*
1288 w_CT_SdtContentCell = w_EG_ContentCellContent*
1289 w_CT_SdtBlock =
1290   element sdtPr { w_CT_SdtPr }?,
1291   element sdtEndPr { w_CT_SdtEndPr }?,
1292   element sdtContent { w_CT_SdtContentBlock }?
1293 w_CT_SdtRun =
1294   element sdtPr { w_CT_SdtPr }?,
1295   element sdtEndPr { w_CT_SdtEndPr }?,
1296   element sdtContent { w_CT_SdtContentRun }?
1297 w_CT_SdtCell =
1298   element sdtPr { w_CT_SdtPr }?,
1299   element sdtEndPr { w_CT_SdtEndPr }?,
1300   element sdtContent { w_CT_SdtContentCell }?
1301 w_CT_SdtRow =
1302   element sdtPr { w_CT_SdtPr }?,
1303   element sdtEndPr { w_CT_SdtEndPr }?,
1304   element sdtContent { w_CT_SdtContentRow }?
1305 w_CT_Attr =
1306   attribute w:uri { s_ST_String }?,
1307   attribute w:name { s_ST_String },
1308   attribute w:val { s_ST_String }
1309 w_CT_CustomXmlRun =
1310   attribute w:uri { s_ST_String }?,
1311   attribute w:element { s_ST_XmlName },
1312   element customXmlPr { w_CT_CustomXmlPr }?,
1313   w_EG_PContent*

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1314 w_CT_SmartTagRun =
1315     attribute w:uri { s_ST_String }?,
1316     attribute w:element { s_ST_XmlName },
1317     element smartTagPr { w_CT_SmartTagPr }?,
1318     w_EG_PContent*
1319 w_CT_CustomXmlBlock =
1320     attribute w:uri { s_ST_String }?,
1321     attribute w:element { s_ST_XmlName },
1322     element customXmlPr { w_CT_CustomXmlPr }?,
1323     w_EG_ContentBlockContent*
1324 w_CT_CustomXmlPr =
1325     element placeholder { w_CT_String }?,
1326     element attr { w_CT_Attr }*
1327 w_CT_CustomXmlRow =
1328     attribute w:uri { s_ST_String }?,
1329     attribute w:element { s_ST_XmlName },
1330     element customXmlPr { w_CT_CustomXmlPr }?,
1331     w_EG_ContentRowContent*
1332 w_CT_CustomXmlCell =
1333     attribute w:uri { s_ST_String }?,
1334     attribute w:element { s_ST_XmlName },
1335     element customXmlPr { w_CT_CustomXmlPr }?,
1336     w_EG_ContentCellContent*
1337 w_CT_SmartTagPr = element attr { w_CT_Attr }*
1338 w_EG_PContent =
1339     w_EG_ContentRunContent*
1340     | element fldSimple { w_CT_SimpleField }*
1341     | element hyperlink { w_CT_Hyperlink }
1342     | element subDoc { w_CT_Rel }
1343 w_CT_P =
1344     attribute w:rsidRPr { w_ST_LongHexNumber }?,
1345     attribute w:rsidR { w_ST_LongHexNumber }?,
1346     attribute w:rsidDel { w_ST_LongHexNumber }?,
1347     attribute w:rsidP { w_ST_LongHexNumber }?,
1348     attribute w:rsidRDefault { w_ST_LongHexNumber }?,
1349     element pPr { w_CT_PPr }?,
1350     w_EG_PContent*
1351 w_ST_TblWidth =
1352     string "nil" | string "pct" | string "dxa" | string "auto"
1353 w_CT_Height =
1354     attribute w:val { s_ST_TwipsMeasure }?,
1355     attribute w:hRule { w_ST_HeightRule }?
1356 w_ST_MeasurementOrPercent = w_ST_DecimalNumberOrPercent | s_ST_UniversalMeasure
1357 w_CT_TblWidth =
1358     attribute w:w { w_ST_MeasurementOrPercent }?,
1359     attribute w:type { w_ST_TblWidth }?
1360 w_CT_TblGridCol = attribute w:w { s_ST_TwipsMeasure }?
1361 w_CT_TblGridBase = element gridCol { w_CT_TblGridCol }*
1362 w_CT_TblGrid =
1363     w_CT_TblGridBase,
1364     element tblGridChange { w_CT_TblGridChange }?
1365 w_CT_TcBorders =
1366     element top { w_CT_Border }?,

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1367     element start { w_CT_Border }?,
1368     element bottom { w_CT_Border }?,
1369     element end { w_CT_Border }?,
1370     element insideH { w_CT_Border }?,
1371     element insideV { w_CT_Border }?,
1372     element tl2br { w_CT_Border }?,
1373     element tr2bl { w_CT_Border }?
1374 w_CT_TcMar =
1375     element top { w_CT_TblWidth }?,
1376     element start { w_CT_TblWidth }?,
1377     element bottom { w_CT_TblWidth }?,
1378     element end { w_CT_TblWidth }?
1379 w_ST_Merge = string "continue" | string "restart"
1380 w_CT_VMerge = attribute w:val { w_ST_Merge }?
1381 w_CT_TcPrBase =
1382     element cnfStyle { w_CT_Cnf }?,
1383     element tcW { w_CT_TblWidth }?,
1384     element gridSpan { w_CT_DecimalNumber }?,
1385     element vMerge { w_CT_VMerge }?,
1386     element tcBorders { w_CT_TcBorders }?,
1387     element shd { w_CT_Shadow }?,
1388     element nowrap { w_CT_OnOff }?,
1389     element tcMar { w_CT_TcMar }?,
1390     element textDirection { w_CT_TextDirection }?,
1391     element tcFitText { w_CT_OnOff }?,
1392     element vAlign { w_CT_VerticalJc }?,
1393     element hideMark { w_CT_OnOff }?,
1394     element headers { w_CT_Headers }?
1395 w_CT_TcPr =
1396     w_CT_TcPrInner,
1397     element tcPrChange { w_CT_TcPrChange }?
1398 w_CT_TcPrInner = w_CT_TcPrBase, w_EG_CellMarkupElements?
1399 w_CT_Tc =
1400     attribute w:id { s_ST_String }?,
1401     element tcPr { w_CT_TcPr }?,
1402     w_EG_BlockLevelElts+
1403 w_CT_Cnf =
1404     attribute w:firstRow { s_ST_OnOff }?,
1405     attribute w:lastRow { s_ST_OnOff }?,
1406     attribute w:firstColumn { s_ST_OnOff }?,
1407     attribute w:lastColumn { s_ST_OnOff }?,
1408     attribute w:oddVBand { s_ST_OnOff }?,
1409     attribute w:evenVBand { s_ST_OnOff }?,
1410     attribute w:oddHBand { s_ST_OnOff }?,
1411     attribute w:evenHBand { s_ST_OnOff }?,
1412     attribute w:firstRowFirstColumn { s_ST_OnOff }?,
1413     attribute w:firstRowLastColumn { s_ST_OnOff }?,
1414     attribute w:lastRowFirstColumn { s_ST_OnOff }?,
1415     attribute w:lastRowLastColumn { s_ST_OnOff }?
1416 w_CT_Headers = element header { w_CT_String }*
1417 w_CT_TrPrBase =
1418     (element cnfStyle { w_CT_Cnf }?
1419     | element divId { w_CT_DecimalNumber }?)

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1420 | element gridBefore { w_CT_DecimalNumber }?
1421 | element gridAfter { w_CT_DecimalNumber }?
1422 | element wBefore { w_CT_TblWidth }?
1423 | element wAfter { w_CT_TblWidth }?
1424 | element cantSplit { w_CT_OnOff }?
1425 | element trHeight { w_CT_Height }?
1426 | element tblHeader { w_CT_OnOff }?
1427 | element tblCellSpacing { w_CT_TblWidth }?
1428 | element jc { w_CT_JcTable }?
1429 | element hidden { w_CT_OnOff }?)+
1430 w_CT_TrPr =
1431   w_CT_TrPrBase,
1432   element ins { w_CT_TrackChange }?,
1433   element del { w_CT_TrackChange }?,
1434   element trPrChange { w_CT_TrPrChange }?
1435 w_CT_Row =
1436   attribute w:rsidRPr { w_ST_LongHexNumber }?,
1437   attribute w:rsidR { w_ST_LongHexNumber }?,
1438   attribute w:rsidDel { w_ST_LongHexNumber }?,
1439   attribute w:rsidTr { w_ST_LongHexNumber }?,
1440   element tblPrEx { w_CT_TblPrEx }?,
1441   element trPr { w_CT_TrPr }?,
1442   w_EG_ContentCellContent*
1443 w_ST_TblLayoutType = string "fixed" | string "autofit"
1444 w_CT_TblLayoutType = attribute w:type { w_ST_TblLayoutType }?
1445 w_ST_TblOverlap = string "never" | string "overlap"
1446 w_CT_TblOverlap = attribute w:val { w_ST_TblOverlap }
1447 w_CT_TblPPr =
1448   attribute w:leftFromText { s_ST_TwipsMeasure }?,
1449   attribute w:rightFromText { s_ST_TwipsMeasure }?,
1450   attribute w:topFromText { s_ST_TwipsMeasure }?,
1451   attribute w:bottomFromText { s_ST_TwipsMeasure }?,
1452   attribute w:vertAnchor { w_ST_VAnchor }?,
1453   attribute w:horzAnchor { w_ST_HAnchor }?,
1454   attribute w:tblpXSpec { s_ST_XAlign }?,
1455   attribute w:tblpX { w_ST_SignedTwipsMeasure }?,
1456   attribute w:tblpYSpec { s_ST_YAlign }?,
1457   attribute w:tblpY { w_ST_SignedTwipsMeasure }?
1458 w_CT_TblCellMar =
1459   element top { w_CT_TblWidth }?,
1460   element start { w_CT_TblWidth }?,
1461   element bottom { w_CT_TblWidth }?,
1462   element end { w_CT_TblWidth }?
1463 w_CT_TblBorders =
1464   element top { w_CT_Border }?,
1465   element start { w_CT_Border }?,
1466   element bottom { w_CT_Border }?,
1467   element end { w_CT_Border }?,
1468   element insideH { w_CT_Border }?,
1469   element insideV { w_CT_Border }?
1470 w_CT_TblPrBase =
1471   element tblStyle { w_CT_String }?,
1472   element tblpPr { w_CT_TblPPr }?,

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1473     element tblOverlap { w_CT_TblOverlap }?,
1474     element bidiVisual { w_CT_OnOff }?,
1475     element tblStyleRowBandSize { w_CT_DecimalNumber }?,
1476     element tblStyleColBandSize { w_CT_DecimalNumber }?,
1477     element tblW { w_CT_TblWidth }?,
1478     element jc { w_CT_JcTable }?,
1479     element tblCellSpacing { w_CT_TblWidth }?,
1480     element tblInd { w_CT_TblWidth }?,
1481     element tblBorders { w_CT_TblBorders }?,
1482     element shd { w_CT_Shd }?,
1483     element tblLayout { w_CT_TblLayoutType }?,
1484     element tblCellMar { w_CT_TblCellMar }?,
1485     element tblLook { w_CT_TblLook }?,
1486     element tblCaption { w_CT_String }?,
1487     element tblDescription { w_CT_String }?
1488 w_CT_TblPr =
1489     w_CT_TblPrBase,
1490     element tblPrChange { w_CT_TblPrChange }?
1491 w_CT_TblPrExBase =
1492     element tblW { w_CT_TblWidth }?,
1493     element jc { w_CT_JcTable }?,
1494     element tblCellSpacing { w_CT_TblWidth }?,
1495     element tblInd { w_CT_TblWidth }?,
1496     element tblBorders { w_CT_TblBorders }?,
1497     element shd { w_CT_Shd }?,
1498     element tblLayout { w_CT_TblLayoutType }?,
1499     element tblCellMar { w_CT_TblCellMar }?,
1500     element tblLook { w_CT_TblLook }?
1501 w_CT_TblPrEx =
1502     w_CT_TblPrExBase,
1503     element tblPrExChange { w_CT_TblPrExChange }?
1504 w_CT_Tbl =
1505     w_EG_RangeMarkupElements*,
1506     element tblPr { w_CT_TblPr },
1507     element tblGrid { w_CT_TblGrid },
1508     w_EG_ContentRowContent*
1509 w_CT_TblLook =
1510     attribute w:firstRow { s_ST_OnOff }?,
1511     attribute w:lastRow { s_ST_OnOff }?,
1512     attribute w:firstColumn { s_ST_OnOff }?,
1513     attribute w:lastColumn { s_ST_OnOff }?,
1514     attribute w:noHBand { s_ST_OnOff }?,
1515     attribute w:noVBand { s_ST_OnOff }?
1516 w_ST_FtnPos =
1517     string "pageBottom"
1518     | string "beneathText"
1519     | string "sectEnd"
1520     | string "docEnd"
1521 w_CT_FtnPos = attribute w:val { w_ST_FtnPos }
1522 w_ST_EdnPos = string "sectEnd" | string "docEnd"
1523 w_CT_EdnPos = attribute w:val { w_ST_EdnPos }
1524 w_CT_NumFmt =
1525     attribute w:val { w_ST_NumberFormat },

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1526     attribute w:format { s_ST_String }?
1527 w_ST_RestartNumber =
1528     string "continuous" | string "eachSect" | string "eachPage"
1529 w_CT_NumRestart = attribute w:val { w_ST_RestartNumber }
1530 w_CT_FtnEdnRef =
1531     attribute w:customMarkFollows { s_ST_OnOff }?,
1532     attribute w:id { w_ST_DecimalNumber }
1533 w_CT_FtnEdnSepRef = attribute w:id { w_ST_DecimalNumber }
1534 w_CT_FtnEdn =
1535     attribute w:type { w_ST_FtnEdn }?,
1536     attribute w:id { w_ST_DecimalNumber },
1537     w_EG_BlockLevelElts+
1538 w_EG_FtnEdnNumProps =
1539     element numStart { w_CT_DecimalNumber }?,
1540     element numRestart { w_CT_NumRestart }?
1541 w_CT_FtnProps =
1542     element pos { w_CT_FtnPos }?,
1543     element numFmt { w_CT_NumFmt }?,
1544     w_EG_FtnEdnNumProps?
1545 w_CT_EdnProps =
1546     element pos { w_CT_EdnPos }?,
1547     element numFmt { w_CT_NumFmt }?,
1548     w_EG_FtnEdnNumProps?
1549 w_CT_FtnDocProps =
1550     w_CT_FtnProps,
1551     element footnote { w_CT_FtnEdnSepRef }*
1552 w_CT_EdnDocProps =
1553     w_CT_EdnProps,
1554     element endnote { w_CT_FtnEdnSepRef }*
1555 w_CT_RecipientData =
1556     element active { w_CT_OnOff }?,
1557     element column { w_CT_DecimalNumber },
1558     element uniqueTag { w_CT_Base64Binary }
1559 w_CT_Base64Binary = attribute w:val { xsd:base64Binary }
1560 w_CT_Recipients = element recipientData { w_CT_RecipientData }+
1561 w_recipients = element recipients { w_CT_Recipients }
1562 w_CT_OdsoFieldMapData =
1563     element type { w_CT_MailMergeOdsoFMDFieldType }?,
1564     element name { w_CT_String }?,
1565     element mappedName { w_CT_String }?,
1566     element column { w_CT_DecimalNumber }?,
1567     element lid { w_CT_Lang }?,
1568     element dynamicAddress { w_CT_OnOff }?
1569 w_ST_MailMergeSourceType =
1570     string "database"
1571     | string "addressBook"
1572     | string "document1"
1573     | string "document2"
1574     | string "text"
1575     | string "email"
1576     | string "native"
1577     | string "legacy"
1578     | string "master"

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1579 w_CT_MailMergeSourceType = attribute w:val { w_ST_MailMergeSourceType }
1580 w_CT_Odso =
1581     element udl { w_CT_String }?,
1582     element table { w_CT_String }?,
1583     element src { w_CT_Rel }?,
1584     element colDelim { w_CT_DecimalNumber }?,
1585     element type { w_CT_MailMergeSourceType }?,
1586     element fHdr { w_CT_OnOff }?,
1587     element fieldMapData { w_CT_OdsoFieldMapData }*,
1588     element recipientData { w_CT_Rel }*
1589 w_CT_MailMerge =
1590     element mainDocumentType { w_CT_MailMergeDocType },
1591     element linkToQuery { w_CT_OnOff }?,
1592     element dataType { w_CT_MailMergeDataType },
1593     element connectString { w_CT_String }?,
1594     element query { w_CT_String }?,
1595     element dataSource { w_CT_Rel }?,
1596     element headerSource { w_CT_Rel }?,
1597     element doNotSuppressBlankLines { w_CT_OnOff }?,
1598     element destination { w_CT_MailMergeDest }?,
1599     element addressFieldName { w_CT_String }?,
1600     element mailSubject { w_CT_String }?,
1601     element mailAsAttachment { w_CT_OnOff }?,
1602     element viewMergedData { w_CT_OnOff }?,
1603     element activeRecord { w_CT_DecimalNumber }?,
1604     element checkErrors { w_CT_DecimalNumber }?,
1605     element odso { w_CT_Odso }?
1606 w_ST_TargetScreenSz =
1607     string "544x376"
1608     | string "640x480"
1609     | string "720x512"
1610     | string "800x600"
1611     | string "1024x768"
1612     | string "1152x882"
1613     | string "1152x900"
1614     | string "1280x1024"
1615     | string "1600x1200"
1616     | string "1800x1440"
1617     | string "1920x1200"
1618 w_CT_TargetScreenSz = attribute w:val { w_ST_TargetScreenSz }
1619 w_CT_Compat =
1620     element spaceForUL { w_CT_OnOff }?,
1621     element balanceSingleByteDoubleByteWidth { w_CT_OnOff }?,
1622     element doNotLeaveBackslashAlone { w_CT_OnOff }?,
1623     element ulTrailSpace { w_CT_OnOff }?,
1624     element doNotExpandShiftReturn { w_CT_OnOff }?,
1625     element adjustLineHeightInTable { w_CT_OnOff }?,
1626     element applyBreakingRules { w_CT_OnOff }?,
1627     element compatSetting { w_CT_CompatSetting }*
1628 w_CT_CompatSetting =
1629     attribute w:name { s_ST_String }?,
1630     attribute w:uri { s_ST_String }?,
1631     attribute w:val { s_ST_String }?

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1632 w_CT_DocVar =
1633     attribute w:name { s_ST_String },
1634     attribute w:val { s_ST_String }
1635 w_CT_DocVars = element docVar { w_CT_DocVar }*
1636 w_CT_DocRsids =
1637     element rsidRoot { w_CT_LongHexNumber }?,
1638     element rsid { w_CT_LongHexNumber }*
1639 w_ST_CharacterSpacing =
1640     string "doNotCompress"
1641     | string "compressPunctuation"
1642     | string "compressPunctuationAndJapaneseKana"
1643 w_CT_CharacterSpacing = attribute w:val { w_ST_CharacterSpacing }
1644 w_CT_SaveThroughXslt =
1645     r_id?,
1646     attribute w:solutionID { s_ST_String }?
1647 w_CT_RPrDefault = element rPr { w_CT_RPr }?
1648 w_CT_PPrDefault = element pPr { w_CT_PPrGeneral }?
1649 w_CT_DocDefaults =
1650     element rPrDefault { w_CT_RPrDefault }?,
1651     element pPrDefault { w_CT_PPrDefault }?
1652 w_ST_WmlColorSchemeIndex =
1653     string "dark1"
1654     | string "light1"
1655     | string "dark2"
1656     | string "light2"
1657     | string "accent1"
1658     | string "accent2"
1659     | string "accent3"
1660     | string "accent4"
1661     | string "accent5"
1662     | string "accent6"
1663     | string "hyperlink"
1664     | string "followedHyperlink"
1665 w_CT_ColorSchemeMapping =
1666     attribute w:bg1 { w_ST_WmlColorSchemeIndex }?,
1667     attribute w:t1 { w_ST_WmlColorSchemeIndex }?,
1668     attribute w:bg2 { w_ST_WmlColorSchemeIndex }?,
1669     attribute w:t2 { w_ST_WmlColorSchemeIndex }?,
1670     attribute w:accent1 { w_ST_WmlColorSchemeIndex }?,
1671     attribute w:accent2 { w_ST_WmlColorSchemeIndex }?,
1672     attribute w:accent3 { w_ST_WmlColorSchemeIndex }?,
1673     attribute w:accent4 { w_ST_WmlColorSchemeIndex }?,
1674     attribute w:accent5 { w_ST_WmlColorSchemeIndex }?,
1675     attribute w:accent6 { w_ST_WmlColorSchemeIndex }?,
1676     attribute w:hyperlink { w_ST_WmlColorSchemeIndex }?,
1677     attribute w:followedHyperlink { w_ST_WmlColorSchemeIndex }?
1678 w_CT_ReadingModeInkLockDown =
1679     attribute w:actualPg { s_ST_OnOff },
1680     attribute w:w { w_ST_PixelsMeasure },
1681     attribute w:h { w_ST_PixelsMeasure },
1682     attribute w:fontSz { w_ST_DecimalNumberOrPercent }
1683 w_CT_WriteProtection =
1684     attribute w:recommended { s_ST_OnOff }?,

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1685     w_AG_Password
1686 w_CT_Settings =
1687     element writeProtection { w_CT_WriteProtection }?,
1688     element view { w_CT_View }?,
1689     element zoom { w_CT_Zoom }?,
1690     element removePersonalInformation { w_CT_OnOff }?,
1691     element removeDateAndTime { w_CT_OnOff }?,
1692     element doNotDisplayPageBoundaries { w_CT_OnOff }?,
1693     element displayBackgroundShape { w_CT_OnOff }?,
1694     element printPostScriptOverText { w_CT_OnOff }?,
1695     element printFractionalCharacterWidth { w_CT_OnOff }?,
1696     element printFormsData { w_CT_OnOff }?,
1697     element embedTrueTypeFonts { w_CT_OnOff }?,
1698     element embedSystemFonts { w_CT_OnOff }?,
1699     element saveSubsetFonts { w_CT_OnOff }?,
1700     element saveFormsData { w_CT_OnOff }?,
1701     element mirrorMargins { w_CT_OnOff }?,
1702     element alignBordersAndEdges { w_CT_OnOff }?,
1703     element bordersDoNotSurroundHeader { w_CT_OnOff }?,
1704     element bordersDoNotSurroundFooter { w_CT_OnOff }?,
1705     element gutterAtTop { w_CT_OnOff }?,
1706     element hideSpellingErrors { w_CT_OnOff }?,
1707     element hideGrammaticalErrors { w_CT_OnOff }?,
1708     element activeWritingStyle { w_CT_WritingStyle }*,
1709     element proofState { w_CT_Proof }?,
1710     element formsDesign { w_CT_OnOff }?,
1711     element attachedTemplate { w_CT_Rel }?,
1712     element linkStyles { w_CT_OnOff }?,
1713     element stylePaneFormatFilter { w_CT_StylePaneFilter }?,
1714     element stylePaneSortMethod { w_CT_StyleSort }?,
1715     element documentType { w_CT_DocType }?,
1716     element mailMerge { w_CT_MailMerge }?,
1717     element revisionView { w_CT_TrackChangesView }?,
1718     element trackRevisions { w_CT_OnOff }?,
1719     element doNotTrackMoves { w_CT_OnOff }?,
1720     element doNotTrackFormatting { w_CT_OnOff }?,
1721     element documentProtection { w_CT_DocProtect }?,
1722     element autoFormatOverride { w_CT_OnOff }?,
1723     element styleLockTheme { w_CT_OnOff }?,
1724     element styleLockQFSet { w_CT_OnOff }?,
1725     element defaultTabStop { w_CT_TwipsMeasure }?,
1726     element autoHyphenation { w_CT_OnOff }?,
1727     element consecutiveHyphenLimit { w_CT_DecimalNumber }?,
1728     element hyphenationZone { w_CT_TwipsMeasure }?,
1729     element doNotHyphenateCaps { w_CT_OnOff }?,
1730     element showEnvelope { w_CT_OnOff }?,
1731     element summaryLength { w_CT_DecimalNumberOrPrecent }?,
1732     element clickAndTypeStyle { w_CT_String }?,
1733     element defaultTableStyle { w_CT_String }?,
1734     element evenAndOddHeaders { w_CT_OnOff }?,
1735     element bookFoldRevPrinting { w_CT_OnOff }?,
1736     element bookFoldPrinting { w_CT_OnOff }?,
1737     element bookFoldPrintingSheets { w_CT_DecimalNumber }?,

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1738 element drawingGridHorizontalSpacing { w_CT_TwipsMeasure }?,
1739 element drawingGridVerticalSpacing { w_CT_TwipsMeasure }?,
1740 element displayHorizontalDrawingGridEvery { w_CT_DecimalNumber }?,
1741 element displayVerticalDrawingGridEvery { w_CT_DecimalNumber }?,
1742 element doNotUseMarginsForDrawingGridOrigin { w_CT_OnOff }?,
1743 element drawingGridHorizontalOrigin { w_CT_TwipsMeasure }?,
1744 element drawingGridVerticalOrigin { w_CT_TwipsMeasure }?,
1745 element doNotShadeFormData { w_CT_OnOff }?,
1746 element noPunctuationKerning { w_CT_OnOff }?,
1747 element characterSpacingControl { w_CT_CharacterSpacing }?,
1748 element printTwoOnOne { w_CT_OnOff }?,
1749 element strictFirstAndLastChars { w_CT_OnOff }?,
1750 element noLineBreaksAfter { w_CT_Kinsoku }?,
1751 element noLineBreaksBefore { w_CT_Kinsoku }?,
1752 element savePreviewPicture { w_CT_OnOff }?,
1753 element doNotValidateAgainstSchema { w_CT_OnOff }?,
1754 element saveInvalidXml { w_CT_OnOff }?,
1755 element ignoreMixedContent { w_CT_OnOff }?,
1756 element alwaysShowPlaceholderText { w_CT_OnOff }?,
1757 element doNotDemarcateInvalidXml { w_CT_OnOff }?,
1758 element saveXmlDataOnly { w_CT_OnOff }?,
1759 element useXSLTWhenSaving { w_CT_OnOff }?,
1760 element saveThroughXslt { w_CT_SaveThroughXslt }?,
1761 element showXMLTags { w_CT_OnOff }?,
1762 element alwaysMergeEmptyNamespace { w_CT_OnOff }?,
1763 element updateFields { w_CT_OnOff }?,
1764 element footnotePr { w_CT_FtnDocProps }?,
1765 element endnotePr { w_CT_EdnDocProps }?,
1766 element compat { w_CT_Compat }?,
1767 element docVars { w_CT_DocVars }?,
1768 element rsids { w_CT_DocRsids }?,
1769 m_mathPr?,
1770 element attachedSchema { w_CT_String }*,
1771 element themeFontLang { w_CT_Language }?,
1772 element clrSchemeMapping { w_CT_ColorSchemeMapping }?,
1773 element doNotIncludeSubdocsInStats { w_CT_OnOff }?,
1774 element doNotAutoCompressPictures { w_CT_OnOff }?,
1775 element forceUpgrade { w_CT_Empty }?,
1776 element captions { w_CT_Captions }?,
1777 element readModeInkLockDown { w_CT_ReadingModeInkLockDown }?,
1778 element smartTagType { w_CT_SmartTagType }*,
1779 sl_schemaLibrary?,
1780 element doNotEmbedSmartTags { w_CT_OnOff }?,
1781 element decimalSymbol { w_CT_String }?,
1782 element listSeparator { w_CT_String }?
1783 w_CT_StyleSort = attribute w:val { w_ST_StyleSort }
1784 w_CT_StylePaneFilter =
1785   attribute w:allStyles { s_ST_OnOff }?,
1786   attribute w:customStyles { s_ST_OnOff }?,
1787   attribute w:latentStyles { s_ST_OnOff }?,
1788   attribute w:stylesInUse { s_ST_OnOff }?,
1789   attribute w:headingStyles { s_ST_OnOff }?,
1790   attribute w:numberingStyles { s_ST_OnOff }?,

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1791 attribute w:tableStyles { s_ST_OnOff }?,
1792 attribute w:directFormattingOnRuns { s_ST_OnOff }?,
1793 attribute w:directFormattingOnParagraphs { s_ST_OnOff }?,
1794 attribute w:directFormattingOnNumbering { s_ST_OnOff }?,
1795 attribute w:directFormattingOnTables { s_ST_OnOff }?,
1796 attribute w:clearFormatting { s_ST_OnOff }?,
1797 attribute w:top3HeadingStyles { s_ST_OnOff }?,
1798 attribute w:visibleStyles { s_ST_OnOff }?,
1799 attribute w:alternateStyleNames { s_ST_OnOff }?
1800 w_ST_StyleSort =
1801     string "name"
1802     | string "priority"
1803     | string "default"
1804     | string "font"
1805     | string "basedOn"
1806     | string "type"
1807 w_CT_WebSettings =
1808     element frameset { w_CT_Frameset }?,
1809     element divs { w_CT_Divs }?,
1810     element encoding { w_CT_String }?,
1811     element optimizeForBrowser { w_CT_OptimizeForBrowser }?,
1812     element allowPNG { w_CT_OnOff }?,
1813     element doNotRelyOnCSS { w_CT_OnOff }?,
1814     element doNotSaveAsSingleFile { w_CT_OnOff }?,
1815     element doNotOrganizeInFolder { w_CT_OnOff }?,
1816     element doNotUseLongFileNames { w_CT_OnOff }?,
1817     element pixelsPerInch { w_CT_DecimalNumber }?,
1818     element targetScreenSz { w_CT_TargetScreenSz }?,
1819     element saveSmartTagsAsXml { w_CT_OnOff }?
1820 w_ST_FrameScrollbar = string "on" | string "off" | string "auto"
1821 w_CT_FrameScrollbar = attribute w:val { w_ST_FrameScrollbar }
1822 w_CT_OptimizeForBrowser =
1823     w_CT_OnOff,
1824     attribute w:target { s_ST_String }?
1825 w_CT_Frame =
1826     element sz { w_CT_String }?,
1827     element name { w_CT_String }?,
1828     element title { w_CT_String }?,
1829     element longDesc { w_CT_Rel }?,
1830     element sourceFileName { w_CT_Rel }?,
1831     element marW { w_CT_PixelsMeasure }?,
1832     element marH { w_CT_PixelsMeasure }?,
1833     element scrollbar { w_CT_FrameScrollbar }?,
1834     element noResizeAllowed { w_CT_OnOff }?,
1835     element linkedToFile { w_CT_OnOff }?
1836 w_ST_FrameLayout = string "rows" | string "cols" | string "none"
1837 w_CT_FrameLayout = attribute w:val { w_ST_FrameLayout }
1838 w_CT_FramesetSplitbar =
1839     element w { w_CT_TwipsMeasure }?,
1840     element color { w_CT_Color }?,
1841     element noBorder { w_CT_OnOff }?,
1842     element flatBorders { w_CT_OnOff }?
1843 w_CT_Frameset =

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1844 element sz { w_CT_String }?,
1845 element framesetSplitbar { w_CT_FramesetSplitbar }?,
1846 element frameLayout { w_CT_FrameLayout }?,
1847 element title { w_CT_String }?,
1848 (element frameset { w_CT_Frameset }*
1849   | element frame { w_CT_Frame }*)*
1850 w_CT_NumPicBullet =
1851   attribute w:numPicBulletId { w_ST_DecimalNumber },
1852   (element drawing { w_CT_Drawing })
1853 w_ST_LevelSuffix = string "tab" | string "space" | string "nothing"
1854 w_CT_LevelSuffix = attribute w:val { w_ST_LevelSuffix }
1855 w_CT_LevelText =
1856   attribute w:val { s_ST_String }?,
1857   attribute w:null { s_ST_OnOff }?
1858 w_CT_Lvl =
1859   attribute w:ilvl { w_ST_DecimalNumber },
1860   attribute w:tplc { w_ST_LongHexNumber }?,
1861   attribute w:tentative { s_ST_OnOff }?,
1862   element start { w_CT_DecimalNumber }?,
1863   element numFmt { w_CT_NumFmt }?,
1864   element lvlRestart { w_CT_DecimalNumber }?,
1865   element pStyle { w_CT_String }?,
1866   element isLgl { w_CT_OnOff }?,
1867   element suff { w_CT_LevelSuffix }?,
1868   element lvlText { w_CT_LevelText }?,
1869   element lvlPicBulletId { w_CT_DecimalNumber }?,
1870   element lvlJc { w_CT_Jc }?,
1871   element pPr { w_CT_PPrGeneral }?,
1872   element rPr { w_CT_RPr }?
1873 w_ST_MultiLevelType =
1874   string "singleLevel" | string "multilevel" | string "hybridMultilevel"
1875 w_CT_MultiLevelType = attribute w:val { w_ST_MultiLevelType }
1876 w_CT_AbstractNum =
1877   attribute w:abstractNumId { w_ST_DecimalNumber },
1878   element nsid { w_CT_LongHexNumber }?,
1879   element multiLevelType { w_CT_MultiLevelType }?,
1880   element tpl { w_CT_LongHexNumber }?,
1881   element name { w_CT_String }?,
1882   element styleLink { w_CT_String }?,
1883   element numStyleLink { w_CT_String }?,
1884   element lvl { w_CT_Lvl }*
1885 w_CT_NumLvl =
1886   attribute w:ilvl { w_ST_DecimalNumber },
1887   element startOverride { w_CT_DecimalNumber }?,
1888   element lvl { w_CT_Lvl }?
1889 w_CT_Num =
1890   attribute w:numId { w_ST_DecimalNumber },
1891   element abstractNumId { w_CT_DecimalNumber },
1892   element lvlOverride { w_CT_NumLvl }*
1893 w_CT_Numbering =
1894   element numPicBullet { w_CT_NumPicBullet }*,
1895   element abstractNum { w_CT_AbstractNum }*,
1896   element num { w_CT_Num }*,

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1897     element numIdMacAtCleanup { w_CT_DecimalNumber }?
1898 w_ST_TblStyleOverrideType =
1899     string "wholeTable"
1900     | string "firstRow"
1901     | string "lastRow"
1902     | string "firstCol"
1903     | string "lastCol"
1904     | string "band1Vert"
1905     | string "band2Vert"
1906     | string "band1Horz"
1907     | string "band2Horz"
1908     | string "neCell"
1909     | string "nwCell"
1910     | string "seCell"
1911     | string "swCell"
1912 w_CT_TblStylePr =
1913     attribute w:type { w_ST_TblStyleOverrideType },
1914     element pPr { w_CT_PPrGeneral }?,
1915     element rPr { w_CT_RPr }?,
1916     element tblPr { w_CT_TblPrBase }?,
1917     element trPr { w_CT_TrPr }?,
1918     element tcPr { w_CT_TcPr }?
1919 w_ST_StyleType =
1920     string "paragraph"
1921     | string "character"
1922     | string "table"
1923     | string "numbering"
1924 w_CT_Style =
1925     attribute w:type { w_ST_StyleType }?,
1926     attribute w:styleId { s_ST_String }?,
1927     attribute w:default { s_ST_OnOff }?,
1928     attribute w:customStyle { s_ST_OnOff }?,
1929     element name { w_CT_String }?,
1930     element aliases { w_CT_String }?,
1931     element basedOn { w_CT_String }?,
1932     element next { w_CT_String }?,
1933     element link { w_CT_String }?,
1934     element autoRedefine { w_CT_OnOff }?,
1935     element hidden { w_CT_OnOff }?,
1936     element uiPriority { w_CT_DecimalNumber }?,
1937     element semiHidden { w_CT_OnOff }?,
1938     element unhideWhenUsed { w_CT_OnOff }?,
1939     element qFormat { w_CT_OnOff }?,
1940     element locked { w_CT_OnOff }?,
1941     element personal { w_CT_OnOff }?,
1942     element personalCompose { w_CT_OnOff }?,
1943     element personalReply { w_CT_OnOff }?,
1944     element rsid { w_CT_LongHexNumber }?,
1945     element pPr { w_CT_PPrGeneral }?,
1946     element rPr { w_CT_RPr }?,
1947     element tblPr { w_CT_TblPrBase }?,
1948     element trPr { w_CT_TrPr }?,
1949     element tcPr { w_CT_TcPr }?,

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1950     element tblStylePr { w_CT_TblStylePr }*
1951 w_CT_LsdException =
1952     attribute w:name { s_ST_String },
1953     attribute w:locked { s_ST_OnOff }?,
1954     attribute w:uiPriority { w_ST_DecimalNumber }?,
1955     attribute w:semiHidden { s_ST_OnOff }?,
1956     attribute w:unhideWhenUsed { s_ST_OnOff }?,
1957     attribute w:qFormat { s_ST_OnOff }?
1958 w_CT_LatentStyles =
1959     attribute w:defLockedState { s_ST_OnOff }?,
1960     attribute w:defUIPriority { w_ST_DecimalNumber }?,
1961     attribute w:defSemiHidden { s_ST_OnOff }?,
1962     attribute w:defUnhideWhenUsed { s_ST_OnOff }?,
1963     attribute w:defQFormat { s_ST_OnOff }?,
1964     attribute w:count { w_ST_DecimalNumber }?,
1965     element lsdException { w_CT_LsdException }*
1966 w_CT_Styles =
1967     element docDefaults { w_CT_DocDefaults }?,
1968     element latentStyles { w_CT_LatentStyles }?,
1969     element style { w_CT_Style }*
1970 w_CT_Panose = attribute w:val { s_ST_Panose }
1971 w_ST_FontFamily =
1972     string "decorative"
1973     | string "modern"
1974     | string "roman"
1975     | string "script"
1976     | string "swiss"
1977     | string "auto"
1978 w_CT_FontFamily = attribute w:val { w_ST_FontFamily }
1979 w_ST_Pitch = string "fixed" | string "variable" | string "default"
1980 w_CT_Pitch = attribute w:val { w_ST_Pitch }
1981 w_CT_FontSig =
1982     attribute w:usb0 { w_ST_LongHexNumber },
1983     attribute w:usb1 { w_ST_LongHexNumber },
1984     attribute w:usb2 { w_ST_LongHexNumber },
1985     attribute w:usb3 { w_ST_LongHexNumber },
1986     attribute w:csb0 { w_ST_LongHexNumber },
1987     attribute w:csb1 { w_ST_LongHexNumber }
1988 w_CT_FontRel =
1989     w_CT_Rel,
1990     attribute w:fontKey { s_ST_Guid }?,
1991     attribute w:subsetting { s_ST_OnOff }?
1992 w_CT_Font =
1993     attribute w:name { s_ST_String },
1994     element altName { w_CT_String }?,
1995     element panose1 { w_CT_Panose }?,
1996     element charset { w_CT_Charset }?,
1997     element family { w_CT_FontFamily }?,
1998     element notTrueType { w_CT_OnOff }?,
1999     element pitch { w_CT_Pitch }?,
2000     element sig { w_CT_FontSig }?,
2001     element embedRegular { w_CT_FontRel }?,
2002     element embedBold { w_CT_FontRel }?,

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2003     element embedItalic { w_CT_FontRel }?,
2004     element embedBoldItalic { w_CT_FontRel }?
2005 w_CT_FontsList = element font { w_CT_Font }*
2006 w_CT_DivBdr =
2007     element top { w_CT_Border }?,
2008     element left { w_CT_Border }?,
2009     element bottom { w_CT_Border }?,
2010     element right { w_CT_Border }?
2011 w_CT_Div =
2012     attribute w:id { w_ST_DecimalNumber },
2013     element blockQuote { w_CT_OnOff }?,
2014     element bodyDiv { w_CT_OnOff }?,
2015     element marLeft { w_CT_SignedTwipsMeasure },
2016     element marRight { w_CT_SignedTwipsMeasure },
2017     element marTop { w_CT_SignedTwipsMeasure },
2018     element marBottom { w_CT_SignedTwipsMeasure },
2019     element divBdr { w_CT_DivBdr }?,
2020     element divsChild { w_CT_Divs }*
2021 w_CT_Divs = element div { w_CT_Div }+
2022 w_EG_MathContent = m_oMathPara | m_oMath
2023 w_EG_BlockLevelChunkElts = w_EG_ContentBlockContent*
2024 w_EG_BlockLevelElts =
2025     w_EG_BlockLevelChunkElts*
2026     | element altChunk { w_CT_AltChunk }*
2027 w_EG_RunLevelElts =
2028     element proofErr { w_CT_ProofErr }?
2029     | element permStart { w_CT_PermStart }?
2030     | element permEnd { w_CT_Perm }?
2031     | w_EG_RangeMarkupElements*
2032     | element ins { w_CT_RunTrackChange }?
2033     | element del { w_CT_RunTrackChange }?
2034     | element moveFrom { w_CT_RunTrackChange }
2035     | element moveTo { w_CT_RunTrackChange }
2036     | w_EG_MathContent*
2037 w_CT_Body =
2038     w_EG_BlockLevelElts*,
2039     element sectPr { w_CT_SectPr }?
2040 w_CT_Comments = element comment { w_CT_Comment }*
2041 w_comments = element comments { w_CT_Comments }
2042 w_CT_Footnotes = element footnote { w_CT_FtnEdn }*
2043 w_footnotes = element footnotes { w_CT_Footnotes }
2044 w_CT_Endnotes = element endnote { w_CT_FtnEdn }*
2045 w_endnotes = element endnotes { w_CT_Endnotes }
2046 w_hdr = element hdr { w_CT_HdrFtr }
2047 w_ftr = element ftr { w_CT_HdrFtr }
2048 w_CT_SmartTagType =
2049     attribute w:namespaceuri { s_ST_String }?,
2050     attribute w:name { s_ST_String }?,
2051     attribute w:url { s_ST_String }?
2052 w_ST_ThemeColor =
2053     string "dark1"
2054     | string "light1"
2055     | string "dark2"

```

```

2056 | string "light2"
2057 | string "accent1"
2058 | string "accent2"
2059 | string "accent3"
2060 | string "accent4"
2061 | string "accent5"
2062 | string "accent6"
2063 | string "hyperlink"
2064 | string "followedHyperlink"
2065 | string "none"
2066 | string "background1"
2067 | string "text1"
2068 | string "background2"
2069 | string "text2"
2070 w_ST_DocPartBehavior = string "content" | string "p" | string "pg"
2071 w_CT_DocPartBehavior = attribute w:val { w_ST_DocPartBehavior }
2072 w_CT_DocPartBehaviors = element behavior { w_CT_DocPartBehavior }+
2073 w_ST_DocPartType =
2074     string "none"
2075     | string "normal"
2076     | string "autoExp"
2077     | string "toolbar"
2078     | string "speller"
2079     | string "formFld"
2080     | string "bbPlcHdr"
2081 w_CT_DocPartType = attribute w:val { w_ST_DocPartType }
2082 w_CT_DocPartTypes =
2083     attribute w:all { s_ST_OnOff }?,
2084     (element type { w_CT_DocPartType }+)
2085 w_ST_DocPartGallery =
2086     string "placeholder"
2087     | string "any"
2088     | string "default"
2089     | string "docParts"
2090     | string "coverPg"
2091     | string "eq"
2092     | string "ftrs"
2093     | string "hdrs"
2094     | string "pgNum"
2095     | string "tbls"
2096     | string "watermarks"
2097     | string "autoTxt"
2098     | string "txtBox"
2099     | string "pgNumT"
2100     | string "pgNumB"
2101     | string "pgNumMargins"
2102     | string "tblOfContents"
2103     | string "bib"
2104     | string "custQuickParts"
2105     | string "custCoverPg"
2106     | string "custEq"
2107     | string "custFtrs"
2108     | string "custHdrs"

```

```

2109 | string "custPgNum"
2110 | string "custTbls"
2111 | string "custWatermarks"
2112 | string "custAutoTxt"
2113 | string "custTxtBox"
2114 | string "custPgNumT"
2115 | string "custPgNumB"
2116 | string "custPgNumMargins"
2117 | string "custTblOfContents"
2118 | string "custBib"
2119 | string "custom1"
2120 | string "custom2"
2121 | string "custom3"
2122 | string "custom4"
2123 | string "custom5"
2124 w_CT_DocPartGallery = attribute w:val { w_ST_DocPartGallery }
2125 w_CT_DocPartCategory =
2126     element name { w_CT_String },
2127     element gallery { w_CT_DocPartGallery }
2128 w_CT_DocPartName =
2129     attribute w:val { s_ST_String },
2130     attribute w:decorated { s_ST_OnOff }?
2131 w_CT_DocPartPr =
2132     element name { w_CT_DocPartName }&
2133     element style { w_CT_String }?&
2134     element category { w_CT_DocPartCategory }?&
2135     element types { w_CT_DocPartTypes }?&
2136     element behaviors { w_CT_DocPartBehaviors }?&
2137     element description { w_CT_String }?&
2138     element guid { w_CT_Guid }?
2139 w_CT_DocPart =
2140     element docPartPr { w_CT_DocPartPr }?,
2141     element docPartBody { w_CT_Body }?
2142 w_CT_DocParts = element docPart { w_CT_DocPart }+
2143 w_settings = element settings { w_CT_Settings }
2144 w_webSettings = element webSettings { w_CT_WebSettings }
2145 w_fonts = element fonts { w_CT_FontsList }
2146 w_numbering = element numbering { w_CT_Numbering }
2147 w_styles = element styles { w_CT_Styles }
2148 w_ST_CaptionPos =
2149     string "above" | string "below" | string "left" | string "right"
2150 w_CT_Caption =
2151     attribute w:name { s_ST_String },
2152     attribute w:pos { w_ST_CaptionPos }?,
2153     attribute w:chapNum { s_ST_OnOff }?,
2154     attribute w:heading { w_ST_DecimalNumber }?,
2155     attribute w:noLabel { s_ST_OnOff }?,
2156     attribute w:numFmt { w_ST_NumberFormat }?,
2157     attribute w:sep { w_ST_ChapterSep }?
2158 w_CT_AutoCaption =
2159     attribute w:name { s_ST_String },
2160     attribute w:caption { s_ST_String }
2161 w_CT_AutoCaptions = element autoCaption { w_CT_AutoCaption }+

```



```

2162 w_CT_Captions =
2163     element caption { w_CT_Caption }+,
2164     element autoCaptions { w_CT_AutoCaptions }?
2165 w_CT_DocumentBase = element background { w_CT_Background }?
2166 w_CT_Document =
2167     w_CT_DocumentBase,
2168     element body { w_CT_Body }?,
2169     attribute w:conformance { s_ST_ConformanceClass }?
2170 w_CT_GlossaryDocument =
2171     w_CT_DocumentBase,
2172     element docParts { w_CT_DocParts }?
2173 w_document = element document { w_CT_Document }
2174 w_glossaryDocument = element glossaryDocument { w_CT_GlossaryDocument }

```

B.1.1 Part Schemas

B.1.1.1 Comments Part

This schema is available in the file WordprocessingML_Comments.rnc.

```

1  include "wml.rnc"
2  include "shared-relationshipReference.rnc"
3  include "dml-wordprocessingDrawing.rnc"
4  include "dml-main.rnc"
5  include "dml-diagram.rnc"
6  include "shared-commonSimpleTypes.rnc"
7  include "dml-lockedCanvas.rnc"
8  include "any.rnc"
9  include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 include "xml.rnc"
13 include "shared-customXmlSchemaProperties.rnc"
14 include "shared-math.rnc"
15 start = w_comments

```

B.1.1.2 Document Settings Part

This schema is available in the file WordprocessingML_Document_Settings.rnc.

```

1  include "wml.rnc"
2  include "shared-relationshipReference.rnc"
3  include "dml-wordprocessingDrawing.rnc"
4  include "dml-main.rnc"
5  include "dml-diagram.rnc"
6  include "shared-commonSimpleTypes.rnc"
7  include "dml-lockedCanvas.rnc"
8  include "any.rnc"
9  include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 include "xml.rnc"
13 include "shared-customXmlSchemaProperties.rnc"

```

```

14 include "shared-math.rnc"
15 start = w_settings

```

B.1.1.3 Endnotes Part

This schema is available in the file WordprocessingML_Endnotes.rnc.

```

1 include "wml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-wordprocessingDrawing.rnc"
4 include "dml-main.rnc"
5 include "dml-diagram.rnc"
6 include "shared-commonSimpleTypes.rnc"
7 include "dml-lockedCanvas.rnc"
8 include "any.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 include "xml.rnc"
13 include "shared-customXmlSchemaProperties.rnc"
14 include "shared-math.rnc"
15 start = w_endnotes

```

B.1.1.4 Font Table Part

This schema is available in the file WordprocessingML_Font_Table.rnc.

```

1 include "wml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-wordprocessingDrawing.rnc"
4 include "dml-main.rnc"
5 include "dml-diagram.rnc"
6 include "shared-commonSimpleTypes.rnc"
7 include "dml-lockedCanvas.rnc"
8 include "any.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 include "xml.rnc"
13 include "shared-customXmlSchemaProperties.rnc"
14 include "shared-math.rnc"
15 start = w_fonts

```

B.1.1.5 Footer Part

This schema is available in the file WordprocessingML_Footer.rnc.

```

1 include "wml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-wordprocessingDrawing.rnc"
4 include "dml-main.rnc"
5 include "dml-diagram.rnc"
6 include "shared-commonSimpleTypes.rnc"
7 include "dml-lockedCanvas.rnc"

```

```

8 include "any.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 include "xml.rnc"
13 include "shared-customXmlSchemaProperties.rnc"
14 include "shared-math.rnc"
15 start = w_ftr

```

B.1.1.6 Footnotes Part

This schema is available in the file WordprocessingML_Footnotes.rnc.

```

1 include "wml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-wordprocessingDrawing.rnc"
4 include "dml-main.rnc"
5 include "dml-diagram.rnc"
6 include "shared-commonSimpleTypes.rnc"
7 include "dml-lockedCanvas.rnc"
8 include "any.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 include "xml.rnc"
13 include "shared-customXmlSchemaProperties.rnc"
14 include "shared-math.rnc"
15 start = w_footnotes

```

B.1.1.7 Glossary Document Part

This schema is available in the file WordprocessingML_Glossary_Document.rnc.

```

1 include "wml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-wordprocessingDrawing.rnc"
4 include "dml-main.rnc"
5 include "dml-diagram.rnc"
6 include "shared-commonSimpleTypes.rnc"
7 include "dml-lockedCanvas.rnc"
8 include "any.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 include "xml.rnc"
13 include "shared-customXmlSchemaProperties.rnc"
14 include "shared-math.rnc"
15 start = w_glossaryDocument

```

B.1.1.8 Header Part

This schema is available in the file WordprocessingML_Header.rnc.

```

1 include "wml.rnc"

```

```

2 include "shared-relationshipReference.rnc"
3 include "dml-wordprocessingDrawing.rnc"
4 include "dml-main.rnc"
5 include "dml-diagram.rnc"
6 include "shared-commonSimpleTypes.rnc"
7 include "dml-lockedCanvas.rnc"
8 include "any.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 include "xml.rnc"
13 include "shared-customXmlSchemaProperties.rnc"
14 include "shared-math.rnc"
15 start = w_hdr

```

B.1.1.9 Mail Merge Recipient Data Part

This schema is available in the file WordprocessingML_Mail_Merge_Recipient_Data.rnc.

```

1 include "wml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-wordprocessingDrawing.rnc"
4 include "dml-main.rnc"
5 include "dml-diagram.rnc"
6 include "shared-commonSimpleTypes.rnc"
7 include "dml-lockedCanvas.rnc"
8 include "any.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 include "xml.rnc"
13 include "shared-customXmlSchemaProperties.rnc"
14 include "shared-math.rnc"
15 start = w_recipients

```

B.1.1.10 Main Document Part

This schema is available in the file WordprocessingML_Main_Document.rnc.

```

1 include "wml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-wordprocessingDrawing.rnc"
4 include "dml-main.rnc"
5 include "dml-diagram.rnc"
6 include "shared-commonSimpleTypes.rnc"
7 include "dml-lockedCanvas.rnc"
8 include "any.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 include "xml.rnc"
13 include "shared-customXmlSchemaProperties.rnc"
14 include "shared-math.rnc"
15 start = w_document

```

B.1.1.11 Numbering Definitions Part

This schema is available in the file WordprocessingML_Numbering_Definitions.rnc.

```

1 include "wml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-wordprocessingDrawing.rnc"
4 include "dml-main.rnc"
5 include "dml-diagram.rnc"
6 include "shared-commonSimpleTypes.rnc"
7 include "dml-lockedCanvas.rnc"
8 include "any.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 include "xml.rnc"
13 include "shared-customXmlSchemaProperties.rnc"
14 include "shared-math.rnc"
15 start = w_numbering

```

B.1.1.12 Style Definitions Part

This schema is available in the file WordprocessingML_Style_Definitions.rnc.

```

1 include "wml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-wordprocessingDrawing.rnc"
4 include "dml-main.rnc"
5 include "dml-diagram.rnc"
6 include "shared-commonSimpleTypes.rnc"
7 include "dml-lockedCanvas.rnc"
8 include "any.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 include "xml.rnc"
13 include "shared-customXmlSchemaProperties.rnc"
14 include "shared-math.rnc"
15 start = w_styles

```

B.1.1.13 Web Settings Part

This schema is available in the file WordprocessingML_Web_Settings.rnc.

```

1 include "wml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-wordprocessingDrawing.rnc"
4 include "dml-main.rnc"
5 include "dml-diagram.rnc"
6 include "shared-commonSimpleTypes.rnc"
7 include "dml-lockedCanvas.rnc"
8 include "any.rnc"
9 include "dml-chart.rnc"

```

```

10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 include "xml.rnc"
13 include "shared-customXmlSchemaProperties.rnc"
14 include "shared-math.rnc"
15 start = w_webSettings

```

B.2 SpreadsheetML

This schema is available in the file sml.rnc.

```

1 namespace o = "urn:schemas-microsoft-com:office:office"
2 namespace r =
3   "http://purl.oclc.org/ooxml/officeDocument/relationships"
4 namespace s =
5   "http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
6 default namespace sml =
7   "http://purl.oclc.org/ooxml/spreadsheetml/main"
8 namespace v = "urn:schemas-microsoft-com:vml"
9 namespace w10 = "urn:schemas-microsoft-com:office:word"
10 namespace x = "urn:schemas-microsoft-com:office:excel"
11 namespace xdr =
12   "http://purl.oclc.org/ooxml/drawingml/spreadsheetDrawing"
13
14 sml_CT_AutoFilter =
15   attribute ref { sml_ST_Ref }?,
16   element filterColumn { sml_CT_FilterColumn }*,
17   element sortState { sml_CT_SortState }?,
18   element extLst { sml_CT_ExtensionList }?
19 sml_CT_FilterColumn =
20   attribute colId { xsd:unsignedInt },
21
22   ## default value: false
23   attribute hiddenButton { xsd:boolean }?,
24
25   ## default value: true
26   attribute showButton { xsd:boolean }?,
27   (element filters { sml_CT_Filters }?
28     | element top10 { sml_CT_Top10 }?
29     | element customFilters { sml_CT_CustomFilters }?
30     | element dynamicFilter { sml_CT_DynamicFilter }?
31     | element colorFilter { sml_CT_ColorFilter }?
32     | element iconFilter { sml_CT_IconFilter }?
33     | element extLst { sml_CT_ExtensionList }?)?
34 sml_CT_Filters =
35
36   ## default value: false
37   attribute blank { xsd:boolean }?,
38
39   ## default value: none
40   attribute calendarType { s_ST_CalendarType }?,
41   element filter { sml_CT_Filter }*,
42   element dateGroupItem { sml_CT_DateGroupItem }*

```

```

43 sml_CT_Filter = attribute val { s_ST_Xstring }?
44 sml_CT_CustomFilters =
45
46   ## default value: false
47   attribute and { xsd:boolean }?,
48   element customFilter { sml_CT_CustomFilter }+
49 sml_CT_CustomFilter =
50
51   ## default value: equal
52   attribute operator { sml_ST_FilterOperator }?,
53   attribute val { s_ST_Xstring }?
54 sml_CT_Top10 =
55
56   ## default value: true
57   attribute top { xsd:boolean }?,
58
59   ## default value: false
60   attribute percent { xsd:boolean }?,
61   attribute val { xsd:double },
62   attribute filterVal { xsd:double }?
63 sml_CT_ColorFilter =
64   attribute dxId { sml_ST_DxId }?,
65
66   ## default value: true
67   attribute cellColor { xsd:boolean }?
68 sml_CT_IconFilter =
69   attribute iconSet { sml_ST_IconSetType },
70   attribute iconId { xsd:unsignedInt }?
71 sml_ST_FilterOperator =
72   string "equal"
73   | string "lessThan"
74   | string "lessThanOrEqual"
75   | string "notEqual"
76   | string "greaterThanOrEqual"
77   | string "greaterThan"
78 sml_CT_DynamicFilter =
79   attribute type { sml_ST_DynamicFilterType },
80   attribute val { xsd:double }?,
81   attribute valIso { xsd:dateTime }?,
82   attribute maxValIso { xsd:dateTime }?
83 sml_ST_DynamicFilterType =
84   string "null"
85   | string "aboveAverage"
86   | string "belowAverage"
87   | string "tomorrow"
88   | string "today"
89   | string "yesterday"
90   | string "nextWeek"
91   | string "thisWeek"
92   | string "lastWeek"
93   | string "nextMonth"
94   | string "thisMonth"
95   | string "lastMonth"

```

```

96 | string "nextQuarter"
97 | string "thisQuarter"
98 | string "lastQuarter"
99 | string "nextYear"
100 | string "thisYear"
101 | string "lastYear"
102 | string "yearToDate"
103 | string "Q1"
104 | string "Q2"
105 | string "Q3"
106 | string "Q4"
107 | string "M1"
108 | string "M2"
109 | string "M3"
110 | string "M4"
111 | string "M5"
112 | string "M6"
113 | string "M7"
114 | string "M8"
115 | string "M9"
116 | string "M10"
117 | string "M11"
118 | string "M12"
119 sml_ST_IconSetType =
120     string "3Arrows"
121     | string "3ArrowsGray"
122     | string "3Flags"
123     | string "3TrafficLights1"
124     | string "3TrafficLights2"
125     | string "3Signs"
126     | string "3Symbols"
127     | string "3Symbols2"
128     | string "4Arrows"
129     | string "4ArrowsGray"
130     | string "4RedToBlack"
131     | string "4Rating"
132     | string "4TrafficLights"
133     | string "5Arrows"
134     | string "5ArrowsGray"
135     | string "5Rating"
136     | string "5Quarters"
137 sml_CT_SortState =
138
139     ## default value: false
140     attribute columnSort { xsd:boolean }?,
141
142     ## default value: false
143     attribute caseSensitive { xsd:boolean }?,
144
145     ## default value: none
146     attribute sortMethod { sml_ST_SortMethod }?,
147     attribute ref { sml_ST_Ref },
148     element sortCondition { sml_CT_SortCondition }*,

```



```

149     element extlst { sml_CT_ExtensionList }?
150 sml_CT_SortCondition =
151
152     ## default value: false
153     attribute descending { xsd:boolean }?,
154
155     ## default value: value
156     attribute sortBy { sml_ST_SortBy }?,
157     attribute ref { sml_ST_Ref },
158     attribute customList { s_ST_Xstring }?,
159     attribute dxId { sml_ST_DxfId }?,
160
161     ## default value: 3Arrows
162     attribute iconSet { sml_ST_IconSetType }?,
163     attribute iconId { xsd:unsignedInt }?
164 sml_ST_SortBy =
165     string "value"
166     | string "cellColor"
167     | string "fontColor"
168     | string "icon"
169 sml_ST_SortMethod = string "stroke" | string "pinYin" | string "none"
170 sml_CT_DateGroupItem =
171     attribute year { xsd:unsignedShort },
172     attribute month { xsd:unsignedShort }?,
173     attribute day { xsd:unsignedShort }?,
174     attribute hour { xsd:unsignedShort }?,
175     attribute minute { xsd:unsignedShort }?,
176     attribute second { xsd:unsignedShort }?,
177     attribute dateTimeGrouping { sml_ST_DateTimeGrouping }
178 sml_ST_DateTimeGrouping =
179     string "year"
180     | string "month"
181     | string "day"
182     | string "hour"
183     | string "minute"
184     | string "second"
185 sml_ST_CellRef = xsd:string
186 sml_ST_Ref = xsd:string
187 sml_ST_RefA = xsd:string
188 sml_ST_Sqref = list { sml_ST_Ref* }
189 sml_ST_Formula = s_ST_Xstring
190 sml_ST_UnsignedIntHex = xsd:hexBinary { length = "4" }
191 sml_CT_XStringElement = attribute v { s_ST_Xstring }
192 sml_CT_Extension =
193     attribute uri { xsd:token }?,
194     sml_CT_Extension_any
195 sml_CT_Extension_any =
196     element * - (o:* | v:* | w10:* | x:*) {
197         anyAttribute*,
198         mixed { anyElement* }
199     }
200 sml_CT_ObjectAnchor =
201

```

```

202  ## default value: false
203  attribute moveWithCells { xsd:boolean }?,
204
205  ## default value: false
206  attribute sizeWithCells { xsd:boolean }?,
207  xdr_from,
208  xdr_to
209  sml_EG_ExtensionList = element ext { sml_CT_Extension }*
210  sml_CT_ExtensionList = sml_EG_ExtensionList?
211  sml_calcChain = element calcChain { sml_CT_CalcChain }
212  sml_CT_CalcChain =
213    element c { sml_CT_CalcCell }+,
214    element extList { sml_CT_ExtensionList }?
215  sml_CT_CalcCell =
216    attribute r { sml_ST_CellRef },
217
218  ## default value: 0
219  attribute i { xsd:int }?,
220
221  ## default value: false
222  attribute s { xsd:boolean }?,
223
224  ## default value: false
225  attribute l { xsd:boolean }?,
226
227  ## default value: false
228  attribute t { xsd:boolean }?,
229
230  ## default value: false
231  attribute a { xsd:boolean }?
232  sml_comments = element comments { sml_CT_Comments }
233  sml_CT_Comments =
234    element authors { sml_CT_Authors },
235    element commentList { sml_CT_CommentList },
236    element extList { sml_CT_ExtensionList }?
237  sml_CT_Authors = element author { s_ST_Xstring }*
238  sml_CT_CommentList = element comment { sml_CT_Comment }*
239  sml_CT_Comment =
240    attribute ref { sml_ST_Ref },
241    attribute authorId { xsd:unsignedInt },
242    attribute guid { s_ST_Guid }?,
243    attribute shapeId { xsd:unsignedInt }?,
244    element text { sml_CT_Rst },
245    element commentPr { sml_CT_CommentPr }?
246  sml_CT_CommentPr =
247
248  ## default value: true
249  attribute locked { xsd:boolean }?,
250
251  ## default value: true
252  attribute defaultSize { xsd:boolean }?,
253
254  ## default value: true

```

```

255 attribute print { xsd:boolean }?,
256
257 ## default value: false
258 attribute disabled { xsd:boolean }?,
259
260 ## default value: true
261 attribute autoFill { xsd:boolean }?,
262
263 ## default value: true
264 attribute autoLine { xsd:boolean }?,
265 attribute altText { s_ST_Xstring }?,
266
267 ## default value: left
268 attribute textHAlign { sml_ST_TextHAlign }?,
269
270 ## default value: top
271 attribute textVAlign { sml_ST_TextVAlign }?,
272
273 ## default value: true
274 attribute lockText { xsd:boolean }?,
275
276 ## default value: false
277 attribute justLastX { xsd:boolean }?,
278
279 ## default value: false
280 attribute autoScale { xsd:boolean }?,
281 element anchor { sml_CT_ObjectAnchor }
282 sml_ST_TextHAlign =
283   string "left"
284   | string "center"
285   | string "right"
286   | string "justify"
287   | string "distributed"
288 sml_ST_TextVAlign =
289   string "top"
290   | string "center"
291   | string "bottom"
292   | string "justify"
293   | string "distributed"
294 sml_MapInfo = element MapInfo { sml_CT_MapInfo }
295 sml_CT_MapInfo =
296   attribute SelectionNamespaces { xsd:string },
297   element Schema { sml_CT_Schema }+,
298   element Map { sml_CT_Map }+
299 sml_CT_Schema =
300   mixed {
301     attribute ID { xsd:string },
302     attribute SchemaRef { xsd:string }?,
303     attribute Namespace { xsd:string }?,
304     attribute SchemaLanguage { xsd:token }?,
305     sml_CT_Schema_any
306   }
307 sml_CT_Schema_any =

```

```

308     element * - (o:* | v:* | w10:* | x:*) {
309         anyAttribute*,
310         mixed { anyElement* }
311     }
312 sml_CT_Map =
313     attribute ID { xsd:unsignedInt },
314     attribute Name { xsd:string },
315     attribute RootElement { xsd:string },
316     attribute SchemaID { xsd:string },
317     attribute ShowImportExportValidationErrors { xsd:boolean },
318     attribute AutoFit { xsd:boolean },
319     attribute Append { xsd:boolean },
320     attribute PreserveSortAFLayout { xsd:boolean },
321     attribute PreserveFormat { xsd:boolean },
322     element DataBinding { sml_CT_DataBinding }?
323 sml_CT_DataBinding =
324     attribute DataBindingName { xsd:string }?,
325     attribute FileBinding { xsd:boolean }?,
326     attribute ConnectionID { xsd:unsignedInt }?,
327     attribute FileBindingName { xsd:string }?,
328     attribute DataBindingLoadMode { xsd:unsignedInt },
329     sml_CT_DataBinding_any
330 sml_CT_DataBinding_any =
331     element * - (o:* | v:* | w10:* | x:*) {
332         anyAttribute*,
333         mixed { anyElement* }
334     }
335 sml_connections = element connections { sml_CT_Connections }
336 sml_CT_Connections = element connection { sml_CT_Connection }+
337 sml_CT_Connection =
338     attribute id { xsd:unsignedInt },
339     attribute sourceFile { s_ST_Xstring }?,
340     attribute odcFile { s_ST_Xstring }?,
341
342     ## default value: false
343     attribute keepAlive { xsd:boolean }?,
344
345     ## default value: 0
346     attribute interval { xsd:unsignedInt }?,
347     attribute name { s_ST_Xstring }?,
348     attribute description { s_ST_Xstring }?,
349     attribute type { xsd:unsignedInt }?,
350
351     ## default value: 1
352     attribute reconnectionMethod { xsd:unsignedInt }?,
353     attribute refreshedVersion { xsd:unsignedByte },
354
355     ## default value: 0
356     attribute minRefreshableVersion { xsd:unsignedByte }?,
357
358     ## default value: false
359     attribute savePassword { xsd:boolean }?,
360

```

```

361  ## default value: false
362  attribute new { xsd:boolean }?,
363
364  ## default value: false
365  attribute deleted { xsd:boolean }?,
366
367  ## default value: false
368  attribute onlyUseConnectionFile { xsd:boolean }?,
369
370  ## default value: false
371  attribute background { xsd:boolean }?,
372
373  ## default value: false
374  attribute refreshOnLoad { xsd:boolean }?,
375
376  ## default value: false
377  attribute saveData { xsd:boolean }?,
378
379  ## default value: integrated
380  attribute credentials { sml_ST_CredMethod }?,
381  attribute singleSignOnId { s_ST_Xstring }?,
382  element dbPr { sml_CT_DbPr }?,
383  element olapPr { sml_CT_OlapPr }?,
384  element webPr { sml_CT_WebPr }?,
385  element textPr { sml_CT_TextPr }?,
386  element parameters { sml_CT_Parameters }?,
387  element extLst { sml_CT_ExtensionList }?
388  sml_ST_CredMethod =
389    string "integrated"
390    | string "none"
391    | string "stored"
392    | string "prompt"
393  sml_CT_DbPr =
394    attribute connection { s_ST_Xstring },
395    attribute command { s_ST_Xstring }?,
396    attribute serverCommand { s_ST_Xstring }?,
397
398  ## default value: 2
399  attribute commandType { xsd:unsignedInt }?
400  sml_CT_OlapPr =
401
402  ## default value: false
403  attribute local { xsd:boolean }?,
404  attribute localConnection { s_ST_Xstring }?,
405
406  ## default value: true
407  attribute localRefresh { xsd:boolean }?,
408
409  ## default value: false
410  attribute sendLocale { xsd:boolean }?,
411  attribute rowDrillCount { xsd:unsignedInt }?,
412
413  ## default value: true

```

```

414     attribute serverFill { xsd:boolean }?,
415
416     ## default value: true
417     attribute serverNumberFormat { xsd:boolean }?,
418
419     ## default value: true
420     attribute serverFont { xsd:boolean }?,
421
422     ## default value: true
423     attribute serverFontColor { xsd:boolean }?
424 sml_CT_WebPr =
425
426     ## default value: false
427     attribute xml { xsd:boolean }?,
428
429     ## default value: false
430     attribute sourceData { xsd:boolean }?,
431
432     ## default value: false
433     attribute parsePre { xsd:boolean }?,
434
435     ## default value: false
436     attribute consecutive { xsd:boolean }?,
437
438     ## default value: false
439     attribute firstRow { xsd:boolean }?,
440
441     ## default value: false
442     attribute xl97 { xsd:boolean }?,
443
444     ## default value: false
445     attribute textDates { xsd:boolean }?,
446
447     ## default value: false
448     attribute xl2000 { xsd:boolean }?,
449     attribute url { s_ST_Xstring }?,
450     attribute post { s_ST_Xstring }?,
451
452     ## default value: false
453     attribute htmlTables { xsd:boolean }?,
454
455     ## default value: none
456     attribute htmlFormat { sml_ST_HtmlFmt }?,
457     attribute editPage { s_ST_Xstring }?,
458     element tables { sml_CT_Tables }?
459 sml_ST_HtmlFmt = string "none" | string "rtf" | string "all"
460 sml_CT_Parameters =
461     attribute count { xsd:unsignedInt }?,
462     element parameter { sml_CT_Parameter }+
463 sml_CT_Parameter =
464     attribute name { s_ST_Xstring }?,
465
466     ## default value: 0

```

```

467 attribute sqlType { xsd:int }?,
468
469 ## default value: prompt
470 attribute parameterType { sml_ST_ParameterType }?,
471
472 ## default value: false
473 attribute refreshOnChange { xsd:boolean }?,
474 attribute prompt { s_ST_Xstring }?,
475 attribute boolean { xsd:boolean }?,
476 attribute double { xsd:double }?,
477 attribute integer { xsd:int }?,
478 attribute string { s_ST_Xstring }?,
479 attribute cell { s_ST_Xstring }?
480 sml_ST_ParameterType = string "prompt" | string "value" | string "cell"
481 sml_CT_Tables =
482     attribute count { xsd:unsignedInt }?,
483     (element m { sml_CT_TableMissing }
484       | element s { sml_CT_XStringElement }
485       | element x { sml_CT_Index })+
486 sml_CT_TableMissing = empty
487 sml_CT_TextPr =
488
489 ## default value: true
490 attribute prompt { xsd:boolean }?,
491
492 ## default value: win
493 attribute fileType { sml_ST_FileType }?,
494 attribute characterSet { xsd:string }?,
495
496 ## default value: 1
497 attribute firstRow { xsd:unsignedInt }?,
498 attribute sourceFile { s_ST_Xstring }?,
499
500 ## default value: true
501 attribute delimited { xsd:boolean }?,
502
503 ## default value: .
504 attribute decimal { s_ST_Xstring }?,
505
506 ## default value: ,
507 attribute thousands { s_ST_Xstring }?,
508
509 ## default value: true
510 attribute tab { xsd:boolean }?,
511
512 ## default value: false
513 attribute space { xsd:boolean }?,
514
515 ## default value: false
516 attribute comma { xsd:boolean }?,
517
518 ## default value: false
519 attribute semicolon { xsd:boolean }?,

```

```

520
521   ## default value: false
522   attribute consecutive { xsd:boolean }?,
523
524   ## default value: doubleQuote
525   attribute qualifier { sml_ST_Qualifier }?,
526   attribute delimiter { s_ST_Xstring }?,
527   element textFields { sml_CT_TextFields }?
528 sml_ST_FileType =
529     string "mac"
530     | string "win"
531     | string "dos"
532     | string "lin"
533     | string "other"
534 sml_ST_Qualifier =
535     string "doubleQuote" | string "singleQuote" | string "none"
536 sml_CT_TextFields =
537
538     ## default value: 1
539     attribute count { xsd:unsignedInt }?,
540     element textField { sml_CT_TextField }+
541 sml_CT_TextField =
542
543     ## default value: general
544     attribute type { sml_ST_ExternalConnectionType }?,
545
546     ## default value: 0
547     attribute position { xsd:unsignedInt }?
548 sml_ST_ExternalConnectionType =
549     string "general"
550     | string "text"
551     | string "MDY"
552     | string "DMY"
553     | string "YMD"
554     | string "MYD"
555     | string "DYM"
556     | string "YDM"
557     | string "skip"
558     | string "EMD"
559 sml_pivotCacheDefinition =
560     element pivotCacheDefinition { sml_CT_PivotCacheDefinition }
561 sml_pivotCacheRecords =
562     element pivotCacheRecords { sml_CT_PivotCacheRecords }
563 sml_pivotTableDefinition =
564     element pivotTableDefinition { sml_CT_pivotTableDefinition }
565 sml_CT_PivotCacheDefinition =
566     r_id?,
567
568     ## default value: false
569     attribute invalid { xsd:boolean }?,
570
571     ## default value: true
572     attribute saveData { xsd:boolean }?,

```



```

573
574 ## default value: false
575 attribute refreshOnLoad { xsd:boolean }?,
576
577 ## default value: false
578 attribute optimizeMemory { xsd:boolean }?,
579
580 ## default value: true
581 attribute enableRefresh { xsd:boolean }?,
582 attribute refreshedBy { s_ST_Xstring }?,
583 attribute refreshedDateIso { xsd:dateTime }?,
584
585 ## default value: false
586 attribute backgroundQuery { xsd:boolean }?,
587 attribute missingItemsLimit { xsd:unsignedInt }?,
588
589 ## default value: 0
590 attribute createdVersion { xsd:unsignedByte }?,
591
592 ## default value: 0
593 attribute refreshedVersion { xsd:unsignedByte }?,
594
595 ## default value: 0
596 attribute minRefreshableVersion { xsd:unsignedByte }?,
597 attribute recordCount { xsd:unsignedInt }?,
598
599 ## default value: false
600 attribute upgradeOnRefresh { xsd:boolean }?,
601
602 ## default value: false
603 attribute tupleCache { xsd:boolean }?,
604
605 ## default value: false
606 attribute supportSubquery { xsd:boolean }?,
607
608 ## default value: false
609 attribute supportAdvancedDrill { xsd:boolean }?,
610 element cacheSource { sml_CT_CacheSource },
611 element cacheFields { sml_CT_CacheFields },
612 element cacheHierarchies { sml_CT_CacheHierarchies },
613 element kpis { sml_CT_PCDKPIs },
614 element tupleCache { sml_CT_TupleCache },
615 element calculatedItems { sml_CT_CalculatedItems },
616 element calculatedMembers { sml_CT_CalculatedMembers },
617 element dimensions { sml_CT_Dimensions },
618 element measureGroups { sml_CT_MeasureGroups },
619 element maps { sml_CT_MeasureDimensionMaps },
620 element extLst { sml_CT_ExtensionList }?
621 sml_CT_CacheFields =
622   attribute count { xsd:unsignedInt }?,
623   element cacheField { sml_CT_CacheField }*
624 sml_CT_CacheField =
625   attribute name { s_ST_Xstring },

```

```

626 attribute caption { s_ST_Xstring }?,
627 attribute propertyName { s_ST_Xstring }?,
628
629 ## default value: false
630 attribute serverField { xsd:boolean }?,
631
632 ## default value: true
633 attribute uniqueList { xsd:boolean }?,
634 attribute numFmtId { sml_ST_NumFmtId }?,
635 attribute formula { s_ST_Xstring }?,
636
637 ## default value: 0
638 attribute sqlType { xsd:int }?,
639
640 ## default value: 0
641 attribute hierarchy { xsd:int }?,
642
643 ## default value: 0
644 attribute level { xsd:unsignedInt }?,
645
646 ## default value: true
647 attribute databaseField { xsd:boolean }?,
648 attribute mappingCount { xsd:unsignedInt }?,
649
650 ## default value: false
651 attribute memberPropertyField { xsd:boolean }?,
652 element sharedItems { sml_CT_SharedItems }?,
653 element fieldGroup { sml_CT_FieldGroup }?,
654 element mpMap { sml_CT_X }*,
655 element extLst { sml_CT_ExtensionList }?
656 sml_CT_CacheSource =
657     attribute type { sml_ST_SourceType },
658
659 ## default value: 0
660 attribute connectionId { xsd:unsignedInt }?,
661 (element worksheetSource { sml_CT_WorksheetSource }
662     | element consolidation { sml_CT_Consolidation }
663     | element extLst { sml_CT_ExtensionList }?)?
664 sml_ST_SourceType =
665     string "worksheet"
666     | string "external"
667     | string "consolidation"
668     | string "scenario"
669 sml_CT_WorksheetSource =
670     attribute ref { sml_ST_Ref }?,
671     attribute name { s_ST_Xstring }?,
672     attribute sheet { s_ST_Xstring }?,
673     r_id?
674 sml_CT_Consolidation =
675
676 ## default value: true
677 attribute autoPage { xsd:boolean }?,
678 element pages { sml_CT_Pages }?,

```

```

679     element rangeSets { sml_CT_RangeSets }
680 sml_CT_Pages =
681     attribute count { xsd:unsignedInt }?,
682     element page { sml_CT_PCDSPage }+
683 sml_CT_PCDSPage =
684     attribute count { xsd:unsignedInt }?,
685     element pageItem { sml_CT_PageItem }*
686 sml_CT_PageItem = attribute name { s_ST_Xstring }
687 sml_CT_RangeSets =
688     attribute count { xsd:unsignedInt }?,
689     element rangeSet { sml_CT_RangeSet }+
690 sml_CT_RangeSet =
691     attribute i1 { xsd:unsignedInt }?,
692     attribute i2 { xsd:unsignedInt }?,
693     attribute i3 { xsd:unsignedInt }?,
694     attribute i4 { xsd:unsignedInt }?,
695     attribute ref { sml_ST_Ref }?,
696     attribute name { s_ST_Xstring }?,
697     attribute sheet { s_ST_Xstring }?,
698     r_id?
699 sml_CT_SharedItems =
700
701     ## default value: true
702     attribute containsSemiMixedTypes { xsd:boolean }?,
703
704     ## default value: true
705     attribute containsNonDate { xsd:boolean }?,
706
707     ## default value: false
708     attribute containsDate { xsd:boolean }?,
709
710     ## default value: true
711     attribute containsString { xsd:boolean }?,
712
713     ## default value: false
714     attribute containsBlank { xsd:boolean }?,
715
716     ## default value: false
717     attribute containsMixedTypes { xsd:boolean }?,
718
719     ## default value: false
720     attribute containsNumber { xsd:boolean }?,
721
722     ## default value: false
723     attribute containsInteger { xsd:boolean }?,
724     attribute minValue { xsd:double }?,
725     attribute maxValue { xsd:double }?,
726     attribute minDate { xsd:dateTime }?,
727     attribute maxDate { xsd:dateTime }?,
728     attribute count { xsd:unsignedInt }?,
729
730     ## default value: false
731     attribute longText { xsd:boolean }?,

```

```

732 (element m { sml_CT_Missing }
733 | element n { sml_CT_Number }
734 | element b { sml_CT_Boolean }
735 | element e { sml_CT_Error }
736 | element s { sml_CT_String }
737 | element d { sml_CT_DateTime })*
738 sml_CT_Missing =
739   attribute u { xsd:boolean }?,
740   attribute f { xsd:boolean }?,
741   attribute c { s_ST_Xstring }?,
742   attribute cp { xsd:unsignedInt }?,
743   attribute in { xsd:unsignedInt }?,
744   attribute bc { sml_ST_UnsignedIntHex }?,
745   attribute fc { sml_ST_UnsignedIntHex }?,
746
747   ## default value: false
748   attribute i { xsd:boolean }?,
749
750   ## default value: false
751   attribute un { xsd:boolean }?,
752
753   ## default value: false
754   attribute st { xsd:boolean }?,
755
756   ## default value: false
757   attribute b { xsd:boolean }?,
758   element tpls { sml_CT_Tuples }*,
759   element x { sml_CT_X }*
760 sml_CT_Number =
761   attribute v { xsd:double },
762   attribute u { xsd:boolean }?,
763   attribute f { xsd:boolean }?,
764   attribute c { s_ST_Xstring }?,
765   attribute cp { xsd:unsignedInt }?,
766   attribute in { xsd:unsignedInt }?,
767   attribute bc { sml_ST_UnsignedIntHex }?,
768   attribute fc { sml_ST_UnsignedIntHex }?,
769
770   ## default value: false
771   attribute i { xsd:boolean }?,
772
773   ## default value: false
774   attribute un { xsd:boolean }?,
775
776   ## default value: false
777   attribute st { xsd:boolean }?,
778
779   ## default value: false
780   attribute b { xsd:boolean }?,
781   element tpls { sml_CT_Tuples }*,
782   element x { sml_CT_X }*
783 sml_CT_Boolean =
784   attribute v { xsd:boolean },

```

```

785     attribute u { xsd:boolean }?,
786     attribute f { xsd:boolean }?,
787     attribute c { s_ST_Xstring }?,
788     attribute cp { xsd:unsignedInt }?,
789     element x { sml_CT_X }*
790 sml_CT_Error =
791     attribute v { s_ST_Xstring },
792     attribute u { xsd:boolean }?,
793     attribute f { xsd:boolean }?,
794     attribute c { s_ST_Xstring }?,
795     attribute cp { xsd:unsignedInt }?,
796     attribute in { xsd:unsignedInt }?,
797     attribute bc { sml_ST_UnsignedIntHex }?,
798     attribute fc { sml_ST_UnsignedIntHex }?,
799
800     ## default value: false
801     attribute i { xsd:boolean }?,
802
803     ## default value: false
804     attribute un { xsd:boolean }?,
805
806     ## default value: false
807     attribute st { xsd:boolean }?,
808
809     ## default value: false
810     attribute b { xsd:boolean }?,
811     element tpls { sml_CT_Tuples }?,
812     element x { sml_CT_X }*
813 sml_CT_String =
814     attribute v { s_ST_Xstring },
815     attribute u { xsd:boolean }?,
816     attribute f { xsd:boolean }?,
817     attribute c { s_ST_Xstring }?,
818     attribute cp { xsd:unsignedInt }?,
819     attribute in { xsd:unsignedInt }?,
820     attribute bc { sml_ST_UnsignedIntHex }?,
821     attribute fc { sml_ST_UnsignedIntHex }?,
822
823     ## default value: false
824     attribute i { xsd:boolean }?,
825
826     ## default value: false
827     attribute un { xsd:boolean }?,
828
829     ## default value: false
830     attribute st { xsd:boolean }?,
831
832     ## default value: false
833     attribute b { xsd:boolean }?,
834     element tpls { sml_CT_Tuples }*,
835     element x { sml_CT_X }*
836 sml_CT_DateTime =
837     attribute v { xsd:dateTime },

```

```

838     attribute u { xsd:boolean }?,
839     attribute f { xsd:boolean }?,
840     attribute c { s_ST_Xstring }?,
841     attribute cp { xsd:unsignedInt }?,
842     element x { sml_CT_X }*
843 sml_CT_FieldGroup =
844     attribute par { xsd:unsignedInt }?,
845     attribute base { xsd:unsignedInt }?,
846     element rangePr { sml_CT_RangePr }?,
847     element discretePr { sml_CT_DiscretePr }?,
848     element groupItems { sml_CT_GroupItems }?
849 sml_CT_RangePr =
850
851     ## default value: true
852     attribute autoStart { xsd:boolean }?,
853
854     ## default value: true
855     attribute autoEnd { xsd:boolean }?,
856
857     ## default value: range
858     attribute groupBy { sml_ST_GroupBy }?,
859     attribute startNum { xsd:double }?,
860     attribute endNum { xsd:double }?,
861     attribute startDate { xsd:dateTime }?,
862     attribute endDate { xsd:dateTime }?,
863
864     ## default value: 1
865     attribute groupInterval { xsd:double }?
866 sml_ST_GroupBy =
867     string "range"
868     | string "seconds"
869     | string "minutes"
870     | string "hours"
871     | string "days"
872     | string "months"
873     | string "quarters"
874     | string "years"
875 sml_CT_DiscretePr =
876     attribute count { xsd:unsignedInt }?,
877     element x { sml_CT_Index }+
878 sml_CT_GroupItems =
879     attribute count { xsd:unsignedInt }?,
880     (element m { sml_CT_Missing }
881     | element n { sml_CT_Number }
882     | element b { sml_CT_Boolean }
883     | element e { sml_CT_Error }
884     | element s { sml_CT_String }
885     | element d { sml_CT_DateTime })+
886 sml_CT_PivotCacheRecords =
887     attribute count { xsd:unsignedInt }?,
888     element r { sml_CT_Record }*,
889     element extLst { sml_CT_ExtensionList }?
890 sml_CT_Record =

```

```

891 (element m { sml_CT_Missing }
892 | element n { sml_CT_Number }
893 | element b { sml_CT_Boolean }
894 | element e { sml_CT_Error }
895 | element s { sml_CT_String }
896 | element d { sml_CT_DateTime }
897 | element x { sml_CT_Index })+
898 sml_CT_PCDKPIs =
899   attribute count { xsd:unsignedInt }?,
900   element kpi { sml_CT_PCDKPI }*
901 sml_CT_PCDKPI =
902   attribute uniqueName { s_ST_Xstring },
903   attribute caption { s_ST_Xstring }?,
904   attribute displayFolder { s_ST_Xstring }?,
905   attribute measureGroup { s_ST_Xstring }?,
906   attribute parent { s_ST_Xstring }?,
907   attribute value { s_ST_Xstring },
908   attribute goal { s_ST_Xstring }?,
909   attribute status { s_ST_Xstring }?,
910   attribute trend { s_ST_Xstring }?,
911   attribute weight { s_ST_Xstring }?,
912   attribute time { s_ST_Xstring }?
913 sml_CT_CacheHierarchies =
914   attribute count { xsd:unsignedInt }?,
915   element cacheHierarchy { sml_CT_CacheHierarchy }*
916 sml_CT_CacheHierarchy =
917   attribute uniqueName { s_ST_Xstring },
918   attribute caption { s_ST_Xstring }?,
919
920   ## default value: false
921   attribute measure { xsd:boolean }?,
922
923   ## default value: false
924   attribute set { xsd:boolean }?,
925   attribute parentSet { xsd:unsignedInt }?,
926
927   ## default value: 0
928   attribute iconSet { xsd:int }?,
929
930   ## default value: false
931   attribute attribute { xsd:boolean }?,
932
933   ## default value: false
934   attribute time { xsd:boolean }?,
935
936   ## default value: false
937   attribute keyAttribute { xsd:boolean }?,
938   attribute defaultMemberUniqueName { s_ST_Xstring }?,
939   attribute allUniqueName { s_ST_Xstring }?,
940   attribute allCaption { s_ST_Xstring }?,
941   attribute dimensionUniqueName { s_ST_Xstring }?,
942   attribute displayFolder { s_ST_Xstring }?,
943   attribute measureGroup { s_ST_Xstring }?,

```

```

944
945   ## default value: false
946   attribute measures { xsd:boolean }?,
947   attribute count { xsd:unsignedInt },
948
949   ## default value: false
950   attribute oneField { xsd:boolean }?,
951   attribute memberValueDatatype { xsd:unsignedShort }?,
952   attribute unbalanced { xsd:boolean }?,
953   attribute unbalancedGroup { xsd:boolean }?,
954
955   ## default value: false
956   attribute hidden { xsd:boolean }?,
957   element fieldsUsage { sml_CT_FieldsUsage }?,
958   element groupLevels { sml_CT_GroupLevels }?,
959   element extLst { sml_CT_ExtensionList }?
960 sml_CT_FieldsUsage =
961   attribute count { xsd:unsignedInt }?,
962   element fieldUsage { sml_CT_FieldUsage }*
963 sml_CT_FieldUsage = attribute x { xsd:int }
964 sml_CT_GroupLevels =
965   attribute count { xsd:unsignedInt }?,
966   element groupLevel { sml_CT_GroupLevel }+
967 sml_CT_GroupLevel =
968   attribute uniqueName { s_ST_Xstring },
969   attribute caption { s_ST_Xstring },
970
971   ## default value: false
972   attribute user { xsd:boolean }?,
973
974   ## default value: false
975   attribute customRollUp { xsd:boolean }?,
976   element groups { sml_CT_Groups }?,
977   element extLst { sml_CT_ExtensionList }?
978 sml_CT_Groups =
979   attribute count { xsd:unsignedInt }?,
980   element group { sml_CT_LevelGroup }+
981 sml_CT_LevelGroup =
982   attribute name { s_ST_Xstring },
983   attribute uniqueName { s_ST_Xstring },
984   attribute caption { s_ST_Xstring },
985   attribute uniqueParent { s_ST_Xstring }?,
986   attribute id { xsd:int }?,
987   element groupMembers { sml_CT_GroupMembers }
988 sml_CT_GroupMembers =
989   attribute count { xsd:unsignedInt }?,
990   element groupMember { sml_CT_GroupMember }+
991 sml_CT_GroupMember =
992   attribute uniqueName { s_ST_Xstring },
993
994   ## default value: false
995   attribute group { xsd:boolean }?
996 sml_CT_TupleCache =

```



```

997     element entries { sml_CT_PCSDTCEntries }?,
998     element sets { sml_CT_Sets }?,
999     element queryCache { sml_CT_QueryCache }?,
1000     element serverFormats { sml_CT_ServerFormats }?,
1001     element extLst { sml_CT_ExtensionList }?
1002 sml_CT_ServerFormat =
1003     attribute culture { s_ST_Xstring }?,
1004     attribute format { s_ST_Xstring }?
1005 sml_CT_ServerFormats =
1006     attribute count { xsd:unsignedInt }?,
1007     element serverFormat { sml_CT_ServerFormat }*
1008 sml_CT_PCSDTCEntries =
1009     attribute count { xsd:unsignedInt }?,
1010     (element m { sml_CT_Missing }
1011      | element n { sml_CT_Number }
1012      | element e { sml_CT_Error }
1013      | element s { sml_CT_String })+
1014 sml_CT_Tuples =
1015     attribute c { xsd:unsignedInt }?,
1016     element tpl { sml_CT_Tuple }+
1017 sml_CT_Tuple =
1018     attribute fld { xsd:unsignedInt }?,
1019     attribute hier { xsd:unsignedInt }?,
1020     attribute item { xsd:unsignedInt }
1021 sml_CT_Sets =
1022     attribute count { xsd:unsignedInt }?,
1023     element set { sml_CT_Set }+
1024 sml_CT_Set =
1025     attribute count { xsd:unsignedInt }?,
1026     attribute maxRank { xsd:int },
1027     attribute setDefinition { s_ST_Xstring },
1028
1029     ## default value: none
1030     attribute sortType { sml_ST_SortType }?,
1031
1032     ## default value: false
1033     attribute queryFailed { xsd:boolean }?,
1034     element tpls { sml_CT_Tuples }*,
1035     element sortByTuple { sml_CT_Tuples }?
1036 sml_ST_SortType =
1037     string "none"
1038     | string "ascending"
1039     | string "descending"
1040     | string "ascendingAlpha"
1041     | string "descendingAlpha"
1042     | string "ascendingNatural"
1043     | string "descendingNatural"
1044 sml_CT_QueryCache =
1045     attribute count { xsd:unsignedInt }?,
1046     element query { sml_CT_Query }+
1047 sml_CT_Query =
1048     attribute mdx { s_ST_Xstring },
1049     element tpls { sml_CT_Tuples }?

```

```

1050 sml_CT_CalculatedItems =
1051     attribute count { xsd:unsignedInt }?,
1052     element calculatedItem { sml_CT_CalculatedItem }+
1053 sml_CT_CalculatedItem =
1054     attribute field { xsd:unsignedInt }?,
1055     attribute formula { s_ST_Xstring }?,
1056     element pivotArea { sml_CT_PivotArea },
1057     element extLst { sml_CT_ExtensionList }?
1058 sml_CT_CalculatedMembers =
1059     attribute count { xsd:unsignedInt }?,
1060     element calculatedMember { sml_CT_CalculatedMember }+
1061 sml_CT_CalculatedMember =
1062     attribute name { s_ST_Xstring },
1063     attribute mdx { s_ST_Xstring },
1064     attribute memberName { s_ST_Xstring }?,
1065     attribute hierarchy { s_ST_Xstring }?,
1066     attribute parent { s_ST_Xstring }?,
1067
1068     ## default value: 0
1069     attribute solveOrder { xsd:int }?,
1070
1071     ## default value: false
1072     attribute set { xsd:boolean }?,
1073     element extLst { sml_CT_ExtensionList }?
1074 sml_CT_pivotTableDefinition =
1075     attribute name { s_ST_Xstring },
1076     attribute cacheId { xsd:unsignedInt },
1077
1078     ## default value: false
1079     attribute dataOnRows { xsd:boolean }?,
1080     attribute dataPosition { xsd:unsignedInt }?,
1081     sml_AG_AutoFormat,
1082     attribute dataCaption { s_ST_Xstring },
1083     attribute grandTotalCaption { s_ST_Xstring }?,
1084     attribute errorCaption { s_ST_Xstring }?,
1085
1086     ## default value: false
1087     attribute showError { xsd:boolean }?,
1088     attribute missingCaption { s_ST_Xstring }?,
1089
1090     ## default value: true
1091     attribute showMissing { xsd:boolean }?,
1092     attribute pageStyle { s_ST_Xstring }?,
1093     attribute pivotTableStyle { s_ST_Xstring }?,
1094     attribute vacatedStyle { s_ST_Xstring }?,
1095     attribute tag { s_ST_Xstring }?,
1096
1097     ## default value: 0
1098     attribute updatedVersion { xsd:unsignedByte }?,
1099
1100     ## default value: 0
1101     attribute minRefreshableVersion { xsd:unsignedByte }?,
1102

```

```

1103 ## default value: false
1104 attribute asteriskTotals { xsd:boolean }?,
1105
1106 ## default value: true
1107 attribute showItems { xsd:boolean }?,
1108
1109 ## default value: false
1110 attribute editData { xsd:boolean }?,
1111
1112 ## default value: false
1113 attribute disableFieldList { xsd:boolean }?,
1114
1115 ## default value: true
1116 attribute showCalcMbrs { xsd:boolean }?,
1117
1118 ## default value: true
1119 attribute visualTotals { xsd:boolean }?,
1120
1121 ## default value: true
1122 attribute showMultipleLabel { xsd:boolean }?,
1123
1124 ## default value: true
1125 attribute showDataDropDown { xsd:boolean }?,
1126
1127 ## default value: true
1128 attribute showDrill { xsd:boolean }?,
1129
1130 ## default value: false
1131 attribute printDrill { xsd:boolean }?,
1132
1133 ## default value: true
1134 attribute showMemberPropertyTips { xsd:boolean }?,
1135
1136 ## default value: true
1137 attribute showDataTips { xsd:boolean }?,
1138
1139 ## default value: true
1140 attribute enableWizard { xsd:boolean }?,
1141
1142 ## default value: true
1143 attribute enableDrill { xsd:boolean }?,
1144
1145 ## default value: true
1146 attribute enableFieldProperties { xsd:boolean }?,
1147
1148 ## default value: true
1149 attribute preserveFormatting { xsd:boolean }?,
1150
1151 ## default value: false
1152 attribute useAutoFormatting { xsd:boolean }?,
1153
1154 ## default value: 0
1155 attribute pageWrap { xsd:unsignedInt }?,

```

```

1156
1157   ## default value: false
1158   attribute pageOverThenDown { xsd:boolean }?,
1159
1160   ## default value: false
1161   attribute subtotalHiddenItems { xsd:boolean }?,
1162
1163   ## default value: true
1164   attribute rowGrandTotals { xsd:boolean }?,
1165
1166   ## default value: true
1167   attribute colGrandTotals { xsd:boolean }?,
1168
1169   ## default value: false
1170   attribute fieldPrintTitles { xsd:boolean }?,
1171
1172   ## default value: false
1173   attribute itemPrintTitles { xsd:boolean }?,
1174
1175   ## default value: false
1176   attribute mergeItem { xsd:boolean }?,
1177
1178   ## default value: true
1179   attribute showDropZones { xsd:boolean }?,
1180
1181   ## default value: 0
1182   attribute createdVersion { xsd:unsignedByte }?,
1183
1184   ## default value: 1
1185   attribute indent { xsd:unsignedInt }?,
1186
1187   ## default value: false
1188   attribute showEmptyRow { xsd:boolean }?,
1189
1190   ## default value: false
1191   attribute showEmptyCol { xsd:boolean }?,
1192
1193   ## default value: true
1194   attribute showHeaders { xsd:boolean }?,
1195
1196   ## default value: true
1197   attribute compact { xsd:boolean }?,
1198
1199   ## default value: false
1200   attribute outline { xsd:boolean }?,
1201
1202   ## default value: false
1203   attribute outlineData { xsd:boolean }?,
1204
1205   ## default value: true
1206   attribute compactData { xsd:boolean }?,
1207
1208   ## default value: false

```

```

1209 attribute published { xsd:boolean }?,
1210
1211 ## default value: false
1212 attribute gridDropZones { xsd:boolean }?,
1213
1214 ## default value: true
1215 attribute immersive { xsd:boolean }?,
1216
1217 ## default value: true
1218 attribute multipleFieldFilters { xsd:boolean }?,
1219
1220 ## default value: 0
1221 attribute chartFormat { xsd:unsignedInt }?,
1222 attribute rowHeaderCaption { s_ST_Xstring }?,
1223 attribute colHeaderCaption { s_ST_Xstring }?,
1224
1225 ## default value: false
1226 attribute fieldListSortAscending { xsd:boolean }?,
1227
1228 ## default value: false
1229 attribute mdxSubqueries { xsd:boolean }?,
1230
1231 ## default value: true
1232 attribute customListSort { xsd:boolean }?,
1233 element location { sml_CT_Location },
1234 element pivotFields { sml_CT_PivotFields }?,
1235 element rowFields { sml_CT_RowFields }?,
1236 element rowItems { sml_CT_rowItems }?,
1237 element colFields { sml_CT_ColFields }?,
1238 element colItems { sml_CT_colItems }?,
1239 element pageFields { sml_CT_PageFields }?,
1240 element dataFields { sml_CT_DataFields }?,
1241 element formats { sml_CT_Formats }?,
1242 element conditionalFormats { sml_CT_ConditionalFormats }?,
1243 element chartFormats { sml_CT_ChartFormats }?,
1244 element pivotHierarchies { sml_CT_PivotHierarchies }?,
1245 element pivotTableStyleInfo { sml_CT_PivotTableStyle }?,
1246 element filters { sml_CT_PivotFilters }?,
1247 element rowHierarchiesUsage { sml_CT_RowHierarchiesUsage }?,
1248 element colHierarchiesUsage { sml_CT_ColHierarchiesUsage }?,
1249 element extLst { sml_CT_ExtensionList }?
1250 sml_CT_Location =
1251 attribute ref { sml_ST_Ref },
1252 attribute firstHeaderRow { xsd:unsignedInt },
1253 attribute firstDataRow { xsd:unsignedInt },
1254 attribute firstDataCol { xsd:unsignedInt },
1255
1256 ## default value: 0
1257 attribute rowPageCount { xsd:unsignedInt }?,
1258
1259 ## default value: 0
1260 attribute colPageCount { xsd:unsignedInt }?
1261 sml_CT_PivotFields =

```

```

1262     attribute count { xsd:unsignedInt }?,
1263     element pivotField { sml_CT_PivotField }+
1264 sml_CT_PivotField =
1265     attribute name { s_ST_Xstring }?,
1266     attribute axis { sml_ST_Axis }?,
1267
1268     ## default value: false
1269     attribute dataField { xsd:boolean }?,
1270     attribute subtotalCaption { s_ST_Xstring }?,
1271
1272     ## default value: true
1273     attribute showDropDowns { xsd:boolean }?,
1274
1275     ## default value: false
1276     attribute hiddenLevel { xsd:boolean }?,
1277     attribute uniqueMemberProperty { s_ST_Xstring }?,
1278
1279     ## default value: true
1280     attribute compact { xsd:boolean }?,
1281
1282     ## default value: false
1283     attribute allDrilled { xsd:boolean }?,
1284     attribute numFmtId { sml_ST_NumFmtId }?,
1285
1286     ## default value: true
1287     attribute outline { xsd:boolean }?,
1288
1289     ## default value: true
1290     attribute subtotalTop { xsd:boolean }?,
1291
1292     ## default value: true
1293     attribute dragToRow { xsd:boolean }?,
1294
1295     ## default value: true
1296     attribute dragToCol { xsd:boolean }?,
1297
1298     ## default value: false
1299     attribute multipleItemSelectionAllowed { xsd:boolean }?,
1300
1301     ## default value: true
1302     attribute dragToPage { xsd:boolean }?,
1303
1304     ## default value: true
1305     attribute dragToData { xsd:boolean }?,
1306
1307     ## default value: true
1308     attribute dragOff { xsd:boolean }?,
1309
1310     ## default value: true
1311     attribute showAll { xsd:boolean }?,
1312
1313     ## default value: false
1314     attribute insertBlankRow { xsd:boolean }?,

```

```

1315
1316 ## default value: false
1317 attribute serverField { xsd:boolean }?,
1318
1319 ## default value: false
1320 attribute insertPageBreak { xsd:boolean }?,
1321
1322 ## default value: false
1323 attribute autoShow { xsd:boolean }?,
1324
1325 ## default value: true
1326 attribute topAutoShow { xsd:boolean }?,
1327
1328 ## default value: false
1329 attribute hideNewItems { xsd:boolean }?,
1330
1331 ## default value: false
1332 attribute measureFilter { xsd:boolean }?,
1333
1334 ## default value: false
1335 attribute includeNewItemsInFilter { xsd:boolean }?,
1336
1337 ## default value: 10
1338 attribute itemPageCount { xsd:unsignedInt }?,
1339
1340 ## default value: manual
1341 attribute sortType { sml_ST_FieldSortType }?,
1342 attribute dataSourceSort { xsd:boolean }?,
1343
1344 ## default value: false
1345 attribute nonAutoSortDefault { xsd:boolean }?,
1346 attribute rankBy { xsd:unsignedInt }?,
1347
1348 ## default value: true
1349 attribute defaultSubtotal { xsd:boolean }?,
1350
1351 ## default value: false
1352 attribute sumSubtotal { xsd:boolean }?,
1353
1354 ## default value: false
1355 attribute countASubtotal { xsd:boolean }?,
1356
1357 ## default value: false
1358 attribute avgSubtotal { xsd:boolean }?,
1359
1360 ## default value: false
1361 attribute maxSubtotal { xsd:boolean }?,
1362
1363 ## default value: false
1364 attribute minSubtotal { xsd:boolean }?,
1365
1366 ## default value: false
1367 attribute productSubtotal { xsd:boolean }?,

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```

1368
1369   ## default value: false
1370   attribute countSubtotal { xsd:boolean }?,
1371
1372   ## default value: false
1373   attribute stdDevSubtotal { xsd:boolean }?,
1374
1375   ## default value: false
1376   attribute stdDevPSubtotal { xsd:boolean }?,
1377
1378   ## default value: false
1379   attribute varSubtotal { xsd:boolean }?,
1380
1381   ## default value: false
1382   attribute varPSubtotal { xsd:boolean }?,
1383
1384   ## default value: false
1385   attribute showPropCell { xsd:boolean }?,
1386
1387   ## default value: false
1388   attribute showPropTip { xsd:boolean }?,
1389
1390   ## default value: false
1391   attribute showPropAsCaption { xsd:boolean }?,
1392
1393   ## default value: false
1394   attribute defaultAttributeDrillState { xsd:boolean }?,
1395   element items { sml_CT_Items }?,
1396   element autoSortScope { sml_CT_AutoSortScope }?,
1397   element extLst { sml_CT_ExtensionList }?
1398 sml_CT_AutoSortScope = element pivotArea { sml_CT_PivotArea }
1399 sml_CT_Items =
1400   attribute count { xsd:unsignedInt }?,
1401   element item { sml_CT_Item }+
1402 sml_CT_Item =
1403   attribute n { s_ST_Xstring }?,
1404
1405   ## default value: data
1406   attribute t { sml_ST_ItemType }?,
1407
1408   ## default value: false
1409   attribute h { xsd:boolean }?,
1410
1411   ## default value: false
1412   attribute s { xsd:boolean }?,
1413
1414   ## default value: true
1415   attribute sd { xsd:boolean }?,
1416
1417   ## default value: false
1418   attribute f { xsd:boolean }?,
1419
1420   ## default value: false

```



```

1421     attribute m { xsd:boolean }?,
1422
1423     ## default value: false
1424     attribute c { xsd:boolean }?,
1425     attribute x { xsd:unsignedInt }?,
1426
1427     ## default value: false
1428     attribute d { xsd:boolean }?,
1429
1430     ## default value: true
1431     attribute e { xsd:boolean }?
1432 sml_CT_PageFields =
1433     attribute count { xsd:unsignedInt }?,
1434     element pageField { sml_CT_PageField }+
1435 sml_CT_PageField =
1436     attribute fld { xsd:int },
1437     attribute item { xsd:unsignedInt }?,
1438     attribute hier { xsd:int }?,
1439     attribute name { s_ST_Xstring }?,
1440     attribute cap { s_ST_Xstring }?,
1441     element extLst { sml_CT_ExtensionList }?
1442 sml_CT_DataFields =
1443     attribute count { xsd:unsignedInt }?,
1444     element dataField { sml_CT_DataField }+
1445 sml_CT_DataField =
1446     attribute name { s_ST_Xstring }?,
1447     attribute fld { xsd:unsignedInt },
1448
1449     ## default value: sum
1450     attribute subtotal { sml_ST_DataConsolidateFunction }?,
1451
1452     ## default value: normal
1453     attribute showDataAs { sml_ST_ShowDataAs }?,
1454
1455     ## default value: -1
1456     attribute baseField { xsd:int }?,
1457
1458     ## default value: 1048832
1459     attribute baseItem { xsd:unsignedInt }?,
1460     attribute numFmtId { sml_ST_NumFmtId }?,
1461     element extLst { sml_CT_ExtensionList }?
1462 sml_CT_rowItems =
1463     attribute count { xsd:unsignedInt }?,
1464     element i { sml_CT_I }+
1465 sml_CT_colItems =
1466     attribute count { xsd:unsignedInt }?,
1467     element i { sml_CT_I }+
1468 sml_CT_I =
1469
1470     ## default value: data
1471     attribute t { sml_ST_ItemType }?,
1472
1473     ## default value: 0

```

```

1474     attribute r { xsd:unsignedInt }?,
1475
1476     ## default value: 0
1477     attribute i { xsd:unsignedInt }?,
1478     element x { sml_CT_X }*
1479 sml_CT_X =
1480
1481     ## default value: 0
1482     attribute v { xsd:int }?
1483 sml_CT_RowFields =
1484
1485     ## default value: 0
1486     attribute count { xsd:unsignedInt }?,
1487     element field { sml_CT_Field }+
1488 sml_CT_ColFields =
1489
1490     ## default value: 0
1491     attribute count { xsd:unsignedInt }?,
1492     element field { sml_CT_Field }+
1493 sml_CT_Field = attribute x { xsd:int }
1494 sml_CT_Formats =
1495
1496     ## default value: 0
1497     attribute count { xsd:unsignedInt }?,
1498     element format { sml_CT_Format }+
1499 sml_CT_Format =
1500
1501     ## default value: formatting
1502     attribute action { sml_ST_FormatAction }?,
1503     attribute dxId { sml_ST_DxfId }?,
1504     element pivotArea { sml_CT_PivotArea },
1505     element extLst { sml_CT_ExtensionList }?
1506 sml_CT_ConditionalFormats =
1507
1508     ## default value: 0
1509     attribute count { xsd:unsignedInt }?,
1510     element conditionalFormat { sml_CT_ConditionalFormat }+
1511 sml_CT_ConditionalFormat =
1512
1513     ## default value: selection
1514     attribute scope { sml_ST_Scope }?,
1515
1516     ## default value: none
1517     attribute type { sml_ST_Type }?,
1518     attribute priority { xsd:unsignedInt },
1519     element pivotAreas { sml_CT_PivotAreas },
1520     element extLst { sml_CT_ExtensionList }?
1521 sml_CT_PivotAreas =
1522     attribute count { xsd:unsignedInt }?,
1523     element pivotArea { sml_CT_PivotArea }*
1524 sml_ST_Scope = string "selection" | string "data" | string "field"
1525 sml_ST_Type =
1526     string "none" | string "all" | string "row" | string "column"

```

```

1527 sml_CT_ChartFormats =
1528
1529     ## default value: 0
1530     attribute count { xsd:unsignedInt }?,
1531     element chartFormat { sml_CT_ChartFormat }+
1532 sml_CT_ChartFormat =
1533     attribute chart { xsd:unsignedInt },
1534     attribute format { xsd:unsignedInt },
1535
1536     ## default value: false
1537     attribute series { xsd:boolean }?,
1538     element pivotArea { sml_CT_PivotArea }
1539 sml_CT_PivotHierarchies =
1540     attribute count { xsd:unsignedInt }?,
1541     element pivotHierarchy { sml_CT_PivotHierarchy }+
1542 sml_CT_PivotHierarchy =
1543
1544     ## default value: false
1545     attribute outline { xsd:boolean }?,
1546
1547     ## default value: false
1548     attribute multipleItemSelectionAllowed { xsd:boolean }?,
1549
1550     ## default value: false
1551     attribute subtotalTop { xsd:boolean }?,
1552
1553     ## default value: true
1554     attribute showInFieldList { xsd:boolean }?,
1555
1556     ## default value: true
1557     attribute dragToRow { xsd:boolean }?,
1558
1559     ## default value: true
1560     attribute dragToCol { xsd:boolean }?,
1561
1562     ## default value: true
1563     attribute dragToPage { xsd:boolean }?,
1564
1565     ## default value: false
1566     attribute dragToData { xsd:boolean }?,
1567
1568     ## default value: true
1569     attribute dragOff { xsd:boolean }?,
1570
1571     ## default value: false
1572     attribute includeNewItemInFilter { xsd:boolean }?,
1573     attribute caption { s_ST_Xstring }?,
1574     element mps { sml_CT_MemberProperties }?,
1575     element members { sml_CT_Members }*,
1576     element extLst { sml_CT_ExtensionList }?
1577 sml_CT_RowHierarchiesUsage =
1578     attribute count { xsd:unsignedInt }?,
1579     element rowHierarchyUsage { sml_CT_HierarchyUsage }+

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```

1580 sml_CT_ColHierarchiesUsage =
1581     attribute count { xsd:unsignedInt }?,
1582     element colHierarchyUsage { sml_CT_HierarchyUsage }+
1583 sml_CT_HierarchyUsage = attribute hierarchyUsage { xsd:int }
1584 sml_CT_MemberProperties =
1585     attribute count { xsd:unsignedInt }?,
1586     element mp { sml_CT_MemberProperty }+
1587 sml_CT_MemberProperty =
1588     attribute name { s_ST_Xstring }?,
1589
1590     ## default value: false
1591     attribute showCell { xsd:boolean }?,
1592
1593     ## default value: false
1594     attribute showTip { xsd:boolean }?,
1595
1596     ## default value: false
1597     attribute showAsCaption { xsd:boolean }?,
1598     attribute nameLen { xsd:unsignedInt }?,
1599     attribute pPos { xsd:unsignedInt }?,
1600     attribute pLen { xsd:unsignedInt }?,
1601     attribute level { xsd:unsignedInt }?,
1602     attribute field { xsd:unsignedInt }
1603 sml_CT_Members =
1604     attribute count { xsd:unsignedInt }?,
1605     attribute level { xsd:unsignedInt }?,
1606     element member { sml_CT_Member }+
1607 sml_CT_Member = attribute name { s_ST_Xstring }
1608 sml_CT_Dimensions =
1609     attribute count { xsd:unsignedInt }?,
1610     element dimension { sml_CT_PivotDimension }*
1611 sml_CT_PivotDimension =
1612
1613     ## default value: false
1614     attribute measure { xsd:boolean }?,
1615     attribute name { s_ST_Xstring },
1616     attribute uniqueName { s_ST_Xstring },
1617     attribute caption { s_ST_Xstring }
1618 sml_CT_MeasureGroups =
1619     attribute count { xsd:unsignedInt }?,
1620     element measureGroup { sml_CT_MeasureGroup }*
1621 sml_CT_MeasureDimensionMaps =
1622     attribute count { xsd:unsignedInt }?,
1623     element map { sml_CT_MeasureDimensionMap }*
1624 sml_CT_MeasureGroup =
1625     attribute name { s_ST_Xstring },
1626     attribute caption { s_ST_Xstring }
1627 sml_CT_MeasureDimensionMap =
1628     attribute measureGroup { xsd:unsignedInt }?,
1629     attribute dimension { xsd:unsignedInt }?
1630 sml_CT_PivotTableStyle =
1631     attribute name { xsd:string }?,
1632     attribute showRowHeaders { xsd:boolean }?,

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1633     attribute showColHeaders { xsd:boolean }?,
1634     attribute showRowStripes { xsd:boolean }?,
1635     attribute showColStripes { xsd:boolean }?,
1636     attribute showLastColumn { xsd:boolean }?
1637 sml_CT_PivotFilters =
1638
1639     ## default value: 0
1640     attribute count { xsd:unsignedInt }?,
1641     element filter { sml_CT_PivotFilter }*
1642 sml_CT_PivotFilter =
1643     attribute fld { xsd:unsignedInt },
1644     attribute mpFld { xsd:unsignedInt }?,
1645     attribute type { sml_ST_PivotFilterType },
1646
1647     ## default value: 0
1648     attribute evalOrder { xsd:int }?,
1649     attribute id { xsd:unsignedInt },
1650     attribute iMeasureHier { xsd:unsignedInt }?,
1651     attribute iMeasureFld { xsd:unsignedInt }?,
1652     attribute name { s_ST_Xstring }?,
1653     attribute description { s_ST_Xstring }?,
1654     attribute stringValue1 { s_ST_Xstring }?,
1655     attribute stringValue2 { s_ST_Xstring }?,
1656     element autoFilter { sml_CT_AutoFilter },
1657     element extLst { sml_CT_ExtensionList }?
1658 sml_ST_ShowDataAs =
1659     string "normal"
1660     | string "difference"
1661     | string "percent"
1662     | string "percentDiff"
1663     | string "runTotal"
1664     | string "percentOfRow"
1665     | string "percentOfCol"
1666     | string "percentOfTotal"
1667     | string "index"
1668 sml_ST_ItemType =
1669     string "data"
1670     | string "default"
1671     | string "sum"
1672     | string "countA"
1673     | string "avg"
1674     | string "max"
1675     | string "min"
1676     | string "product"
1677     | string "count"
1678     | string "stdDev"
1679     | string "stdDevP"
1680     | string "var"
1681     | string "varP"
1682     | string "grand"
1683     | string "blank"
1684 sml_ST_FormatAction =
1685     string "blank"

```

```

1686 | string "formatting"
1687 | string "drill"
1688 | string "formula"
1689 sml_ST_FieldSortType =
1690     string "manual" | string "ascending" | string "descending"
1691 sml_ST_PivotFilterType =
1692     string "unknown"
1693     | string "count"
1694     | string "percent"
1695     | string "sum"
1696     | string "captionEqual"
1697     | string "captionNotEqual"
1698     | string "captionBeginsWith"
1699     | string "captionNotBeginsWith"
1700     | string "captionEndsWith"
1701     | string "captionNotEndsWith"
1702     | string "captionContains"
1703     | string "captionNotContains"
1704     | string "captionGreaterThan"
1705     | string "captionGreaterThanOrEqual"
1706     | string "captionLessThan"
1707     | string "captionLessThanOrEqual"
1708     | string "captionBetween"
1709     | string "captionNotBetween"
1710     | string "valueEqual"
1711     | string "valueNotEqual"
1712     | string "valueGreaterThan"
1713     | string "valueGreaterThanOrEqual"
1714     | string "valueLessThan"
1715     | string "valueLessThanOrEqual"
1716     | string "valueBetween"
1717     | string "valueNotBetween"
1718     | string "dateEqual"
1719     | string "dateNotEqual"
1720     | string "dateOlderThan"
1721     | string "dateOlderThanOrEqual"
1722     | string "dateNewerThan"
1723     | string "dateNewerThanOrEqual"
1724     | string "dateBetween"
1725     | string "dateNotBetween"
1726     | string "tomorrow"
1727     | string "today"
1728     | string "yesterday"
1729     | string "nextWeek"
1730     | string "thisWeek"
1731     | string "lastWeek"
1732     | string "nextMonth"
1733     | string "thisMonth"
1734     | string "lastMonth"
1735     | string "nextQuarter"
1736     | string "thisQuarter"
1737     | string "lastQuarter"
1738     | string "nextYear"

```

```

1739 | string "thisYear"
1740 | string "lastYear"
1741 | string "yearToDate"
1742 | string "Q1"
1743 | string "Q2"
1744 | string "Q3"
1745 | string "Q4"
1746 | string "M1"
1747 | string "M2"
1748 | string "M3"
1749 | string "M4"
1750 | string "M5"
1751 | string "M6"
1752 | string "M7"
1753 | string "M8"
1754 | string "M9"
1755 | string "M10"
1756 | string "M11"
1757 | string "M12"
1758 sml_CT_PivotArea =
1759     attribute field { xsd:int }?,
1760
1761     ## default value: normal
1762     attribute type { sml_ST_PivotAreaType }?,
1763
1764     ## default value: true
1765     attribute dataOnly { xsd:boolean }?,
1766
1767     ## default value: false
1768     attribute labelOnly { xsd:boolean }?,
1769
1770     ## default value: false
1771     attribute grandRow { xsd:boolean }?,
1772
1773     ## default value: false
1774     attribute grandCol { xsd:boolean }?,
1775
1776     ## default value: false
1777     attribute cacheIndex { xsd:boolean }?,
1778
1779     ## default value: true
1780     attribute outline { xsd:boolean }?,
1781     attribute offset { sml_ST_Ref }?,
1782
1783     ## default value: false
1784     attribute collapsedLevelsAreSubtotals { xsd:boolean }?,
1785     attribute axis { sml_ST_Axis }?,
1786     attribute fieldPosition { xsd:unsignedInt }?,
1787     element references { sml_CT_PivotAreaReferences }?,
1788     element extLst { sml_CT_ExtensionList }?
1789 sml_ST_PivotAreaType =
1790     string "none"
1791     | string "normal"

```

```

1792 | string "data"
1793 | string "all"
1794 | string "origin"
1795 | string "button"
1796 | string "topEnd"
1797 sml_CT_PivotAreaReferences =
1798     attribute count { xsd:unsignedInt }?,
1799     element reference { sml_CT_PivotAreaReference }+
1800 sml_CT_PivotAreaReference =
1801     attribute field { xsd:unsignedInt }?,
1802     attribute count { xsd:unsignedInt }?,
1803
1804     ## default value: true
1805     attribute selected { xsd:boolean }?,
1806
1807     ## default value: false
1808     attribute byPosition { xsd:boolean }?,
1809
1810     ## default value: false
1811     attribute relative { xsd:boolean }?,
1812
1813     ## default value: false
1814     attribute defaultSubtotal { xsd:boolean }?,
1815
1816     ## default value: false
1817     attribute sumSubtotal { xsd:boolean }?,
1818
1819     ## default value: false
1820     attribute countASubtotal { xsd:boolean }?,
1821
1822     ## default value: false
1823     attribute avgSubtotal { xsd:boolean }?,
1824
1825     ## default value: false
1826     attribute maxSubtotal { xsd:boolean }?,
1827
1828     ## default value: false
1829     attribute minSubtotal { xsd:boolean }?,
1830
1831     ## default value: false
1832     attribute productSubtotal { xsd:boolean }?,
1833
1834     ## default value: false
1835     attribute countSubtotal { xsd:boolean }?,
1836
1837     ## default value: false
1838     attribute stdDevSubtotal { xsd:boolean }?,
1839
1840     ## default value: false
1841     attribute stdDevPSubtotal { xsd:boolean }?,
1842
1843     ## default value: false
1844     attribute varSubtotal { xsd:boolean }?,

```



```

1845
1846   ## default value: false
1847   attribute varPSubtotal { xsd:boolean }?,
1848   element x { sml_CT_Index }*,
1849   element extLst { sml_CT_ExtensionList }?
1850 sml_CT_Index = attribute v { xsd:unsignedInt }
1851 sml_ST_Axis =
1852     string "axisRow"
1853     | string "axisCol"
1854     | string "axisPage"
1855     | string "axisValues"
1856 sml_queryTable = element queryTable { sml_CT_QueryTable }
1857 sml_CT_QueryTable =
1858     attribute name { s_ST_Xstring },
1859
1860   ## default value: true
1861   attribute headers { xsd:boolean }?,
1862
1863   ## default value: false
1864   attribute rowNumbers { xsd:boolean }?,
1865
1866   ## default value: false
1867   attribute disableRefresh { xsd:boolean }?,
1868
1869   ## default value: true
1870   attribute backgroundRefresh { xsd:boolean }?,
1871
1872   ## default value: false
1873   attribute firstBackgroundRefresh { xsd:boolean }?,
1874
1875   ## default value: false
1876   attribute refreshOnLoad { xsd:boolean }?,
1877
1878   ## default value: insertDelete
1879   attribute growShrinkType { sml_ST_GrowShrinkType }?,
1880
1881   ## default value: false
1882   attribute fillFormulas { xsd:boolean }?,
1883
1884   ## default value: false
1885   attribute removeDataOnSave { xsd:boolean }?,
1886
1887   ## default value: false
1888   attribute disableEdit { xsd:boolean }?,
1889
1890   ## default value: true
1891   attribute preserveFormatting { xsd:boolean }?,
1892
1893   ## default value: true
1894   attribute adjustColumnWidth { xsd:boolean }?,
1895
1896   ## default value: false
1897   attribute intermediate { xsd:boolean }?,

```

```

1898     attribute connectionId { xsd:unsignedInt },
1899     sml_AG_AutoFormat,
1900     element queryTableRefresh { sml_CT_QueryTableRefresh }?,
1901     element extLst { sml_CT_ExtensionList }?
1902 sml_CT_QueryTableRefresh =
1903
1904     ## default value: true
1905     attribute preserveSortFilterLayout { xsd:boolean }?,
1906
1907     ## default value: false
1908     attribute fieldIdWrapped { xsd:boolean }?,
1909
1910     ## default value: true
1911     attribute headersInLastRefresh { xsd:boolean }?,
1912
1913     ## default value: 0
1914     attribute minimumVersion { xsd:unsignedByte }?,
1915
1916     ## default value: 1
1917     attribute nextId { xsd:unsignedInt }?,
1918
1919     ## default value: 0
1920     attribute unboundColumnsLeft { xsd:unsignedInt }?,
1921
1922     ## default value: 0
1923     attribute unboundColumnsRight { xsd:unsignedInt }?,
1924     element queryTableFields { sml_CT_QueryTableFields },
1925     element queryTableDeletedFields { sml_CT_QueryTableDeletedFields }?,
1926     element sortState { sml_CT_SortState }?,
1927     element extLst { sml_CT_ExtensionList }?
1928 sml_CT_QueryTableDeletedFields =
1929     attribute count { xsd:unsignedInt }?,
1930     element deletedField { sml_CT_DeletedField }+
1931 sml_CT_DeletedField = attribute name { s_ST_Xstring }
1932 sml_CT_QueryTableFields =
1933
1934     ## default value: 0
1935     attribute count { xsd:unsignedInt }?,
1936     element queryTableField { sml_CT_QueryTableField }*
1937 sml_CT_QueryTableField =
1938     attribute id { xsd:unsignedInt },
1939     attribute name { s_ST_Xstring }?,
1940
1941     ## default value: true
1942     attribute dataBound { xsd:boolean }?,
1943
1944     ## default value: false
1945     attribute rowNumbers { xsd:boolean }?,
1946
1947     ## default value: false
1948     attribute fillFormulas { xsd:boolean }?,
1949
1950     ## default value: false

```

```

1951     attribute clipped { xsd:boolean }?,
1952
1953     ## default value: 0
1954     attribute tableColumnId { xsd:unsignedInt }?,
1955     element extLst { sml_CT_ExtensionList }?
1956 sml_ST_GrowShrinkType =
1957     string "insertDelete" | string "insertClear" | string "overwriteClear"
1958 sml_sst = element sst { sml_CT_Sst }
1959 sml_CT_Sst =
1960     attribute count { xsd:unsignedInt }?,
1961     attribute uniqueCount { xsd:unsignedInt }?,
1962     element si { sml_CT_Rst }*,
1963     element extLst { sml_CT_ExtensionList }?
1964 sml_ST_PhoneticType =
1965     string "halfwidthKatakana"
1966     | string "fullwidthKatakana"
1967     | string "Hiragana"
1968     | string "noConversion"
1969 sml_ST_PhoneticAlignment =
1970     string "noControl"
1971     | string "left"
1972     | string "center"
1973     | string "distributed"
1974 sml_CT_PhoneticRun =
1975     attribute sb { xsd:unsignedInt },
1976     attribute eb { xsd:unsignedInt },
1977     element t { s_ST_Xstring }
1978 sml_CT_RElt =
1979     element rPr { sml_CT_RPrElt }?,
1980     element t { s_ST_Xstring }
1981 sml_CT_RPrElt =
1982     (element rFont { sml_CT_FontName }?
1983     | element charset { sml_CT_IntProperty }?
1984     | element family { sml_CT_IntProperty }?
1985     | element b { sml_CT_BooleanProperty }?
1986     | element i { sml_CT_BooleanProperty }?
1987     | element strike { sml_CT_BooleanProperty }?
1988     | element outline { sml_CT_BooleanProperty }?
1989     | element shadow { sml_CT_BooleanProperty }?
1990     | element condense { sml_CT_BooleanProperty }?
1991     | element extend { sml_CT_BooleanProperty }?
1992     | element color { sml_CT_Color }?
1993     | element sz { sml_CT_FontSize }?
1994     | element u { sml_CT_UnderlineProperty }?
1995     | element vertAlign { sml_CT_VerticalAlignFontProperty }?
1996     | element scheme { sml_CT_FontScheme }?)+
1997 sml_CT_Rst =
1998     element t { s_ST_Xstring }?,
1999     element r { sml_CT_RElt }*,
2000     element rPh { sml_CT_PhoneticRun }*,
2001     element phoneticPr { sml_CT_PhoneticPr }?
2002 sml_CT_PhoneticPr =
2003     attribute fontId { sml_ST_FontId },

```

```

2004
2005     ## default value: fullwidthKatakana
2006     attribute type { sml_ST_PhoneticType }?,
2007
2008     ## default value: left
2009     attribute alignment { sml_ST_PhoneticAlignment }?
2010 sml_headers = element headers { sml_CT_RevisionHeaders }
2011 sml_revisions = element revisions { sml_CT_Revisions }
2012 sml_CT_RevisionHeaders =
2013     attribute guid { s_ST_Guid },
2014     attribute lastGuid { s_ST_Guid }?,
2015
2016     ## default value: true
2017     attribute shared { xsd:boolean }?,
2018
2019     ## default value: false
2020     attribute diskRevisions { xsd:boolean }?,
2021
2022     ## default value: true
2023     attribute history { xsd:boolean }?,
2024
2025     ## default value: true
2026     attribute trackRevisions { xsd:boolean }?,
2027
2028     ## default value: false
2029     attribute exclusive { xsd:boolean }?,
2030
2031     ## default value: 0
2032     attribute revisionId { xsd:unsignedInt }?,
2033
2034     ## default value: 1
2035     attribute version { xsd:int }?,
2036
2037     ## default value: true
2038     attribute keepChangeHistory { xsd:boolean }?,
2039
2040     ## default value: false
2041     attribute protected { xsd:boolean }?,
2042
2043     ## default value: 30
2044     attribute preserveHistory { xsd:unsignedInt }?,
2045     element header { sml_CT_RevisionHeader }+
2046 sml_CT_Revisions =
2047     (element rrc { sml_CT_RevisionRowColumn }*
2048     | element rm { sml_CT_RevisionMove }*
2049     | element rcv { sml_CT_RevisionCustomView }*
2050     | element rsnm { sml_CT_RevisionSheetRename }*
2051     | element ris { sml_CT_RevisionInsertSheet }*
2052     | element rcc { sml_CT_RevisionCellChange }*
2053     | element rfmt { sml_CT_RevisionFormatting }*
2054     | element raf { sml_CT_RevisionAutoFormatting }*
2055     | element rdn { sml_CT_RevisionDefinedName }*
2056     | element rcmt { sml_CT_RevisionComment }*)

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2057 | element rqt { sml_CT_RevisionQueryTableField }*
2058 | element rcft { sml_CT_RevisionConflict }*)+
2059 sml_AG_RevData =
2060   attribute rId { xsd:unsignedInt },
2061
2062   ## default value: false
2063   attribute ua { xsd:boolean }?,
2064
2065   ## default value: false
2066   attribute ra { xsd:boolean }?
2067 sml_CT_RevisionHeader =
2068   attribute guid { s_ST_Guid },
2069   attribute dateTime { xsd:dateTime },
2070   attribute maxSheetId { xsd:unsignedInt },
2071   attribute userName { s_ST_Xstring },
2072   r_id,
2073   attribute minRId { xsd:unsignedInt }?,
2074   attribute maxRId { xsd:unsignedInt }?,
2075   element sheetIdMap { sml_CT_SheetIdMap },
2076   element reviewedList { sml_CT_ReviewedRevisions }?,
2077   element extLst { sml_CT_ExtensionList }?
2078 sml_CT_SheetIdMap =
2079   attribute count { xsd:unsignedInt }?,
2080   element sheetId { sml_CT_SheetId }+
2081 sml_CT_SheetId = attribute val { xsd:unsignedInt }
2082 sml_CT_ReviewedRevisions =
2083   attribute count { xsd:unsignedInt }?,
2084   element reviewed { sml_CT_Reviewed }+
2085 sml_CT_Reviewed = attribute rId { xsd:unsignedInt }
2086 sml_CT_UndoInfo =
2087   attribute index { xsd:unsignedInt },
2088   attribute exp { sml_ST_FormulaExpression },
2089
2090   ## default value: false
2091   attribute ref3D { xsd:boolean }?,
2092
2093   ## default value: false
2094   attribute array { xsd:boolean }?,
2095
2096   ## default value: false
2097   attribute v { xsd:boolean }?,
2098
2099   ## default value: false
2100   attribute nf { xsd:boolean }?,
2101
2102   ## default value: false
2103   attribute cs { xsd:boolean }?,
2104   attribute dr { sml_ST_RefA },
2105   attribute dn { s_ST_Xstring }?,
2106   attribute r { sml_ST_CellRef }?,
2107   attribute sId { xsd:unsignedInt }?
2108 sml_CT_RevisionRowColumn =
2109   sml_AG_RevData,

```

```

2110     attribute sId { xsd:unsignedInt },
2111
2112     ## default value: false
2113     attribute eol { xsd:boolean }?,
2114     attribute ref { sml_ST_Ref },
2115     attribute action { sml_ST_rwColActionType },
2116
2117     ## default value: false
2118     attribute edge { xsd:boolean }?,
2119     (element undo { sml_CT_UndoInfo }*
2120      | element rcc { sml_CT_RevisionCellChange }*
2121      | element rfmt { sml_CT_RevisionFormatting }*)*
2122 sml_CT_RevisionMove =
2123     sml_AG_RevData,
2124     attribute sheetId { xsd:unsignedInt },
2125     attribute source { sml_ST_Ref },
2126     attribute destination { sml_ST_Ref },
2127
2128     ## default value: 0
2129     attribute sourceSheetId { xsd:unsignedInt }?,
2130     (element undo { sml_CT_UndoInfo }*
2131      | element rcc { sml_CT_RevisionCellChange }*
2132      | element rfmt { sml_CT_RevisionFormatting }*)*
2133 sml_CT_RevisionCustomView =
2134     attribute guid { s_ST_Guid },
2135     attribute action { sml_ST_RevisionAction }
2136 sml_CT_RevisionSheetRename =
2137     sml_AG_RevData,
2138     attribute sheetId { xsd:unsignedInt },
2139     attribute oldName { s_ST_Xstring },
2140     attribute newName { s_ST_Xstring },
2141     element extLst { sml_CT_ExtensionList }?
2142 sml_CT_RevisionInsertSheet =
2143     sml_AG_RevData,
2144     attribute sheetId { xsd:unsignedInt },
2145     attribute name { s_ST_Xstring },
2146     attribute sheetPosition { xsd:unsignedInt }
2147 sml_CT_RevisionCellChange =
2148     sml_AG_RevData,
2149     attribute sId { xsd:unsignedInt },
2150
2151     ## default value: false
2152     attribute odxf { xsd:boolean }?,
2153
2154     ## default value: false
2155     attribute xfdxf { xsd:boolean }?,
2156
2157     ## default value: false
2158     attribute s { xsd:boolean }?,
2159
2160     ## default value: false
2161     attribute dxf { xsd:boolean }?,
2162     attribute numFmtId { sml_ST_NumFmtId }?,

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```

2163
2164   ## default value: false
2165   attribute quotePrefix { xsd:boolean }?,
2166
2167   ## default value: false
2168   attribute oldQuotePrefix { xsd:boolean }?,
2169
2170   ## default value: false
2171   attribute ph { xsd:boolean }?,
2172
2173   ## default value: false
2174   attribute oldPh { xsd:boolean }?,
2175
2176   ## default value: false
2177   attribute endOfListFormulaUpdate { xsd:boolean }?,
2178   element oc { sml_CT_Cell }?,
2179   element nc { sml_CT_Cell },
2180   element odxf { sml_CT_Dxf }?,
2181   element ndxf { sml_CT_Dxf }?,
2182   element extLst { sml_CT_ExtensionList }?
2183 sml_CT_RevisionFormatting =
2184   attribute sheetId { xsd:unsignedInt },
2185
2186   ## default value: false
2187   attribute xfDxf { xsd:boolean }?,
2188
2189   ## default value: false
2190   attribute s { xsd:boolean }?,
2191   attribute sqref { sml_ST_Sqref },
2192   attribute start { xsd:unsignedInt }?,
2193   attribute length { xsd:unsignedInt }?,
2194   element dxf { sml_CT_Dxf }?,
2195   element extLst { sml_CT_ExtensionList }?
2196 sml_CT_RevisionAutoFormatting =
2197   attribute sheetId { xsd:unsignedInt },
2198   sml_AG_AutoFormat,
2199   attribute ref { sml_ST_Ref }
2200 sml_CT_RevisionComment =
2201   attribute sheetId { xsd:unsignedInt },
2202   attribute cell { sml_ST_CellRef },
2203   attribute guid { s_ST_Guid },
2204
2205   ## default value: add
2206   attribute action { sml_ST_RevisionAction }?,
2207
2208   ## default value: false
2209   attribute alwaysShow { xsd:boolean }?,
2210
2211   ## default value: false
2212   attribute old { xsd:boolean }?,
2213
2214   ## default value: false
2215   attribute hiddenRow { xsd:boolean }?,

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2216
2217   ## default value: false
2218   attribute hiddenColumn { xsd:boolean }?,
2219   attribute author { s_ST_Xstring },
2220
2221   ## default value: 0
2222   attribute oldLength { xsd:unsignedInt }?,
2223
2224   ## default value: 0
2225   attribute newLength { xsd:unsignedInt }?
2226 sml_CT_RevisionDefinedName =
2227   sml_AG_RevData,
2228   attribute localSheetId { xsd:unsignedInt }?,
2229
2230   ## default value: false
2231   attribute customView { xsd:boolean }?,
2232   attribute name { s_ST_Xstring },
2233
2234   ## default value: false
2235   attribute function { xsd:boolean }?,
2236
2237   ## default value: false
2238   attribute oldFunction { xsd:boolean }?,
2239   attribute functionGroupId { xsd:unsignedByte }?,
2240   attribute oldFunctionGroupId { xsd:unsignedByte }?,
2241   attribute shortcutKey { xsd:unsignedByte }?,
2242   attribute oldShortcutKey { xsd:unsignedByte }?,
2243
2244   ## default value: false
2245   attribute hidden { xsd:boolean }?,
2246
2247   ## default value: false
2248   attribute oldHidden { xsd:boolean }?,
2249   attribute customMenu { s_ST_Xstring }?,
2250   attribute oldCustomMenu { s_ST_Xstring }?,
2251   attribute description { s_ST_Xstring }?,
2252   attribute oldDescription { s_ST_Xstring }?,
2253   attribute help { s_ST_Xstring }?,
2254   attribute oldHelp { s_ST_Xstring }?,
2255   attribute statusBar { s_ST_Xstring }?,
2256   attribute oldStatusBar { s_ST_Xstring }?,
2257   attribute comment { s_ST_Xstring }?,
2258   attribute oldComment { s_ST_Xstring }?,
2259   element formula { sml_ST_Formula }?,
2260   element oldFormula { sml_ST_Formula }?,
2261   element extLst { sml_CT_ExtensionList }?
2262 sml_CT_RevisionConflict =
2263   sml_AG_RevData,
2264   attribute sheetId { xsd:unsignedInt }?
2265 sml_CT_RevisionQueryTableField =
2266   attribute sheetId { xsd:unsignedInt },
2267   attribute ref { sml_ST_Ref },
2268   attribute fieldId { xsd:unsignedInt }

```



```

2269 sml_ST_rwColActionType =
2270     string "insertRow"
2271     | string "deleteRow"
2272     | string "insertCol"
2273     | string "deleteCol"
2274 sml_ST_RevisionAction = string "add" | string "delete"
2275 sml_ST_FormulaExpression =
2276     string "ref"
2277     | string "refError"
2278     | string "area"
2279     | string "areaError"
2280     | string "computedArea"
2281 sml_users = element users { sml_CT_Users }
2282 sml_CT_Users =
2283     attribute count { xsd:unsignedInt }?,
2284     element userInfo { sml_CT_SharedUser }*
2285 sml_CT_SharedUser =
2286     attribute guid { s_ST_Guid },
2287     attribute name { s_ST_Xstring },
2288     attribute id { xsd:int },
2289     attribute dateTime { xsd:dateTime },
2290     element extLst { sml_CT_ExtensionList }?
2291 sml_worksheet = element worksheet { sml_CT_Worksheet }
2292 sml_chartsheet = element chartsheet { sml_CT_Chartsheet }
2293 sml_dialogsheet = element dialogsheet { sml_CT_Dialogsheet }
2294 sml_CT_Macrosheet =
2295     element sheetPr { sml_CT_SheetPr }?,
2296     element dimension { sml_CT_SheetDimension }?,
2297     element sheetViews { sml_CT_SheetViews }?,
2298     element sheetFormatPr { sml_CT_SheetFormatPr }?,
2299     element cols { sml_CT_Cols }*,
2300     element sheetData { sml_CT_SheetData },
2301     element sheetProtection { sml_CT_SheetProtection }?,
2302     element autoFilter { sml_CT_AutoFilter }?,
2303     element sortState { sml_CT_SortState }?,
2304     element dataConsolidate { sml_CT_DataConsolidate }?,
2305     element customSheetViews { sml_CT_CustomSheetViews }?,
2306     element phoneticPr { sml_CT_PhoneticPr }?,
2307     element conditionalFormatting { sml_CT_ConditionalFormatting }*,
2308     element printOptions { sml_CT_PrintOptions }?,
2309     element pageMargins { sml_CT_PageMargins }?,
2310     element pageSetup { sml_CT_PageSetup }?,
2311     element headerFooter { sml_CT_HeaderFooter }?,
2312     element rowBreaks { sml_CT_PageBreak }?,
2313     element colBreaks { sml_CT_PageBreak }?,
2314     element customProperties { sml_CT_CustomProperties }?,
2315     element drawing { sml_CT_Drawing }?,
2316     element drawingHF { sml_CT_DrawingHF }?,
2317     element picture { sml_CT_SheetBackgroundPicture }?,
2318     element oleObjects { sml_CT_OleObjects }?,
2319     element extLst { sml_CT_ExtensionList }?
2320 sml_CT_Dialogsheet =
2321     element sheetPr { sml_CT_SheetPr }?,

```

```

2322     element sheetViews { sml_CT_SheetViews }?,
2323     element sheetFormatPr { sml_CT_SheetFormatPr }?,
2324     element sheetProtection { sml_CT_SheetProtection }?,
2325     element customSheetViews { sml_CT_CustomSheetViews }?,
2326     element printOptions { sml_CT_PrintOptions }?,
2327     element pageMargins { sml_CT_PageMargins }?,
2328     element pageSetup { sml_CT_PageSetup }?,
2329     element headerFooter { sml_CT_HeaderFooter }?,
2330     element drawing { sml_CT_Drawing }?,
2331     element drawingHF { sml_CT_DrawingHF }?,
2332     element oleObjects { sml_CT_OleObjects }?,
2333     element controls { sml_CT_Controls }?,
2334     element extLst { sml_CT_ExtensionList }?
2335 sml_CT_Worksheet =
2336     element sheetPr { sml_CT_SheetPr }?,
2337     element dimension { sml_CT_SheetDimension }?,
2338     element sheetViews { sml_CT_SheetViews }?,
2339     element sheetFormatPr { sml_CT_SheetFormatPr }?,
2340     element cols { sml_CT_Cols }*,
2341     element sheetData { sml_CT_SheetData },
2342     element sheetCalcPr { sml_CT_SheetCalcPr }?,
2343     element sheetProtection { sml_CT_SheetProtection }?,
2344     element protectedRanges { sml_CT_ProtectedRanges }?,
2345     element scenarios { sml_CT_Scenarios }?,
2346     element autoFilter { sml_CT_AutoFilter }?,
2347     element sortState { sml_CT_SortState }?,
2348     element dataConsolidate { sml_CT_DataConsolidate }?,
2349     element customSheetViews { sml_CT_CustomSheetViews }?,
2350     element mergeCells { sml_CT_MergeCells }?,
2351     element phoneticPr { sml_CT_PhoneticPr }?,
2352     element conditionalFormatting { sml_CT_ConditionalFormatting }*,
2353     element dataValidations { sml_CT_DataValidations }?,
2354     element hyperlinks { sml_CT_Hyperlinks }?,
2355     element printOptions { sml_CT_PrintOptions }?,
2356     element pageMargins { sml_CT_PageMargins }?,
2357     element pageSetup { sml_CT_PageSetup }?,
2358     element headerFooter { sml_CT_HeaderFooter }?,
2359     element rowBreaks { sml_CT_PageBreak }?,
2360     element colBreaks { sml_CT_PageBreak }?,
2361     element customProperties { sml_CT_CustomProperties }?,
2362     element cellWatches { sml_CT_CellWatches }?,
2363     element ignoredErrors { sml_CT_IgnoredErrors }?,
2364     element smartTags { sml_CT_SmartTags }?,
2365     element drawing { sml_CT_Drawing }?,
2366     element drawingHF { sml_CT_DrawingHF }?,
2367     element picture { sml_CT_SheetBackgroundPicture }?,
2368     element oleObjects { sml_CT_OleObjects }?,
2369     element controls { sml_CT_Controls }?,
2370     element webPublishItems { sml_CT_WebPublishItems }?,
2371     element tableParts { sml_CT_TableParts }?,
2372     element extLst { sml_CT_ExtensionList }?
2373 sml_CT_SheetData = element row { sml_CT_Row }*
2374 sml_CT_SheetCalcPr =

```

```

2375
2376   ## default value: false
2377   attribute fullCalcOnLoad { xsd:boolean }?
2378 sml_CT_SheetFormatPr =
2379
2380   ## default value: 8
2381   attribute baseColWidth { xsd:unsignedInt }?,
2382   attribute defaultColWidth { xsd:double }?,
2383   attribute defaultRowHeight { xsd:double },
2384
2385   ## default value: false
2386   attribute customHeight { xsd:boolean }?,
2387
2388   ## default value: false
2389   attribute zeroHeight { xsd:boolean }?,
2390
2391   ## default value: false
2392   attribute thickTop { xsd:boolean }?,
2393
2394   ## default value: false
2395   attribute thickBottom { xsd:boolean }?,
2396
2397   ## default value: 0
2398   attribute outlineLevelRow { xsd:unsignedByte }?,
2399
2400   ## default value: 0
2401   attribute outlineLevelCol { xsd:unsignedByte }?
2402 sml_CT_Cols = element col { sml_CT_Col }+
2403 sml_CT_Col =
2404   attribute min { xsd:unsignedInt },
2405   attribute max { xsd:unsignedInt },
2406   attribute width { xsd:double }?,
2407
2408   ## default value: 0
2409   attribute style { xsd:unsignedInt }?,
2410
2411   ## default value: false
2412   attribute hidden { xsd:boolean }?,
2413
2414   ## default value: false
2415   attribute bestFit { xsd:boolean }?,
2416
2417   ## default value: false
2418   attribute customWidth { xsd:boolean }?,
2419
2420   ## default value: false
2421   attribute phonetic { xsd:boolean }?,
2422
2423   ## default value: 0
2424   attribute outlineLevel { xsd:unsignedByte }?,
2425
2426   ## default value: false
2427   attribute collapsed { xsd:boolean }?

```

```

2428 sml_ST_CellSpan = xsd:string
2429 sml_ST_CellSpans = list { sml_ST_CellSpan* }
2430 sml_CT_Row =
2431     attribute r { xsd:unsignedInt }?,
2432     attribute spans { sml_ST_CellSpans }?,
2433
2434     ## default value: 0
2435     attribute s { xsd:unsignedInt }?,
2436
2437     ## default value: false
2438     attribute customFormat { xsd:boolean }?,
2439     attribute ht { xsd:double }?,
2440
2441     ## default value: false
2442     attribute hidden { xsd:boolean }?,
2443
2444     ## default value: false
2445     attribute customHeight { xsd:boolean }?,
2446
2447     ## default value: 0
2448     attribute outlineLevel { xsd:unsignedByte }?,
2449
2450     ## default value: false
2451     attribute collapsed { xsd:boolean }?,
2452
2453     ## default value: false
2454     attribute thickTop { xsd:boolean }?,
2455
2456     ## default value: false
2457     attribute thickBot { xsd:boolean }?,
2458
2459     ## default value: false
2460     attribute ph { xsd:boolean }?,
2461     element c { sml_CT_Cell }*,
2462     element extLst { sml_CT_ExtensionList }?
2463 sml_CT_Cell =
2464     attribute r { sml_ST_CellRef }?,
2465
2466     ## default value: 0
2467     attribute s { xsd:unsignedInt }?,
2468
2469     ## default value: n
2470     attribute t { sml_ST_CellType }?,
2471
2472     ## default value: 0
2473     attribute cm { xsd:unsignedInt }?,
2474
2475     ## default value: 0
2476     attribute vm { xsd:unsignedInt }?,
2477
2478     ## default value: false
2479     attribute ph { xsd:boolean }?,
2480     element f { sml_CT_CellFormula }?,

```

```

2481     element v { s_ST_Xstring }?,
2482     element is { sml_CT_Rst }?,
2483     element extLst { sml_CT_ExtensionList }?
2484 sml_ST_CellType =
2485     string "b"
2486     | string "d"
2487     | string "n"
2488     | string "e"
2489     | string "s"
2490     | string "str"
2491     | string "inlineStr"
2492 sml_ST_CellFormulaType =
2493     string "normal"
2494     | string "array"
2495     | string "dataTable"
2496     | string "shared"
2497 sml_CT_SheetPr =
2498
2499     ## default value: false
2500     attribute syncHorizontal { xsd:boolean }?,
2501
2502     ## default value: false
2503     attribute syncVertical { xsd:boolean }?,
2504     attribute syncRef { sml_ST_Ref }?,
2505
2506     ## default value: false
2507     attribute transitionEvaluation { xsd:boolean }?,
2508
2509     ## default value: false
2510     attribute transitionEntry { xsd:boolean }?,
2511
2512     ## default value: true
2513     attribute published { xsd:boolean }?,
2514     attribute codeName { xsd:string }?,
2515
2516     ## default value: false
2517     attribute filterMode { xsd:boolean }?,
2518
2519     ## default value: true
2520     attribute enableFormatConditionsCalculation { xsd:boolean }?,
2521     element tabColor { sml_CT_Color }?,
2522     element outlinePr { sml_CT_OutlinePr }?,
2523     element pageSetUpPr { sml_CT_PageSetUpPr }?
2524 sml_CT_SheetDimension = attribute ref { sml_ST_Ref }
2525 sml_CT_SheetViews =
2526     element sheetView { sml_CT_SheetView }+,
2527     element extLst { sml_CT_ExtensionList }?
2528 sml_CT_SheetView =
2529
2530     ## default value: false
2531     attribute windowProtection { xsd:boolean }?,
2532
2533     ## default value: false

```

```

2534     attribute showFormulas { xsd:boolean }?,
2535
2536     ## default value: true
2537     attribute showGridLines { xsd:boolean }?,
2538
2539     ## default value: true
2540     attribute showRowColHeaders { xsd:boolean }?,
2541
2542     ## default value: true
2543     attribute showZeros { xsd:boolean }?,
2544
2545     ## default value: false
2546     attribute rightToLeft { xsd:boolean }?,
2547
2548     ## default value: false
2549     attribute tabSelected { xsd:boolean }?,
2550
2551     ## default value: true
2552     attribute showRuler { xsd:boolean }?,
2553
2554     ## default value: true
2555     attribute showOutlineSymbols { xsd:boolean }?,
2556
2557     ## default value: true
2558     attribute defaultGridColor { xsd:boolean }?,
2559
2560     ## default value: true
2561     attribute showWhiteSpace { xsd:boolean }?,
2562
2563     ## default value: normal
2564     attribute view { sml_ST_SheetViewType }?,
2565     attribute topLeftCell { sml_ST_CellRef }?,
2566
2567     ## default value: 64
2568     attribute colorId { xsd:unsignedInt }?,
2569
2570     ## default value: 100
2571     attribute zoomScale { xsd:unsignedInt }?,
2572
2573     ## default value: 0
2574     attribute zoomScaleNormal { xsd:unsignedInt }?,
2575
2576     ## default value: 0
2577     attribute zoomScaleSheetLayoutView { xsd:unsignedInt }?,
2578
2579     ## default value: 0
2580     attribute zoomScalePageLayoutView { xsd:unsignedInt }?,
2581     attribute workbookViewId { xsd:unsignedInt },
2582     element pane { sml_CT_Pane }?,
2583     element selection { sml_CT_Selection }*,
2584     element pivotSelection { sml_CT_PivotSelection }*,
2585     element extLst { sml_CT_ExtensionList }?
2586 sml_CT_Pane =

```

```

2587
2588   ## default value: 0
2589   attribute xSplit { xsd:double }?,
2590
2591   ## default value: 0
2592   attribute ySplit { xsd:double }?,
2593   attribute topLeftCell { sml_ST_CellRef }?,
2594
2595   ## default value: topLeft
2596   attribute activePane { sml_ST_Pane }?,
2597
2598   ## default value: split
2599   attribute state { sml_ST_PaneState }?
2600 sml_CT_PivotSelection =
2601
2602   ## default value: topLeft
2603   attribute pane { sml_ST_Pane }?,
2604
2605   ## default value: false
2606   attribute showHeader { xsd:boolean }?,
2607
2608   ## default value: false
2609   attribute label { xsd:boolean }?,
2610
2611   ## default value: false
2612   attribute data { xsd:boolean }?,
2613
2614   ## default value: false
2615   attribute extendable { xsd:boolean }?,
2616
2617   ## default value: 0
2618   attribute count { xsd:unsignedInt }?,
2619   attribute axis { sml_ST_Axis }?,
2620
2621   ## default value: 0
2622   attribute dimension { xsd:unsignedInt }?,
2623
2624   ## default value: 0
2625   attribute start { xsd:unsignedInt }?,
2626
2627   ## default value: 0
2628   attribute min { xsd:unsignedInt }?,
2629
2630   ## default value: 0
2631   attribute max { xsd:unsignedInt }?,
2632
2633   ## default value: 0
2634   attribute activeRow { xsd:unsignedInt }?,
2635
2636   ## default value: 0
2637   attribute activeCol { xsd:unsignedInt }?,
2638
2639   ## default value: 0

```

```

2640     attribute previousRow { xsd:unsignedInt }?,
2641
2642     ## default value: 0
2643     attribute previousCol { xsd:unsignedInt }?,
2644
2645     ## default value: 0
2646     attribute click { xsd:unsignedInt }?,
2647     r_id?,
2648     element pivotArea { sml_CT_PivotArea }
2649 sml_CT_Selection =
2650
2651     ## default value: topLeft
2652     attribute pane { sml_ST_Pane }?,
2653     attribute activeCell { sml_ST_CellRef }?,
2654
2655     ## default value: 0
2656     attribute activeCellId { xsd:unsignedInt }?,
2657
2658     ## default value: A1
2659     attribute sqref { sml_ST_Sqref }?
2660 sml_ST_Pane =
2661     string "bottomRight"
2662     | string "topRight"
2663     | string "bottomLeft"
2664     | string "topLeft"
2665 sml_CT_PageBreak =
2666
2667     ## default value: 0
2668     attribute count { xsd:unsignedInt }?,
2669
2670     ## default value: 0
2671     attribute manualBreakCount { xsd:unsignedInt }?,
2672     element brk { sml_CT_Break }*
2673 sml_CT_Break =
2674
2675     ## default value: 0
2676     attribute id { xsd:unsignedInt }?,
2677
2678     ## default value: 0
2679     attribute min { xsd:unsignedInt }?,
2680
2681     ## default value: 0
2682     attribute max { xsd:unsignedInt }?,
2683
2684     ## default value: false
2685     attribute man { xsd:boolean }?,
2686
2687     ## default value: false
2688     attribute pt { xsd:boolean }?
2689 sml_ST_SheetViewType =
2690     string "normal" | string "pageBreakPreview" | string "pageLayout"
2691 sml_CT_OutlinePr =
2692

```



```

2693 ## default value: false
2694 attribute applyStyles { xsd:boolean }?,
2695
2696 ## default value: true
2697 attribute summaryBelow { xsd:boolean }?,
2698
2699 ## default value: true
2700 attribute summaryRight { xsd:boolean }?,
2701
2702 ## default value: true
2703 attribute showOutlineSymbols { xsd:boolean }?
2704 sml_CT_PageSetUpPr =
2705
2706 ## default value: true
2707 attribute autoPageBreaks { xsd:boolean }?,
2708
2709 ## default value: false
2710 attribute fitToPage { xsd:boolean }?
2711 sml_CT_DataConsolidate =
2712
2713 ## default value: sum
2714 attribute function { sml_ST_DataConsolidateFunction }?,
2715
2716 ## default value: false
2717 attribute startLabels { xsd:boolean }?,
2718
2719 ## default value: false
2720 attribute topLabels { xsd:boolean }?,
2721
2722 ## default value: false
2723 attribute link { xsd:boolean }?,
2724 element dataRefs { sml_CT_DataRefs }?
2725 sml_ST_DataConsolidateFunction =
2726   string "average"
2727   | string "count"
2728   | string "countNums"
2729   | string "max"
2730   | string "min"
2731   | string "product"
2732   | string "stdDev"
2733   | string "stdDevp"
2734   | string "sum"
2735   | string "var"
2736   | string "varp"
2737 sml_CT_DataRefs =
2738   attribute count { xsd:unsignedInt }?,
2739   element dataRef { sml_CT_DataRef }*
2740 sml_CT_DataRef =
2741   attribute ref { sml_ST_Ref }?,
2742   attribute name { s_ST_Xstring }?,
2743   attribute sheet { s_ST_Xstring }?,
2744   r_id?
2745 sml_CT_MergeCells =

```

```

2746     attribute count { xsd:unsignedInt }?,
2747     element mergeCell { sml_CT_MergeCell }+
2748 sml_CT_MergeCell = attribute ref { sml_ST_Ref }
2749 sml_CT_SmartTags = element cellSmartTags { sml_CT_CellSmartTags }+
2750 sml_CT_CellSmartTags =
2751     attribute r { sml_ST_CellRef },
2752     element cellSmartTag { sml_CT_CellSmartTag }+
2753 sml_CT_CellSmartTag =
2754     attribute type { xsd:unsignedInt },
2755
2756     ## default value: false
2757     attribute deleted { xsd:boolean }?,
2758
2759     ## default value: false
2760     attribute xmlBased { xsd:boolean }?,
2761     element cellSmartTagPr { sml_CT_CellSmartTagPr }*
2762 sml_CT_CellSmartTagPr =
2763     attribute key { s_ST_Xstring },
2764     attribute val { s_ST_Xstring }
2765 sml_CT_Drawing = r_id
2766 sml_CT_DrawingHF =
2767     r_id,
2768     attribute lho { xsd:unsignedInt }?,
2769     attribute lhe { xsd:unsignedInt }?,
2770     attribute lhf { xsd:unsignedInt }?,
2771     attribute cho { xsd:unsignedInt }?,
2772     attribute che { xsd:unsignedInt }?,
2773     attribute chf { xsd:unsignedInt }?,
2774     attribute rho { xsd:unsignedInt }?,
2775     attribute rhe { xsd:unsignedInt }?,
2776     attribute rhf { xsd:unsignedInt }?,
2777     attribute lfo { xsd:unsignedInt }?,
2778     attribute lfe { xsd:unsignedInt }?,
2779     attribute lff { xsd:unsignedInt }?,
2780     attribute cfo { xsd:unsignedInt }?,
2781     attribute cfe { xsd:unsignedInt }?,
2782     attribute cff { xsd:unsignedInt }?,
2783     attribute rfo { xsd:unsignedInt }?,
2784     attribute rfe { xsd:unsignedInt }?,
2785     attribute rff { xsd:unsignedInt }?
2786 sml_CT_CustomSheetViews =
2787     element customSheetView { sml_CT_CustomSheetView }+
2788 sml_CT_CustomSheetView =
2789     attribute guid { s_ST_Guid },
2790
2791     ## default value: 100
2792     attribute scale { xsd:unsignedInt }?,
2793
2794     ## default value: 64
2795     attribute colorId { xsd:unsignedInt }?,
2796
2797     ## default value: false
2798     attribute showPageBreaks { xsd:boolean }?,

```

```

2799
2800   ## default value: false
2801   attribute showFormulas { xsd:boolean }?,
2802
2803   ## default value: true
2804   attribute showGridLines { xsd:boolean }?,
2805
2806   ## default value: true
2807   attribute showRowCol { xsd:boolean }?,
2808
2809   ## default value: true
2810   attribute outlineSymbols { xsd:boolean }?,
2811
2812   ## default value: true
2813   attribute zeroValues { xsd:boolean }?,
2814
2815   ## default value: false
2816   attribute fitToPage { xsd:boolean }?,
2817
2818   ## default value: false
2819   attribute printArea { xsd:boolean }?,
2820
2821   ## default value: false
2822   attribute filter { xsd:boolean }?,
2823
2824   ## default value: false
2825   attribute showAutoFilter { xsd:boolean }?,
2826
2827   ## default value: false
2828   attribute hiddenRows { xsd:boolean }?,
2829
2830   ## default value: false
2831   attribute hiddenColumns { xsd:boolean }?,
2832
2833   ## default value: visible
2834   attribute state { sml_ST_SheetState }?,
2835
2836   ## default value: false
2837   attribute filterUnique { xsd:boolean }?,
2838
2839   ## default value: normal
2840   attribute view { sml_ST_SheetViewType }?,
2841
2842   ## default value: true
2843   attribute showRuler { xsd:boolean }?,
2844   attribute topLeftCell { sml_ST_CellRef }?,
2845   element pane { sml_CT_Pane }?,
2846   element selection { sml_CT_Selection }?,
2847   element rowBreaks { sml_CT_PageBreak }?,
2848   element colBreaks { sml_CT_PageBreak }?,
2849   element pageMargins { sml_CT_PageMargins }?,
2850   element printOptions { sml_CT_PrintOptions }?,
2851   element pageSetup { sml_CT_PageSetup }?,

```

```

2852     element headerFooter { sml_CT_HeaderFooter }?,
2853     element autoFilter { sml_CT_AutoFilter }?,
2854     element extLst { sml_CT_ExtensionList }?
2855 sml_CT_DataValidations =
2856
2857     ## default value: false
2858     attribute disablePrompts { xsd:boolean }?,
2859     attribute xWindow { xsd:unsignedInt }?,
2860     attribute yWindow { xsd:unsignedInt }?,
2861     attribute count { xsd:unsignedInt }?,
2862     element dataValidation { sml_CT_DataValidation }+
2863 sml_CT_DataValidation =
2864
2865     ## default value: none
2866     attribute type { sml_ST_DataValidationType }?,
2867
2868     ## default value: stop
2869     attribute errorStyle { sml_ST_DataValidationErrorStyle }?,
2870
2871     ## default value: noControl
2872     attribute imeMode { sml_ST_DataValidationImeMode }?,
2873
2874     ## default value: between
2875     attribute operator { sml_ST_DataValidationOperator }?,
2876
2877     ## default value: false
2878     attribute allowBlank { xsd:boolean }?,
2879
2880     ## default value: false
2881     attribute showDropDown { xsd:boolean }?,
2882
2883     ## default value: false
2884     attribute showInputMessage { xsd:boolean }?,
2885
2886     ## default value: false
2887     attribute showErrorMessage { xsd:boolean }?,
2888     attribute errorTitle { s_ST_Xstring }?,
2889     attribute error { s_ST_Xstring }?,
2890     attribute promptTitle { s_ST_Xstring }?,
2891     attribute prompt { s_ST_Xstring }?,
2892     attribute sqref { sml_ST_Sqref },
2893     element formula1 { sml_ST_Formula }?,
2894     element formula2 { sml_ST_Formula }?
2895 sml_ST_DataValidationType =
2896     string "none"
2897     | string "whole"
2898     | string "decimal"
2899     | string "list"
2900     | string "date"
2901     | string "time"
2902     | string "textLength"
2903     | string "custom"
2904 sml_ST_DataValidationOperator =

```

```

2905     string "between"
2906     | string "notBetween"
2907     | string "equal"
2908     | string "notEqual"
2909     | string "lessThan"
2910     | string "lessThanOrEqual"
2911     | string "greaterThan"
2912     | string "greaterThanOrEqual"
2913 sml_ST_DataValidationErrorStyle =
2914     string "stop" | string "warning" | string "information"
2915 sml_ST_DataValidationImeMode =
2916     string "noControl"
2917     | string "off"
2918     | string "on"
2919     | string "disabled"
2920     | string "hiragana"
2921     | string "fullKatakana"
2922     | string "halfKatakana"
2923     | string "fullAlpha"
2924     | string "halfAlpha"
2925     | string "fullHangul"
2926     | string "halfHangul"
2927 sml_ST_CfType =
2928     string "expression"
2929     | string "cellIs"
2930     | string "colorScale"
2931     | string "dataBar"
2932     | string "iconSet"
2933     | string "top10"
2934     | string "uniqueValues"
2935     | string "duplicateValues"
2936     | string "containsText"
2937     | string "notContainsText"
2938     | string "beginsWith"
2939     | string "endsWith"
2940     | string "containsBlanks"
2941     | string "notContainsBlanks"
2942     | string "containsErrors"
2943     | string "notContainsErrors"
2944     | string "timePeriod"
2945     | string "aboveAverage"
2946 sml_ST_TimePeriod =
2947     string "today"
2948     | string "yesterday"
2949     | string "tomorrow"
2950     | string "last7Days"
2951     | string "thisMonth"
2952     | string "lastMonth"
2953     | string "nextMonth"
2954     | string "thisWeek"
2955     | string "lastWeek"
2956     | string "nextWeek"
2957 sml_ST_ConditionalFormattingOperator =

```

```

2958 string "lessThan"
2959 | string "lessThanOrEqual"
2960 | string "equal"
2961 | string "notEqual"
2962 | string "greaterThanOrEqual"
2963 | string "greaterThan"
2964 | string "between"
2965 | string "notBetween"
2966 | string "containsText"
2967 | string "notContains"
2968 | string "beginsWith"
2969 | string "endsWith"
2970 sml_ST_CfvoType =
2971     string "num"
2972     | string "percent"
2973     | string "max"
2974     | string "min"
2975     | string "formula"
2976     | string "percentile"
2977 sml_CT_ConditionalFormatting =
2978
2979     ## default value: false
2980     attribute pivot { xsd:boolean }?,
2981     attribute sqref { sml_ST_Sqref }?,
2982     element cfRule { sml_CT_CfRule }+,
2983     element extLst { sml_CT_ExtensionList }?
2984 sml_CT_CfRule =
2985     attribute type { sml_ST_CfType }?,
2986     attribute dxId { sml_ST_DxfId }?,
2987     attribute priority { xsd:int },
2988
2989     ## default value: false
2990     attribute stopIfTrue { xsd:boolean }?,
2991
2992     ## default value: true
2993     attribute aboveAverage { xsd:boolean }?,
2994
2995     ## default value: false
2996     attribute percent { xsd:boolean }?,
2997
2998     ## default value: false
2999     attribute bottom { xsd:boolean }?,
3000     attribute operator { sml_ST_ConditionalFormattingOperator }?,
3001     attribute text { xsd:string }?,
3002     attribute timePeriod { sml_ST_TimePeriod }?,
3003     attribute rank { xsd:unsignedInt }?,
3004     attribute stdDev { xsd:int }?,
3005
3006     ## default value: false
3007     attribute equalAverage { xsd:boolean }?,
3008     element formula { sml_ST_Formula }*,
3009     element colorScale { sml_CT_ColorScale }?,
3010     element dataBar { sml_CT_DataBar }?,

```

```

3011     element iconSet { sml_CT_IconSet }?,
3012     element extLst { sml_CT_ExtensionList }?
3013 sml_CT_Hyperlinks = element hyperlink { sml_CT_Hyperlink }+
3014 sml_CT_Hyperlink =
3015     attribute ref { sml_ST_Ref },
3016     r_id?,
3017     attribute location { s_ST_Xstring }?,
3018     attribute tooltip { s_ST_Xstring }?,
3019     attribute display { s_ST_Xstring }?
3020 sml_CT_CellFormula =
3021     sml_ST_Formula,
3022
3023     ## default value: normal
3024     attribute t { sml_ST_CellFormulaType }?,
3025
3026     ## default value: false
3027     attribute aca { xsd:boolean }?,
3028     attribute ref { sml_ST_Ref }?,
3029
3030     ## default value: false
3031     attribute dt2D { xsd:boolean }?,
3032
3033     ## default value: false
3034     attribute dtr { xsd:boolean }?,
3035
3036     ## default value: false
3037     attribute del1 { xsd:boolean }?,
3038
3039     ## default value: false
3040     attribute del2 { xsd:boolean }?,
3041     attribute r1 { sml_ST_CellRef }?,
3042     attribute r2 { sml_ST_CellRef }?,
3043
3044     ## default value: false
3045     attribute ca { xsd:boolean }?,
3046     attribute si { xsd:unsignedInt }?,
3047
3048     ## default value: false
3049     attribute bx { xsd:boolean }?
3050 sml_CT_ColorScale =
3051     element cfvo { sml_CT_Cfvo }+,
3052     element color { sml_CT_Color }+
3053 sml_CT_DataBar =
3054
3055     ## default value: 10
3056     attribute minLength { xsd:unsignedInt }?,
3057
3058     ## default value: 90
3059     attribute maxLength { xsd:unsignedInt }?,
3060
3061     ## default value: true
3062     attribute showValue { xsd:boolean }?,
3063     element cfvo { sml_CT_Cfvo }+,

```

```

3064     element color { sml_CT_Color }
3065 sml_CT_IconSet =
3066
3067     ## default value: 3TrafficLights1
3068     attribute iconSet { sml_ST_IconSetType }?,
3069
3070     ## default value: true
3071     attribute showValue { xsd:boolean }?,
3072
3073     ## default value: true
3074     attribute percent { xsd:boolean }?,
3075
3076     ## default value: false
3077     attribute reverse { xsd:boolean }?,
3078     element cfvo { sml_CT_Cfvo }+
3079 sml_CT_Cfvo =
3080     attribute type { sml_ST_CfvoType },
3081     attribute val { s_ST_Xstring }?,
3082
3083     ## default value: true
3084     attribute gte { xsd:boolean }?,
3085     element extLst { sml_CT_ExtensionList }?
3086 sml_CT_PageMargins =
3087     attribute left { xsd:double },
3088     attribute right { xsd:double },
3089     attribute top { xsd:double },
3090     attribute bottom { xsd:double },
3091     attribute header { xsd:double },
3092     attribute footer { xsd:double }
3093 sml_CT_PrintOptions =
3094
3095     ## default value: false
3096     attribute horizontalCentered { xsd:boolean }?,
3097
3098     ## default value: false
3099     attribute verticalCentered { xsd:boolean }?,
3100
3101     ## default value: false
3102     attribute headings { xsd:boolean }?,
3103
3104     ## default value: false
3105     attribute gridLines { xsd:boolean }?,
3106
3107     ## default value: true
3108     attribute gridLinesSet { xsd:boolean }?
3109 sml_CT_PageSetup =
3110
3111     ## default value: 1
3112     attribute paperSize { xsd:unsignedInt }?,
3113     attribute paperHeight { s_ST_PositiveUniversalMeasure }?,
3114     attribute paperWidth { s_ST_PositiveUniversalMeasure }?,
3115
3116     ## default value: 100

```



```

3117 attribute scale { xsd:unsignedInt }?,
3118
3119 ## default value: 1
3120 attribute firstPageNumber { xsd:unsignedInt }?,
3121
3122 ## default value: 1
3123 attribute fitToWidth { xsd:unsignedInt }?,
3124
3125 ## default value: 1
3126 attribute fitToHeight { xsd:unsignedInt }?,
3127
3128 ## default value: downThenOver
3129 attribute pageOrder { sml_ST_PageOrder }?,
3130
3131 ## default value: default
3132 attribute orientation { sml_ST_Orientation }?,
3133
3134 ## default value: true
3135 attribute usePrinterDefaults { xsd:boolean }?,
3136
3137 ## default value: false
3138 attribute blackAndWhite { xsd:boolean }?,
3139
3140 ## default value: false
3141 attribute draft { xsd:boolean }?,
3142
3143 ## default value: none
3144 attribute cellComments { sml_ST_CellComments }?,
3145
3146 ## default value: false
3147 attribute useFirstPageNumber { xsd:boolean }?,
3148
3149 ## default value: displayed
3150 attribute errors { sml_ST_PrintError }?,
3151
3152 ## default value: 600
3153 attribute horizontalDpi { xsd:unsignedInt }?,
3154
3155 ## default value: 600
3156 attribute verticalDpi { xsd:unsignedInt }?,
3157
3158 ## default value: 1
3159 attribute copies { xsd:unsignedInt }?,
3160 r_id?
3161 sml_ST_PageOrder = string "downThenOver" | string "overThenDown"
3162 sml_ST_Orientation =
3163     string "default" | string "portrait" | string "landscape"
3164 sml_ST_CellComments =
3165     string "none" | string "asDisplayed" | string "atEnd"
3166 sml_CT_HeaderFooter =
3167
3168 ## default value: false
3169 attribute differentOddEven { xsd:boolean }?,

```

```

3170
3171   ## default value: false
3172   attribute differentFirst { xsd:boolean }?,
3173
3174   ## default value: true
3175   attribute scaleWithDoc { xsd:boolean }?,
3176
3177   ## default value: true
3178   attribute alignWithMargins { xsd:boolean }?,
3179   element oddHeader { s_ST_Xstring }?,
3180   element oddFooter { s_ST_Xstring }?,
3181   element evenHeader { s_ST_Xstring }?,
3182   element evenFooter { s_ST_Xstring }?,
3183   element firstHeader { s_ST_Xstring }?,
3184   element firstFooter { s_ST_Xstring }?
3185 sml_ST_PrintError =
3186   string "displayed" | string "blank" | string "dash" | string "NA"
3187 sml_CT_Scenarios =
3188   attribute current { xsd:unsignedInt }?,
3189   attribute show { xsd:unsignedInt }?,
3190   attribute sqref { sml_ST_Sqref }?,
3191   element scenario { sml_CT_Scenario }+
3192 sml_CT_SheetProtection =
3193   attribute algorithmName { s_ST_Xstring }?,
3194   attribute hashValue { xsd:base64Binary }?,
3195   attribute saltValue { xsd:base64Binary }?,
3196   attribute spinCount { xsd:unsignedInt }?,
3197
3198   ## default value: false
3199   attribute sheet { xsd:boolean }?,
3200
3201   ## default value: false
3202   attribute objects { xsd:boolean }?,
3203
3204   ## default value: false
3205   attribute scenarios { xsd:boolean }?,
3206
3207   ## default value: true
3208   attribute formatCells { xsd:boolean }?,
3209
3210   ## default value: true
3211   attribute formatColumns { xsd:boolean }?,
3212
3213   ## default value: true
3214   attribute formatRows { xsd:boolean }?,
3215
3216   ## default value: true
3217   attribute insertColumns { xsd:boolean }?,
3218
3219   ## default value: true
3220   attribute insertRows { xsd:boolean }?,
3221
3222   ## default value: true

```

```

3223 attribute insertHyperlinks { xsd:boolean }?,
3224
3225 ## default value: true
3226 attribute deleteColumns { xsd:boolean }?,
3227
3228 ## default value: true
3229 attribute deleteRows { xsd:boolean }?,
3230
3231 ## default value: false
3232 attribute selectLockedCells { xsd:boolean }?,
3233
3234 ## default value: true
3235 attribute sort { xsd:boolean }?,
3236
3237 ## default value: true
3238 attribute autoFilter { xsd:boolean }?,
3239
3240 ## default value: true
3241 attribute pivotTables { xsd:boolean }?,
3242
3243 ## default value: false
3244 attribute selectUnlockedCells { xsd:boolean }?
3245 sml_CT_ProtectedRanges =
3246   element protectedRange { sml_CT_ProtectedRange }+
3247 sml_CT_ProtectedRange =
3248   attribute sqref { sml_ST_Sqref },
3249   attribute name { s_ST_Xstring },
3250   attribute algorithmName { s_ST_Xstring }?,
3251   attribute hashValue { xsd:base64Binary }?,
3252   attribute saltValue { xsd:base64Binary }?,
3253   attribute spinCount { xsd:unsignedInt }?,
3254   element securityDescriptor { xsd:string }*
3255 sml_CT_Scenario =
3256   attribute name { s_ST_Xstring },
3257
3258 ## default value: false
3259 attribute locked { xsd:boolean }?,
3260
3261 ## default value: false
3262 attribute hidden { xsd:boolean }?,
3263 attribute count { xsd:unsignedInt }?,
3264 attribute user { s_ST_Xstring }?,
3265 attribute comment { s_ST_Xstring }?,
3266 element inputCells { sml_CT_InputCells }+
3267 sml_CT_InputCells =
3268   attribute r { sml_ST_CellRef },
3269
3270 ## default value: false
3271 attribute deleted { xsd:boolean }?,
3272
3273 ## default value: false
3274 attribute undone { xsd:boolean }?,
3275 attribute val { s_ST_Xstring },

```

```

3276     attribute numFmtId { sml_ST_NumFmtId }?
3277 sml_CT_CellWatches = element cellWatch { sml_CT_CellWatch }+
3278 sml_CT_CellWatch = attribute r { sml_ST_CellRef }
3279 sml_CT_Chartsheet =
3280     element sheetPr { sml_CT_ChartsheetPr }?,
3281     element sheetViews { sml_CT_ChartsheetViews },
3282     element sheetProtection { sml_CT_ChartsheetProtection }?,
3283     element customSheetViews { sml_CT_CustomChartsheetViews }?,
3284     element pageMargins { sml_CT_PageMargins }?,
3285     element pageSetup { sml_CT-CsPageSetup }?,
3286     element headerFooter { sml_CT_HeaderFooter }?,
3287     element drawing { sml_CT_Drawing },
3288     element drawingHF { sml_CT_DrawingHF }?,
3289     element picture { sml_CT_SheetBackgroundPicture }?,
3290     element webPublishItems { sml_CT_WebPublishItems }?,
3291     element extLst { sml_CT_ExtensionList }?
3292 sml_CT_ChartsheetPr =
3293
3294     ## default value: true
3295     attribute published { xsd:boolean }?,
3296     attribute codeName { xsd:string }?,
3297     element tabColor { sml_CT_Color }?
3298 sml_CT_ChartsheetViews =
3299     element sheetView { sml_CT_ChartsheetView }+,
3300     element extLst { sml_CT_ExtensionList }?
3301 sml_CT_ChartsheetView =
3302
3303     ## default value: false
3304     attribute tabSelected { xsd:boolean }?,
3305
3306     ## default value: 100
3307     attribute zoomScale { xsd:unsignedInt }?,
3308     attribute workbookViewId { xsd:unsignedInt },
3309
3310     ## default value: false
3311     attribute zoomToFit { xsd:boolean }?,
3312     element extLst { sml_CT_ExtensionList }?
3313 sml_CT_ChartsheetProtection =
3314     attribute algorithmName { s_ST_Xstring }?,
3315     attribute hashValue { xsd:base64Binary }?,
3316     attribute saltValue { xsd:base64Binary }?,
3317     attribute spinCount { xsd:unsignedInt }?,
3318
3319     ## default value: false
3320     attribute content { xsd:boolean }?,
3321
3322     ## default value: false
3323     attribute objects { xsd:boolean }?
3324 sml_CT-CsPageSetup =
3325
3326     ## default value: 1
3327     attribute paperSize { xsd:unsignedInt }?,
3328     attribute paperHeight { s_ST_PositiveUniversalMeasure }?,

```

```

3329 attribute paperWidth { s_ST_PositiveUniversalMeasure }?,
3330
3331 ## default value: 1
3332 attribute firstPageNumber { xsd:unsignedInt }?,
3333
3334 ## default value: default
3335 attribute orientation { sml_ST_Orientation }?,
3336
3337 ## default value: true
3338 attribute usePrinterDefaults { xsd:boolean }?,
3339
3340 ## default value: false
3341 attribute blackAndWhite { xsd:boolean }?,
3342
3343 ## default value: false
3344 attribute draft { xsd:boolean }?,
3345
3346 ## default value: false
3347 attribute useFirstPageNumber { xsd:boolean }?,
3348
3349 ## default value: 600
3350 attribute horizontalDpi { xsd:unsignedInt }?,
3351
3352 ## default value: 600
3353 attribute verticalDpi { xsd:unsignedInt }?,
3354
3355 ## default value: 1
3356 attribute copies { xsd:unsignedInt }?,
3357 r_id?
3358 sml_CT_CustomChartsheetViews =
3359   element customSheetView { sml_CT_CustomChartsheetView }*
3360 sml_CT_CustomChartsheetView =
3361   attribute guid { s_ST_Guid },
3362
3363 ## default value: 100
3364 attribute scale { xsd:unsignedInt }?,
3365
3366 ## default value: visible
3367 attribute state { sml_ST_SheetState }?,
3368
3369 ## default value: false
3370 attribute zoomToFit { xsd:boolean }?,
3371 element pageMargins { sml_CT_PageMargins }?,
3372 element pageSetup { sml_CT-CsPageSetup }?,
3373 element headerFooter { sml_CT_HeaderFooter }?
3374 sml_CT_CustomProperties = element customPr { sml_CT_CustomProperty }+
3375 sml_CT_CustomProperty =
3376   attribute name { s_ST_Xstring },
3377   r_id
3378 sml_CT_OleObjects = element oleObject { sml_CT_OleObject }+
3379 sml_CT_OleObject =
3380   attribute progId { xsd:string }?,
3381

```

```

3382  ## default value: DVASPECT_CONTENT
3383  attribute dvAspect { sml_ST_DvAspect }?,
3384  attribute link { s_ST_Xstring }?,
3385  attribute oleUpdate { sml_ST_OleUpdate }?,
3386
3387  ## default value: false
3388  attribute autoLoad { xsd:boolean }?,
3389  attribute shapeId { xsd:unsignedInt },
3390  r_id?,
3391  element objectPr { sml_CT_ObjectPr }?
3392  sml_CT_ObjectPr =
3393
3394  ## default value: true
3395  attribute locked { xsd:boolean }?,
3396
3397  ## default value: true
3398  attribute defaultSize { xsd:boolean }?,
3399
3400  ## default value: true
3401  attribute print { xsd:boolean }?,
3402
3403  ## default value: false
3404  attribute disabled { xsd:boolean }?,
3405
3406  ## default value: false
3407  attribute uiObject { xsd:boolean }?,
3408
3409  ## default value: true
3410  attribute autoFill { xsd:boolean }?,
3411
3412  ## default value: true
3413  attribute autoLine { xsd:boolean }?,
3414
3415  ## default value: true
3416  attribute autoPict { xsd:boolean }?,
3417  attribute macro { sml_ST_Formula }?,
3418  attribute altText { s_ST_Xstring }?,
3419
3420  ## default value: false
3421  attribute dde { xsd:boolean }?,
3422  r_id?,
3423  element anchor { sml_CT_ObjectAnchor }
3424  sml_ST_DvAspect = string "DVASPECT_CONTENT" | string "DVASPECT_ICON"
3425  sml_ST_OleUpdate = string "OLEUPDATE_ALWAYS" | string "OLEUPDATE_ONCALL"
3426  sml_CT_WebPublishItems =
3427  attribute count { xsd:unsignedInt }?,
3428  element webPublishItem { sml_CT_WebPublishItem }+
3429  sml_CT_WebPublishItem =
3430  attribute id { xsd:unsignedInt },
3431  attribute divId { s_ST_Xstring },
3432  attribute sourceType { sml_ST_WebSourceType },
3433  attribute sourceRef { sml_ST_Ref }?,
3434  attribute sourceObject { s_ST_Xstring }?,

```

```

3435     attribute destinationFile { s_ST_Xstring },
3436     attribute title { s_ST_Xstring }?,
3437
3438     ## default value: false
3439     attribute autoRepublish { xsd:boolean }?
3440 sml_CT_Controls = element control { sml_CT_Control }+
3441 sml_CT_Control =
3442     attribute shapeId { xsd:unsignedInt },
3443     r_id,
3444     attribute name { xsd:string }?,
3445     element controlPr { sml_CT_ControlPr }?
3446 sml_CT_ControlPr =
3447
3448     ## default value: true
3449     attribute locked { xsd:boolean }?,
3450
3451     ## default value: true
3452     attribute defaultSize { xsd:boolean }?,
3453
3454     ## default value: true
3455     attribute print { xsd:boolean }?,
3456
3457     ## default value: false
3458     attribute disabled { xsd:boolean }?,
3459
3460     ## default value: false
3461     attribute recalcAlways { xsd:boolean }?,
3462
3463     ## default value: false
3464     attribute uiObject { xsd:boolean }?,
3465
3466     ## default value: true
3467     attribute autoFill { xsd:boolean }?,
3468
3469     ## default value: true
3470     attribute autoLine { xsd:boolean }?,
3471
3472     ## default value: true
3473     attribute autoPict { xsd:boolean }?,
3474     attribute macro { sml_ST_Formula }?,
3475     attribute altText { s_ST_Xstring }?,
3476     attribute linkedCell { sml_ST_Formula }?,
3477     attribute listFillRange { sml_ST_Formula }?,
3478
3479     ## default value: pict
3480     attribute cf { s_ST_Xstring }?,
3481     r_id?,
3482     element anchor { sml_CT_ObjectAnchor }
3483 sml_ST_WebSourceType =
3484     string "sheet"
3485     | string "printArea"
3486     | string "autoFilter"
3487     | string "range"

```

```

3488 | string "chart"
3489 | string "pivotTable"
3490 | string "query"
3491 | string "label"
3492 sml_CT_IgnoredErrors =
3493     element ignoredError { sml_CT_IgnoredError }+,
3494     element extLst { sml_CT_ExtensionList }?
3495 sml_CT_IgnoredError =
3496     attribute sqref { sml_ST_Sqref },
3497
3498     ## default value: false
3499     attribute evalError { xsd:boolean }?,
3500
3501     ## default value: false
3502     attribute twoDigitTextYear { xsd:boolean }?,
3503
3504     ## default value: false
3505     attribute numberStoredAsText { xsd:boolean }?,
3506
3507     ## default value: false
3508     attribute formula { xsd:boolean }?,
3509
3510     ## default value: false
3511     attribute formulaRange { xsd:boolean }?,
3512
3513     ## default value: false
3514     attribute unlockedFormula { xsd:boolean }?,
3515
3516     ## default value: false
3517     attribute emptyCellReference { xsd:boolean }?,
3518
3519     ## default value: false
3520     attribute listDataValidation { xsd:boolean }?,
3521
3522     ## default value: false
3523     attribute calculatedColumn { xsd:boolean }?
3524 sml_ST_PaneState =
3525     string "split" | string "frozen" | string "frozenSplit"
3526 sml_CT_TableParts =
3527     attribute count { xsd:unsignedInt }?,
3528     element tablePart { sml_CT_TablePart }*
3529 sml_CT_TablePart = r_id
3530 sml_metadata = element metadata { sml_CT_Metadata }
3531 sml_CT_Metadata =
3532     element metadataTypes { sml_CT_MetadataTypes }?,
3533     element metadataStrings { sml_CT_MetadataStrings }?,
3534     element mdxMetadata { sml_CT_MdxMetadata }?,
3535     element futureMetadata { sml_CT_FutureMetadata }*,
3536     element cellMetadata { sml_CT_MetadataBlocks }?,
3537     element valueMetadata { sml_CT_MetadataBlocks }?,
3538     element extLst { sml_CT_ExtensionList }?
3539 sml_CT_MetadataTypes =
3540

```



```

3541  ## default value: 0
3542  attribute count { xsd:unsignedInt }?,
3543  element metadataType { sml_CT_MetadataType }+
3544  sml_CT_MetadataType =
3545  attribute name { s_ST_Xstring },
3546  attribute minSupportedVersion { xsd:unsignedInt },
3547
3548  ## default value: false
3549  attribute ghostRow { xsd:boolean }?,
3550
3551  ## default value: false
3552  attribute ghostCol { xsd:boolean }?,
3553
3554  ## default value: false
3555  attribute edit { xsd:boolean }?,
3556
3557  ## default value: false
3558  attribute delete { xsd:boolean }?,
3559
3560  ## default value: false
3561  attribute copy { xsd:boolean }?,
3562
3563  ## default value: false
3564  attribute pasteAll { xsd:boolean }?,
3565
3566  ## default value: false
3567  attribute pasteFormulas { xsd:boolean }?,
3568
3569  ## default value: false
3570  attribute pasteValues { xsd:boolean }?,
3571
3572  ## default value: false
3573  attribute pasteFormats { xsd:boolean }?,
3574
3575  ## default value: false
3576  attribute pasteComments { xsd:boolean }?,
3577
3578  ## default value: false
3579  attribute pasteDataValidation { xsd:boolean }?,
3580
3581  ## default value: false
3582  attribute pasteBorders { xsd:boolean }?,
3583
3584  ## default value: false
3585  attribute pasteColWidths { xsd:boolean }?,
3586
3587  ## default value: false
3588  attribute pasteNumberFormats { xsd:boolean }?,
3589
3590  ## default value: false
3591  attribute merge { xsd:boolean }?,
3592
3593  ## default value: false

```

```

3594     attribute splitFirst { xsd:boolean }?,
3595
3596     ## default value: false
3597     attribute splitAll { xsd:boolean }?,
3598
3599     ## default value: false
3600     attribute rowColShift { xsd:boolean }?,
3601
3602     ## default value: false
3603     attribute clearAll { xsd:boolean }?,
3604
3605     ## default value: false
3606     attribute clearFormats { xsd:boolean }?,
3607
3608     ## default value: false
3609     attribute clearContents { xsd:boolean }?,
3610
3611     ## default value: false
3612     attribute clearComments { xsd:boolean }?,
3613
3614     ## default value: false
3615     attribute assign { xsd:boolean }?,
3616
3617     ## default value: false
3618     attribute coerce { xsd:boolean }?,
3619
3620     ## default value: false
3621     attribute adjust { xsd:boolean }?,
3622
3623     ## default value: false
3624     attribute cellMeta { xsd:boolean }?
3625 sml_CT_MetadataBlocks =
3626
3627     ## default value: 0
3628     attribute count { xsd:unsignedInt }?,
3629     element bk { sml_CT_MetadataBlock }+
3630 sml_CT_MetadataBlock = element rc { sml_CT_MetadataRecord }+
3631 sml_CT_MetadataRecord =
3632     attribute t { xsd:unsignedInt },
3633     attribute v { xsd:unsignedInt }
3634 sml_CT_FutureMetadata =
3635     attribute name { s_ST_Xstring },
3636
3637     ## default value: 0
3638     attribute count { xsd:unsignedInt }?,
3639     element bk { sml_CT_FutureMetadataBlock }*,
3640     element extLst { sml_CT_ExtensionList }?
3641 sml_CT_FutureMetadataBlock = element extLst { sml_CT_ExtensionList }?
3642 sml_CT_MdxMetadata =
3643
3644     ## default value: 0
3645     attribute count { xsd:unsignedInt }?,
3646     element mdx { sml_CT_Mdx }+

```

```

3647 sml_CT_Mdx =
3648     attribute n { xsd:unsignedInt },
3649     attribute f { sml_ST_MdxFunctionType },
3650     (element t { sml_CT_MdxTuple }
3651       | element ms { sml_CT_MdxSet }
3652       | element p { sml_CT_MdxMemeberProp }
3653       | element k { sml_CT_MdxKPI })
3654 sml_ST_MdxFunctionType =
3655     string "m"
3656     | string "v"
3657     | string "s"
3658     | string "c"
3659     | string "r"
3660     | string "p"
3661     | string "k"
3662 sml_CT_MdxTuple =
3663
3664     ## default value: 0
3665     attribute c { xsd:unsignedInt }?,
3666     attribute ct { s_ST_Xstring }?,
3667     attribute si { xsd:unsignedInt }?,
3668     attribute fi { xsd:unsignedInt }?,
3669     attribute bc { sml_ST_UnsignedIntHex }?,
3670     attribute fc { sml_ST_UnsignedIntHex }?,
3671
3672     ## default value: false
3673     attribute i { xsd:boolean }?,
3674
3675     ## default value: false
3676     attribute u { xsd:boolean }?,
3677
3678     ## default value: false
3679     attribute st { xsd:boolean }?,
3680
3681     ## default value: false
3682     attribute b { xsd:boolean }?,
3683     element n { sml_CT_MetadataStringIndex }*
3684 sml_CT_MdxSet =
3685     attribute ns { xsd:unsignedInt },
3686
3687     ## default value: 0
3688     attribute c { xsd:unsignedInt }?,
3689
3690     ## default value: u
3691     attribute o { sml_ST_MdxSetOrder }?,
3692     element n { sml_CT_MetadataStringIndex }*
3693 sml_ST_MdxSetOrder =
3694     string "u"
3695     | string "a"
3696     | string "d"
3697     | string "aa"
3698     | string "ad"
3699     | string "na"

```

```

3700 | string "nd"
3701 sml_CT_MdxMemeberProp =
3702     attribute n { xsd:unsignedInt },
3703     attribute np { xsd:unsignedInt }
3704 sml_CT_MdxKPI =
3705     attribute n { xsd:unsignedInt },
3706     attribute np { xsd:unsignedInt },
3707     attribute p { sml_ST_MdxKPIProperty }
3708 sml_ST_MdxKPIProperty =
3709     string "v"
3710     | string "g"
3711     | string "s"
3712     | string "t"
3713     | string "w"
3714     | string "m"
3715 sml_CT_MetadadataStringIndex =
3716     attribute x { xsd:unsignedInt },
3717
3718     ## default value: false
3719     attribute s { xsd:boolean }?
3720 sml_CT_MetadadataStrings =
3721
3722     ## default value: 0
3723     attribute count { xsd:unsignedInt }?,
3724     element s { sml_CT_XStringElement }+
3725 sml_singleXmlCells = element singleXmlCells { sml_CT_SingleXmlCells }
3726 sml_CT_SingleXmlCells = element singleXmlCell { sml_CT_SingleXmlCell }+
3727 sml_CT_SingleXmlCell =
3728     attribute id { xsd:unsignedInt },
3729     attribute r { sml_ST_CellRef },
3730     attribute connectionId { xsd:unsignedInt },
3731     element xmlCellPr { sml_CT_XmlCellPr },
3732     element extLst { sml_CT_ExtensionList }?
3733 sml_CT_XmlCellPr =
3734     attribute id { xsd:unsignedInt },
3735     attribute uniqueName { s_ST_Xstring }?,
3736     element xmlPr { sml_CT_XmlPr },
3737     element extLst { sml_CT_ExtensionList }?
3738 sml_CT_XmlPr =
3739     attribute mapId { xsd:unsignedInt },
3740     attribute xpath { s_ST_Xstring },
3741     attribute xmlDataType { sml_ST_XmlDataType },
3742     element extLst { sml_CT_ExtensionList }?
3743 sml_styleSheet = element styleSheet { sml_CT_Stylesheet }
3744 sml_CT_Stylesheet =
3745     element numFmts { sml_CT_NumFmts }?,
3746     element fonts { sml_CT_Fonts }?,
3747     element fills { sml_CT_Fills }?,
3748     element borders { sml_CT_Borders }?,
3749     element cellStyleXfs { sml_CT_CellStyleXfs }?,
3750     element cellXfs { sml_CT_CellXfs }?,
3751     element cellStyles { sml_CT_CellStyles }?,
3752     element dxfs { sml_CT_Dxfs }?,

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3753     element tableStyles { sml_CT_TableStyles }?,
3754     element colors { sml_CT_Colors }?,
3755     element extLst { sml_CT_ExtensionList }?
3756 sml_CT_CellAlignment =
3757     attribute horizontal { sml_ST_HorizontalAlignment }?,
3758     attribute vertical { sml_ST_VerticalAlignment }?,
3759     attribute textRotation { xsd:unsignedInt }?,
3760     attribute wrapText { xsd:boolean }?,
3761     attribute indent { xsd:unsignedInt }?,
3762     attribute relativeIndent { xsd:int }?,
3763     attribute justifyLastLine { xsd:boolean }?,
3764     attribute shrinkToFit { xsd:boolean }?,
3765     attribute readingOrder { xsd:unsignedInt }?
3766 sml_ST_BorderStyle =
3767     string "none"
3768     | string "thin"
3769     | string "medium"
3770     | string "dashed"
3771     | string "dotted"
3772     | string "thick"
3773     | string "double"
3774     | string "hair"
3775     | string "mediumDashed"
3776     | string "dashDot"
3777     | string "mediumDashDot"
3778     | string "dashDotDot"
3779     | string "mediumDashDotDot"
3780     | string "slantDashDot"
3781 sml_CT_Borders =
3782     attribute count { xsd:unsignedInt }?,
3783     element border { sml_CT_Border }*
3784 sml_CT_Border =
3785     attribute diagonalUp { xsd:boolean }?,
3786     attribute diagonalDown { xsd:boolean }?,
3787
3788     ## default value: true
3789     attribute outline { xsd:boolean }?,
3790     element start { sml_CT_BorderPr }?,
3791     element end { sml_CT_BorderPr }?,
3792     element top { sml_CT_BorderPr }?,
3793     element bottom { sml_CT_BorderPr }?,
3794     element diagonal { sml_CT_BorderPr }?,
3795     element vertical { sml_CT_BorderPr }?,
3796     element horizontal { sml_CT_BorderPr }?
3797 sml_CT_BorderPr =
3798
3799     ## default value: none
3800     attribute style { sml_ST_BorderStyle }?,
3801     element color { sml_CT_Color }?
3802 sml_CT_CellProtection =
3803     attribute locked { xsd:boolean }?,
3804     attribute hidden { xsd:boolean }?
3805 sml_CT_Fonts =

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3806     attribute count { xsd:unsignedInt }?,
3807     element font { sml_CT_Font }*
3808 sml_CT_Fills =
3809     attribute count { xsd:unsignedInt }?,
3810     element fill { sml_CT_Fill }*
3811 sml_CT_Fill =
3812     element patternFill { sml_CT_PatternFill }?
3813     | element gradientFill { sml_CT_GradientFill }?
3814 sml_CT_PatternFill =
3815     attribute patternType { sml_ST_PatternType }?,
3816     element fgColor { sml_CT_Color }?,
3817     element bgColor { sml_CT_Color }?
3818 sml_CT_Color =
3819     attribute auto { xsd:boolean }?,
3820     attribute indexed { xsd:unsignedInt }?,
3821     attribute rgb { sml_ST_UnsignedIntHex }?,
3822     attribute theme { xsd:unsignedInt }?,
3823
3824     ## default value: 0.0
3825     attribute tint { xsd:double }?
3826 sml_ST_PatternType =
3827     string "none"
3828     | string "solid"
3829     | string "mediumGray"
3830     | string "darkGray"
3831     | string "lightGray"
3832     | string "darkHorizontal"
3833     | string "darkVertical"
3834     | string "darkDown"
3835     | string "darkUp"
3836     | string "darkGrid"
3837     | string "darkTrellis"
3838     | string "lightHorizontal"
3839     | string "lightVertical"
3840     | string "lightDown"
3841     | string "lightUp"
3842     | string "lightGrid"
3843     | string "lightTrellis"
3844     | string "gray125"
3845     | string "gray0625"
3846 sml_CT_GradientFill =
3847
3848     ## default value: linear
3849     attribute type { sml_ST_GradientType }?,
3850
3851     ## default value: 0
3852     attribute degree { xsd:double }?,
3853
3854     ## default value: 0
3855     attribute left { xsd:double }?,
3856
3857     ## default value: 0
3858     attribute right { xsd:double }?,

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3859
3860   ## default value: 0
3861   attribute top { xsd:double }?,
3862
3863   ## default value: 0
3864   attribute bottom { xsd:double }?,
3865   element stop { sml_CT_GradientStop }*
3866 sml_CT_GradientStop =
3867   attribute position { xsd:double },
3868   element color { sml_CT_Color }
3869 sml_ST_GradientType = string "linear" | string "path"
3870 sml_ST_HorizontalAlignment =
3871   string "general"
3872   | string "left"
3873   | string "center"
3874   | string "right"
3875   | string "fill"
3876   | string "justify"
3877   | string "centerContinuous"
3878   | string "distributed"
3879 sml_ST_VerticalAlignment =
3880   string "top"
3881   | string "center"
3882   | string "bottom"
3883   | string "justify"
3884   | string "distributed"
3885 sml_CT_NumFmts =
3886   attribute count { xsd:unsignedInt }?,
3887   element numFmt { sml_CT_NumFmt }*
3888 sml_CT_NumFmt =
3889   attribute numFmtId { sml_ST_NumFmtId },
3890   attribute formatCode { s_ST_Xstring }
3891 sml_CT_CellStyleXfs =
3892   attribute count { xsd:unsignedInt }?,
3893   element xf { sml_CT_Xf }+
3894 sml_CT_CellXfs =
3895   attribute count { xsd:unsignedInt }?,
3896   element xf { sml_CT_Xf }+
3897 sml_CT_Xf =
3898   attribute numFmtId { sml_ST_NumFmtId }?,
3899   attribute fontId { sml_ST_FontId }?,
3900   attribute fillId { sml_ST_FillId }?,
3901   attribute borderId { sml_ST_BorderId }?,
3902   attribute xfId { sml_ST_CellStyleXfId }?,
3903
3904   ## default value: false
3905   attribute quotePrefix { xsd:boolean }?,
3906
3907   ## default value: false
3908   attribute pivotButton { xsd:boolean }?,
3909   attribute applyNumberFormat { xsd:boolean }?,
3910   attribute applyFont { xsd:boolean }?,
3911   attribute applyFill { xsd:boolean }?,

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3912     attribute applyBorder { xsd:boolean }?,
3913     attribute applyAlignment { xsd:boolean }?,
3914     attribute applyProtection { xsd:boolean }?,
3915     element alignment { sml_CT_CellAlignment }?,
3916     element protection { sml_CT_CellProtection }?,
3917     element extLst { sml_CT_ExtensionList }?
3918 sml_CT_CellStyles =
3919     attribute count { xsd:unsignedInt }?,
3920     element cellStyle { sml_CT_CellStyle }+
3921 sml_CT_CellStyle =
3922     attribute name { s_ST_Xstring }?,
3923     attribute xfId { sml_ST_CellStyleXfId },
3924     attribute builtinId { xsd:unsignedInt }?,
3925     attribute iLevel { xsd:unsignedInt }?,
3926     attribute hidden { xsd:boolean }?,
3927     attribute customBuiltin { xsd:boolean }?,
3928     element extLst { sml_CT_ExtensionList }?
3929 sml_CT_Dxfs =
3930     attribute count { xsd:unsignedInt }?,
3931     element dxf { sml_CT_Dxf }*
3932 sml_CT_Dxf =
3933     element font { sml_CT_Font }?,
3934     element numFmt { sml_CT_NumFmt }?,
3935     element fill { sml_CT_Fill }?,
3936     element alignment { sml_CT_CellAlignment }?,
3937     element border { sml_CT_Border }?,
3938     element protection { sml_CT_CellProtection }?,
3939     element extLst { sml_CT_ExtensionList }?
3940 sml_ST_NumFmtId = xsd:unsignedInt
3941 sml_ST_FontId = xsd:unsignedInt
3942 sml_ST_FillId = xsd:unsignedInt
3943 sml_ST_BorderId = xsd:unsignedInt
3944 sml_ST_CellStyleXfId = xsd:unsignedInt
3945 sml_ST_DxfId = xsd:unsignedInt
3946 sml_CT_Colors =
3947     element indexedColors { sml_CT_IndexedColors }?,
3948     element mruColors { sml_CT_MRUColors }?
3949 sml_CT_IndexedColors = element rgbColor { sml_CT_RgbColor }+
3950 sml_CT_MRUColors = element color { sml_CT_Color }+
3951 sml_CT_RgbColor = attribute rgb { sml_ST_UnsignedIntHex }?
3952 sml_CT_TableStyles =
3953     attribute count { xsd:unsignedInt }?,
3954     attribute defaultTableStyle { xsd:string }?,
3955     attribute defaultPivotStyle { xsd:string }?,
3956     element tableStyle { sml_CT_TableStyle }*
3957 sml_CT_TableStyle =
3958     attribute name { xsd:string },
3959
3960     ## default value: true
3961     attribute pivot { xsd:boolean }?,
3962
3963     ## default value: true
3964     attribute table { xsd:boolean }?,

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3965     attribute count { xsd:unsignedInt }?,
3966     element tableStyleElement { sml_CT_TableStyleElement }*
3967 sml_CT_TableStyleElement =
3968     attribute type { sml_ST_TableStyleType },
3969
3970     ## default value: 1
3971     attribute size { xsd:unsignedInt }?,
3972     attribute dxId { sml_ST_DxId }?
3973 sml_ST_TableStyleType =
3974     string "wholeTable"
3975     | string "headerRow"
3976     | string "totalRow"
3977     | string "firstColumn"
3978     | string "lastColumn"
3979     | string "firstRowStripe"
3980     | string "secondRowStripe"
3981     | string "firstColumnStripe"
3982     | string "secondColumnStripe"
3983     | string "firstHeaderCell"
3984     | string "lastHeaderCell"
3985     | string "firstTotalCell"
3986     | string "lastTotalCell"
3987     | string "firstSubtotalColumn"
3988     | string "secondSubtotalColumn"
3989     | string "thirdSubtotalColumn"
3990     | string "firstSubtotalRow"
3991     | string "secondSubtotalRow"
3992     | string "thirdSubtotalRow"
3993     | string "blankRow"
3994     | string "firstColumnSubheading"
3995     | string "secondColumnSubheading"
3996     | string "thirdColumnSubheading"
3997     | string "firstRowSubheading"
3998     | string "secondRowSubheading"
3999     | string "thirdRowSubheading"
4000     | string "pageFieldLabels"
4001     | string "pageFieldValues"
4002 sml_CT_BooleanProperty =
4003
4004     ## default value: true
4005     attribute val { xsd:boolean }?
4006 sml_CT_FontSize = attribute val { xsd:double }
4007 sml_CT_IntProperty = attribute val { xsd:int }
4008 sml_CT_FontName = attribute val { s_ST_Xstring }
4009 sml_CT_VerticalAlignFontProperty =
4010     attribute val { s_ST_VerticalAlignRun }
4011 sml_CT_FontScheme = attribute val { sml_ST_FontScheme }
4012 sml_ST_FontScheme = string "none" | string "major" | string "minor"
4013 sml_CT_UnderlineProperty =
4014
4015     ## default value: single
4016     attribute val { sml_ST_UnderlineValues }?
4017 sml_ST_UnderlineValues =

```

```

4018     string "single"
4019     | string "double"
4020     | string "singleAccounting"
4021     | string "doubleAccounting"
4022     | string "none"
4023 sml_CT_FontFamily = attribute val { sml_ST_FontFamily }
4024 sml_ST_FontFamily = xsd:integer { minInclusive = "0" maxInclusive = "14" }
4025 sml_CT_Font =
4026     (element name { sml_CT_FontName }?
4027     | element charset { sml_CT_IntProperty }?
4028     | element family { sml_CT_FontFamily }?
4029     | element b { sml_CT_BooleanProperty }?
4030     | element i { sml_CT_BooleanProperty }?
4031     | element strike { sml_CT_BooleanProperty }?
4032     | element outline { sml_CT_BooleanProperty }?
4033     | element shadow { sml_CT_BooleanProperty }?
4034     | element condense { sml_CT_BooleanProperty }?
4035     | element extend { sml_CT_BooleanProperty }?
4036     | element color { sml_CT_Color }?
4037     | element sz { sml_CT_FontSize }?
4038     | element u { sml_CT_UnderlineProperty }?
4039     | element vertAlign { sml_CT_VerticalAlignFontProperty }?
4040     | element scheme { sml_CT_FontScheme }?)+
4041 sml_AG_AutoFormat =
4042     attribute autoFormatId { xsd:unsignedInt }?,
4043     attribute applyNumberFormats { xsd:boolean }?,
4044     attribute applyBorderFormats { xsd:boolean }?,
4045     attribute applyFontFormats { xsd:boolean }?,
4046     attribute applyPatternFormats { xsd:boolean }?,
4047     attribute applyAlignmentFormats { xsd:boolean }?,
4048     attribute applyWidthHeightFormats { xsd:boolean }?
4049 sml_externallink = element externalLink { sml_CT_ExternalLink }
4050 sml_CT_ExternalLink =
4051     (element externalBook { sml_CT_ExternalBook }?
4052     | element ddeLink { sml_CT_DdeLink }?
4053     | element oleLink { sml_CT_OleLink }?),
4054     element extLst { sml_CT_ExtensionList }?
4055 sml_CT_ExternalBook =
4056     r_id,
4057     element sheetNames { sml_CT_ExternalSheetNames }?,
4058     element definedNames { sml_CT_ExternalDefinedNames }?,
4059     element sheetDataSet { sml_CT_ExternalSheetDataSet }?
4060 sml_CT_ExternalSheetNames =
4061     element sheetName { sml_CT_ExternalSheetName }+
4062 sml_CT_ExternalSheetName = attribute val { s_ST_Xstring }?
4063 sml_CT_ExternalDefinedNames =
4064     element definedName { sml_CT_ExternalDefinedName }*
4065 sml_CT_ExternalDefinedName =
4066     attribute name { s_ST_Xstring },
4067     attribute refersTo { s_ST_Xstring }?,
4068     attribute sheetId { xsd:unsignedInt }?
4069 sml_CT_ExternalSheetDataSet =
4070     element sheetData { sml_CT_ExternalSheetData }+

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4071 sml_CT_ExternalSheetData =
4072     attribute sheetId { xsd:unsignedInt },
4073
4074     ## default value: false
4075     attribute refreshError { xsd:boolean }?,
4076     element row { sml_CT_ExternalRow }*
4077 sml_CT_ExternalRow =
4078     attribute r { xsd:unsignedInt },
4079     element cell { sml_CT_ExternalCell }*
4080 sml_CT_ExternalCell =
4081     attribute r { sml_ST_CellRef }?,
4082
4083     ## default value: n
4084     attribute t { sml_ST_CellType }?,
4085
4086     ## default value: 0
4087     attribute vm { xsd:unsignedInt }?,
4088     element v { s_ST_Xstring }?
4089 sml_CT_DdeLink =
4090     attribute ddeService { s_ST_Xstring },
4091     attribute ddeTopic { s_ST_Xstring },
4092     element ddeItems { sml_CT_DdeItems }?
4093 sml_CT_DdeItems = element ddeItem { sml_CT_DdeItem }*
4094 sml_CT_DdeItem =
4095
4096     ## default value: 0
4097     attribute name { s_ST_Xstring }?,
4098
4099     ## default value: false
4100     attribute ole { xsd:boolean }?,
4101
4102     ## default value: false
4103     attribute advise { xsd:boolean }?,
4104
4105     ## default value: false
4106     attribute preferPic { xsd:boolean }?,
4107     element values { sml_CT_DdeValues }?
4108 sml_CT_DdeValues =
4109
4110     ## default value: 1
4111     attribute rows { xsd:unsignedInt }?,
4112
4113     ## default value: 1
4114     attribute cols { xsd:unsignedInt }?,
4115     element value { sml_CT_DdeValue }+
4116 sml_CT_DdeValue =
4117
4118     ## default value: n
4119     attribute t { sml_ST_DdeValueType }?,
4120     element val { s_ST_Xstring }
4121 sml_ST_DdeValueType =
4122     string "nil" | string "b" | string "n" | string "e" | string "str"
4123 sml_CT_OleLink =

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4124     r_id,
4125     attribute progId { s_ST_Xstring },
4126     element oleItems { sml_CT_OleItems }?
4127 sml_CT_OleItems = element oleItem { sml_CT_OleItem }*
4128 sml_CT_OleItem =
4129     attribute name { s_ST_Xstring },
4130
4131     ## default value: false
4132     attribute icon { xsd:boolean }?,
4133
4134     ## default value: false
4135     attribute advise { xsd:boolean }?,
4136
4137     ## default value: false
4138     attribute preferPic { xsd:boolean }?
4139 sml_table = element table { sml_CT_Table }
4140 sml_CT_Table =
4141     attribute id { xsd:unsignedInt },
4142     attribute name { s_ST_Xstring }?,
4143     attribute displayName { s_ST_Xstring },
4144     attribute comment { s_ST_Xstring }?,
4145     attribute ref { sml_ST_Ref },
4146
4147     ## default value: worksheet
4148     attribute tableType { sml_ST_TableType }?,
4149
4150     ## default value: 1
4151     attribute headerRowCount { xsd:unsignedInt }?,
4152
4153     ## default value: false
4154     attribute insertRow { xsd:boolean }?,
4155
4156     ## default value: false
4157     attribute insertRowShift { xsd:boolean }?,
4158
4159     ## default value: 0
4160     attribute totalsRowCount { xsd:unsignedInt }?,
4161
4162     ## default value: true
4163     attribute totalsRowShown { xsd:boolean }?,
4164
4165     ## default value: false
4166     attribute published { xsd:boolean }?,
4167     attribute headerRowDxfId { sml_ST_DxfId }?,
4168     attribute dataDxfId { sml_ST_DxfId }?,
4169     attribute totalsRowDxfId { sml_ST_DxfId }?,
4170     attribute headerRowBorderDxfId { sml_ST_DxfId }?,
4171     attribute tableBorderDxfId { sml_ST_DxfId }?,
4172     attribute totalsRowBorderDxfId { sml_ST_DxfId }?,
4173     attribute headerRowCellStyle { s_ST_Xstring }?,
4174     attribute dataCellStyle { s_ST_Xstring }?,
4175     attribute totalsRowCellStyle { s_ST_Xstring }?,
4176     attribute connectionId { xsd:unsignedInt }?,

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4177     element autoFilter { sml_CT_AutoFilter }?,
4178     element sortState { sml_CT_SortState }?,
4179     element tableColumns { sml_CT_TableColumns },
4180     element tableStyleInfo { sml_CT_TableStyleInfo }?,
4181     element extLst { sml_CT_ExtensionList }?
4182 sml_ST_TableType =
4183     string "worksheet" | string "xml" | string "queryTable"
4184 sml_CT_TableStyleInfo =
4185     attribute name { s_ST_Xstring }?,
4186     attribute showFirstColumn { xsd:boolean }?,
4187     attribute showLastColumn { xsd:boolean }?,
4188     attribute showRowStripes { xsd:boolean }?,
4189     attribute showColumnStripes { xsd:boolean }?
4190 sml_CT_TableColumns =
4191     attribute count { xsd:unsignedInt }?,
4192     element tableColumn { sml_CT_TableColumn }+
4193 sml_CT_TableColumn =
4194     attribute id { xsd:unsignedInt },
4195     attribute uniqueName { s_ST_Xstring }?,
4196     attribute name { s_ST_Xstring },
4197
4198     ## default value: none
4199     attribute totalsRowFunction { sml_ST_TotalsRowFunction }?,
4200     attribute totalsRowLabel { s_ST_Xstring }?,
4201     attribute queryTableFieldId { xsd:unsignedInt }?,
4202     attribute headerRowDxfId { sml_ST_DxfId }?,
4203     attribute dataDxfId { sml_ST_DxfId }?,
4204     attribute totalsRowDxfId { sml_ST_DxfId }?,
4205     attribute headerRowCellStyle { s_ST_Xstring }?,
4206     attribute dataCellStyle { s_ST_Xstring }?,
4207     attribute totalsRowCellStyle { s_ST_Xstring }?,
4208     element calculatedColumnFormula { sml_CT_TableFormula }?,
4209     element totalsRowFormula { sml_CT_TableFormula }?,
4210     element xmlColumnPr { sml_CT_XmlColumnPr }?,
4211     element extLst { sml_CT_ExtensionList }?
4212 sml_CT_TableFormula =
4213     sml_ST_Formula,
4214
4215     ## default value: false
4216     attribute array { xsd:boolean }?
4217 sml_ST_TotalsRowFunction =
4218     string "none"
4219     | string "sum"
4220     | string "min"
4221     | string "max"
4222     | string "average"
4223     | string "count"
4224     | string "countNums"
4225     | string "stdDev"
4226     | string "var"
4227     | string "custom"
4228 sml_CT_XmlColumnPr =
4229     attribute mapId { xsd:unsignedInt },

```

```

4230     attribute xpath { s_ST_Xstring },
4231
4232     ## default value: false
4233     attribute denormalized { xsd:boolean }?,
4234     attribute xmlDataType { sml_ST_XmlDataType },
4235     element extLst { sml_CT_ExtensionList }?
4236 sml_ST_XmlDataType = xsd:string
4237 sml_volTypes = element volTypes { sml_CT_VolTypes }
4238 sml_CT_VolTypes =
4239     element volType { sml_CT_VolType }+,
4240     element extLst { sml_CT_ExtensionList }?
4241 sml_CT_VolType =
4242     attribute type { sml_ST_VolDepType },
4243     element main { sml_CT_VolMain }+
4244 sml_CT_VolMain =
4245     attribute first { s_ST_Xstring },
4246     element tp { sml_CT_VolTopic }+
4247 sml_CT_VolTopic =
4248
4249     ## default value: n
4250     attribute t { sml_ST_VolValueType }?,
4251     element v { s_ST_Xstring },
4252     element stp { s_ST_Xstring }*,
4253     element tr { sml_CT_VolTopicRef }+
4254 sml_CT_VolTopicRef =
4255     attribute r { sml_ST_CellRef },
4256     attribute s { xsd:unsignedInt }
4257 sml_ST_VolDepType = string "realTimeData" | string "olapFunctions"
4258 sml_ST_VolValueType = string "b" | string "n" | string "e" | string "s"
4259 sml_workbook = element workbook { sml_CT_Workbook }
4260 sml_CT_Workbook =
4261     attribute conformance { s_ST_ConformanceClass }?,
4262     element fileVersion { sml_CT_FileVersion }?,
4263     element fileSharing { sml_CT_FileSharing }?,
4264     element workbookPr { sml_CT_WorkbookPr }?,
4265     element workbookProtection { sml_CT_WorkbookProtection }?,
4266     element bookViews { sml_CT_BookViews }?,
4267     element sheets { sml_CT_Sheets },
4268     element functionGroups { sml_CT_FunctionGroups }?,
4269     element externalReferences { sml_CT_ExternalReferences }?,
4270     element definedNames { sml_CT_DefinedNames }?,
4271     element calcPr { sml_CT_CalcPr }?,
4272     element oleSize { sml_CT_OleSize }?,
4273     element customWorkbookViews { sml_CT_CustomWorkbookViews }?,
4274     element pivotCaches { sml_CT_PivotCaches }?,
4275     element smartTagPr { sml_CT_SmartTagPr }?,
4276     element smartTagTypes { sml_CT_SmartTagTypes }?,
4277     element webPublishing { sml_CT_WebPublishing }?,
4278     element fileRecoveryPr { sml_CT_FileRecoveryPr }*,
4279     element webPublishObjects { sml_CT_WebPublishObjects }?,
4280     element extLst { sml_CT_ExtensionList }?
4281 sml_CT_FileVersion =
4282     attribute appName { xsd:string }?,

```

```

4283     attribute lastEdited { xsd:string }?,
4284     attribute lowestEdited { xsd:string }?,
4285     attribute rupBuild { xsd:string }?,
4286     attribute codeName { s_ST_Guid }?
4287 sml_CT_BookViews = element workbookView { sml_CT_BookView }+
4288 sml_CT_BookView =
4289
4290     ## default value: visible
4291     attribute visibility { sml_ST_Visibility }?,
4292
4293     ## default value: false
4294     attribute minimized { xsd:boolean }?,
4295
4296     ## default value: true
4297     attribute showHorizontalScroll { xsd:boolean }?,
4298
4299     ## default value: true
4300     attribute showVerticalScroll { xsd:boolean }?,
4301
4302     ## default value: true
4303     attribute showSheetTabs { xsd:boolean }?,
4304     attribute xWindow { xsd:int }?,
4305     attribute yWindow { xsd:int }?,
4306     attribute windowWidth { xsd:unsignedInt }?,
4307     attribute windowHeight { xsd:unsignedInt }?,
4308
4309     ## default value: 600
4310     attribute tabRatio { xsd:unsignedInt }?,
4311
4312     ## default value: 0
4313     attribute firstSheet { xsd:unsignedInt }?,
4314
4315     ## default value: 0
4316     attribute activeTab { xsd:unsignedInt }?,
4317
4318     ## default value: true
4319     attribute autoFilterDateGrouping { xsd:boolean }?,
4320     element extLst { sml_CT_ExtensionList }?
4321 sml_ST_Visibility =
4322     string "visible" | string "hidden" | string "veryHidden"
4323 sml_CT_CustomWorkbookViews =
4324     element customWorkbookView { sml_CT_CustomWorkbookView }+
4325 sml_CT_CustomWorkbookView =
4326     attribute name { s_ST_Xstring },
4327     attribute guid { s_ST_Guid },
4328
4329     ## default value: false
4330     attribute autoUpdate { xsd:boolean }?,
4331     attribute mergeInterval { xsd:unsignedInt }?,
4332
4333     ## default value: false
4334     attribute changesSavedWin { xsd:boolean }?,
4335

```

```

4336 ## default value: false
4337 attribute onlySync { xsd:boolean }?,
4338
4339 ## default value: false
4340 attribute personalView { xsd:boolean }?,
4341
4342 ## default value: true
4343 attribute includePrintSettings { xsd:boolean }?,
4344
4345 ## default value: true
4346 attribute includeHiddenRowCol { xsd:boolean }?,
4347
4348 ## default value: false
4349 attribute maximized { xsd:boolean }?,
4350
4351 ## default value: false
4352 attribute minimized { xsd:boolean }?,
4353
4354 ## default value: true
4355 attribute showHorizontalScroll { xsd:boolean }?,
4356
4357 ## default value: true
4358 attribute showVerticalScroll { xsd:boolean }?,
4359
4360 ## default value: true
4361 attribute showSheetTabs { xsd:boolean }?,
4362
4363 ## default value: 0
4364 attribute xWindow { xsd:int }?,
4365
4366 ## default value: 0
4367 attribute yWindow { xsd:int }?,
4368 attribute windowWidth { xsd:unsignedInt },
4369 attribute windowHeight { xsd:unsignedInt },
4370
4371 ## default value: 600
4372 attribute tabRatio { xsd:unsignedInt }?,
4373 attribute activeSheetId { xsd:unsignedInt },
4374
4375 ## default value: true
4376 attribute showFormulaBar { xsd:boolean }?,
4377
4378 ## default value: true
4379 attribute showStatusbar { xsd:boolean }?,
4380
4381 ## default value: commIndicator
4382 attribute showComments { sml_ST_Comments }?,
4383
4384 ## default value: all
4385 attribute showObjects { sml_ST_Objects }?,
4386 element extLst { sml_CT_ExtensionList }?
4387 sml_ST_Comments =
4388     string "commNone"

```



```

4389 | string "commIndicator"
4390 | string "commIndAndComment"
4391 sml_ST_Objects = string "all" | string "placeholders" | string "none"
4392 sml_CT_Sheets = element sheet { sml_CT_Sheet }+
4393 sml_CT_Sheet =
4394     attribute name { s_ST_Xstring },
4395     attribute sheetId { xsd:unsignedInt },
4396
4397     ## default value: visible
4398     attribute state { sml_ST_SheetState }?,
4399     r_id
4400 sml_ST_SheetState =
4401     string "visible" | string "hidden" | string "veryHidden"
4402 sml_CT_WorkbookPr =
4403
4404     ## default value: false
4405     attribute date1904 { xsd:boolean }?,
4406
4407     ## default value: all
4408     attribute showObjects { sml_ST_Objects }?,
4409
4410     ## default value: true
4411     attribute showBorderUnselectedTables { xsd:boolean }?,
4412
4413     ## default value: false
4414     attribute filterPrivacy { xsd:boolean }?,
4415
4416     ## default value: false
4417     attribute promptedSolutions { xsd:boolean }?,
4418
4419     ## default value: true
4420     attribute showInkAnnotation { xsd:boolean }?,
4421
4422     ## default value: false
4423     attribute backupFile { xsd:boolean }?,
4424
4425     ## default value: true
4426     attribute saveExternalLinkValues { xsd:boolean }?,
4427
4428     ## default value: userSet
4429     attribute updateLinks { sml_ST_UpdateLinks }?,
4430     attribute codeName { xsd:string }?,
4431
4432     ## default value: false
4433     attribute hidePivotFieldList { xsd:boolean }?,
4434
4435     ## default value: false
4436     attribute showPivotChartFilter { xsd:boolean }?,
4437
4438     ## default value: false
4439     attribute allowRefreshQuery { xsd:boolean }?,
4440
4441     ## default value: false

```

```

4442     attribute publishItems { xsd:boolean }?,
4443
4444     ## default value: false
4445     attribute checkCompatibility { xsd:boolean }?,
4446
4447     ## default value: true
4448     attribute autoCompressPictures { xsd:boolean }?,
4449
4450     ## default value: false
4451     attribute refreshAllConnections { xsd:boolean }?,
4452     attribute defaultThemeVersion { xsd:unsignedInt }?
4453 sml_ST_UpdateLinks = string "userSet" | string "never" | string "always"
4454 sml_CT_SmartTagPr =
4455
4456     ## default value: false
4457     attribute embed { xsd:boolean }?,
4458
4459     ## default value: all
4460     attribute show { sml_ST_SmartTagShow }?
4461 sml_ST_SmartTagShow =
4462     string "all" | string "none" | string "noIndicator"
4463 sml_CT_SmartTagTypes = element smartTagType { sml_CT_SmartTagType }*
4464 sml_CT_SmartTagType =
4465     attribute namespaceUri { s_ST_Xstring }?,
4466     attribute name { s_ST_Xstring }?,
4467     attribute url { s_ST_Xstring }?
4468 sml_CT_FileRecoveryPr =
4469
4470     ## default value: true
4471     attribute autoRecover { xsd:boolean }?,
4472
4473     ## default value: false
4474     attribute crashSave { xsd:boolean }?,
4475
4476     ## default value: false
4477     attribute dataExtractLoad { xsd:boolean }?,
4478
4479     ## default value: false
4480     attribute repairLoad { xsd:boolean }?
4481 sml_CT_CalcPr =
4482     attribute calcId { xsd:unsignedInt }?,
4483
4484     ## default value: auto
4485     attribute calcMode { sml_ST_CalcMode }?,
4486
4487     ## default value: false
4488     attribute fullCalcOnLoad { xsd:boolean }?,
4489
4490     ## default value: A1
4491     attribute refMode { sml_ST_RefMode }?,
4492
4493     ## default value: false
4494     attribute iterate { xsd:boolean }?,

```

```

4495
4496 ## default value: 100
4497 attribute iterateCount { xsd:unsignedInt }?,
4498
4499 ## default value: 0.001
4500 attribute iterateDelta { xsd:double }?,
4501
4502 ## default value: true
4503 attribute fullPrecision { xsd:boolean }?,
4504
4505 ## default value: true
4506 attribute calcCompleted { xsd:boolean }?,
4507
4508 ## default value: true
4509 attribute calcOnSave { xsd:boolean }?,
4510
4511 ## default value: true
4512 attribute concurrentCalc { xsd:boolean }?,
4513 attribute concurrentManualCount { xsd:unsignedInt }?,
4514 attribute forceFullCalc { xsd:boolean }?
4515 sml_ST_CalcMode = string "manual" | string "auto" | string "autoNoTable"
4516 sml_ST_RefMode = string "A1" | string "R1C1"
4517 sml_CT_DefinedNames = element definedName { sml_CT_DefinedName }*
4518 sml_CT_DefinedName =
4519     sml_ST_Formula,
4520     attribute name { s_ST_Xstring },
4521     attribute comment { s_ST_Xstring }?,
4522     attribute customMenu { s_ST_Xstring }?,
4523     attribute description { s_ST_Xstring }?,
4524     attribute help { s_ST_Xstring }?,
4525     attribute statusBar { s_ST_Xstring }?,
4526     attribute localSheetId { xsd:unsignedInt }?,
4527
4528 ## default value: false
4529 attribute hidden { xsd:boolean }?,
4530
4531 ## default value: false
4532 attribute function { xsd:boolean }?,
4533
4534 ## default value: false
4535 attribute vbProcedure { xsd:boolean }?,
4536
4537 ## default value: false
4538 attribute xlm { xsd:boolean }?,
4539 attribute functionGroupId { xsd:unsignedInt }?,
4540 attribute shortcutKey { s_ST_Xstring }?,
4541
4542 ## default value: false
4543 attribute publishToServer { xsd:boolean }?,
4544
4545 ## default value: false
4546 attribute workbookParameter { xsd:boolean }?
4547 sml_CT_ExternalReferences =

```

```

4548     element externalReference { sml_CT_ExternalReference }+
4549 sml_CT_ExternalReference = r_id
4550 sml_CT_SheetBackgroundPicture = r_id
4551 sml_CT_PivotCaches = element pivotCache { sml_CT_PivotCache }+
4552 sml_CT_PivotCache =
4553     attribute cacheId { xsd:unsignedInt },
4554     r_id
4555 sml_CT_FileSharing =
4556
4557     ## default value: false
4558     attribute readOnlyRecommended { xsd:boolean }?,
4559     attribute userName { s_ST_Xstring }?,
4560     attribute algorithmName { s_ST_Xstring }?,
4561     attribute hashValue { xsd:base64Binary }?,
4562     attribute saltValue { xsd:base64Binary }?,
4563     attribute spinCount { xsd:unsignedInt }?
4564 sml_CT_OleSize = attribute ref { sml_ST_Ref }
4565 sml_CT_WorkbookProtection =
4566
4567     ## default value: false
4568     attribute lockStructure { xsd:boolean }?,
4569
4570     ## default value: false
4571     attribute lockWindows { xsd:boolean }?,
4572
4573     ## default value: false
4574     attribute lockRevision { xsd:boolean }?,
4575     attribute revisionsAlgorithmName { s_ST_Xstring }?,
4576     attribute revisionsHashValue { xsd:base64Binary }?,
4577     attribute revisionsSaltValue { xsd:base64Binary }?,
4578     attribute revisionsSpinCount { xsd:unsignedInt }?,
4579     attribute workbookAlgorithmName { s_ST_Xstring }?,
4580     attribute workbookHashValue { xsd:base64Binary }?,
4581     attribute workbookSaltValue { xsd:base64Binary }?,
4582     attribute workbookSpinCount { xsd:unsignedInt }?
4583 sml_CT_WebPublishing =
4584
4585     ## default value: true
4586     attribute css { xsd:boolean }?,
4587
4588     ## default value: true
4589     attribute thicket { xsd:boolean }?,
4590
4591     ## default value: true
4592     attribute longFileNames { xsd:boolean }?,
4593
4594     ## default value: false
4595     attribute vml { xsd:boolean }?,
4596
4597     ## default value: false
4598     attribute allowPng { xsd:boolean }?,
4599
4600     ## default value: 800x600

```

```

4601 attribute targetScreenSize { sml_ST_TargetScreenSize }?,
4602
4603 ## default value: 96
4604 attribute dpi { xsd:unsignedInt }?,
4605 attribute characterSet { xsd:string }?
4606 sml_ST_TargetScreenSize =
4607     string "544x376"
4608     | string "640x480"
4609     | string "720x512"
4610     | string "800x600"
4611     | string "1024x768"
4612     | string "1152x882"
4613     | string "1152x900"
4614     | string "1280x1024"
4615     | string "1600x1200"
4616     | string "1800x1440"
4617     | string "1920x1200"
4618 sml_CT_FunctionGroups =
4619
4620 ## default value: 16
4621 attribute builtInGroupCount { xsd:unsignedInt }?,
4622 element functionGroup { sml_CT_FunctionGroup }*
4623 sml_CT_FunctionGroup = attribute name { s_ST_Xstring }?
4624 sml_CT_WebPublishObjects =
4625     attribute count { xsd:unsignedInt }?,
4626     element webPublishObject { sml_CT_WebPublishObject }+
4627 sml_CT_WebPublishObject =
4628     attribute id { xsd:unsignedInt },
4629     attribute divId { s_ST_Xstring },
4630     attribute sourceObject { s_ST_Xstring }?,
4631     attribute destinationFile { s_ST_Xstring },
4632     attribute title { s_ST_Xstring }?,
4633
4634 ## default value: false
4635 attribute autoRepublish { xsd:boolean }?

```

B.2.1 Part Schemas

B.2.1.1 Calculation Chain Part

This schema is available in the file SpreadsheetML_Calculation_Chain.rnc.

```

1 include "sml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "any.rnc"
4 include "shared-commonSimpleTypes.rnc"
5 include "dml-spreadsheetDrawing.rnc"
6 include "dml-main.rnc"
7 include "dml-diagram.rnc"
8 include "dml-lockedCanvas.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"

```

```
12 start = sml_calcChain
```

B.2.1.2 Chartsheet Part

This schema is available in the file SpreadsheetML_Chartsheet.rnc.

```
1 include "sml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "any.rnc"
4 include "shared-commonSimpleTypes.rnc"
5 include "dml-spreadsheetDrawing.rnc"
6 include "dml-main.rnc"
7 include "dml-diagram.rnc"
8 include "dml-lockedCanvas.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 start = sml_chartsheet
```

B.2.1.3 Comments Part

This schema is available in the file SpreadsheetML_Comments.rnc.

```
1 include "sml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "any.rnc"
4 include "shared-commonSimpleTypes.rnc"
5 include "dml-spreadsheetDrawing.rnc"
6 include "dml-main.rnc"
7 include "dml-diagram.rnc"
8 include "dml-lockedCanvas.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 start = sml_comments
```

B.2.1.4 Connections Part

This schema is available in the file SpreadsheetML_Connections.rnc.

```
1 include "sml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "any.rnc"
4 include "shared-commonSimpleTypes.rnc"
5 include "dml-spreadsheetDrawing.rnc"
6 include "dml-main.rnc"
7 include "dml-diagram.rnc"
8 include "dml-lockedCanvas.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 start = sml_connections
```

B.2.1.5 Custom XML Mappings Part

This schema is available in the file SpreadsheetML_Custom_XML_Mappings.rnc.

```

1 include "sml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "any.rnc"
4 include "shared-commonSimpleTypes.rnc"
5 include "dml-spreadsheetDrawing.rnc"
6 include "dml-main.rnc"
7 include "dml-diagram.rnc"
8 include "dml-lockedCanvas.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 start = sml_MapInfo

```

B.2.1.6 Dialogsheet Part

This schema is available in the file SpreadsheetML_Dialogsheet.rnc.

```

1 include "sml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "any.rnc"
4 include "shared-commonSimpleTypes.rnc"
5 include "dml-spreadsheetDrawing.rnc"
6 include "dml-main.rnc"
7 include "dml-diagram.rnc"
8 include "dml-lockedCanvas.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 start = sml_dialogsheet

```

B.2.1.7 Drawing Part

This schema is available in the file SpreadsheetML_Drawing.rnc.

```

1 include "dml-spreadsheetDrawing.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-main.rnc"
4 include "dml-diagram.rnc"
5 include "shared-commonSimpleTypes.rnc"
6 include "dml-lockedCanvas.rnc"
7 include "any.rnc"
8 include "dml-chart.rnc"
9 include "dml-chartDrawing.rnc"
10 include "dml-picture.rnc"
11 start = xdr_wsDr

```

B.2.1.8 External Workbook References Part

This schema is available in the file SpreadsheetML_External_Workbook_References.rnc.

```

1 include "sml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "any.rnc"
4 include "shared-commonSimpleTypes.rnc"
5 include "dml-spreadsheetDrawing.rnc"
6 include "dml-main.rnc"
7 include "dml-diagram.rnc"
8 include "dml-lockedCanvas.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 start = sml_externallink

```

B.2.1.9 Metadata Part

This schema is available in the file SpreadsheetML_Metadata.rnc.

```

1 include "sml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "any.rnc"
4 include "shared-commonSimpleTypes.rnc"
5 include "dml-spreadsheetDrawing.rnc"
6 include "dml-main.rnc"
7 include "dml-diagram.rnc"
8 include "dml-lockedCanvas.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 start = sml_metadata

```

B.2.1.10 Pivot Table Part

This schema is available in the file SpreadsheetML_Pivot_Table.rnc.

```

1 include "sml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "any.rnc"
4 include "shared-commonSimpleTypes.rnc"
5 include "dml-spreadsheetDrawing.rnc"
6 include "dml-main.rnc"
7 include "dml-diagram.rnc"
8 include "dml-lockedCanvas.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 start = sml_pivotTableDefinition

```

B.2.1.11 Pivot Table Cache Definition Part

This schema is available in the file SpreadsheetML_Pivot_Table_Cache_Definition.rnc.

```

1 include "sml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "any.rnc"

```



```

4 include "shared-commonSimpleTypes.rnc"
5 include "dml-spreadsheetDrawing.rnc"
6 include "dml-main.rnc"
7 include "dml-diagram.rnc"
8 include "dml-lockedCanvas.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 start = sml_pivotCacheDefinition

```

B.2.1.12 Pivot Table Cache Records Part

This schema is available in the file SpreadsheetML_Pivot_Table_Cache_Records.rnc.

```

1 include "sml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "any.rnc"
4 include "shared-commonSimpleTypes.rnc"
5 include "dml-spreadsheetDrawing.rnc"
6 include "dml-main.rnc"
7 include "dml-diagram.rnc"
8 include "dml-lockedCanvas.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 start = sml_pivotCacheRecords

```

B.2.1.13 Query Table Part

This schema is available in the file SpreadsheetML_Query_Table.rnc.

```

1 include "sml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "any.rnc"
4 include "shared-commonSimpleTypes.rnc"
5 include "dml-spreadsheetDrawing.rnc"
6 include "dml-main.rnc"
7 include "dml-diagram.rnc"
8 include "dml-lockedCanvas.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 start = sml_queryTable

```

B.2.1.14 Shared String Table Part

This schema is available in the file SpreadsheetML_Shared_String_Table.rnc.

```

1 include "sml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "any.rnc"
4 include "shared-commonSimpleTypes.rnc"
5 include "dml-spreadsheetDrawing.rnc"
6 include "dml-main.rnc"

```

```

7  include "dml-diagram.rnc"
8  include "dml-lockedCanvas.rnc"
9  include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 start = sml_sst

```

B.2.1.15 Shared Workbook Revision Headers Part

This schema is available in the file SpreadsheetML_Shared_Workbook_Revision_Headers.rnc.

```

1  include "sml.rnc"
2  include "shared-relationshipReference.rnc"
3  include "any.rnc"
4  include "shared-commonSimpleTypes.rnc"
5  include "dml-spreadsheetDrawing.rnc"
6  include "dml-main.rnc"
7  include "dml-diagram.rnc"
8  include "dml-lockedCanvas.rnc"
9  include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 start = sml_headers

```

B.2.1.16 Shared Workbook Revision Log Part

This schema is available in the file SpreadsheetML_Shared_Workbook_Revision_Log.rnc.

```

1  include "sml.rnc"
2  include "shared-relationshipReference.rnc"
3  include "any.rnc"
4  include "shared-commonSimpleTypes.rnc"
5  include "dml-spreadsheetDrawing.rnc"
6  include "dml-main.rnc"
7  include "dml-diagram.rnc"
8  include "dml-lockedCanvas.rnc"
9  include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 start = sml_revisions

```

B.2.1.17 Shared Workbook User Data Part

This schema is available in the file SpreadsheetML_Shared_Workbook_User_Data.rnc.

```

1  include "sml.rnc"
2  include "shared-relationshipReference.rnc"
3  include "any.rnc"
4  include "shared-commonSimpleTypes.rnc"
5  include "dml-spreadsheetDrawing.rnc"
6  include "dml-main.rnc"
7  include "dml-diagram.rnc"
8  include "dml-lockedCanvas.rnc"
9  include "dml-chart.rnc"

```

```

10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 start = sml_users

```

B.2.1.18 Single Cell Table Definitions Part

This schema is available in the file SpreadsheetML_Single_Cell_Table_Definitions.rnc.

```

1 include "sml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "any.rnc"
4 include "shared-commonSimpleTypes.rnc"
5 include "dml-spreadsheetDrawing.rnc"
6 include "dml-main.rnc"
7 include "dml-diagram.rnc"
8 include "dml-lockedCanvas.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 start = sml_singleXmlCells

```

B.2.1.19 Styles Part

This schema is available in the file SpreadsheetML_Styles.rnc.

```

1 include "sml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "any.rnc"
4 include "shared-commonSimpleTypes.rnc"
5 include "dml-spreadsheetDrawing.rnc"
6 include "dml-main.rnc"
7 include "dml-diagram.rnc"
8 include "dml-lockedCanvas.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 start = sml_styleSheet

```

B.2.1.20 Table Definitions Part

This schema is available in the file SpreadsheetML_Table_Definitions.rnc.

```

1 include "sml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "any.rnc"
4 include "shared-commonSimpleTypes.rnc"
5 include "dml-spreadsheetDrawing.rnc"
6 include "dml-main.rnc"
7 include "dml-diagram.rnc"
8 include "dml-lockedCanvas.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 start = sml_table

```

B.2.1.21 Volatile Dependencies Part

This schema is available in the file SpreadsheetML_Volatile_Dependencies.rnc.

```

1 include "sml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "any.rnc"
4 include "shared-commonSimpleTypes.rnc"
5 include "dml-spreadsheetDrawing.rnc"
6 include "dml-main.rnc"
7 include "dml-diagram.rnc"
8 include "dml-lockedCanvas.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 start = sml_volTypes

```

B.2.1.22 Workbook Part

This schema is available in the file SpreadsheetML_Workbook.rnc.

```

1 include "sml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "any.rnc"
4 include "shared-commonSimpleTypes.rnc"
5 include "dml-spreadsheetDrawing.rnc"
6 include "dml-main.rnc"
7 include "dml-diagram.rnc"
8 include "dml-lockedCanvas.rnc"
9 include "dml-chart.rnc"
10 include "dml-chartDrawing.rnc"
11 include "dml-picture.rnc"
12 start = sml_workbook

```

B.2.1.23 Worksheet Part

This schema is available in the file SpreadsheetML_Worksheet.rnc.

```

15 include "sml.rnc"
16 include "shared-relationshipReference.rnc"
17 include "any.rnc"
18 include "shared-commonSimpleTypes.rnc"
19 include "dml-spreadsheetDrawing.rnc"
20 include "dml-main.rnc"
21 include "dml-diagram.rnc"
22 include "dml-lockedCanvas.rnc"
23 include "dml-chart.rnc"
24 include "dml-chartDrawing.rnc"
25 include "dml-picture.rnc"
26 start = sml_worksheet

```

B.3 PresentationML

This schema is available in the file pml.rnc.

```

1 default namespace =
2   "http://purl.oclc.org/ooxml/presentationml/main"
3 namespace a = "http://purl.oclc.org/ooxml/drawingml/main"
4 namespace o = "urn:schemas-microsoft-com:office:office"
5 namespace p =
6   "http://purl.oclc.org/ooxml/presentationml/main"
7 namespace r =
8   "http://purl.oclc.org/ooxml/officeDocument/relationships"
9 namespace s =
10  "http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
11 namespace v = "urn:schemas-microsoft-com:vm1"
12 namespace w10 = "urn:schemas-microsoft-com:office:word"
13 namespace x = "urn:schemas-microsoft-com:office:excel"
14
15 p_ST_TransitionSideDirectionType = "l" | "u" | "r" | "d"
16 p_ST_TransitionCornerDirectionType = "lu" | "ru" | "ld" | "rd"
17 p_ST_TransitionInOutDirectionType = "out" | "in"
18 p_CT_SideDirectionTransition =
19
20   ## default value: l
21   attribute dir { p_ST_TransitionSideDirectionType }?
22 p_CT_CornerDirectionTransition =
23
24   ## default value: lu
25   attribute dir { p_ST_TransitionCornerDirectionType }?
26 p_ST_TransitionEightDirectionType =
27   p_ST_TransitionSideDirectionType | p_ST_TransitionCornerDirectionType
28 p_CT_EightDirectionTransition =
29
30   ## default value: l
31   attribute dir { p_ST_TransitionEightDirectionType }?
32 p_CT_OrientationTransition =
33
34   ## default value: horz
35   attribute dir { p_ST_Direction }?
36 p_CT_InOutTransition =
37
38   ## default value: out
39   attribute dir { p_ST_TransitionInOutDirectionType }?
40 p_CT_OptionalBlackTransition =
41
42   ## default value: false
43   attribute thruBlk { xsd:boolean }?
44 p_CT_SplitTransition =
45
46   ## default value: horz
47   attribute orient { p_ST_Direction }?,
48

```

```

49  ## default value: out
50  attribute dir { p_ST_TransitionInOutDirectionType }?
51  p_CT_WheelTransition =
52
53  ## default value: 4
54  attribute spokes { xsd:unsignedInt }?
55  p_CT_TransitionStartSoundAction =
56
57  ## default value: false
58  attribute loop { xsd:boolean }?,
59  element snd { a_CT_EmbeddedWAVAudioFile }
60  p_CT_TransitionSoundAction =
61  element stSnd { p_CT_TransitionStartSoundAction }
62  | element endSnd { p_CT_Empty }
63  p_ST_TransitionSpeed = "slow" | "med" | "fast"
64  p_CT_SlideTransition =
65
66  ## default value: fast
67  attribute spd { p_ST_TransitionSpeed }?,
68
69  ## default value: true
70  attribute advClick { xsd:boolean }?,
71  attribute advTm { xsd:unsignedInt }?,
72  (element blinds { p_CT_OrientationTransition }
73  | element checker { p_CT_OrientationTransition }
74  | element circle { p_CT_Empty }
75  | element dissolve { p_CT_Empty }
76  | element comb { p_CT_OrientationTransition }
77  | element cover { p_CT_EightDirectionTransition }
78  | element cut { p_CT_OptionalBlackTransition }
79  | element diamond { p_CT_Empty }
80  | element fade { p_CT_OptionalBlackTransition }
81  | element newsflash { p_CT_Empty }
82  | element plus { p_CT_Empty }
83  | element pull { p_CT_EightDirectionTransition }
84  | element push { p_CT_SideDirectionTransition }
85  | element random { p_CT_Empty }
86  | element randomBar { p_CT_OrientationTransition }
87  | element split { p_CT_SplitTransition }
88  | element strips { p_CT_CornerDirectionTransition }
89  | element wedge { p_CT_Empty }
90  | element wheel { p_CT_WheelTransition }
91  | element wipe { p_CT_SideDirectionTransition }
92  | element zoom { p_CT_InOutTransition })?,
93  element sndAc { p_CT_TransitionSoundAction }?,
94  element extLst { p_CT_ExtensionListModify }?
95  p_ST_TLTimeIndefinite = "indefinite"
96  p_ST_TLTime = xsd:unsignedInt | p_ST_TLTimeIndefinite
97  p_ST_TLTimeNodeID = xsd:unsignedInt
98  p_CT_TLIterateIntervalTime = attribute val { p_ST_TLTime }
99  p_CT_TLIterateIntervalPercentage =
100  attribute val { a_ST_PositivePercentage }
101  p_ST_IterateType = "el" | "wd" | "lt"

```

```

102 p_CT_TLIterateData =
103
104   ## default value: el
105   attribute type { p_ST_IterateType }?,
106
107   ## default value: false
108   attribute backwards { xsd:boolean }?,
109   (element tmAbs { p_CT_TLIterateIntervalTime }
110    | element tmPct { p_CT_TLIterateIntervalPercentage })
111 p_CT_TLSubShapeId = attribute spid { a_ST_ShapeID }
112 p_CT_TLTextTargetElement =
113   (element charRg { p_CT_IndexRange }
114    | element pRg { p_CT_IndexRange })?
115 p_ST_TLChartSubelementType =
116   "gridLegend" | "series" | "category" | "ptInSeries" | "ptInCategory"
117 p_CT_TLOleChartTargetElement =
118   attribute type { p_ST_TLChartSubelementType },
119
120   ## default value: 0
121   attribute lvl { xsd:unsignedInt }?
122 p_CT_TLShapeTargetElement =
123   attribute spid { a_ST_DrawingElementId },
124   (element bg { p_CT_Empty }
125    | element subSp { p_CT_TLSubShapeId }
126    | element oleChartEl { p_CT_TLOleChartTargetElement }
127    | element txEl { p_CT_TLTextTargetElement }
128    | element graphicEl { a_CT_AnimationElementChoice })?
129 p_CT_TLTimeTargetElement =
130   element sldTgt { p_CT_Empty }
131   | element sndTgt { a_CT_EmbeddedWAVAudioFile }
132   | element spTgt { p_CT_TLShapeTargetElement }
133   | element inkTgt { p_CT_TLSubShapeId }
134 p_CT_TLTriggerTimeNodeID = attribute val { p_ST_TLTimeNodeID }
135 p_ST_TLTriggerRuntimeNode = "first" | "last" | "all"
136 p_CT_TLTriggerRuntimeNode = attribute val { p_ST_TLTriggerRuntimeNode }
137 p_ST_TLTriggerEvent =
138   "onBegin"
139   | "onEnd"
140   | "begin"
141   | "end"
142   | "onClick"
143   | "onDb1Click"
144   | "onMouseOver"
145   | "onMouseOut"
146   | "onNext"
147   | "onPrev"
148   | "onStopAudio"
149 p_CT_TLTimeCondition =
150   attribute evt { p_ST_TLTriggerEvent }?,
151   attribute delay { p_ST_TLTime }?,
152   (element tgtEl { p_CT_TLTimeTargetElement }
153    | element tn { p_CT_TLTriggerTimeNodeID }
154    | element rtn { p_CT_TLTriggerRuntimeNode })?

```

```

155 p_CT_TLTimeConditionList = element cond { p_CT_TLTimeCondition }+
156 p_CT_TimeNodeList =
157   (element par { p_CT_TLTimeNodeParallel }
158     | element seq { p_CT_TLTimeNodeSequence }
159     | element excl { p_CT_TLTimeNodeExclusive }
160     | element anim { p_CT_TLAnimateBehavior }
161     | element animClr { p_CT_TLAnimateColorBehavior }
162     | element animEffect { p_CT_TLAnimateEffectBehavior }
163     | element animMotion { p_CT_TLAnimateMotionBehavior }
164     | element animRot { p_CT_TLAnimateRotationBehavior }
165     | element animScale { p_CT_TLAnimateScaleBehavior }
166     | element cmd { p_CT_TLCommandBehavior }
167     | element set { p_CT_TLSetBehavior }
168     | element audio { p_CT_TLMediaNodeAudio }
169     | element video { p_CT_TLMediaNodeVideo } )+
170 p_ST_TLTimeNodePresetClassType =
171   "entr" | "exit" | "emph" | "path" | "verb" | "mediacall"
172 p_ST_TLTimeNodeRestartType = "always" | "whenNotActive" | "never"
173 p_ST_TLTimeNodeFillType = "remove" | "freeze" | "hold" | "transition"
174 p_ST_TLTimeNodeSyncType = "canSlip" | "locked"
175 p_ST_TLTimeNodeMasterRelation = "sameClick" | "lastClick" | "nextClick"
176 p_ST_TLTimeNodeType =
177   "clickEffect"
178   | "withEffect"
179   | "afterEffect"
180   | "mainSeq"
181   | "interactiveSeq"
182   | "clickPar"
183   | "withGroup"
184   | "afterGroup"
185   | "tmRoot"
186 p_CT_TLCommonTimeNodeData =
187   attribute id { p_ST_TLTimeNodeID }?,
188   attribute presetID { xsd:int }?,
189   attribute presetClass { p_ST_TLTimeNodePresetClassType }?,
190   attribute presetSubtype { xsd:int }?,
191   attribute dur { p_ST_TLTime }?,
192
193   ## default value: 1000
194   attribute repeatCount { p_ST_TLTime }?,
195   attribute repeatDur { p_ST_TLTime }?,
196
197   ## default value: 100%
198   attribute spd { a_ST_Percentage }?,
199
200   ## default value: 0%
201   attribute accel { a_ST_PositiveFixedPercentage }?,
202
203   ## default value: 0%
204   attribute decel { a_ST_PositiveFixedPercentage }?,
205
206   ## default value: false
207   attribute autoRev { xsd:boolean }?,

```



```

208 attribute restart { p_ST_TLTimeNodeRestartType }?,
209 attribute fill { p_ST_TLTimeNodeFillType }?,
210 attribute syncBehavior { p_ST_TLTimeNodeSyncType }?,
211 attribute tmFilter { xsd:string }?,
212 attribute evtFilter { xsd:string }?,
213 attribute display { xsd:boolean }?,
214 attribute masterRel { p_ST_TLTimeNodeMasterRelation }?,
215 attribute bldLvl { xsd:int }?,
216 attribute grpId { xsd:unsignedInt }?,
217 attribute afterEffect { xsd:boolean }?,
218 attribute nodeType { p_ST_TLTimeNodeType }?,
219 attribute nodePh { xsd:boolean }?,
220 element stCondLst { p_CT_TLTimeConditionList }?,
221 element endCondLst { p_CT_TLTimeConditionList }?,
222 element endSync { p_CT_TLTimeCondition }?,
223 element iterate { p_CT_TLIterateData }?,
224 element childTnLst { p_CT_TimeNodeList }?,
225 element subTnLst { p_CT_TimeNodeList }?
226 p_CT_TLTimeNodeParallel = element cTn { p_CT_TLCommonTimeNodeData }
227 p_ST_TLNextActionType = "none" | "seek"
228 p_ST_TLPreviousActionType = "none" | "skipTimed"
229 p_CT_TLTimeNodeSequence =
230   attribute concurrent { xsd:boolean }?,
231   attribute prevAc { p_ST_TLPreviousActionType }?,
232   attribute nextAc { p_ST_TLNextActionType }?,
233   element cTn { p_CT_TLCommonTimeNodeData },
234   element prevCondLst { p_CT_TLTimeConditionList }?,
235   element nextCondLst { p_CT_TLTimeConditionList }?
236 p_CT_TLTimeNodeExclusive = element cTn { p_CT_TLCommonTimeNodeData }
237 p_CT_TLBehaviorAttributeNameList = element attrName { xsd:string }+
238 p_ST_TLBehaviorAdditiveType = "base" | "sum" | "repl" | "mult" | "none"
239 p_ST_TLBehaviorAccumulateType = "none" | "always"
240 p_ST_TLBehaviorTransformType = "pt" | "img"
241 p_ST_TLBehaviorOverrideType = "normal" | "childStyle"
242 p_CT_TLCommonBehaviorData =
243   attribute additive { p_ST_TLBehaviorAdditiveType }?,
244   attribute accumulate { p_ST_TLBehaviorAccumulateType }?,
245   attribute xfrmType { p_ST_TLBehaviorTransformType }?,
246   attribute from { xsd:string }?,
247   attribute to { xsd:string }?,
248   attribute by { xsd:string }?,
249   attribute rctx { xsd:string }?,
250   attribute override { p_ST_TLBehaviorOverrideType }?,
251   element cTn { p_CT_TLCommonTimeNodeData },
252   element tgtEl { p_CT_TLTimeTargetElement },
253   element attrNameLst { p_CT_TLBehaviorAttributeNameList }?
254 p_CT_TLAnimVariantBooleanVal = attribute val { xsd:boolean }
255 p_CT_TLAnimVariantIntegerVal = attribute val { xsd:int }
256 p_CT_TLAnimVariantFloatVal = attribute val { xsd:float }
257 p_CT_TLAnimVariantStringVal = attribute val { xsd:string }
258 p_CT_TLAnimVariant =
259   element boolVal { p_CT_TLAnimVariantBooleanVal }
260   | element intVal { p_CT_TLAnimVariantIntegerVal }

```

```

261 | element fltVal { p_CT_TLAnimVariantFloatVal }
262 | element strVal { p_CT_TLAnimVariantStringVal }
263 | element clrVal { a_CT_Color }
264 p_ST_TLTimeAnimateValueTime =
265   a_ST_PositiveFixedPercentage | p_ST_TLTimeIndefinite
266 p_CT_TLTimeAnimateValue =
267
268   ## default value: indefinite
269   attribute tm { p_ST_TLTimeAnimateValueTime }?,
270   attribute fmla { xsd:string }?,
271   element val { p_CT_TLAnimVariant }?
272 p_CT_TLTimeAnimateValueList = element tav { p_CT_TLTimeAnimateValue }*
273 p_ST_TLAnimateBehaviorCalcMode = "discrete" | "lin" | "fmla"
274 p_ST_TLAnimateBehaviorValueType = "str" | "num" | "clr"
275 p_CT_TLAnimateBehavior =
276   attribute by { xsd:string }?,
277   attribute from { xsd:string }?,
278   attribute to { xsd:string }?,
279   attribute calcmode { p_ST_TLAnimateBehaviorCalcMode }?,
280   attribute valueType { p_ST_TLAnimateBehaviorValueType }?,
281   element cBhvr { p_CT_TLCommonBehaviorData },
282   element tavLst { p_CT_TLTimeAnimateValueList }?
283 p_CT_TLByRgbColorTransform =
284   attribute r { a_ST_FixedPercentage },
285   attribute g { a_ST_FixedPercentage },
286   attribute b { a_ST_FixedPercentage }
287 p_CT_TLByHslColorTransform =
288   attribute h { a_ST_Angle },
289   attribute s { a_ST_FixedPercentage },
290   attribute l { a_ST_FixedPercentage }
291 p_CT_TLByAnimateColorTransform =
292   element rgb { p_CT_TLByRgbColorTransform }
293   | element hsl { p_CT_TLByHslColorTransform }
294 p_ST_TLAnimateColorSpace = "rgb" | "hsl"
295 p_ST_TLAnimateColorDirection = "cw" | "ccw"
296 p_CT_TLAnimateColorBehavior =
297   attribute clrSpc { p_ST_TLAnimateColorSpace }?,
298   attribute dir { p_ST_TLAnimateColorDirection }?,
299   element cBhvr { p_CT_TLCommonBehaviorData },
300   element by { p_CT_TLByAnimateColorTransform }?,
301   element from { a_CT_Color }?,
302   element to { a_CT_Color }?
303 p_ST_TLAnimateEffectTransition = "in" | "out" | "none"
304 p_CT_TLAnimateEffectBehavior =
305   attribute transition { p_ST_TLAnimateEffectTransition }?,
306   attribute filter { xsd:string }?,
307   attribute prLst { xsd:string }?,
308   element cBhvr { p_CT_TLCommonBehaviorData },
309   element progress { p_CT_TLAnimVariant }?
310 p_ST_TLAnimateMotionBehaviorOrigin = "parent" | "layout"
311 p_ST_TLAnimateMotionPathEditMode = "relative" | "fixed"
312 p_CT_TLPoint =
313   attribute x { a_ST_Percentage },

```

```

314     attribute y { a_ST_Percentage }
315 p_CT_TLAnimateMotionBehavior =
316     attribute origin { p_ST_TLAnimateMotionBehaviorOrigin }?,
317     attribute path { xsd:string }?,
318     attribute pathEditMode { p_ST_TLAnimateMotionPathEditMode }?,
319     attribute rAng { a_ST_Angle }?,
320     attribute ptsTypes { xsd:string }?,
321     element cBhvr { p_CT_TLCommonBehaviorData },
322     element by { p_CT_TLPoint }?,
323     element from { p_CT_TLPoint }?,
324     element to { p_CT_TLPoint }?,
325     element rCtr { p_CT_TLPoint }?
326 p_CT_TLAnimateRotationBehavior =
327     attribute by { a_ST_Angle }?,
328     attribute from { a_ST_Angle }?,
329     attribute to { a_ST_Angle }?,
330     element cBhvr { p_CT_TLCommonBehaviorData }
331 p_CT_TLAnimateScaleBehavior =
332     attribute zoomContents { xsd:boolean }?,
333     element cBhvr { p_CT_TLCommonBehaviorData },
334     element by { p_CT_TLPoint }?,
335     element from { p_CT_TLPoint }?,
336     element to { p_CT_TLPoint }?
337 p_ST_TLCommandType = "evt" | "call" | "verb"
338 p_CT_TLCommandBehavior =
339     attribute type { p_ST_TLCommandType }?,
340     attribute cmd { xsd:string }?,
341     element cBhvr { p_CT_TLCommonBehaviorData }
342 p_CT_TLSetBehavior =
343     element cBhvr { p_CT_TLCommonBehaviorData },
344     element to { p_CT_TLAnimVariant }?
345 p_CT_TLCommonMediaNodeData =
346
347     ## default value: 50%
348     attribute vol { a_ST_PositiveFixedPercentage }?,
349
350     ## default value: false
351     attribute mute { xsd:boolean }?,
352
353     ## default value: 1
354     attribute numSld { xsd:unsignedInt }?,
355
356     ## default value: true
357     attribute showWhenStopped { xsd:boolean }?,
358     element cTn { p_CT_TLCommonTimeNodeData },
359     element tgtEl { p_CT_TLTimeTargetElement }
360 p_CT_TLMediaNodeAudio =
361
362     ## default value: false
363     attribute isNarration { xsd:boolean }?,
364     element cMediaNode { p_CT_TLCommonMediaNodeData }
365 p_CT_TLMediaNodeVideo =
366

```

```

367  ## default value: false
368  attribute fullScrn { xsd:boolean }?,
369  element cMediaNode { p_CT_TLCommonMediaNodeData }
370  p_AG_TLBuild =
371  attribute spid { a_ST_DrawingElementId },
372  attribute grpId { xsd:unsignedInt },
373
374  ## default value: false
375  attribute uiExpand { xsd:boolean }?
376  p_CT_TLTemplate =
377
378  ## default value: 0
379  attribute lvl { xsd:unsignedInt }?,
380  element tnLst { p_CT_TimeNodeList }
381  p_CT_TLTemplateList = element tpl { p_CT_TLTemplate }*
382  p_ST_TLParaBuildType = "allAtOnce" | "p" | "cust" | "whole"
383  p_CT_TLBuildParagraph =
384  p_AG_TLBuild,
385
386  ## default value: whole
387  attribute build { p_ST_TLParaBuildType }?,
388
389  ## default value: 1
390  attribute bldLvl { xsd:unsignedInt }?,
391
392  ## default value: false
393  attribute animBg { xsd:boolean }?,
394
395  ## default value: true
396  attribute autoUpdateAnimBg { xsd:boolean }?,
397
398  ## default value: false
399  attribute rev { xsd:boolean }?,
400
401  ## default value: indefinite
402  attribute advAuto { p_ST_TLTime }?,
403  element tplLst { p_CT_TLTemplateList }?
404  p_ST_TLDiagramBuildType =
405  "whole"
406  | "depthByNode"
407  | "depthByBranch"
408  | "breadthByNode"
409  | "breadthByLvl"
410  | "cw"
411  | "cwIn"
412  | "cwOut"
413  | "ccw"
414  | "ccwIn"
415  | "ccwOut"
416  | "inByRing"
417  | "outByRing"
418  | "up"
419  | "down"

```

```

420 | "allAtOnce"
421 | "cust"
422 p_CT_TLBuildDiagram =
423   p_AG_TLBuild,
424
425   ## default value: whole
426   attribute bld { p_ST_TLDiagramBuildType }?
427 p_ST_TLOleChartBuildType =
428   "allAtOnce" | "series" | "category" | "seriesEl" | "categoryEl"
429 p_CT_TLOleBuildChart =
430   p_AG_TLBuild,
431
432   ## default value: allAtOnce
433   attribute bld { p_ST_TLOleChartBuildType }?,
434
435   ## default value: true
436   attribute animBg { xsd:boolean }?
437 p_CT_TLGraphicalObjectBuild =
438   p_AG_TLBuild,
439   (element bldAsOne { p_CT_Empty }
440   | element bldSub { a_CT_AnimationGraphicalObjectBuildProperties })
441 p_CT_BuildList =
442   (element bldP { p_CT_TLBuildParagraph }
443   | element bldDgm { p_CT_TLBuildDiagram }
444   | element bldOleChart { p_CT_TLOleBuildChart }
445   | element bldGraphic { p_CT_TLGraphicalObjectBuild })+
446 p_CT_SlideTiming =
447   element tnLst { p_CT_TimeNodeList }?,
448   element bldLst { p_CT_BuildList }?,
449   element extLst { p_CT_ExtensionListModify }?
450 p_CT_Empty = empty
451 p_ST_Name = xsd:string
452 p_ST_Direction = "horz" | "vert"
453 p_ST_Index = xsd:unsignedInt
454 p_CT_IndexRange =
455   attribute st { p_ST_Index },
456   attribute end { p_ST_Index }
457 p_CT_SlideRelationshipListEntry = r_id
458 p_CT_SlideRelationshipList =
459   element sld { p_CT_SlideRelationshipListEntry }*
460 p_CT_CustomShowId = attribute id { xsd:unsignedInt }
461 p_EG_SlideListChoice =
462   element sldAll { p_CT_Empty }
463   | element sldRg { p_CT_IndexRange }
464   | element custShow { p_CT_CustomShowId }
465 p_CT_CustomerData = r_id
466 p_CT_TagsData = r_id
467 p_CT_CustomerDataList =
468   (element custData { p_CT_CustomerData }*,
469   element tags { p_CT_TagsData }?)?
470 p_CT_Extension =
471   attribute uri { xsd:token },
472   p_CT_Extension_any*

```

```

473 p_CT_Extension_any =
474     element * - (o:* | v:* | w10:* | x:*) {
475         anyAttribute*,
476         mixed { anyElement* }
477     }
478 p_EG_ExtensionList = element ext { p_CT_Extension }*
479 p_CT_ExtensionList = p_EG_ExtensionList?
480 p_CT_ExtensionListModify =
481
482     ## default value: false
483     attribute mod { xsd:boolean }?,
484     p_EG_ExtensionList?
485 p_CT_CommentAuthor =
486     attribute id { xsd:unsignedInt },
487     attribute name { p_ST_Name },
488     attribute initials { p_ST_Name },
489     attribute lastIdx { xsd:unsignedInt },
490     attribute clrIdx { xsd:unsignedInt },
491     element extLst { p_CT_ExtensionList }?
492 p_CT_CommentAuthorList = element cmAuthor { p_CT_CommentAuthor }*
493 p_cmAuthorLst = element cmAuthorLst { p_CT_CommentAuthorList }
494 p_CT_Comment =
495     attribute authorId { xsd:unsignedInt },
496     attribute dt { xsd:dateTime }?,
497     attribute idx { p_ST_Index },
498     element pos { a_CT_Point2D },
499     element text { xsd:string },
500     element extLst { p_CT_ExtensionListModify }?
501 p_CT_CommentList = element cm { p_CT_Comment }*
502 p_cmLst = element cmLst { p_CT_CommentList }
503 p_AG_Ole =
504     attribute name { xsd:string }?,
505
506     ## default value: false
507     attribute showAsIcon { xsd:boolean }?,
508     r_id?,
509     attribute imgW { a_ST_PositiveCoordinate32 }?,
510     attribute imgH { a_ST_PositiveCoordinate32 }?
511 p_ST_OleObjectFollowColorScheme = "none" | "full" | "textAndBackground"
512 p_CT_OleObjectEmbed =
513
514     ## default value: none
515     attribute followColorScheme { p_ST_OleObjectFollowColorScheme }?,
516     element extLst { p_CT_ExtensionList }?
517 p_CT_OleObjectLink =
518
519     ## default value: false
520     attribute updateAutomatic { xsd:boolean }?,
521     element extLst { p_CT_ExtensionList }?
522 p_CT_OleObject =
523     p_AG_Ole,
524     attribute progId { xsd:string }?,
525     (element embed { p_CT_OleObjectEmbed }

```

```

526 | element link { p_CT_OleObjectLink }},
527 element pic { p_CT_Picture }
528 p_oleObj = element oleObj { p_CT_OleObject }
529 p_CT_Control =
530   p_AG_Ole,
531   element extLst { p_CT_ExtensionList }?,
532   element pic { p_CT_Picture }?
533 p_CT_ControlList = element control { p_CT_Control }*
534 p_ST_SlideId =
535   xsd:unsignedInt { minInclusive = "256" maxExclusive = "2147483648" }
536 p_CT_SlideIdListEntry =
537   attribute id { p_ST_SlideId },
538   r_id,
539   element extLst { p_CT_ExtensionList }?
540 p_CT_SlideIdList = element sldId { p_CT_SlideIdListEntry }*
541 p_ST_SlideMasterId = xsd:unsignedInt { minInclusive = "2147483648" }
542 p_CT_SlideMasterIdListEntry =
543   attribute id { p_ST_SlideMasterId }?,
544   r_id,
545   element extLst { p_CT_ExtensionList }?
546 p_CT_SlideMasterIdList =
547   element sldMasterId { p_CT_SlideMasterIdListEntry }*
548 p_CT_NotesMasterIdListEntry =
549   r_id,
550   element extLst { p_CT_ExtensionList }?
551 p_CT_NotesMasterIdList =
552   element notesMasterId { p_CT_NotesMasterIdListEntry }?
553 p_CT_HandoutMasterIdListEntry =
554   r_id,
555   element extLst { p_CT_ExtensionList }?
556 p_CT_HandoutMasterIdList =
557   element handoutMasterId { p_CT_HandoutMasterIdListEntry }?
558 p_CT_EmbeddedFontDataId = r_id
559 p_CT_EmbeddedFontListEntry =
560   element font { a_CT_TextFont },
561   element regular { p_CT_EmbeddedFontDataId }?,
562   element bold { p_CT_EmbeddedFontDataId }?,
563   element italic { p_CT_EmbeddedFontDataId }?,
564   element boldItalic { p_CT_EmbeddedFontDataId }?
565 p_CT_EmbeddedFontList =
566   element embeddedFont { p_CT_EmbeddedFontListEntry }*
567 p_CT_SmartTags = r_id
568 p_CT_CustomShow =
569   attribute name { p_ST_Name },
570   attribute id { xsd:unsignedInt },
571   element sldLst { p_CT_SlideRelationshipList },
572   element extLst { p_CT_ExtensionList }?
573 p_CT_CustomShowList = element custShow { p_CT_CustomShow }*
574 p_ST_PhotoAlbumLayout =
575   "fitToSlide"
576 | "1pic"
577 | "2pic"
578 | "4pic"

```

```

579 | "1picTitle"
580 | "2picTitle"
581 | "4picTitle"
582 p_ST_PhotoAlbumFrameShape =
583   "frameStyle1"
584   | "frameStyle2"
585   | "frameStyle3"
586   | "frameStyle4"
587   | "frameStyle5"
588   | "frameStyle6"
589   | "frameStyle7"
590 p_CT_PhotoAlbum =
591
592   ## default value: false
593   attribute bw { xsd:boolean }?,
594
595   ## default value: false
596   attribute showCaptions { xsd:boolean }?,
597
598   ## default value: fitToSlide
599   attribute layout { p_ST_PhotoAlbumLayout }?,
600
601   ## default value: frameStyle1
602   attribute frame { p_ST_PhotoAlbumFrameShape }?,
603   element extLst { p_CT_ExtensionList }?
604 p_ST_SlideSizeCoordinate =
605   xsd:int {
606     minInclusive = "914400"
607     maxInclusive = "51206400"
608   }
609 p_ST_SlideSizeType =
610   "screen4x3"
611   | "letter"
612   | "A4"
613   | "35mm"
614   | "overhead"
615   | "banner"
616   | "custom"
617   | "ledger"
618   | "A3"
619   | "B4ISO"
620   | "B5ISO"
621   | "B4JIS"
622   | "B5JIS"
623   | "hagakiCard"
624   | "screen16x9"
625   | "screen16x10"
626 p_CT_SlideSize =
627   attribute cx { p_ST_SlideSizeCoordinate },
628   attribute cy { p_ST_SlideSizeCoordinate },
629
630   ## default value: custom
631   attribute type { p_ST_SlideSizeType }?

```



```

632 p_CT_Kinsoku =
633     attribute lang { xsd:string }?,
634     attribute invalStChars { xsd:string },
635     attribute invalEndChars { xsd:string }
636 p_ST_BookmarkIdSeed =
637     xsd:unsignedInt { minInclusive = "1" maxExclusive = "2147483648" }
638 p_CT_ModifyVerifier =
639     attribute algorithmName { xsd:string }?,
640     attribute hashValue { xsd:base64Binary }?,
641     attribute saltValue { xsd:base64Binary }?,
642     attribute spinValue { xsd:unsignedInt }?
643 p_CT_Presentation =
644
645     ## default value: 50%
646     attribute serverZoom { a_ST_Percentage }?,
647
648     ## default value: 1
649     attribute firstSlideNum { xsd:int }?,
650
651     ## default value: true
652     attribute showSpecialPlsOnTitleSld { xsd:boolean }?,
653
654     ## default value: false
655     attribute rtl { xsd:boolean }?,
656
657     ## default value: false
658     attribute removePersonalInfoOnSave { xsd:boolean }?,
659
660     ## default value: false
661     attribute compatMode { xsd:boolean }?,
662
663     ## default value: true
664     attribute strictFirstAndLastChars { xsd:boolean }?,
665
666     ## default value: false
667     attribute embedTrueTypeFonts { xsd:boolean }?,
668
669     ## default value: false
670     attribute saveSubsetFonts { xsd:boolean }?,
671
672     ## default value: true
673     attribute autoCompressPictures { xsd:boolean }?,
674
675     ## default value: 1
676     attribute bookmarkIdSeed { p_ST_BookmarkIdSeed }?,
677     attribute conformance { s_ST_ConformanceClass }?,
678     element sldMasterIdLst { p_CT_SlideMasterIdList }?,
679     element notesMasterIdLst { p_CT_NotesMasterIdList }?,
680     element handoutMasterIdLst { p_CT_HandoutMasterIdList }?,
681     element sldIdLst { p_CT_SlideIdList }?,
682     element sldSz { p_CT_SlideSize }?,
683     element notesSz { a_CT_PositiveSize2D },
684     element smartTags { p_CT_SmartTags }?,

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```

685     element embeddedFontList { p_CT_EmbeddedFontList }?,
686     element custShowList { p_CT_CustomShowList }?,
687     element photoAlbum { p_CT_PhotoAlbum }?,
688     element custDataList { p_CT_CustomerDataList }?,
689     element kinsoku { p_CT_Kinsoku }?,
690     element defaultTextStyle { a_CT_TextListStyle }?,
691     element modifyVerifier { p_CT_ModifyVerifier }?,
692     element extList { p_CT_ExtensionList }?
693 p_presentation = element presentation { p_CT_Presentation }
694 p_CT_HtmlPublishProperties =
695
696     ## default value: true
697     attribute showSpeakerNotes { xsd:boolean }?,
698     attribute target { xsd:string }?,
699     attribute title { xsd:string }?,
700     r_id,
701     p_EG_SlideListChoice,
702     element extList { p_CT_ExtensionList }?
703 p_ST_PrintWhat =
704     "slides"
705     | "handouts1"
706     | "handouts2"
707     | "handouts3"
708     | "handouts4"
709     | "handouts6"
710     | "handouts9"
711     | "notes"
712     | "outline"
713 p_ST_PrintColorMode = "bw" | "gray" | "clr"
714 p_CT_PrintProperties =
715
716     ## default value: slides
717     attribute prnWhat { p_ST_PrintWhat }?,
718
719     ## default value: clr
720     attribute clrMode { p_ST_PrintColorMode }?,
721
722     ## default value: false
723     attribute hiddenSlides { xsd:boolean }?,
724
725     ## default value: false
726     attribute scaleToFitPaper { xsd:boolean }?,
727
728     ## default value: false
729     attribute frameSlides { xsd:boolean }?,
730     element extList { p_CT_ExtensionList }?
731 p_CT_ShowInfoBrowse =
732
733     ## default value: true
734     attribute showScrollbar { xsd:boolean }?
735 p_CT_ShowInfoKiosk =
736
737     ## default value: 300000

```

```

738     attribute restart { xsd:unsignedInt }?
739 p_EG_ShowType =
740     element present { p_CT_Empty }
741     | element browse { p_CT_ShowInfoBrowse }
742     | element kiosk { p_CT_ShowInfoKiosk }
743 p_CT_ShowProperties =
744
745     ## default value: false
746     attribute loop { xsd:boolean }?,
747
748     ## default value: false
749     attribute showNarration { xsd:boolean }?,
750
751     ## default value: true
752     attribute showAnimation { xsd:boolean }?,
753
754     ## default value: true
755     attribute useTimings { xsd:boolean }?,
756     (p_EG_ShowType?,
757     p_EG_SlideListChoice?,
758     element penClr { a_CT_Color }?,
759     element extLst { p_CT_ExtensionList }?)?
760 p_CT_PresentationProperties =
761     element prnPr { p_CT_PrintProperties }?,
762     element showPr { p_CT_ShowProperties }?,
763     element clrMru { a_CT_ColorMRU }?,
764     element extLst { p_CT_ExtensionList }?
765 p_presentationPr =
766     element presentationPr { p_CT_PresentationProperties }
767 p_CT_HeaderFooter =
768
769     ## default value: true
770     attribute sldNum { xsd:boolean }?,
771
772     ## default value: true
773     attribute hdr { xsd:boolean }?,
774
775     ## default value: true
776     attribute ftr { xsd:boolean }?,
777
778     ## default value: true
779     attribute dt { xsd:boolean }?,
780     element extLst { p_CT_ExtensionListModify }?
781 p_ST_PlaceholderType =
782     "title"
783     | "body"
784     | "ctrTitle"
785     | "subTitle"
786     | "dt"
787     | "sldNum"
788     | "ftr"
789     | "hdr"
790     | "obj"

```

```

791 | "chart"
792 | "tbl"
793 | "clipArt"
794 | "dgm"
795 | "media"
796 | "sldImg"
797 | "pic"
798 p_ST_PlaceholderSize = "full" | "half" | "quarter"
799 p_CT_Placeholder =
800
801   ## default value: obj
802   attribute type { p_ST_PlaceholderType }?,
803
804   ## default value: horz
805   attribute orient { p_ST_Direction }?,
806
807   ## default value: full
808   attribute sz { p_ST_PlaceholderSize }?,
809
810   ## default value: 0
811   attribute idx { xsd:unsignedInt }?,
812
813   ## default value: false
814   attribute hasCustomPrompt { xsd:boolean }?,
815   element extLst { p_CT_ExtensionListModify }?
816 p_CT_ApplicationNonVisualDrawingProps =
817
818   ## default value: false
819   attribute isPhoto { xsd:boolean }?,
820
821   ## default value: false
822   attribute userDrawn { xsd:boolean }?,
823   element ph { p_CT_Placeholder }?,
824   a_EG_Media?,
825   element custDataLst { p_CT_CustomerDataList }?,
826   element extLst { p_CT_ExtensionList }?
827 p_CT_ShapeNonVisual =
828   element cNvPr { a_CT_NonVisualDrawingProps },
829   element cNvSpPr { a_CT_NonVisualDrawingShapeProps },
830   element nvPr { p_CT_ApplicationNonVisualDrawingProps }
831 p_CT_Shape =
832
833   ## default value: false
834   attribute useBgFill { xsd:boolean }?,
835   element nvSpPr { p_CT_ShapeNonVisual },
836   element spPr { a_CT_ShapeProperties },
837   element style { a_CT_ShapeStyle }?,
838   element txBdy { a_CT_TextBody }?,
839   element extLst { p_CT_ExtensionListModify }?
840 p_CT_ConnectorNonVisual =
841   element cNvPr { a_CT_NonVisualDrawingProps },
842   element cNvCxnSpPr { a_CT_NonVisualConnectorProperties },
843   element nvPr { p_CT_ApplicationNonVisualDrawingProps }

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```

844 p_CT_Connector =
845     element nvCxnSpPr { p_CT_ConnectorNonVisual },
846     element spPr { a_CT_ShapeProperties },
847     element style { a_CT_ShapeStyle }?,
848     element extLst { p_CT_ExtensionListModify }?
849 p_CT_PictureNonVisual =
850     element cNvPr { a_CT_NonVisualDrawingProps },
851     element cNvPicPr { a_CT_NonVisualPictureProperties },
852     element nvPr { p_CT_ApplicationNonVisualDrawingProps }
853 p_CT_Picture =
854     element nvPicPr { p_CT_PictureNonVisual },
855     element blipFill { a_CT_BlipFillProperties },
856     element spPr { a_CT_ShapeProperties },
857     element style { a_CT_ShapeStyle }?,
858     element extLst { p_CT_ExtensionListModify }?
859 p_CT_GraphicalObjectFrameNonVisual =
860     element cNvPr { a_CT_NonVisualDrawingProps },
861     element cNvGraphicFramePr { a_CT_NonVisualGraphicFrameProperties },
862     element nvPr { p_CT_ApplicationNonVisualDrawingProps }
863 p_CT_GraphicalObjectFrame =
864     attribute bwMode { a_ST_BlackWhiteMode }?,
865     element nvGraphicFramePr { p_CT_GraphicalObjectFrameNonVisual },
866     element xfrm { a_CT_Transform2D },
867     a_graphic,
868     element extLst { p_CT_ExtensionListModify }?
869 p_CT_GroupShapeNonVisual =
870     element cNvPr { a_CT_NonVisualDrawingProps },
871     element cNvGrpSpPr { a_CT_NonVisualGroupDrawingShapeProps },
872     element nvPr { p_CT_ApplicationNonVisualDrawingProps }
873 p_CT_GroupShape =
874     element nvGrpSpPr { p_CT_GroupShapeNonVisual },
875     element grpSpPr { a_CT_GroupShapeProperties },
876     (element sp { p_CT_Shape }
877      | element grpSp { p_CT_GroupShape }
878      | element graphicFrame { p_CT_GraphicalObjectFrame }
879      | element cxnSp { p_CT_Connector }
880      | element pic { p_CT_Picture }
881      | element contentPart { p_CT_Rel })*,
882     element extLst { p_CT_ExtensionListModify }?
883 p_CT_Rel = r_id
884 p_EG_TopLevelSlide = element clrMap { a_CT_ColorMapping }
885 p_EG_ChildSlide = element clrMapOvr { a_CT_ColorMappingOverride }?
886 p_AG_ChildSlide =
887
888     ## default value: true
889     attribute showMasterSp { xsd:boolean }?,
890
891     ## default value: true
892     attribute showMasterPhAnim { xsd:boolean }?
893 p_CT_BackgroundProperties =
894
895     ## default value: false
896     attribute shadeToTitle { xsd:boolean }?,

```

```

897   a_EG_FillProperties,
898   a_EG_EffectProperties?,
899   element extLst { p_CT_ExtensionList }?
900 p_EG_Background =
901   element bgPr { p_CT_BackgroundProperties }
902   | element bgRef { a_CT_StyleMatrixReference }
903 p_CT_Background =
904
905   ## default value: white
906   attribute bwMode { a_ST_BlackWhiteMode }?,
907   p_EG_Background
908 p_CT_CommonSlideData =
909   attribute name { xsd:string }?,
910   element bg { p_CT_Background }?,
911   element spTree { p_CT_GroupShape },
912   element custDataLst { p_CT_CustomerDataList }?,
913   element controls { p_CT_ControlList }?,
914   element extLst { p_CT_ExtensionList }?
915 p_CT_Slide =
916   p_AG_ChildSlide,
917
918   ## default value: true
919   attribute show { xsd:boolean }?,
920   element cSld { p_CT_CommonSlideData },
921   p_EG_ChildSlide?,
922   element transition { p_CT_SlideTransition }?,
923   element timing { p_CT_SlideTiming }?,
924   element extLst { p_CT_ExtensionListModify }?
925 p_sld = element sld { p_CT_Slide }
926 p_ST_SlideLayoutType =
927   "title"
928   | "tx"
929   | "twoColTx"
930   | "tbl"
931   | "txAndChart"
932   | "chartAndTx"
933   | "dgm"
934   | "chart"
935   | "txAndClipArt"
936   | "clipArtAndTx"
937   | "titleOnly"
938   | "blank"
939   | "txAndObj"
940   | "objAndTx"
941   | "objOnly"
942   | "obj"
943   | "txAndMedia"
944   | "mediaAndTx"
945   | "objOverTx"
946   | "txOverObj"
947   | "txAndTwoObj"
948   | "twoObjAndTx"
949   | "twoObjOverTx"

```

```

950 | "fourObj"
951 | "vertTx"
952 | "clipArtAndVertTx"
953 | "vertTitleAndTx"
954 | "vertTitleAndTxOverChart"
955 | "twoObj"
956 | "objAndTwoObj"
957 | "twoObjAndObj"
958 | "cust"
959 | "secHead"
960 | "twoTxTwoObj"
961 | "objTx"
962 | "picTx"
963 p_CT_SlideLayout =
964   p_AG_ChildSlide,
965   attribute matchingName { xsd:string }?,
966
967   ## default value: cust
968   attribute type { p_ST_SlideLayoutType }?,
969
970   ## default value: false
971   attribute preserve { xsd:boolean }?,
972
973   ## default value: false
974   attribute userDrawn { xsd:boolean }?,
975   element cSld { p_CT_CommonSlideData },
976   p_EG_ChildSlide?,
977   element transition { p_CT_SlideTransition }?,
978   element timing { p_CT_SlideTiming }?,
979   element hf { p_CT_HeaderFooter }?,
980   element extLst { p_CT_ExtensionListModify }?
981 p_sldLayout = element sldLayout { p_CT_SlideLayout }
982 p_CT_SlideMasterTextStyles =
983   element titleStyle { a_CT_TextListStyle }?,
984   element bodyStyle { a_CT_TextListStyle }?,
985   element otherStyle { a_CT_TextListStyle }?,
986   element extLst { p_CT_ExtensionList }?
987 p_ST_SlideLayoutId = xsd:unsignedInt { minInclusive = "2147483648" }
988 p_CT_SlideLayoutIdListEntry =
989   attribute id { p_ST_SlideLayoutId }?,
990   r_id,
991   element extLst { p_CT_ExtensionList }?
992 p_CT_SlideLayoutIdList =
993   element sldLayoutId { p_CT_SlideLayoutIdListEntry }*
994 p_CT_SlideMaster =
995
996   ## default value: false
997   attribute preserve { xsd:boolean }?,
998   element cSld { p_CT_CommonSlideData },
999   p_EG_TopLevelSlide,
1000   element sldLayoutIdLst { p_CT_SlideLayoutIdList }?,
1001   element transition { p_CT_SlideTransition }?,
1002   element timing { p_CT_SlideTiming }?,

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1003     element hf { p_CT_HeaderFooter }?,
1004     element txStyles { p_CT_SlideMasterTextStyles }?,
1005     element extLst { p_CT_ExtensionListModify }?
1006 p_sldMaster = element sldMaster { p_CT_SlideMaster }
1007 p_CT_HandoutMaster =
1008     element cSld { p_CT_CommonSlideData },
1009     p_EG_TopLevelSlide,
1010     element hf { p_CT_HeaderFooter }?,
1011     element extLst { p_CT_ExtensionListModify }?
1012 p_handoutMaster = element handoutMaster { p_CT_HandoutMaster }
1013 p_CT_NotesMaster =
1014     element cSld { p_CT_CommonSlideData },
1015     p_EG_TopLevelSlide,
1016     element hf { p_CT_HeaderFooter }?,
1017     element notesStyle { a_CT_TextListStyle }?,
1018     element extLst { p_CT_ExtensionListModify }?
1019 p_notesMaster = element notesMaster { p_CT_NotesMaster }
1020 p_CT_NotesSlide =
1021     p_AG_ChildSlide,
1022     element cSld { p_CT_CommonSlideData },
1023     p_EG_ChildSlide?,
1024     element extLst { p_CT_ExtensionListModify }?
1025 p_notes = element notes { p_CT_NotesSlide }
1026 p_CT_SlideSyncProperties =
1027     attribute serverSldId { xsd:string },
1028     attribute serverSldModifiedTime { xsd:dateTime },
1029     attribute clientInsertedTime { xsd:dateTime },
1030     element extLst { p_CT_ExtensionList }?
1031 p_sldSyncPr = element sldSyncPr { p_CT_SlideSyncProperties }
1032 p_CT_StringTag =
1033     attribute name { xsd:string },
1034     attribute val { xsd:string }
1035 p_CT_TagList = element tag { p_CT_StringTag }*
1036 p_tagLst = element tagLst { p_CT_TagList }
1037 p_ST_SplitterBarState = "minimized" | "restored" | "maximized"
1038 p_ST_ViewType =
1039     "sldView"
1040     | "sldMasterView"
1041     | "notesView"
1042     | "handoutView"
1043     | "notesMasterView"
1044     | "outlineView"
1045     | "sldSorterView"
1046     | "sldThumbnailView"
1047 p_CT_NormalViewPortion =
1048     attribute sz { a_ST_PositiveFixedPercentage },
1049
1050     ## default value: true
1051     attribute autoAdjust { xsd:boolean }?
1052 p_CT_NormalViewProperties =
1053
1054     ## default value: true
1055     attribute showOutlineIcons { xsd:boolean }?,

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```

1056
1057   ## default value: false
1058   attribute snapVertSplitter { xsd:boolean }?,
1059
1060   ## default value: restored
1061   attribute vertBarState { p_ST_SplitterBarState }?,
1062
1063   ## default value: restored
1064   attribute horzBarState { p_ST_SplitterBarState }?,
1065
1066   ## default value: false
1067   attribute preferSingleView { xsd:boolean }?,
1068   element restoredLeft { p_CT_NormalViewPortion },
1069   element restoredTop { p_CT_NormalViewPortion },
1070   element extLst { p_CT_ExtensionList }?
1071 p_CT_CommonViewProperties =
1072
1073   ## default value: false
1074   attribute varScale { xsd:boolean }?,
1075   element scale { a_CT_Scale2D },
1076   element origin { a_CT_Point2D }
1077 p_CT_NotesTextViewProperties =
1078   element cViewPr { p_CT_CommonViewProperties },
1079   element extLst { p_CT_ExtensionList }?
1080 p_CT_OutlineViewSlideEntry =
1081   r_id,
1082
1083   ## default value: false
1084   attribute collapse { xsd:boolean }?
1085 p_CT_OutlineViewSlideList = element sld { p_CT_OutlineViewSlideEntry }*
1086 p_CT_OutlineViewProperties =
1087   element cViewPr { p_CT_CommonViewProperties },
1088   element sldLst { p_CT_OutlineViewSlideList }?,
1089   element extLst { p_CT_ExtensionList }?
1090 p_CT_SlideSorterViewProperties =
1091
1092   ## default value: true
1093   attribute showFormatting { xsd:boolean }?,
1094   element cViewPr { p_CT_CommonViewProperties },
1095   element extLst { p_CT_ExtensionList }?
1096 p_CT_Guide =
1097
1098   ## default value: vert
1099   attribute orient { p_ST_Direction }?,
1100
1101   ## default value: 0
1102   attribute pos { a_ST_Coordinate32 }?
1103 p_CT_GuideList = element guide { p_CT_Guide }*
1104 p_CT_CommonSlideViewProperties =
1105
1106   ## default value: true
1107   attribute snapToGrid { xsd:boolean }?,
1108

```

```

1109  ## default value: false
1110  attribute snapToObjects { xsd:boolean }?,
1111
1112  ## default value: false
1113  attribute showGuides { xsd:boolean }?,
1114  element cViewPr { p_CT_CommonViewProperties },
1115  element guideLst { p_CT_GuideList }?
1116  p_CT_SlideViewProperties =
1117    element cSldViewPr { p_CT_CommonSlideViewProperties },
1118    element extLst { p_CT_ExtensionList }?
1119  p_CT_NotesViewProperties =
1120    element cSldViewPr { p_CT_CommonSlideViewProperties },
1121    element extLst { p_CT_ExtensionList }?
1122  p_CT_ViewProperties =
1123
1124  ## default value: sldView
1125  attribute lastView { p_ST_ViewType }?,
1126
1127  ## default value: true
1128  attribute showComments { xsd:boolean }?,
1129  (element normalViewPr { p_CT_NormalViewProperties }?,
1130   element slideViewPr { p_CT_SlideViewProperties }?,
1131   element outlineViewPr { p_CT_OutlineViewProperties }?,
1132   element notesTextViewPr { p_CT_NotesTextViewProperties }?,
1133   element sorterViewPr { p_CT_SlideSorterViewProperties }?,
1134   element notesViewPr { p_CT_NotesViewProperties }?,
1135   element gridSpacing { a_CT_PositiveSize2D }?,
1136   element extLst { p_CT_ExtensionList }?)?
1137  p_viewPr = element viewPr { p_CT_ViewProperties }

```

B.3.1 Part Schemas

B.3.1.1 Comment Authors Part

This schema is available in the file PresentationML_Comment_Authors.rnc.

```

1  include "pml.rnc"
2  include "shared-relationshipReference.rnc"
3  include "dml-main.rnc"
4  include "dml-diagram.rnc"
5  include "shared-commonSimpleTypes.rnc"
6  include "dml-lockedCanvas.rnc"
7  include "any.rnc"
8  include "dml-chart.rnc"
9  include "dml-chartDrawing.rnc"
10 include "dml-picture.rnc"
11 start = p_cmAuthorLst

```

B.3.1.2 Comments Part

This schema is available in the file PresentationML_Comments.rnc.

```

1  include "pml.rnc"

```

```

2 include "shared-relationshipReference.rnc"
3 include "dml-main.rnc"
4 include "dml-diagram.rnc"
5 include "shared-commonSimpleTypes.rnc"
6 include "dml-lockedCanvas.rnc"
7 include "any.rnc"
8 include "dml-chart.rnc"
9 include "dml-chartDrawing.rnc"
10 include "dml-picture.rnc"
11 start = p_cmlst

```

B.3.1.3 Handout Master Part

This schema is available in the file PresentationML_Handout_Master.rnc.

```

1 include "pml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-main.rnc"
4 include "dml-diagram.rnc"
5 include "shared-commonSimpleTypes.rnc"
6 include "dml-lockedCanvas.rnc"
7 include "any.rnc"
8 include "dml-chart.rnc"
9 include "dml-chartDrawing.rnc"
10 include "dml-picture.rnc"
11 start = p_handoutMaster

```

B.3.1.4 Notes Master Part

This schema is available in the file PresentationML_Notes_Master.rnc.

```

1 include "pml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-main.rnc"
4 include "dml-diagram.rnc"
5 include "shared-commonSimpleTypes.rnc"
6 include "dml-lockedCanvas.rnc"
7 include "any.rnc"
8 include "dml-chart.rnc"
9 include "dml-chartDrawing.rnc"
10 include "dml-picture.rnc"
11 start = p_notesMaster

```

B.3.1.5 Notes Slide Part

This schema is available in the file PresentationML_Notes_Slide.rnc.

```

1 include "pml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-main.rnc"
4 include "dml-diagram.rnc"
5 include "shared-commonSimpleTypes.rnc"
6 include "dml-lockedCanvas.rnc"
7 include "any.rnc"

```

```

8 include "dml-chart.rnc"
9 include "dml-chartDrawing.rnc"
10 include "dml-picture.rnc"
11 start = p_notes

```

B.3.1.6 Presentation Part

This schema is available in the file PresentationML_Presentation.rnc.

```

1 include "pml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-main.rnc"
4 include "dml-diagram.rnc"
5 include "shared-commonSimpleTypes.rnc"
6 include "dml-lockedCanvas.rnc"
7 include "any.rnc"
8 include "dml-chart.rnc"
9 include "dml-chartDrawing.rnc"
10 include "dml-picture.rnc"
11 start = p_presentation

```

B.3.1.7 Presentation Properties Part

This schema is available in the file PresentationML_Presentation_Properties.rnc.

```

1 include "pml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-main.rnc"
4 include "dml-diagram.rnc"
5 include "shared-commonSimpleTypes.rnc"
6 include "dml-lockedCanvas.rnc"
7 include "any.rnc"
8 include "dml-chart.rnc"
9 include "dml-chartDrawing.rnc"
10 include "dml-picture.rnc"
11 start = p_presentationPr

```

B.3.1.8 Slide Part

This schema is available in the file PresentationML_Slide.rnc.

```

1 include "pml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-main.rnc"
4 include "dml-diagram.rnc"
5 include "shared-commonSimpleTypes.rnc"
6 include "dml-lockedCanvas.rnc"
7 include "any.rnc"
8 include "dml-chart.rnc"
9 include "dml-chartDrawing.rnc"
10 include "dml-picture.rnc"
11 start = p_sld

```

B.3.1.9 Slide Layout Part

This schema is available in the file PresentationML_Slide_Layout.rnc.

```

1 include "pml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-main.rnc"
4 include "dml-diagram.rnc"
5 include "shared-commonSimpleTypes.rnc"
6 include "dml-lockedCanvas.rnc"
7 include "any.rnc"
8 include "dml-chart.rnc"
9 include "dml-chartDrawing.rnc"
10 include "dml-picture.rnc"
11 start = p_sldLayout

```

B.3.1.10 Slide Master Part

This schema is available in the file PresentationML_Slide_Master.rnc.

```

1 include "pml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-main.rnc"
4 include "dml-diagram.rnc"
5 include "shared-commonSimpleTypes.rnc"
6 include "dml-lockedCanvas.rnc"
7 include "any.rnc"
8 include "dml-chart.rnc"
9 include "dml-chartDrawing.rnc"
10 include "dml-picture.rnc"
11 start = p_sldMaster

```

B.3.1.11 Slide Synchronization Data Part

This schema is available in the file PresentationML_Slide_Synchronization_Data.rnc.

```

1 include "pml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-main.rnc"
4 include "dml-diagram.rnc"
5 include "shared-commonSimpleTypes.rnc"
6 include "dml-lockedCanvas.rnc"
7 include "any.rnc"
8 include "dml-chart.rnc"
9 include "dml-chartDrawing.rnc"
10 include "dml-picture.rnc"
11 start = p_sldSyncPr

```

B.3.1.12 User Defined Tags Part

This schema is available in the file PresentationML_User-Defined_Tags.rnc.

```

1 include "pml.rnc"
2 include "shared-relationshipReference.rnc"

```

```

3 include "dml-main.rnc"
4 include "dml-diagram.rnc"
5 include "shared-commonSimpleTypes.rnc"
6 include "dml-lockedCanvas.rnc"
7 include "any.rnc"
8 include "dml-chart.rnc"
9 include "dml-chartDrawing.rnc"
10 include "dml-picture.rnc"
11 start = p_tagLst

```

B.3.1.13 View Properties Part

This schema is available in the file PresentationML_View_Properties.rnc.

```

1 include "pml.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-main.rnc"
4 include "dml-diagram.rnc"
5 include "shared-commonSimpleTypes.rnc"
6 include "dml-lockedCanvas.rnc"
7 include "any.rnc"
8 include "dml-chart.rnc"
9 include "dml-chartDrawing.rnc"
10 include "dml-picture.rnc"
11 start = p_viewPr

```

B.4 DrawingML - Framework

B.4.1 DrawingML – Main

This schema is available in the file dml-main.rnc.

```

1 default namespace =
2   "http://purl.oclc.org/ooxml/drawingml/main"
3 namespace a = "http://purl.oclc.org/ooxml/drawingml/main"
4 namespace o = "urn:schemas-microsoft-com:office:office"
5 namespace r =
6   "http://purl.oclc.org/ooxml/officeDocument/relationships"
7 namespace s =
8   "http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
9 namespace v = "urn:schemas-microsoft-com:vml"
10 namespace w10 = "urn:schemas-microsoft-com:office:word"
11 namespace x = "urn:schemas-microsoft-com:office:excel"
12
13 a_CT_AudioFile =
14   r_link,
15   attribute contentType { xsd:string }?,
16   element extLst { a_CT_OfficeArtExtensionList }?
17 a_CT_VideoFile =
18   r_link,
19   attribute contentType { xsd:string }?,
20   element extLst { a_CT_OfficeArtExtensionList }?
21 a_CT_QuickTimeFile =

```

```

22   r_link,
23   element extLst { a_CT_OfficeArtExtensionList }?
24 a_CT_AudioCDTime =
25   attribute track { xsd:unsignedByte },
26
27   ## default value: 0
28   attribute time { xsd:unsignedInt }?
29 a_CT_AudioCD =
30   element st { a_CT_AudioCDTime },
31   element end { a_CT_AudioCDTime },
32   element extLst { a_CT_OfficeArtExtensionList }?
33 a_EG_Media =
34   element audioCd { a_CT_AudioCD }
35   | element wavAudioFile { a_CT_EmbeddedWAVAudioFile }
36   | element audioFile { a_CT_AudioFile }
37   | element videoFile { a_CT_VideoFile }
38   | element quickTimeFile { a_CT_QuickTimeFile }
39 a_videoFile = element videoFile { a_CT_VideoFile }
40 a_ST_StyleMatrixColumnIndex = xsd:unsignedInt
41 a_ST_FontCollectionIndex = "major" | "minor" | "none"
42 a_ST_ColorSchemeIndex =
43   "dk1"
44   | "lt1"
45   | "dk2"
46   | "lt2"
47   | "accent1"
48   | "accent2"
49   | "accent3"
50   | "accent4"
51   | "accent5"
52   | "accent6"
53   | "hlink"
54   | "folHlink"
55 a_CT_ColorScheme =
56   attribute name { xsd:string },
57   element dk1 { a_CT_Color },
58   element lt1 { a_CT_Color },
59   element dk2 { a_CT_Color },
60   element lt2 { a_CT_Color },
61   element accent1 { a_CT_Color },
62   element accent2 { a_CT_Color },
63   element accent3 { a_CT_Color },
64   element accent4 { a_CT_Color },
65   element accent5 { a_CT_Color },
66   element accent6 { a_CT_Color },
67   element hlink { a_CT_Color },
68   element folHlink { a_CT_Color },
69   element extLst { a_CT_OfficeArtExtensionList }?
70 a_CT_CustomColor =
71   attribute name { xsd:string }?,
72   a_EG_ColorChoice
73 a_CT_SupplementalFont =
74   attribute script { xsd:string },

```

```

75     attribute typeface { a_ST_TextTypeface }
76 a_CT_CustomColorList = element custClr { a_CT_CustomColor }*
77 a_CT_FontCollection =
78     element latin { a_CT_TextFont },
79     element ea { a_CT_TextFont },
80     element cs { a_CT_TextFont },
81     element font { a_CT_SupplementalFont }*,
82     element extLst { a_CT_OfficeArtExtensionList }?
83 a_CT_EffectStyleItem =
84     a_EG_EffectProperties,
85     element scene3d { a_CT_Scene3D }?,
86     element sp3d { a_CT_Shape3D }?
87 a_CT_FontScheme =
88     attribute name { xsd:string },
89     element majorFont { a_CT_FontCollection },
90     element minorFont { a_CT_FontCollection },
91     element extLst { a_CT_OfficeArtExtensionList }?
92 a_CT_FillStyleList = a_EG_FillProperties+
93 a_CT_LineStyleList = element ln { a_CT_LineProperties }+
94 a_CT_EffectStyleList = element effectStyle { a_CT_EffectStyleItem }+
95 a_CT_BackgroundFillStyleList = a_EG_FillProperties+
96 a_CT_StyleMatrix =
97     attribute name { xsd:string }?,
98     element fillStyleLst { a_CT_FillStyleList },
99     element lnStyleLst { a_CT_LineStyleList },
100    element effectStyleLst { a_CT_EffectStyleList },
101    element bgFillStyleLst { a_CT_BackgroundFillStyleList }
102 a_CT_BaseStyles =
103     element clrScheme { a_CT_ColorScheme },
104     element fontScheme { a_CT_FontScheme },
105     element fmtScheme { a_CT_StyleMatrix },
106     element extLst { a_CT_OfficeArtExtensionList }?
107 a_CT_OfficeArtExtension =
108     attribute uri { xsd:token },
109     a_CT_OfficeArtExtension_any*
110 a_CT_OfficeArtExtension_any =
111     element * - (o:* | v:* | w10:* | x:*) {
112         anyAttribute*,
113         mixed { anyElement* }
114     }
115 a_ST_Coordinate = a_ST_CoordinateUnqualified | s_ST_UniversalMeasure
116 a_ST_CoordinateUnqualified =
117     xsd:long {
118         minInclusive = "-27273042329600"
119         maxInclusive = "27273042316900"
120     }
121 a_ST_Coordinate32 = a_ST_Coordinate32Unqualified | s_ST_UniversalMeasure
122 a_ST_Coordinate32Unqualified = xsd:int
123 a_ST_PositiveCoordinate =
124     xsd:long { minInclusive = "0" maxInclusive = "27273042316900" }
125 a_ST_PositiveCoordinate32 = xsd:int { minInclusive = "0" }
126 a_ST_Angle = xsd:int
127 a_CT_Angle = attribute val { a_ST_Angle }

```



```

128 a_ST_FixedAngle =
129     xsd:int { minExclusive = "-5400000" maxExclusive = "5400000" }
130 a_ST_PositiveFixedAngle =
131     xsd:int { minInclusive = "0" maxExclusive = "21600000" }
132 a_CT_PositiveFixedAngle = attribute val { a_ST_PositiveFixedAngle }
133 a_ST_Percentage = s_ST_Percentage
134 a_CT_Percentage = attribute val { a_ST_Percentage }
135 a_ST_PositivePercentage = s_ST_PositivePercentage
136 a_CT_PositivePercentage = attribute val { a_ST_PositivePercentage }
137 a_ST_FixedPercentage = s_ST_FixedPercentage
138 a_CT_FixedPercentage = attribute val { a_ST_FixedPercentage }
139 a_ST_PositiveFixedPercentage = s_ST_PositiveFixedPercentage
140 a_CT_PositiveFixedPercentage =
141     attribute val { a_ST_PositiveFixedPercentage }
142 a_CT_Ratio =
143     attribute n { xsd:long },
144     attribute d { xsd:long }
145 a_CT_Point2D =
146     attribute x { a_ST_Coordinate },
147     attribute y { a_ST_Coordinate }
148 a_CT_PositiveSize2D =
149     attribute cx { a_ST_PositiveCoordinate },
150     attribute cy { a_ST_PositiveCoordinate }
151 a_CT_ComplementTransform = empty
152 a_CT_InverseTransform = empty
153 a_CT_GrayscaleTransform = empty
154 a_CT_GammaTransform = empty
155 a_CT_InverseGammaTransform = empty
156 a_EG_ColorTransform =
157     element tint { a_CT_PositiveFixedPercentage }
158     | element shade { a_CT_PositiveFixedPercentage }
159     | element comp { a_CT_ComplementTransform }
160     | element inv { a_CT_InverseTransform }
161     | element gray { a_CT_GrayscaleTransform }
162     | element alpha { a_CT_PositiveFixedPercentage }
163     | element alphaOff { a_CT_FixedPercentage }
164     | element alphaMod { a_CT_PositivePercentage }
165     | element hue { a_CT_PositiveFixedAngle }
166     | element hueOff { a_CT_Angle }
167     | element hueMod { a_CT_PositivePercentage }
168     | element sat { a_CT_Percentage }
169     | element satOff { a_CT_Percentage }
170     | element satMod { a_CT_Percentage }
171     | element lum { a_CT_Percentage }
172     | element lumOff { a_CT_Percentage }
173     | element lumMod { a_CT_Percentage }
174     | element red { a_CT_Percentage }
175     | element redOff { a_CT_Percentage }
176     | element redMod { a_CT_Percentage }
177     | element green { a_CT_Percentage }
178     | element greenOff { a_CT_Percentage }
179     | element greenMod { a_CT_Percentage }
180     | element blue { a_CT_Percentage }

```

```

181 | element blueOff { a_CT_Percentage }
182 | element blueMod { a_CT_Percentage }
183 | element gamma { a_CT_GammaTransform }
184 | element invGamma { a_CT_InverseGammaTransform }
185 a_CT_ScRgbColor =
186   attribute r { a_ST_Percentage },
187   attribute g { a_ST_Percentage },
188   attribute b { a_ST_Percentage },
189   a_EG_ColorTransform*
190 a_CT_SRgbColor =
191   attribute val { s_ST_HexColorRGB },
192   a_EG_ColorTransform*
193 a_CT_HslColor =
194   attribute hue { a_ST_PositiveFixedAngle },
195   attribute sat { a_ST_Percentage },
196   attribute lum { a_ST_Percentage },
197   a_EG_ColorTransform*
198 a_ST_SystemColorVal =
199   "scrollBar"
200   | "background"
201   | "activeCaption"
202   | "inactiveCaption"
203   | "menu"
204   | "window"
205   | "windowFrame"
206   | "menuText"
207   | "windowText"
208   | "captionText"
209   | "activeBorder"
210   | "inactiveBorder"
211   | "appWorkspace"
212   | "highlight"
213   | "highlightText"
214   | "btnFace"
215   | "btnShadow"
216   | "grayText"
217   | "btnText"
218   | "inactiveCaptionText"
219   | "btnHighlight"
220   | "3dDkShadow"
221   | "3dLight"
222   | "infoText"
223   | "infoBk"
224   | "hotLight"
225   | "gradientActiveCaption"
226   | "gradientInactiveCaption"
227   | "menuHighlight"
228   | "menuBar"
229 a_CT_SystemColor =
230   attribute val { a_ST_SystemColorVal },
231   attribute lastClr { s_ST_HexColorRGB }?,
232   a_EG_ColorTransform*
233 a_ST_SchemeColorVal =

```

```

234 "bg1"
235 | "tx1"
236 | "bg2"
237 | "tx2"
238 | "accent1"
239 | "accent2"
240 | "accent3"
241 | "accent4"
242 | "accent5"
243 | "accent6"
244 | "hlink"
245 | "folHlink"
246 | "phClr"
247 | "dk1"
248 | "lt1"
249 | "dk2"
250 | "lt2"
251 a_CT_SchemeColor =
252   attribute val { a_ST_SchemeColorVal },
253   a_EG_ColorTransform*
254 a_ST_PresetColorVal =
255   "aliceBlue"
256   | "antiqueWhite"
257   | "aqua"
258   | "aquamarine"
259   | "azure"
260   | "beige"
261   | "bisque"
262   | "black"
263   | "blanchedAlmond"
264   | "blue"
265   | "blueViolet"
266   | "brown"
267   | "burlyWood"
268   | "cadetBlue"
269   | "chartreuse"
270   | "chocolate"
271   | "coral"
272   | "cornflowerBlue"
273   | "cornsilk"
274   | "crimson"
275   | "cyan"
276   | "darkBlue"
277   | "darkCyan"
278   | "darkGoldenrod"
279   | "darkGray"
280   | "darkGrey"
281   | "darkGreen"
282   | "darkKhaki"
283   | "darkMagenta"
284   | "darkOliveGreen"
285   | "darkOrange"
286   | "darkOrchid"

```

287	"darkRed"
288	"darkSalmon"
289	"darkSeaGreen"
290	"darkSlateBlue"
291	"darkSlateGray"
292	"darkSlateGrey"
293	"darkTurquoise"
294	"darkViolet"
295	"dkBlue"
296	"dkCyan"
297	"dkGoldenrod"
298	"dkGray"
299	"dkGrey"
300	"dkGreen"
301	"dkKhaki"
302	"dkMagenta"
303	"dkOliveGreen"
304	"dkOrange"
305	"dkOrchid"
306	"dkRed"
307	"dkSalmon"
308	"dkSeaGreen"
309	"dkSlateBlue"
310	"dkSlateGray"
311	"dkSlateGrey"
312	"dkTurquoise"
313	"dkViolet"
314	"deepPink"
315	"deepSkyBlue"
316	"dimGray"
317	"dimGrey"
318	"dodgerBlue"
319	"firebrick"
320	"floralWhite"
321	"forestGreen"
322	"fuchsia"
323	"gainsboro"
324	"ghostWhite"
325	"gold"
326	"goldenrod"
327	"gray"
328	"grey"
329	"green"
330	"greenYellow"
331	"honeydew"
332	"hotPink"
333	"indianRed"
334	"indigo"
335	"ivory"
336	"khaki"
337	"lavender"
338	"lavenderBlush"
339	"lawnGreen"

```

340 | "lemonChiffon"
341 | "lightBlue"
342 | "lightCoral"
343 | "lightCyan"
344 | "lightGoldenrodYellow"
345 | "lightGray"
346 | "lightGrey"
347 | "lightGreen"
348 | "lightPink"
349 | "lightSalmon"
350 | "lightSeaGreen"
351 | "lightSkyBlue"
352 | "lightSlateGray"
353 | "lightSlateGrey"
354 | "lightSteelBlue"
355 | "lightYellow"
356 | "ltBlue"
357 | "ltCoral"
358 | "ltCyan"
359 | "ltGoldenrodYellow"
360 | "ltGray"
361 | "ltGrey"
362 | "ltGreen"
363 | "ltPink"
364 | "ltSalmon"
365 | "ltSeaGreen"
366 | "ltSkyBlue"
367 | "ltSlateGray"
368 | "ltSlateGrey"
369 | "ltSteelBlue"
370 | "ltYellow"
371 | "lime"
372 | "limeGreen"
373 | "linen"
374 | "magenta"
375 | "maroon"
376 | "medAquamarine"
377 | "medBlue"
378 | "medOrchid"
379 | "medPurple"
380 | "medSeaGreen"
381 | "medSlateBlue"
382 | "medSpringGreen"
383 | "medTurquoise"
384 | "medVioletRed"
385 | "mediumAquamarine"
386 | "mediumBlue"
387 | "mediumOrchid"
388 | "mediumPurple"
389 | "mediumSeaGreen"
390 | "mediumSlateBlue"
391 | "mediumSpringGreen"
392 | "mediumTurquoise"

```

```
393 | "mediumVioletRed"
394 | "midnightBlue"
395 | "mintCream"
396 | "mistyRose"
397 | "moccasin"
398 | "navajoWhite"
399 | "navy"
400 | "oldLace"
401 | "olive"
402 | "oliveDrab"
403 | "orange"
404 | "orangeRed"
405 | "orchid"
406 | "paleGoldenrod"
407 | "paleGreen"
408 | "paleTurquoise"
409 | "paleVioletRed"
410 | "papayaWhip"
411 | "peachPuff"
412 | "peru"
413 | "pink"
414 | "plum"
415 | "powderBlue"
416 | "purple"
417 | "red"
418 | "rosyBrown"
419 | "royalBlue"
420 | "saddleBrown"
421 | "salmon"
422 | "sandyBrown"
423 | "seaGreen"
424 | "seaShell"
425 | "sienna"
426 | "silver"
427 | "skyBlue"
428 | "slateBlue"
429 | "slateGray"
430 | "slateGrey"
431 | "snow"
432 | "springGreen"
433 | "steelBlue"
434 | "tan"
435 | "teal"
436 | "thistle"
437 | "tomato"
438 | "turquoise"
439 | "violet"
440 | "wheat"
441 | "white"
442 | "whiteSmoke"
443 | "yellow"
444 | "yellowGreen"
445 a_CT_PresetColor =
```

```

446     attribute val { a_ST_PresetColorVal },
447     a_EG_ColorTransform*
448 a_EG_OfficeArtExtensionList = element ext { a_CT_OfficeArtExtension }*
449 a_CT_OfficeArtExtensionList = a_EG_OfficeArtExtensionList
450 a_CT_Scale2D =
451     element sx { a_CT_Ratio },
452     element sy { a_CT_Ratio }
453 a_CT_Transform2D =
454
455     ## default value: 0
456     attribute rot { a_ST_Angle }?,
457
458     ## default value: false
459     attribute flipH { xsd:boolean }?,
460
461     ## default value: false
462     attribute flipV { xsd:boolean }?,
463     element off { a_CT_Point2D }?,
464     element ext { a_CT_PositiveSize2D }?
465 a_CT_GroupTransform2D =
466
467     ## default value: 0
468     attribute rot { a_ST_Angle }?,
469
470     ## default value: false
471     attribute flipH { xsd:boolean }?,
472
473     ## default value: false
474     attribute flipV { xsd:boolean }?,
475     element off { a_CT_Point2D }?,
476     element ext { a_CT_PositiveSize2D }?,
477     element chOff { a_CT_Point2D }?,
478     element chExt { a_CT_PositiveSize2D }?
479 a_CT_Point3D =
480     attribute x { a_ST_Coordinate },
481     attribute y { a_ST_Coordinate },
482     attribute z { a_ST_Coordinate }
483 a_CT_Vector3D =
484     attribute dx { a_ST_Coordinate },
485     attribute dy { a_ST_Coordinate },
486     attribute dz { a_ST_Coordinate }
487 a_CT_SphereCoords =
488     attribute lat { a_ST_PositiveFixedAngle },
489     attribute lon { a_ST_PositiveFixedAngle },
490     attribute rev { a_ST_PositiveFixedAngle }
491 a_CT_RelativeRect =
492
493     ## default value: 0%
494     attribute l { a_ST_Percentage }?,
495
496     ## default value: 0%
497     attribute t { a_ST_Percentage }?,
498

```

```

499  ## default value: 0%
500  attribute r { a_ST_Percentage }?,
501
502  ## default value: 0%
503  attribute b { a_ST_Percentage }?
504  a_ST_RectAlignment =
505    "tl" | "t" | "tr" | "l" | "ctr" | "r" | "bl" | "b" | "br"
506  a_EG_ColorChoice =
507    element scrgbClr { a_CT_ScRgbColor }
508    | element srgbClr { a_CT_SRgbColor }
509    | element hslClr { a_CT_HslColor }
510    | element sysClr { a_CT_SystemColor }
511    | element schemeClr { a_CT_SchemeColor }
512    | element prstClr { a_CT_PresetColor }
513  a_CT_Color = a_EG_ColorChoice
514  a_CT_ColorMRU = a_EG_ColorChoice*
515  a_ST_BlackWhiteMode =
516    "clr"
517    | "auto"
518    | "gray"
519    | "ltGray"
520    | "invGray"
521    | "grayWhite"
522    | "blackGray"
523    | "blackWhite"
524    | "black"
525    | "white"
526    | "hidden"
527  a_AG_Blob = r_embed?, r_link?
528  a_CT_EmbeddedWAVAudioFile =
529    r_embed,
530    attribute name { xsd:string }?
531  a_CT_Hyperlink =
532    r_id?,
533    attribute invalidUrl { xsd:string }?,
534    attribute action { xsd:string }?,
535    attribute tgtFrame { xsd:string }?,
536    attribute tooltip { xsd:string }?,
537
538  ## default value: true
539  attribute history { xsd:boolean }?,
540
541  ## default value: false
542  attribute highlightClick { xsd:boolean }?,
543
544  ## default value: false
545  attribute endSnd { xsd:boolean }?,
546  element snd { a_CT_EmbeddedWAVAudioFile }?,
547  element extLst { a_CT_OfficeArtExtensionList }?
548  a_ST_DrawingElementId = xsd:unsignedInt
549  a_AG_Locking =
550
551  ## default value: false

```



```

552 attribute noGrp { xsd:boolean }?,
553
554 ## default value: false
555 attribute noSelect { xsd:boolean }?,
556
557 ## default value: false
558 attribute noRot { xsd:boolean }?,
559
560 ## default value: false
561 attribute noChangeAspect { xsd:boolean }?,
562
563 ## default value: false
564 attribute noMove { xsd:boolean }?,
565
566 ## default value: false
567 attribute noResize { xsd:boolean }?,
568
569 ## default value: false
570 attribute noEditPoints { xsd:boolean }?,
571
572 ## default value: false
573 attribute noAdjustHandles { xsd:boolean }?,
574
575 ## default value: false
576 attribute noChangeArrowheads { xsd:boolean }?,
577
578 ## default value: false
579 attribute noChangeShapeType { xsd:boolean }?
580 a_CT_ConnectorLocking =
581   a_AG_Locking,
582   element extLst { a_CT_OfficeArtExtensionList }?
583 a_CT_ShapeLocking =
584   a_AG_Locking,
585
586 ## default value: false
587 attribute noTextEdit { xsd:boolean }?,
588   element extLst { a_CT_OfficeArtExtensionList }?
589 a_CT_PictureLocking =
590   a_AG_Locking,
591
592 ## default value: false
593 attribute noCrop { xsd:boolean }?,
594   element extLst { a_CT_OfficeArtExtensionList }?
595 a_CT_GroupLocking =
596
597 ## default value: false
598 attribute noGrp { xsd:boolean }?,
599
600 ## default value: false
601 attribute noUngroup { xsd:boolean }?,
602
603 ## default value: false
604 attribute noSelect { xsd:boolean }?,

```

```

605
606   ## default value: false
607   attribute noRot { xsd:boolean }?,
608
609   ## default value: false
610   attribute noChangeAspect { xsd:boolean }?,
611
612   ## default value: false
613   attribute noMove { xsd:boolean }?,
614
615   ## default value: false
616   attribute noResize { xsd:boolean }?,
617   element extLst { a_CT_OfficeArtExtensionList }?
618 a_CT_GraphicalObjectFrameLocking =
619
620   ## default value: false
621   attribute noGrp { xsd:boolean }?,
622
623   ## default value: false
624   attribute noDrilldown { xsd:boolean }?,
625
626   ## default value: false
627   attribute noSelect { xsd:boolean }?,
628
629   ## default value: false
630   attribute noChangeAspect { xsd:boolean }?,
631
632   ## default value: false
633   attribute noMove { xsd:boolean }?,
634
635   ## default value: false
636   attribute noResize { xsd:boolean }?,
637   element extLst { a_CT_OfficeArtExtensionList }?
638 a_CT_ContentPartLocking =
639   a_AG_Locking,
640   element extLst { a_CT_OfficeArtExtensionList }?
641 a_CT_NonVisualDrawingProps =
642   attribute id { a_ST_DrawingElementId },
643   attribute name { xsd:string },
644   attribute descr { xsd:string }?,
645
646   ## default value: false
647   attribute hidden { xsd:boolean }?,
648   attribute title { xsd:string }?,
649   element hlinkClick { a_CT_Hyperlink }?,
650   element hlinkHover { a_CT_Hyperlink }?,
651   element extLst { a_CT_OfficeArtExtensionList }?
652 a_CT_NonVisualDrawingShapeProps =
653
654   ## default value: false
655   attribute txBox { xsd:boolean }?,
656   element spLocks { a_CT_ShapeLocking }?,
657   element extLst { a_CT_OfficeArtExtensionList }?

```

```

658 a_CT_NonVisualConnectorProperties =
659     element cxnSpLocks { a_CT_ConnectorLocking }?,
660     element stCxn { a_CT_Connection }?,
661     element endCxn { a_CT_Connection }?,
662     element extLst { a_CT_OfficeArtExtensionList }?
663 a_CT_NonVisualPictureProperties =
664
665     ## default value: true
666     attribute preferRelativeResize { xsd:boolean }?,
667     element picLocks { a_CT_PictureLocking }?,
668     element extLst { a_CT_OfficeArtExtensionList }?
669 a_CT_NonVisualGroupDrawingShapeProps =
670     element grpSpLocks { a_CT_GroupLocking }?,
671     element extLst { a_CT_OfficeArtExtensionList }?
672 a_CT_NonVisualGraphicFrameProperties =
673     element graphicFrameLocks { a_CT_GraphicalObjectFrameLocking }?,
674     element extLst { a_CT_OfficeArtExtensionList }?
675 a_CT_NonVisualContentPartProperties =
676
677     ## default value: true
678     attribute isComment { xsd:boolean }?,
679     element cpLocks { a_CT_ContentPartLocking }?,
680     element extLst { a_CT_OfficeArtExtensionList }?
681 a_CT_GraphicalObjectData =
682     attribute uri { xsd:token },
683     a_CT_GraphicalObjectData_any*
684 a_CT_GraphicalObjectData_any =
685     element * - (o:* | v:* | w10:* | x:*) {
686         anyAttribute*,
687         mixed { anyElement* }
688     }
689 a_CT_GraphicalObject = element graphicData { a_CT_GraphicalObjectData }
690 a_graphic = element graphic { a_CT_GraphicalObject }
691 a_ST_ChartBuildStep =
692     "category"
693     | "ptInCategory"
694     | "series"
695     | "ptInSeries"
696     | "allPts"
697     | "gridLegend"
698 a_ST_DgmBuildStep = "sp" | "bg"
699 a_CT_AnimationDgmElement =
700
701     ## default value: {00000000-0000-0000-0000-000000000000}
702     attribute id { s_ST_Guid }?,
703
704     ## default value: sp
705     attribute bldStep { a_ST_DgmBuildStep }?
706 a_CT_AnimationChartElement =
707
708     ## default value: -1
709     attribute seriesIdx { xsd:int }?,
710

```

```

711  ## default value: -1
712  attribute categoryIdx { xsd:int }?,
713  attribute bldStep { a_ST_ChartBuildStep }
714  a_CT_AnimationElementChoice =
715    element dgm { a_CT_AnimationDgmElement }
716    | element chart { a_CT_AnimationChartElement }
717  a_ST_AnimationBuildType = "allAtOnce"
718  a_ST_AnimationDgmOnlyBuildType = "one" | "lvlOne" | "lvlAtOnce"
719  a_ST_AnimationDgmBuildType =
720    a_ST_AnimationBuildType | a_ST_AnimationDgmOnlyBuildType
721  a_CT_AnimationDgmBuildProperties =
722
723  ## default value: allAtOnce
724  attribute bld { a_ST_AnimationDgmBuildType }?,
725
726  ## default value: false
727  attribute rev { xsd:boolean }?
728  a_ST_AnimationChartOnlyBuildType =
729    "series" | "category" | "seriesEl" | "categoryEl"
730  a_ST_AnimationChartBuildType =
731    a_ST_AnimationBuildType | a_ST_AnimationChartOnlyBuildType
732  a_CT_AnimationChartBuildProperties =
733
734  ## default value: allAtOnce
735  attribute bld { a_ST_AnimationChartBuildType }?,
736
737  ## default value: true
738  attribute animBg { xsd:boolean }?
739  a_CT_AnimationGraphicalObjectBuildProperties =
740    element bldDgm { a_CT_AnimationDgmBuildProperties }
741    | element bldChart { a_CT_AnimationChartBuildProperties }
742  a_CT_BackgroundFormatting = a_EG_FillProperties?, a_EG_EffectProperties?
743  a_CT_WholeE2oFormatting =
744    element ln { a_CT_LineProperties }?,
745    a_EG_EffectProperties?
746  a_CT_GvmlUseShapeRectangle = empty
747  a_CT_GvmlTextShape =
748    element txBody { a_CT_TextBody },
749    (element useSpRect { a_CT_GvmlUseShapeRectangle }
750     | element xfrm { a_CT_Transform2D } ),
751    element extLst { a_CT_OfficeArtExtensionList }?
752  a_CT_GvmlShapeNonVisual =
753    element cNvPr { a_CT_NonVisualDrawingProps },
754    element cNvSpPr { a_CT_NonVisualDrawingShapeProps }
755  a_CT_GvmlShape =
756    element nvSpPr { a_CT_GvmlShapeNonVisual },
757    element spPr { a_CT_ShapeProperties },
758    element txSp { a_CT_GvmlTextShape }?,
759    element style { a_CT_ShapeStyle }?,
760    element extLst { a_CT_OfficeArtExtensionList }?
761  a_CT_GvmlConnectorNonVisual =
762    element cNvPr { a_CT_NonVisualDrawingProps },
763    element cNvCxnSpPr { a_CT_NonVisualConnectorProperties }

```

```

764 a_CT_GvmlConnector =
765     element nvCxnSpPr { a_CT_GvmlConnectorNonVisual },
766     element spPr { a_CT_ShapeProperties },
767     element style { a_CT_ShapeStyle }?,
768     element extLst { a_CT_OfficeArtExtensionList }?
769 a_CT_GvmlPictureNonVisual =
770     element cNvPr { a_CT_NonVisualDrawingProps },
771     element cNvPicPr { a_CT_NonVisualPictureProperties }
772 a_CT_GvmlPicture =
773     element nvPicPr { a_CT_GvmlPictureNonVisual },
774     element blipFill { a_CT_BlipFillProperties },
775     element spPr { a_CT_ShapeProperties },
776     element style { a_CT_ShapeStyle }?,
777     element extLst { a_CT_OfficeArtExtensionList }?
778 a_CT_GvmlGraphicFrameNonVisual =
779     element cNvPr { a_CT_NonVisualDrawingProps },
780     element cNvGraphicFramePr { a_CT_NonVisualGraphicFrameProperties }
781 a_CT_GvmlGraphicalObjectFrame =
782     element nvGraphicFramePr { a_CT_GvmlGraphicFrameNonVisual },
783     a_graphic,
784     element xfrm { a_CT_Transform2D },
785     element extLst { a_CT_OfficeArtExtensionList }?
786 a_CT_GvmlGroupShapeNonVisual =
787     element cNvPr { a_CT_NonVisualDrawingProps },
788     element cNvGrpSpPr { a_CT_NonVisualGroupDrawingShapeProps }
789 a_CT_GvmlGroupShape =
790     element nvGrpSpPr { a_CT_GvmlGroupShapeNonVisual },
791     element grpSpPr { a_CT_GroupShapeProperties },
792     (element txSp { a_CT_GvmlTextShape }
793      | element sp { a_CT_GvmlShape }
794      | element cxnSp { a_CT_GvmlConnector }
795      | element pic { a_CT_GvmlPicture }
796      | element graphicFrame { a_CT_GvmlGraphicalObjectFrame }
797      | element grpSp { a_CT_GvmlGroupShape })*,
798     element extLst { a_CT_OfficeArtExtensionList }?
799 a_ST_PresetCameraType =
800     "legacyObliqueTopLeft"
801     | "legacyObliqueTop"
802     | "legacyObliqueTopRight"
803     | "legacyObliqueLeft"
804     | "legacyObliqueFront"
805     | "legacyObliqueRight"
806     | "legacyObliqueBottomLeft"
807     | "legacyObliqueBottom"
808     | "legacyObliqueBottomRight"
809     | "legacyPerspectiveTopLeft"
810     | "legacyPerspectiveTop"
811     | "legacyPerspectiveTopRight"
812     | "legacyPerspectiveLeft"
813     | "legacyPerspectiveFront"
814     | "legacyPerspectiveRight"
815     | "legacyPerspectiveBottomLeft"
816     | "legacyPerspectiveBottom"

```

```

817 | "legacyPerspectiveBottomRight"
818 | "orthographicFront"
819 | "isometricTopUp"
820 | "isometricTopDown"
821 | "isometricBottomUp"
822 | "isometricBottomDown"
823 | "isometricLeftUp"
824 | "isometricLeftDown"
825 | "isometricRightUp"
826 | "isometricRightDown"
827 | "isometricOffAxis1Left"
828 | "isometricOffAxis1Right"
829 | "isometricOffAxis1Top"
830 | "isometricOffAxis2Left"
831 | "isometricOffAxis2Right"
832 | "isometricOffAxis2Top"
833 | "isometricOffAxis3Left"
834 | "isometricOffAxis3Right"
835 | "isometricOffAxis3Bottom"
836 | "isometricOffAxis4Left"
837 | "isometricOffAxis4Right"
838 | "isometricOffAxis4Bottom"
839 | "obliqueTopLeft"
840 | "obliqueTop"
841 | "obliqueTopRight"
842 | "obliqueLeft"
843 | "obliqueRight"
844 | "obliqueBottomLeft"
845 | "obliqueBottom"
846 | "obliqueBottomRight"
847 | "perspectiveFront"
848 | "perspectiveLeft"
849 | "perspectiveRight"
850 | "perspectiveAbove"
851 | "perspectiveBelow"
852 | "perspectiveAboveLeftFacing"
853 | "perspectiveAboveRightFacing"
854 | "perspectiveContrastingLeftFacing"
855 | "perspectiveContrastingRightFacing"
856 | "perspectiveHeroicLeftFacing"
857 | "perspectiveHeroicRightFacing"
858 | "perspectiveHeroicExtremeLeftFacing"
859 | "perspectiveHeroicExtremeRightFacing"
860 | "perspectiveRelaxed"
861 | "perspectiveRelaxedModerately"
862 a_ST_FOVAngle = xsd:int { minInclusive = "0" maxInclusive = "10800000" }
863 a_CT_Camera =
864   attribute prst { a_ST_PresetCameraType },
865   attribute fov { a_ST_FOVAngle }?,
866
867   ## default value: 100%
868   attribute zoom { a_ST_PositivePercentage }?,
869   element rot { a_CT_SphereCoords }?

```

```

870 a_ST_LightRigDirection =
871   "tl" | "t" | "tr" | "l" | "r" | "bl" | "b" | "br"
872 a_ST_LightRigType =
873   "legacyFlat1"
874   | "legacyFlat2"
875   | "legacyFlat3"
876   | "legacyFlat4"
877   | "legacyNormal1"
878   | "legacyNormal2"
879   | "legacyNormal3"
880   | "legacyNormal4"
881   | "legacyHarsh1"
882   | "legacyHarsh2"
883   | "legacyHarsh3"
884   | "legacyHarsh4"
885   | "threePt"
886   | "balanced"
887   | "soft"
888   | "harsh"
889   | "flood"
890   | "contrasting"
891   | "morning"
892   | "sunrise"
893   | "sunset"
894   | "chilly"
895   | "freezing"
896   | "flat"
897   | "twoPt"
898   | "glow"
899   | "brightRoom"
900 a_CT_LightRig =
901   attribute rig { a_ST_LightRigType },
902   attribute dir { a_ST_LightRigDirection },
903   element rot { a_CT_SphereCoords }?
904 a_CT_Scene3D =
905   element camera { a_CT_Camera },
906   element lightRig { a_CT_LightRig },
907   element backdrop { a_CT_Backdrop }?,
908   element extLst { a_CT_OfficeArtExtensionList }?
909 a_CT_Backdrop =
910   element anchor { a_CT_Point3D },
911   element norm { a_CT_Vector3D },
912   element up { a_CT_Vector3D },
913   element extLst { a_CT_OfficeArtExtensionList }?
914 a_ST_BevelPresetType =
915   "relaxedInset"
916   | "circle"
917   | "slope"
918   | "cross"
919   | "angle"
920   | "softRound"
921   | "convex"
922   | "coolSlant"

```

```

923 | "divot"
924 | "ribblet"
925 | "hardEdge"
926 | "artDeco"
927 a_CT_Bevel =
928
929 ## default value: 76200
930 attribute w { a_ST_PositiveCoordinate }?,
931
932 ## default value: 76200
933 attribute h { a_ST_PositiveCoordinate }?,
934
935 ## default value: circle
936 attribute prst { a_ST_BevelPresetType }?
937 a_ST_PresetMaterialType =
938 "legacyMatte"
939 | "legacyPlastic"
940 | "legacyMetal"
941 | "legacyWireframe"
942 | "matte"
943 | "plastic"
944 | "metal"
945 | "warmMatte"
946 | "translucentPowder"
947 | "powder"
948 | "dkEdge"
949 | "softEdge"
950 | "clear"
951 | "flat"
952 | "softmetal"
953 a_CT_Shape3D =
954
955 ## default value: 0
956 attribute z { a_ST_Coordinate }?,
957
958 ## default value: 0
959 attribute extrusionH { a_ST_PositiveCoordinate }?,
960
961 ## default value: 0
962 attribute contourW { a_ST_PositiveCoordinate }?,
963
964 ## default value: warmMatte
965 attribute prstMaterial { a_ST_PresetMaterialType }?,
966 element bevelT { a_CT_Bevel }?,
967 element bevelB { a_CT_Bevel }?,
968 element extrusionClr { a_CT_Color }?,
969 element contourClr { a_CT_Color }?,
970 element extLst { a_CT_OfficeArtExtensionList }?
971 a_CT_FlatText =
972
973 ## default value: 0
974 attribute z { a_ST_Coordinate }?
975 a_EG_Text3D =

```



```

976     element sp3d { a_CT_Shape3D }
977     | element flatTx { a_CT_FlatText }
978 a_CT_AlphaBiLevelEffect =
979     attribute thresh { a_ST_PositiveFixedPercentage }
980 a_CT_AlphaCeilingEffect = empty
981 a_CT_AlphaFloorEffect = empty
982 a_CT_AlphaInverseEffect = a_EG_ColorChoice?
983 a_CT_AlphaModulateFixedEffect =
984
985     ## default value: 100%
986     attribute amt { a_ST_PositivePercentage }?
987 a_CT_AlphaOutsetEffect =
988
989     ## default value: 0
990     attribute rad { a_ST_Coordinate }?
991 a_CT_AlphaReplaceEffect = attribute a { a_ST_PositiveFixedPercentage }
992 a_CT_BiLevelEffect = attribute thresh { a_ST_PositiveFixedPercentage }
993 a_CT_BlurEffect =
994
995     ## default value: 0
996     attribute rad { a_ST_PositiveCoordinate }?,
997
998     ## default value: true
999     attribute grow { xsd:boolean }?
1000 a_CT_ColorChangeEffect =
1001
1002     ## default value: true
1003     attribute useA { xsd:boolean }?,
1004     element clrFrom { a_CT_Color },
1005     element clrTo { a_CT_Color }
1006 a_CT_ColorReplaceEffect = a_EG_ColorChoice
1007 a_CT_DuotoneEffect = a_EG_ColorChoice+
1008 a_CT_GlowEffect =
1009
1010     ## default value: 0
1011     attribute rad { a_ST_PositiveCoordinate }?,
1012     a_EG_ColorChoice
1013 a_CT_GrayscaleEffect = empty
1014 a_CT_HSLEffect =
1015
1016     ## default value: 0
1017     attribute hue { a_ST_PositiveFixedAngle }?,
1018
1019     ## default value: 0%
1020     attribute sat { a_ST_FixedPercentage }?,
1021
1022     ## default value: 0%
1023     attribute lum { a_ST_FixedPercentage }?
1024 a_CT_InnerShadowEffect =
1025
1026     ## default value: 0
1027     attribute blurRad { a_ST_PositiveCoordinate }?,
1028

```

```

1029  ## default value: 0
1030  attribute dist { a_ST_PositiveCoordinate }?,
1031
1032  ## default value: 0
1033  attribute dir { a_ST_PositiveFixedAngle }?,
1034  a_EG_ColorChoice
1035  a_CT_LuminanceEffect =
1036
1037  ## default value: 0%
1038  attribute bright { a_ST_FixedPercentage }?,
1039
1040  ## default value: 0%
1041  attribute contrast { a_ST_FixedPercentage }?
1042  a_CT_OuterShadowEffect =
1043
1044  ## default value: 0
1045  attribute blurRad { a_ST_PositiveCoordinate }?,
1046
1047  ## default value: 0
1048  attribute dist { a_ST_PositiveCoordinate }?,
1049
1050  ## default value: 0
1051  attribute dir { a_ST_PositiveFixedAngle }?,
1052
1053  ## default value: 100%
1054  attribute sx { a_ST_Percentage }?,
1055
1056  ## default value: 100%
1057  attribute sy { a_ST_Percentage }?,
1058
1059  ## default value: 0
1060  attribute kx { a_ST_FixedAngle }?,
1061
1062  ## default value: 0
1063  attribute ky { a_ST_FixedAngle }?,
1064
1065  ## default value: b
1066  attribute algn { a_ST_RectAlignment }?,
1067
1068  ## default value: true
1069  attribute rotWithShape { xsd:boolean }?,
1070  a_EG_ColorChoice
1071  a_ST_PresetShadowVal =
1072  "shdw1"
1073  | "shdw2"
1074  | "shdw3"
1075  | "shdw4"
1076  | "shdw5"
1077  | "shdw6"
1078  | "shdw7"
1079  | "shdw8"
1080  | "shdw9"
1081  | "shdw10"

```

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1082 | "shdw11"
1083 | "shdw12"
1084 | "shdw13"
1085 | "shdw14"
1086 | "shdw15"
1087 | "shdw16"
1088 | "shdw17"
1089 | "shdw18"
1090 | "shdw19"
1091 | "shdw20"
1092 a_CT_PresetShadowEffect =
1093     attribute prst { a_ST_PresetShadowVal },
1094
1095     ## default value: 0
1096     attribute dist { a_ST_PositiveCoordinate }?,
1097
1098     ## default value: 0
1099     attribute dir { a_ST_PositiveFixedAngle }?,
1100     a_EG_ColorChoice
1101 a_CT_ReflectionEffect =
1102
1103     ## default value: 0
1104     attribute blurRad { a_ST_PositiveCoordinate }?,
1105
1106     ## default value: 100%
1107     attribute stA { a_ST_PositiveFixedPercentage }?,
1108
1109     ## default value: 0%
1110     attribute stPos { a_ST_PositiveFixedPercentage }?,
1111
1112     ## default value: 0%
1113     attribute endA { a_ST_PositiveFixedPercentage }?,
1114
1115     ## default value: 100%
1116     attribute endPos { a_ST_PositiveFixedPercentage }?,
1117
1118     ## default value: 0
1119     attribute dist { a_ST_PositiveCoordinate }?,
1120
1121     ## default value: 0
1122     attribute dir { a_ST_PositiveFixedAngle }?,
1123
1124     ## default value: 5400000
1125     attribute fadeDir { a_ST_PositiveFixedAngle }?,
1126
1127     ## default value: 100%
1128     attribute sx { a_ST_Percentage }?,
1129
1130     ## default value: 100%
1131     attribute sy { a_ST_Percentage }?,
1132
1133     ## default value: 0
1134     attribute kx { a_ST_FixedAngle }?,

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1135
1136     ## default value: 0
1137     attribute ky { a_ST_FixedAngle }?,
1138
1139     ## default value: b
1140     attribute algn { a_ST_RectAlignment }?,
1141
1142     ## default value: true
1143     attribute rotWithShape { xsd:boolean }?
1144 a_CT_RelativeOffsetEffect =
1145
1146     ## default value: 0%
1147     attribute tx { a_ST_Percentage }?,
1148
1149     ## default value: 0%
1150     attribute ty { a_ST_Percentage }?
1151 a_CT_SoftEdgesEffect = attribute rad { a_ST_PositiveCoordinate }
1152 a_CT_TintEffect =
1153
1154     ## default value: 0
1155     attribute hue { a_ST_PositiveFixedAngle }?,
1156
1157     ## default value: 0%
1158     attribute amt { a_ST_FixedPercentage }?
1159 a_CT_TransformEffect =
1160
1161     ## default value: 100%
1162     attribute sx { a_ST_Percentage }?,
1163
1164     ## default value: 100%
1165     attribute sy { a_ST_Percentage }?,
1166
1167     ## default value: 0
1168     attribute kx { a_ST_FixedAngle }?,
1169
1170     ## default value: 0
1171     attribute ky { a_ST_FixedAngle }?,
1172
1173     ## default value: 0
1174     attribute tx { a_ST_Coordinate }?,
1175
1176     ## default value: 0
1177     attribute ty { a_ST_Coordinate }?
1178 a_CT_NoFillProperties = empty
1179 a_CT_SolidColorFillProperties = a_EG_ColorChoice?
1180 a_CT_LinearShadeProperties =
1181     attribute ang { a_ST_PositiveFixedAngle }?,
1182     attribute scaled { xsd:boolean }?
1183 a_ST_PathShadeType = "shape" | "circle" | "rect"
1184 a_CT_PathShadeProperties =
1185     attribute path { a_ST_PathShadeType }?,
1186     element fillToRect { a_CT_RelativeRect }?
1187 a_EG_ShadeProperties =

```

```

1188     element lin { a_CT_LinearShadeProperties }
1189     | element path { a_CT_PathShadeProperties }
1190 a_ST_TileFlipMode = "none" | "x" | "y" | "xy"
1191 a_CT_GradientStop =
1192     attribute pos { a_ST_PositiveFixedPercentage },
1193     a_EG_ColorChoice
1194 a_CT_GradientStopList = element gs { a_CT_GradientStop }+
1195 a_CT_GradientFillProperties =
1196     attribute flip { a_ST_TileFlipMode }?,
1197     attribute rotWithShape { xsd:boolean }?,
1198     element gsLst { a_CT_GradientStopList }?,
1199     a_EG_ShadeProperties?,
1200     element tileRect { a_CT_RelativeRect }?
1201 a_CT_TileInfoProperties =
1202     attribute tx { a_ST_Coordinate }?,
1203     attribute ty { a_ST_Coordinate }?,
1204     attribute sx { a_ST_Percentage }?,
1205     attribute sy { a_ST_Percentage }?,
1206     attribute flip { a_ST_TileFlipMode }?,
1207     attribute algn { a_ST_RectAlignment }?
1208 a_CT_StretchInfoProperties = element fillRect { a_CT_RelativeRect }?
1209 a_EG_FillModeProperties =
1210     element tile { a_CT_TileInfoProperties }
1211     | element stretch { a_CT_StretchInfoProperties }
1212 a_ST_BlipCompression = "email" | "screen" | "print" | "hqprint" | "none"
1213 a_CT_Blip =
1214     a_AG_Blob,
1215
1216     ## default value: none
1217     attribute cstate { a_ST_BlipCompression }?,
1218     (element alphaBiLevel { a_CT_AlphaBiLevelEffect }
1219     | element alphaCeiling { a_CT_AlphaCeilingEffect }
1220     | element alphaFloor { a_CT_AlphaFloorEffect }
1221     | element alphaInv { a_CT_AlphaInverseEffect }
1222     | element alphaMod { a_CT_AlphaModulateEffect }
1223     | element alphaModFix { a_CT_AlphaModulateFixedEffect }
1224     | element alphaRepl { a_CT_AlphaReplaceEffect }
1225     | element biLevel { a_CT_BiLevelEffect }
1226     | element blur { a_CT_BlurEffect }
1227     | element clrChange { a_CT_ColorChangeEffect }
1228     | element clrRepl { a_CT_ColorReplaceEffect }
1229     | element duotone { a_CT_DuotoneEffect }
1230     | element fillOverlay { a_CT_FillOverlayEffect }
1231     | element grayscl { a_CT_GrayscaleEffect }
1232     | element hsl { a_CT_HSLEffect }
1233     | element lum { a_CT_LuminanceEffect }
1234     | element tint { a_CT_TintEffect })*,
1235     element extLst { a_CT_OfficeArtExtensionList }?
1236 a_CT_BlipFillProperties =
1237     attribute dpi { xsd:unsignedInt }?,
1238     attribute rotWithShape { xsd:boolean }?,
1239     element blip { a_CT_Blip }?,
1240     element srcRect { a_CT_RelativeRect }?,

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```

1241     a_EG_FillModeProperties?
1242     a_ST_PresetPatternVal =
1243         "pct5"
1244         | "pct10"
1245         | "pct20"
1246         | "pct25"
1247         | "pct30"
1248         | "pct40"
1249         | "pct50"
1250         | "pct60"
1251         | "pct70"
1252         | "pct75"
1253         | "pct80"
1254         | "pct90"
1255         | "horz"
1256         | "vert"
1257         | "ltHorz"
1258         | "ltVert"
1259         | "dkHorz"
1260         | "dkVert"
1261         | "narHorz"
1262         | "narVert"
1263         | "dashHorz"
1264         | "dashVert"
1265         | "cross"
1266         | "dnDiag"
1267         | "upDiag"
1268         | "ltDnDiag"
1269         | "ltUpDiag"
1270         | "dkDnDiag"
1271         | "dkUpDiag"
1272         | "wdDnDiag"
1273         | "wdUpDiag"
1274         | "dashDnDiag"
1275         | "dashUpDiag"
1276         | "diagCross"
1277         | "smCheck"
1278         | "lgCheck"
1279         | "smGrid"
1280         | "lgGrid"
1281         | "dotGrid"
1282         | "smConfetti"
1283         | "lgConfetti"
1284         | "horzBrick"
1285         | "diagBrick"
1286         | "solidDmnd"
1287         | "openDmnd"
1288         | "dotDmnd"
1289         | "plaid"
1290         | "sphere"
1291         | "weave"
1292         | "divot"
1293         | "shingle"

```

```

1294 | "wave"
1295 | "trellis"
1296 | "zigZag"
1297 a_CT_PatternFillProperties =
1298   attribute prst { a_ST_PresetPatternVal }?,
1299   element fgClr { a_CT_Color }?,
1300   element bgClr { a_CT_Color }?
1301 a_CT_GroupFillProperties = empty
1302 a_EG_FillProperties =
1303   element noFill { a_CT_NoFillProperties }
1304   | element solidFill { a_CT_SolidColorFillProperties }
1305   | element gradFill { a_CT_GradientFillProperties }
1306   | element blipFill { a_CT_BlipFillProperties }
1307   | element pattFill { a_CT_PatternFillProperties }
1308   | element grpFill { a_CT_GroupFillProperties }
1309 a_CT_FillProperties = a_EG_FillProperties
1310 a_CT_FillEffect = a_EG_FillProperties
1311 a_ST_BlendMode = "over" | "mult" | "screen" | "darken" | "lighten"
1312 a_CT_FillOverlayEffect =
1313   attribute blend { a_ST_BlendMode },
1314   a_EG_FillProperties
1315 a_CT_EffectReference = attribute ref { xsd:token }
1316 a_EG_Effect =
1317   element cont { a_CT_EffectContainer }
1318   | element effect { a_CT_EffectReference }
1319   | element alphaBiLevel { a_CT_AlphaBiLevelEffect }
1320   | element alphaCeiling { a_CT_AlphaCeilingEffect }
1321   | element alphaFloor { a_CT_AlphaFloorEffect }
1322   | element alphaInv { a_CT_AlphaInverseEffect }
1323   | element alphaMod { a_CT_AlphaModulateEffect }
1324   | element alphaModFix { a_CT_AlphaModulateFixedEffect }
1325   | element alphaOutset { a_CT_AlphaOutsetEffect }
1326   | element alphaRepl { a_CT_AlphaReplaceEffect }
1327   | element biLevel { a_CT_BiLevelEffect }
1328   | element blend { a_CT_BlendEffect }
1329   | element blur { a_CT_BlurEffect }
1330   | element clrChange { a_CT_ColorChangeEffect }
1331   | element clrRepl { a_CT_ColorReplaceEffect }
1332   | element duotone { a_CT_DuotoneEffect }
1333   | element fill { a_CT_FillEffect }
1334   | element fillOverlay { a_CT_FillOverlayEffect }
1335   | element glow { a_CT_GlowEffect }
1336   | element grayscl { a_CT_GrayscaleEffect }
1337   | element hsl { a_CT_HSLEffect }
1338   | element innerShdw { a_CT_InnerShadowEffect }
1339   | element lum { a_CT_LuminanceEffect }
1340   | element outerShdw { a_CT_OuterShadowEffect }
1341   | element prstShdw { a_CT_PresetShadowEffect }
1342   | element reflection { a_CT_ReflectionEffect }
1343   | element relOff { a_CT_RelativeOffsetEffect }
1344   | element softEdge { a_CT_SoftEdgesEffect }
1345   | element tint { a_CT_TintEffect }
1346   | element xfrm { a_CT_TransformEffect }

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```

1347 a_ST_EffectContainerType = "sib" | "tree"
1348 a_CT_EffectContainer =
1349
1350     ## default value: sib
1351     attribute type { a_ST_EffectContainerType }?,
1352     attribute name { xsd:token }?,
1353     a_EG_Effect*
1354 a_CT_AlphaModulateEffect = element cont { a_CT_EffectContainer }
1355 a_CT_BlendEffect =
1356     attribute blend { a_ST_BlendMode },
1357     element cont { a_CT_EffectContainer }
1358 a_CT_EffectList =
1359     element blur { a_CT_BlurEffect }?,
1360     element fillOverlay { a_CT_FillOverlayEffect }?,
1361     element glow { a_CT_GlowEffect }?,
1362     element innerShdw { a_CT_InnerShadowEffect }?,
1363     element outerShdw { a_CT_OuterShadowEffect }?,
1364     element prstShdw { a_CT_PresetShadowEffect }?,
1365     element reflection { a_CT_ReflectionEffect }?,
1366     element softEdge { a_CT_SoftEdgesEffect }?
1367 a_EG_EffectProperties =
1368     element effectLst { a_CT_EffectList }
1369     | element effectDag { a_CT_EffectContainer }
1370 a_CT_EffectProperties = a_EG_EffectProperties
1371 a_blip = element blip { a_CT_Blip }
1372 a_ST_ShapeType =
1373     "line"
1374     | "lineInv"
1375     | "triangle"
1376     | "rtTriangle"
1377     | "rect"
1378     | "diamond"
1379     | "parallelogram"
1380     | "trapezoid"
1381     | "nonIsoscelesTrapezoid"
1382     | "pentagon"
1383     | "hexagon"
1384     | "heptagon"
1385     | "octagon"
1386     | "decagon"
1387     | "dodecagon"
1388     | "star4"
1389     | "star5"
1390     | "star6"
1391     | "star7"
1392     | "star8"
1393     | "star10"
1394     | "star12"
1395     | "star16"
1396     | "star24"
1397     | "star32"
1398     | "roundRect"
1399     | "round1Rect"

```



```

1400 | "round2SameRect"
1401 | "round2DiagRect"
1402 | "snipRoundRect"
1403 | "snip1Rect"
1404 | "snip2SameRect"
1405 | "snip2DiagRect"
1406 | "plaque"
1407 | "ellipse"
1408 | "teardrop"
1409 | "homePlate"
1410 | "chevron"
1411 | "pieWedge"
1412 | "pie"
1413 | "blockArc"
1414 | "donut"
1415 | "noSmoking"
1416 | "rightArrow"
1417 | "leftArrow"
1418 | "upArrow"
1419 | "downArrow"
1420 | "stripedRightArrow"
1421 | "notchedRightArrow"
1422 | "bentUpArrow"
1423 | "leftRightArrow"
1424 | "upDownArrow"
1425 | "leftUpArrow"
1426 | "leftRightUpArrow"
1427 | "quadArrow"
1428 | "leftArrowCallout"
1429 | "rightArrowCallout"
1430 | "upArrowCallout"
1431 | "downArrowCallout"
1432 | "leftRightArrowCallout"
1433 | "upDownArrowCallout"
1434 | "quadArrowCallout"
1435 | "bentArrow"
1436 | "uturnArrow"
1437 | "circularArrow"
1438 | "leftCircularArrow"
1439 | "leftRightCircularArrow"
1440 | "curvedRightArrow"
1441 | "curvedLeftArrow"
1442 | "curvedUpArrow"
1443 | "curvedDownArrow"
1444 | "swooshArrow"
1445 | "cube"
1446 | "can"
1447 | "lightningBolt"
1448 | "heart"
1449 | "sun"
1450 | "moon"
1451 | "smileyFace"
1452 | "irregularSeal1"

```

1453	"irregularSeal2"
1454	"foldedCorner"
1455	"bevel"
1456	"frame"
1457	"halfFrame"
1458	"corner"
1459	"diagStripe"
1460	"chord"
1461	"arc"
1462	"leftBracket"
1463	"rightBracket"
1464	"leftBrace"
1465	"rightBrace"
1466	"bracketPair"
1467	"bracePair"
1468	"straightConnector1"
1469	"bentConnector2"
1470	"bentConnector3"
1471	"bentConnector4"
1472	"bentConnector5"
1473	"curvedConnector2"
1474	"curvedConnector3"
1475	"curvedConnector4"
1476	"curvedConnector5"
1477	"callout1"
1478	"callout2"
1479	"callout3"
1480	"accentCallout1"
1481	"accentCallout2"
1482	"accentCallout3"
1483	"borderCallout1"
1484	"borderCallout2"
1485	"borderCallout3"
1486	"accentBorderCallout1"
1487	"accentBorderCallout2"
1488	"accentBorderCallout3"
1489	"wedgeRectCallout"
1490	"wedgeRoundRectCallout"
1491	"wedgeEllipseCallout"
1492	"cloudCallout"
1493	"cloud"
1494	"ribbon"
1495	"ribbon2"
1496	"ellipseRibbon"
1497	"ellipseRibbon2"
1498	"leftRightRibbon"
1499	"verticalScroll"
1500	"horizontalScroll"
1501	"wave"
1502	"doubleWave"
1503	"plus"
1504	"flowChartProcess"
1505	"flowChartDecision"

1506	"flowChartInputOutput"
1507	"flowChartPredefinedProcess"
1508	"flowChartInternalStorage"
1509	"flowChartDocument"
1510	"flowChartMultidocument"
1511	"flowChartTerminator"
1512	"flowChartPreparation"
1513	"flowChartManualInput"
1514	"flowChartManualOperation"
1515	"flowChartConnector"
1516	"flowChartPunchedCard"
1517	"flowChartPunchedTape"
1518	"flowChartSummingJunction"
1519	"flowChartOr"
1520	"flowChartCollate"
1521	"flowChartSort"
1522	"flowChartExtract"
1523	"flowChartMerge"
1524	"flowChartOfflineStorage"
1525	"flowChartOnlineStorage"
1526	"flowChartMagneticTape"
1527	"flowChartMagneticDisk"
1528	"flowChartMagneticDrum"
1529	"flowChartDisplay"
1530	"flowChartDelay"
1531	"flowChartAlternateProcess"
1532	"flowChartOffpageConnector"
1533	"actionButtonBlank"
1534	"actionButtonHome"
1535	"actionButtonHelp"
1536	"actionButtonInformation"
1537	"actionButtonForwardNext"
1538	"actionButtonBackPrevious"
1539	"actionButtonEnd"
1540	"actionButtonBeginning"
1541	"actionButtonReturn"
1542	"actionButtonDocument"
1543	"actionButtonSound"
1544	"actionButtonMovie"
1545	"gear6"
1546	"gear9"
1547	"funnel"
1548	"mathPlus"
1549	"mathMinus"
1550	"mathMultiply"
1551	"mathDivide"
1552	"mathEqual"
1553	"mathNotEqual"
1554	"cornerTabs"
1555	"squareTabs"
1556	"plaqueTabs"
1557	"chartX"
1558	"chartStar"

```

1559 | "chartPlus"
1560 a_ST_TextShapeType =
1561   "textNoShape"
1562   | "textPlain"
1563   | "textStop"
1564   | "textTriangle"
1565   | "textTriangleInverted"
1566   | "textChevron"
1567   | "textChevronInverted"
1568   | "textRingInside"
1569   | "textRingOutside"
1570   | "textArchUp"
1571   | "textArchDown"
1572   | "textCircle"
1573   | "textButton"
1574   | "textArchUpPour"
1575   | "textArchDownPour"
1576   | "textCirclePour"
1577   | "textButtonPour"
1578   | "textCurveUp"
1579   | "textCurveDown"
1580   | "textCanUp"
1581   | "textCanDown"
1582   | "textWave1"
1583   | "textWave2"
1584   | "textDoubleWave1"
1585   | "textWave4"
1586   | "textInflate"
1587   | "textDeflate"
1588   | "textInflateBottom"
1589   | "textDeflateBottom"
1590   | "textInflateTop"
1591   | "textDeflateTop"
1592   | "textDeflateInflate"
1593   | "textDeflateInflateDeflate"
1594   | "textFadeRight"
1595   | "textFadeLeft"
1596   | "textFadeUp"
1597   | "textFadeDown"
1598   | "textSlantUp"
1599   | "textSlantDown"
1600   | "textCascadeUp"
1601   | "textCascadeDown"
1602 a_ST_GeomGuideName = xsd:token
1603 a_ST_GeomGuideFormula = xsd:string
1604 a_CT_GeomGuide =
1605   attribute name { a_ST_GeomGuideName },
1606   attribute fmla { a_ST_GeomGuideFormula }
1607 a_CT_GeomGuideList = element gd { a_CT_GeomGuide }*
1608 a_ST_AdjCoordinate = a_ST_Coordinate | a_ST_GeomGuideName
1609 a_ST_AdjAngle = a_ST_Angle | a_ST_GeomGuideName
1610 a_CT_AdjPoint2D =
1611   attribute x { a_ST_AdjCoordinate },

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```

1612     attribute y { a_ST_AdjCoordinate }
1613 a_CT_GeomRect =
1614     attribute l { a_ST_AdjCoordinate },
1615     attribute t { a_ST_AdjCoordinate },
1616     attribute r { a_ST_AdjCoordinate },
1617     attribute b { a_ST_AdjCoordinate }
1618 a_CT_XYAdjustHandle =
1619     attribute gdRefX { a_ST_GeomGuideName }?,
1620     attribute minX { a_ST_AdjCoordinate }?,
1621     attribute maxX { a_ST_AdjCoordinate }?,
1622     attribute gdRefY { a_ST_GeomGuideName }?,
1623     attribute minY { a_ST_AdjCoordinate }?,
1624     attribute maxY { a_ST_AdjCoordinate }?,
1625     element pos { a_CT_AdjPoint2D }
1626 a_CT_PolarAdjustHandle =
1627     attribute gdRefR { a_ST_GeomGuideName }?,
1628     attribute minR { a_ST_AdjCoordinate }?,
1629     attribute maxR { a_ST_AdjCoordinate }?,
1630     attribute gdRefAng { a_ST_GeomGuideName }?,
1631     attribute minAng { a_ST_AdjAngle }?,
1632     attribute maxAng { a_ST_AdjAngle }?,
1633     element pos { a_CT_AdjPoint2D }
1634 a_CT_ConnectionSite =
1635     attribute ang { a_ST_AdjAngle },
1636     element pos { a_CT_AdjPoint2D }
1637 a_CT_AdjustHandleList =
1638     (element ahXY { a_CT_XYAdjustHandle }
1639      | element ahPolar { a_CT_PolarAdjustHandle })*
1640 a_CT_ConnectionSiteList = element cxn { a_CT_ConnectionSite }*
1641 a_CT_Connection =
1642     attribute id { a_ST_DrawingElementId },
1643     attribute idx { xsd:unsignedInt }
1644 a_CT_Path2DMoveTo = element pt { a_CT_AdjPoint2D }
1645 a_CT_Path2DLineTo = element pt { a_CT_AdjPoint2D }
1646 a_CT_Path2DArcTo =
1647     attribute wR { a_ST_AdjCoordinate },
1648     attribute hR { a_ST_AdjCoordinate },
1649     attribute stAng { a_ST_AdjAngle },
1650     attribute swAng { a_ST_AdjAngle }
1651 a_CT_Path2DQuadBezierTo = element pt { a_CT_AdjPoint2D }+
1652 a_CT_Path2DCubicBezierTo = element pt { a_CT_AdjPoint2D }+
1653 a_CT_Path2DClose = empty
1654 a_ST_PathFillMode =
1655     "none" | "norm" | "lighten" | "lightenLess" | "darken" | "darkenLess"
1656 a_CT_Path2D =
1657
1658     ## default value: 0
1659     attribute w { a_ST_PositiveCoordinate }?,
1660
1661     ## default value: 0
1662     attribute h { a_ST_PositiveCoordinate }?,
1663
1664     ## default value: norm

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```

1665     attribute fill { a_ST_PathFillMode }?,
1666
1667     ## default value: true
1668     attribute stroke { xsd:boolean }?,
1669
1670     ## default value: true
1671     attribute extrusionOk { xsd:boolean }?,
1672     (element close { a_CT_Path2DClose }
1673      | element moveTo { a_CT_Path2DMoveTo }
1674      | element lnTo { a_CT_Path2DLineTo }
1675      | element arcTo { a_CT_Path2DArcTo }
1676      | element quadBezTo { a_CT_Path2DQuadBezierTo }
1677      | element cubicBezTo { a_CT_Path2DCubicBezierTo })*
1678 a_CT_Path2DList = element path { a_CT_Path2D }*
1679 a_CT_PresetGeometry2D =
1680     attribute prst { a_ST_ShapeType },
1681     element avLst { a_CT_GeomGuideList }?
1682 a_CT_PresetTextShape =
1683     attribute prst { a_ST_TextShapeType },
1684     element avLst { a_CT_GeomGuideList }?
1685 a_CT_CustomGeometry2D =
1686     element avLst { a_CT_GeomGuideList }?,
1687     element gdLst { a_CT_GeomGuideList }?,
1688     element ahLst { a_CT_AdjustHandleList }?,
1689     element cxnLst { a_CT_ConnectionSiteList }?,
1690     element rect { a_CT_GeomRect }?,
1691     element pathLst { a_CT_Path2DList }
1692 a_EG_Geometry =
1693     element custGeom { a_CT_CustomGeometry2D }
1694     | element prstGeom { a_CT_PresetGeometry2D }
1695 a_EG_TextGeometry =
1696     element custGeom { a_CT_CustomGeometry2D }
1697     | element prstTxWarp { a_CT_PresetTextShape }
1698 a_ST_LineEndType =
1699     "none" | "triangle" | "stealth" | "diamond" | "oval" | "arrow"
1700 a_ST_LineEndWidth = "sm" | "med" | "lg"
1701 a_ST_LineEndLength = "sm" | "med" | "lg"
1702 a_CT_LineEndProperties =
1703     attribute type { a_ST_LineEndType }?,
1704     attribute w { a_ST_LineEndWidth }?,
1705     attribute len { a_ST_LineEndLength }?
1706 a_EG_LineFillProperties =
1707     element noFill { a_CT_NoFillProperties }
1708     | element solidFill { a_CT_SolidColorFillProperties }
1709     | element gradFill { a_CT_GradientFillProperties }
1710     | element pattFill { a_CT_PatternFillProperties }
1711 a_CT_LineJoinBevel = empty
1712 a_CT_LineJoinRound = empty
1713 a_CT_LineJoinMiterProperties =
1714     attribute lim { a_ST_PositivePercentage }?
1715 a_EG_LineJoinProperties =
1716     element round { a_CT_LineJoinRound }
1717     | element bevel { a_CT_LineJoinBevel }

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```

1718 | element miter { a_CT_LineJoinMiterProperties }
1719 a_ST_PresetLineDashVal =
1720   "solid"
1721   | "dot"
1722   | "dash"
1723   | "lgDash"
1724   | "dashDot"
1725   | "lgDashDot"
1726   | "lgDashDotDot"
1727   | "sysDash"
1728   | "sysDot"
1729   | "sysDashDot"
1730   | "sysDashDotDot"
1731 a_CT_PresetLineDashProperties =
1732   attribute val { a_ST_PresetLineDashVal }?
1733 a_CT_DashStop =
1734   attribute d { a_ST_PositivePercentage },
1735   attribute sp { a_ST_PositivePercentage }
1736 a_CT_DashStopList = element ds { a_CT_DashStop }*
1737 a_EG_LineDashProperties =
1738   element prstDash { a_CT_PresetLineDashProperties }
1739   | element custDash { a_CT_DashStopList }
1740 a_ST_LineCap = "rnd" | "sq" | "flat"
1741 a_ST_LineWidth =
1742   xsd:int { minInclusive = "0" maxInclusive = "20116800" }
1743 a_ST_PenAlignment = "ctr" | "in"
1744 a_ST_CompoundLine = "sng" | "dbl" | "thickThin" | "thinThick" | "tri"
1745 a_CT_LineProperties =
1746   attribute w { a_ST_LineWidth }?,
1747   attribute cap { a_ST_LineCap }?,
1748   attribute cmpd { a_ST_CompoundLine }?,
1749   attribute algn { a_ST_PenAlignment }?,
1750   a_EG_LineFillProperties?,
1751   a_EG_LineDashProperties?,
1752   a_EG_LineJoinProperties?,
1753   element headEnd { a_CT_LineEndProperties }?,
1754   element tailEnd { a_CT_LineEndProperties }?,
1755   element extLst { a_CT_OfficeArtExtensionList }?
1756 a_ST_ShapeID = xsd:token
1757 a_CT_ShapeProperties =
1758   attribute bwMode { a_ST_BlackWhiteMode }?,
1759   element xfrm { a_CT_Transform2D }?,
1760   a_EG_Geometry?,
1761   a_EG_FillProperties?,
1762   element ln { a_CT_LineProperties }?,
1763   a_EG_EffectProperties?,
1764   element scene3d { a_CT_Scene3D }?,
1765   element sp3d { a_CT_Shape3D }?,
1766   element extLst { a_CT_OfficeArtExtensionList }?
1767 a_CT_GroupShapeProperties =
1768   attribute bwMode { a_ST_BlackWhiteMode }?,
1769   element xfrm { a_CT_GroupTransform2D }?,
1770   a_EG_FillProperties?,

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```

1771   a_EG_EffectProperties?,
1772   element scene3d { a_CT_Scene3D }?,
1773   element extLst { a_CT_OfficeArtExtensionList }?
1774 a_CT_StyleMatrixReference =
1775   attribute idx { a_ST_StyleMatrixColumnIndex },
1776   a_EG_ColorChoice?
1777 a_CT_FontReference =
1778   attribute idx { a_ST_FontCollectionIndex },
1779   a_EG_ColorChoice?
1780 a_CT_ShapeStyle =
1781   element lnRef { a_CT_StyleMatrixReference },
1782   element fillRef { a_CT_StyleMatrixReference },
1783   element effectRef { a_CT_StyleMatrixReference },
1784   element fontRef { a_CT_FontReference }
1785 a_CT_DefaultShapeDefinition =
1786   element spPr { a_CT_ShapeProperties },
1787   element bodyPr { a_CT_TextBodyProperties },
1788   element lstStyle { a_CT_TextListStyle },
1789   element style { a_CT_ShapeStyle }?,
1790   element extLst { a_CT_OfficeArtExtensionList }?
1791 a_CT_ObjectStyleDefaults =
1792   element spDef { a_CT_DefaultShapeDefinition }?,
1793   element lnDef { a_CT_DefaultShapeDefinition }?,
1794   element txDef { a_CT_DefaultShapeDefinition }?,
1795   element extLst { a_CT_OfficeArtExtensionList }?
1796 a_CT_EmptyElement = empty
1797 a_CT_ColorMapping =
1798   attribute bg1 { a_ST_ColorSchemeIndex },
1799   attribute tx1 { a_ST_ColorSchemeIndex },
1800   attribute bg2 { a_ST_ColorSchemeIndex },
1801   attribute tx2 { a_ST_ColorSchemeIndex },
1802   attribute accent1 { a_ST_ColorSchemeIndex },
1803   attribute accent2 { a_ST_ColorSchemeIndex },
1804   attribute accent3 { a_ST_ColorSchemeIndex },
1805   attribute accent4 { a_ST_ColorSchemeIndex },
1806   attribute accent5 { a_ST_ColorSchemeIndex },
1807   attribute accent6 { a_ST_ColorSchemeIndex },
1808   attribute hlink { a_ST_ColorSchemeIndex },
1809   attribute folHlink { a_ST_ColorSchemeIndex },
1810   element extLst { a_CT_OfficeArtExtensionList }?
1811 a_CT_ColorMappingOverride =
1812   element masterClrMapping { a_CT_EmptyElement }
1813   | element overrideClrMapping { a_CT_ColorMapping }
1814 a_CT_ColorSchemeAndMapping =
1815   element clrScheme { a_CT_ColorScheme },
1816   element clrMap { a_CT_ColorMapping }?
1817 a_CT_ColorSchemeList =
1818   element extraClrScheme { a_CT_ColorSchemeAndMapping }*
1819 a_CT_OfficeStyleSheet =
1820   attribute name { xsd:string }?,
1821   element themeElements { a_CT_BaseStyles },
1822   element objectDefaults { a_CT_ObjectStyleDefaults }?,
1823   element extraClrSchemeLst { a_CT_ColorSchemeList }?,

```



```

1824     element custClrLst { a_CT_CustomColorList }?,
1825     element extLst { a_CT_OfficeArtExtensionList }?
1826 a_CT_BaseStylesOverride =
1827     element clrScheme { a_CT_ColorScheme }?,
1828     element fontScheme { a_CT_FontScheme }?,
1829     element fmtScheme { a_CT_StyleMatrix }?
1830 a_CT_ClipboardStyleSheet =
1831     element themeElements { a_CT_BaseStyles },
1832     element clrMap { a_CT_ColorMapping }
1833 a_theme = element theme { a_CT_OfficeStyleSheet }
1834 a_themeOverride = element themeOverride { a_CT_BaseStylesOverride }
1835 a_themeManager = element themeManager { a_CT_EmptyElement }
1836 a_CT_TableCellProperties =
1837
1838     ## default value: 91440
1839     attribute marL { a_ST_Coordinate32 }?,
1840
1841     ## default value: 91440
1842     attribute marR { a_ST_Coordinate32 }?,
1843
1844     ## default value: 45720
1845     attribute marT { a_ST_Coordinate32 }?,
1846
1847     ## default value: 45720
1848     attribute marB { a_ST_Coordinate32 }?,
1849
1850     ## default value: horz
1851     attribute vert { a_ST_TextVerticalType }?,
1852
1853     ## default value: t
1854     attribute anchor { a_ST_TextAnchoringType }?,
1855
1856     ## default value: false
1857     attribute anchorCtr { xsd:boolean }?,
1858
1859     ## default value: clip
1860     attribute horzOverflow { a_ST_TextHorzOverflowType }?,
1861     element lnL { a_CT_LineProperties }?,
1862     element lnR { a_CT_LineProperties }?,
1863     element lnT { a_CT_LineProperties }?,
1864     element lnB { a_CT_LineProperties }?,
1865     element lnTlToBr { a_CT_LineProperties }?,
1866     element lnBlToTr { a_CT_LineProperties }?,
1867     element cell3D { a_CT_Cell3D }?,
1868     a_EG_FillProperties?,
1869     element headers { a_CT_Headers }?,
1870     element extLst { a_CT_OfficeArtExtensionList }?
1871 a_CT_Headers = element header { xsd:string }*
1872 a_CT_TableCol =
1873     attribute w { a_ST_Coordinate },
1874     element extLst { a_CT_OfficeArtExtensionList }?
1875 a_CT_TableGrid = element gridCol { a_CT_TableCol }*
1876 a_CT_TableCell =

```

```

1877
1878   ## default value: 1
1879   attribute rowSpan { xsd:int }?,
1880
1881   ## default value: 1
1882   attribute gridSpan { xsd:int }?,
1883
1884   ## default value: false
1885   attribute hMerge { xsd:boolean }?,
1886
1887   ## default value: false
1888   attribute vMerge { xsd:boolean }?,
1889   attribute id { xsd:string }?,
1890   element txBdy { a_CT_TextBody }?,
1891   element tcPr { a_CT_TableCellProperties }?,
1892   element extLst { a_CT_OfficeArtExtensionList }?
1893 a_CT_TableRow =
1894   attribute h { a_ST_Coordinate },
1895   element tc { a_CT_TableCell }*,
1896   element extLst { a_CT_OfficeArtExtensionList }?
1897 a_CT_TableProperties =
1898
1899   ## default value: false
1900   attribute rtl { xsd:boolean }?,
1901
1902   ## default value: false
1903   attribute firstRow { xsd:boolean }?,
1904
1905   ## default value: false
1906   attribute firstCol { xsd:boolean }?,
1907
1908   ## default value: false
1909   attribute lastRow { xsd:boolean }?,
1910
1911   ## default value: false
1912   attribute lastCol { xsd:boolean }?,
1913
1914   ## default value: false
1915   attribute bandRow { xsd:boolean }?,
1916
1917   ## default value: false
1918   attribute bandCol { xsd:boolean }?,
1919   a_EG_FillProperties?,
1920   a_EG_EffectProperties?,
1921   (element tableStyle { a_CT_TableStyle }
1922    | element tableStyleId { s_ST_Guid })?,
1923   element extLst { a_CT_OfficeArtExtensionList }?
1924 a_CT_Table =
1925   element tblPr { a_CT_TableProperties }?,
1926   element tblGrid { a_CT_TableGrid },
1927   element tr { a_CT_TableRow }*
1928 a_tbl = element tbl { a_CT_Table }
1929 a_CT_Cell3D =

```

```

1930
1931     ## default value: plastic
1932     attribute prstMaterial { a_ST_PresetMaterialType }?,
1933     element bevel { a_CT_Bevel },
1934     element lightRig { a_CT_LightRig }?,
1935     element extLst { a_CT_OfficeArtExtensionList }?
1936 a_EG_ThemeableFillStyle =
1937     element fill { a_CT_FillProperties }
1938     | element fillRef { a_CT_StyleMatrixReference }
1939 a_CT_ThemeableLineStyle =
1940     element ln { a_CT_LineProperties }
1941     | element lnRef { a_CT_StyleMatrixReference }
1942 a_EG_ThemeableEffectStyle =
1943     element effect { a_CT_EffectProperties }
1944     | element effectRef { a_CT_StyleMatrixReference }
1945 a_EG_ThemeableFontStyles =
1946     element font { a_CT_FontCollection }
1947     | element fontRef { a_CT_FontReference }
1948 a_ST_OnOffStyleType = "on" | "off" | "def"
1949 a_CT_TableStyleTextStyle =
1950
1951     ## default value: def
1952     attribute b { a_ST_OnOffStyleType }?,
1953
1954     ## default value: def
1955     attribute i { a_ST_OnOffStyleType }?,
1956     a_EG_ThemeableFontStyles?,
1957     a_EG_ColorChoice?,
1958     element extLst { a_CT_OfficeArtExtensionList }?
1959 a_CT_TableCellBorderStyle =
1960     element left { a_CT_ThemeableLineStyle }?,
1961     element right { a_CT_ThemeableLineStyle }?,
1962     element top { a_CT_ThemeableLineStyle }?,
1963     element bottom { a_CT_ThemeableLineStyle }?,
1964     element insideH { a_CT_ThemeableLineStyle }?,
1965     element insideV { a_CT_ThemeableLineStyle }?,
1966     element tl2br { a_CT_ThemeableLineStyle }?,
1967     element tr2bl { a_CT_ThemeableLineStyle }?,
1968     element extLst { a_CT_OfficeArtExtensionList }?
1969 a_CT_TableBackgroundStyle =
1970     a_EG_ThemeableFillStyle?, a_EG_ThemeableEffectStyle?
1971 a_CT_TableStyleCellStyle =
1972     element tcBdr { a_CT_TableCellBorderStyle }?,
1973     a_EG_ThemeableFillStyle?,
1974     element cell3D { a_CT_Cell3D }?
1975 a_CT_TablePartStyle =
1976     element tcTxStyle { a_CT_TableStyleTextStyle }?,
1977     element tcStyle { a_CT_TableStyleCellStyle }?
1978 a_CT_TableStyle =
1979     attribute styleId { s_ST_Guid },
1980     attribute styleName { xsd:string },
1981     element tblBg { a_CT_TableBackgroundStyle }?,
1982     element wholeTbl { a_CT_TablePartStyle }?,

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```

1983     element band1H { a_CT_TablePartStyle }?,
1984     element band2H { a_CT_TablePartStyle }?,
1985     element band1V { a_CT_TablePartStyle }?,
1986     element band2V { a_CT_TablePartStyle }?,
1987     element lastCol { a_CT_TablePartStyle }?,
1988     element firstCol { a_CT_TablePartStyle }?,
1989     element lastRow { a_CT_TablePartStyle }?,
1990     element seCell { a_CT_TablePartStyle }?,
1991     element swCell { a_CT_TablePartStyle }?,
1992     element firstRow { a_CT_TablePartStyle }?,
1993     element neCell { a_CT_TablePartStyle }?,
1994     element nwCell { a_CT_TablePartStyle }?,
1995     element extLst { a_CT_OfficeArtExtensionList }?
1996 a_CT_TableStyleList =
1997     attribute def { s_ST_Guid },
1998     element tblStyle { a_CT_TableStyle }*
1999 a_tblStyleLst = element tblStyleLst { a_CT_TableStyleList }
2000 a_CT_TextParagraph =
2001     element pPr { a_CT_TextParagraphProperties }?,
2002     a_EG_TextRun*,
2003     element endParaPr { a_CT_TextCharacterProperties }?
2004 a_ST_TextAnchoringType = "t" | "ctr" | "b" | "just" | "dist"
2005 a_ST_TextVertOverflowType = "overflow" | "ellipsis" | "clip"
2006 a_ST_TextHorzOverflowType = "overflow" | "clip"
2007 a_ST_TextVerticalType =
2008     "horz"
2009     | "vert"
2010     | "vert270"
2011     | "wordArtVert"
2012     | "eaVert"
2013     | "mongolianVert"
2014     | "wordArtVertRtl"
2015 a_ST_TextWrappingType = "none" | "square"
2016 a_ST_TextColumnCount =
2017     xsd:int { minInclusive = "1" maxInclusive = "16" }
2018 a_CT_TextListStyle =
2019     element defPPr { a_CT_TextParagraphProperties }?,
2020     element lvl1pPr { a_CT_TextParagraphProperties }?,
2021     element lvl2pPr { a_CT_TextParagraphProperties }?,
2022     element lvl3pPr { a_CT_TextParagraphProperties }?,
2023     element lvl4pPr { a_CT_TextParagraphProperties }?,
2024     element lvl5pPr { a_CT_TextParagraphProperties }?,
2025     element lvl6pPr { a_CT_TextParagraphProperties }?,
2026     element lvl7pPr { a_CT_TextParagraphProperties }?,
2027     element lvl8pPr { a_CT_TextParagraphProperties }?,
2028     element lvl9pPr { a_CT_TextParagraphProperties }?,
2029     element extLst { a_CT_OfficeArtExtensionList }?
2030 a_ST_TextFontScalePercentOrPercentString = s_ST_Percentage
2031 a_CT_TextNormalAutofit =
2032
2033     ## default value: 100%
2034     attribute fontScale { a_ST_TextFontScalePercentOrPercentString }?,
2035

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2036  ## default value: 0%
2037  attribute lnSpcReduction { a_ST_TextSpacingPercentOrPercentString }?
2038  a_CT_TextShapeAutofit = empty
2039  a_CT_TextNoAutofit = empty
2040  a_EG_TextAutofit =
2041    element noAutofit { a_CT_TextNoAutofit }
2042    | element normAutofit { a_CT_TextNormalAutofit }
2043    | element spAutoFit { a_CT_TextShapeAutofit }
2044  a_CT_TextBodyProperties =
2045    attribute rot { a_ST_Angle }?,
2046    attribute spcFirstLastPara { xsd:boolean }?,
2047    attribute vertOverflow { a_ST_TextVertOverflowType }?,
2048    attribute horzOverflow { a_ST_TextHorzOverflowType }?,
2049    attribute vert { a_ST_TextVerticalType }?,
2050    attribute wrap { a_ST_TextWrappingType }?,
2051    attribute lIns { a_ST_Coordinate32 }?,
2052    attribute tIns { a_ST_Coordinate32 }?,
2053    attribute rIns { a_ST_Coordinate32 }?,
2054    attribute bIns { a_ST_Coordinate32 }?,
2055    attribute numCol { a_ST_TextColumnCount }?,
2056    attribute spcCol { a_ST_PositiveCoordinate32 }?,
2057    attribute rtlCol { xsd:boolean }?,
2058    attribute fromWordArt { xsd:boolean }?,
2059    attribute anchor { a_ST_TextAnchoringType }?,
2060    attribute anchorCtr { xsd:boolean }?,
2061    attribute forceAA { xsd:boolean }?,
2062
2063  ## default value: false
2064  attribute upright { xsd:boolean }?,
2065  attribute compatLnSpc { xsd:boolean }?,
2066  element prstTxWarp { a_CT_PresetTextShape }?,
2067  a_EG_TextAutofit?,
2068  element scene3d { a_CT_Scene3D }?,
2069  a_EG_Text3D?,
2070  element extLst { a_CT_OfficeArtExtensionList }?
2071  a_CT_TextBody =
2072    element bodyPr { a_CT_TextBodyProperties },
2073    element lstStyle { a_CT_TextListStyle }?,
2074    element p { a_CT_TextParagraph }+
2075  a_ST_TextBulletStartAtNum =
2076    xsd:int { minInclusive = "1" maxInclusive = "32767" }
2077  a_ST_TextAutonumberScheme =
2078    "alphaLcParenBoth"
2079    | "alphaUcParenBoth"
2080    | "alphaLcParenR"
2081    | "alphaUcParenR"
2082    | "alphaLcPeriod"
2083    | "alphaUcPeriod"
2084    | "arabicParenBoth"
2085    | "arabicParenR"
2086    | "arabicPeriod"
2087    | "arabicPlain"
2088    | "romanLcParenBoth"

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2089 | "romanUcParenBoth"
2090 | "romanLcParenR"
2091 | "romanUcParenR"
2092 | "romanLcPeriod"
2093 | "romanUcPeriod"
2094 | "circleNumDbPlain"
2095 | "circleNumWdBlackPlain"
2096 | "circleNumWdWhitePlain"
2097 | "arabicDbPeriod"
2098 | "arabicDbPlain"
2099 | "ea1ChsPeriod"
2100 | "ea1ChsPlain"
2101 | "ea1ChtPeriod"
2102 | "ea1ChtPlain"
2103 | "ea1JpnChsDbPeriod"
2104 | "ea1JpnKorPlain"
2105 | "ea1JpnKorPeriod"
2106 | "arabic1Minus"
2107 | "arabic2Minus"
2108 | "hebrew2Minus"
2109 | "thaiAlphaPeriod"
2110 | "thaiAlphaParenR"
2111 | "thaiAlphaParenBoth"
2112 | "thaiNumPeriod"
2113 | "thaiNumParenR"
2114 | "thaiNumParenBoth"
2115 | "hindiAlphaPeriod"
2116 | "hindiNumPeriod"
2117 | "hindiNumParenR"
2118 | "hindiAlpha1Period"
2119 a_CT_TextBulletColorFollowText = empty
2120 a_EG_TextBulletColor =
2121   element buClrTx { a_CT_TextBulletColorFollowText }
2122   | element buClr { a_CT_Color }
2123 a_ST_TextBulletSize = a_ST_TextBulletSizePercent
2124 a_ST_TextBulletSizePercent =
2125   xsd:string {
2126     pattern = "0*((2[5-9])|([3-9][0-9])|([1-3][0-9][0-9])|400)%"
2127   }
2128 a_CT_TextBulletSizeFollowText = empty
2129 a_CT_TextBulletSizePercent =
2130   attribute val { a_ST_TextBulletSizePercent }
2131 a_CT_TextBulletSizePoint = attribute val { a_ST_TextFontSize }
2132 a_EG_TextBulletSize =
2133   element buSzTx { a_CT_TextBulletSizeFollowText }
2134   | element buSzPct { a_CT_TextBulletSizePercent }
2135   | element buSzPts { a_CT_TextBulletSizePoint }
2136 a_CT_TextBulletTypefaceFollowText = empty
2137 a_EG_TextBulletTypeface =
2138   element buFontTx { a_CT_TextBulletTypefaceFollowText }
2139   | element buFont { a_CT_TextFont }
2140 a_CT_TextAutonumberBullet =
2141   attribute type { a_ST_TextAutonumberScheme },

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2142
2143     ## default value: 1
2144     attribute startAt { a_ST_TextBulletStartAtNum }?
2145 a_CT_TextCharBullet = attribute char { xsd:string }
2146 a_CT_TextBlipBullet = element blip { a_CT_Blip }
2147 a_CT_TextNoBullet = empty
2148 a_EG_TextBullet =
2149     element buNone { a_CT_TextNoBullet }
2150     | element buAutoNum { a_CT_TextAutonumberBullet }
2151     | element buChar { a_CT_TextCharBullet }
2152     | element buBlip { a_CT_TextBlipBullet }
2153 a_ST_TextPoint = a_ST_TextPointUnqualified | s_ST_UniversalMeasure
2154 a_ST_TextPointUnqualified =
2155     xsd:int { minInclusive = "-400000" maxInclusive = "400000" }
2156 a_ST_TextNonNegativePoint =
2157     xsd:int { minInclusive = "0" maxInclusive = "400000" }
2158 a_ST_TextFontSize =
2159     xsd:int { minInclusive = "100" maxInclusive = "400000" }
2160 a_ST_TextTypeface = xsd:string
2161 a_ST_PitchFamily =
2162     xsd:byte "00" | xsd:byte "01" | xsd:byte "02" | xsd:byte "16" |
2163     xsd:byte "17" | xsd:byte "18" | xsd:byte "32" | xsd:byte "33" |
2164     xsd:byte "34" | xsd:byte "48" | xsd:byte "49" | xsd:byte "50" |
2165     xsd:byte "64" | xsd:byte "65" | xsd:byte "66" | xsd:byte "80" |
2166     xsd:byte "81" | xsd:byte "82"
2167 a_CT_TextFont =
2168     attribute typeface { a_ST_TextTypeface },
2169     attribute panose { s_ST_Panose }?,
2170
2171     ## default value: 0
2172     attribute pitchFamily { a_ST_PitchFamily }?,
2173
2174     ## default value: 1
2175     attribute charset { xsd:byte }?
2176 a_ST_TextUnderlineType =
2177     "none"
2178     | "words"
2179     | "sng"
2180     | "dbl"
2181     | "heavy"
2182     | "dotted"
2183     | "dottedHeavy"
2184     | "dash"
2185     | "dashHeavy"
2186     | "dashLong"
2187     | "dashLongHeavy"
2188     | "dotDash"
2189     | "dotDashHeavy"
2190     | "dotDotDash"
2191     | "dotDotDashHeavy"
2192     | "wavy"
2193     | "wavyHeavy"
2194     | "wavyDb1"

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2195 a_CT_TextUnderlineLineFollowText = empty
2196 a_CT_TextUnderlineFillFollowText = empty
2197 a_CT_TextUnderlineFillGroupWrapper = a_EG_FillProperties
2198 a_EG_TextUnderlineLine =
2199     element uLnTx { a_CT_TextUnderlineLineFollowText }
2200     | element uLn { a_CT_LineProperties }?
2201 a_EG_TextUnderlineFill =
2202     element uFillTx { a_CT_TextUnderlineFillFollowText }
2203     | element uFill { a_CT_TextUnderlineFillGroupWrapper }
2204 a_ST_TextStrikeType = "noStrike" | "sngStrike" | "dblStrike"
2205 a_ST_TextCapsType = "none" | "small" | "all"
2206 a_CT_TextCharacterProperties =
2207     attribute kumimoji { xsd:boolean }?,
2208     attribute lang { s_ST_Lang }?,
2209     attribute altLang { s_ST_Lang }?,
2210     attribute sz { a_ST_TextFontSize }?,
2211     attribute b { xsd:boolean }?,
2212     attribute i { xsd:boolean }?,
2213     attribute u { a_ST_TextUnderlineType }?,
2214     attribute strike { a_ST_TextStrikeType }?,
2215     attribute kern { a_ST_TextNonNegativePoint }?,
2216     attribute cap { a_ST_TextCapsType }?,
2217     attribute spc { a_ST_TextPoint }?,
2218     attribute normalizeH { xsd:boolean }?,
2219     attribute baseline { a_ST_Percentage }?,
2220     attribute noProof { xsd:boolean }?,
2221
2222     ## default value: true
2223     attribute dirty { xsd:boolean }?,
2224
2225     ## default value: false
2226     attribute err { xsd:boolean }?,
2227
2228     ## default value: true
2229     attribute smtClean { xsd:boolean }?,
2230
2231     ## default value: 0
2232     attribute smtId { xsd:unsignedInt }?,
2233     attribute bmk { xsd:string }?,
2234     element ln { a_CT_LineProperties }?,
2235     a_EG_FillProperties?,
2236     a_EG_EffectProperties?,
2237     element highlight { a_CT_Color }?,
2238     a_EG_TextUnderlineLine?,
2239     a_EG_TextUnderlineFill?,
2240     element latin { a_CT_TextFont }?,
2241     element ea { a_CT_TextFont }?,
2242     element cs { a_CT_TextFont }?,
2243     element sym { a_CT_TextFont }?,
2244     element hlinkClick { a_CT_Hyperlink }?,
2245     element hlinkMouseOver { a_CT_Hyperlink }?,
2246     element rtl { a_CT_Boolean }?,
2247     element extLst { a_CT_OfficeArtExtensionList }?

```



```

2248 a_CT_Boolean =
2249
2250     ## default value: 0
2251     attribute val { s_ST_OnOff }?
2252 a_ST_TextSpacingPoint =
2253     xsd:int { minInclusive = "0" maxInclusive = "158400" }
2254 a_ST_TextSpacingPercentOrPercentString = s_ST_Percentage
2255 a_CT_TextSpacingPercent =
2256     attribute val { a_ST_TextSpacingPercentOrPercentString }
2257 a_CT_TextSpacingPoint = attribute val { a_ST_TextSpacingPoint }
2258 a_ST_TextMargin =
2259     xsd:int { minInclusive = "0" maxInclusive = "51206400" }
2260 a_ST_TextIndent =
2261     xsd:int { minInclusive = "-51206400" maxInclusive = "51206400" }
2262 a_ST_TextTabAlignType = "l" | "ctr" | "r" | "dec"
2263 a_CT_TextTabStop =
2264     attribute pos { a_ST_Coordinate32 }?,
2265     attribute algn { a_ST_TextTabAlignType }?
2266 a_CT_TextTabStopList = element tab { a_CT_TextTabStop }*
2267 a_CT_TextLineBreak = element rPr { a_CT_TextCharacterProperties }?
2268 a_CT_TextSpacing =
2269     element spcPct { a_CT_TextSpacingPercent }
2270     | element spcPts { a_CT_TextSpacingPoint }
2271 a_ST_TextAlignType =
2272     "l" | "ctr" | "r" | "just" | "justLow" | "dist" | "thaiDist"
2273 a_ST_TextFontAlignType = "auto" | "t" | "ctr" | "base" | "b"
2274 a_ST_TextIndentLevelType =
2275     xsd:int { minInclusive = "0" maxInclusive = "8" }
2276 a_CT_TextParagraphProperties =
2277     attribute marL { a_ST_TextMargin }?,
2278     attribute marR { a_ST_TextMargin }?,
2279     attribute lvl { a_ST_TextIndentLevelType }?,
2280     attribute indent { a_ST_TextIndent }?,
2281     attribute algn { a_ST_TextAlignType }?,
2282     attribute defTabSz { a_ST_Coordinate32 }?,
2283     attribute rtl { xsd:boolean }?,
2284     attribute eaLnBrk { xsd:boolean }?,
2285     attribute fontAlgn { a_ST_TextFontAlignType }?,
2286     attribute latinLnBrk { xsd:boolean }?,
2287     attribute hangingPunct { xsd:boolean }?,
2288     element lnSpc { a_CT_TextSpacing }?,
2289     element spcBef { a_CT_TextSpacing }?,
2290     element spcAft { a_CT_TextSpacing }?,
2291     a_EG_TextBulletColor?,
2292     a_EG_TextBulletSize?,
2293     a_EG_TextBulletTypeface?,
2294     a_EG_TextBullet?,
2295     element tabLst { a_CT_TextTabStopList }?,
2296     element defRPr { a_CT_TextCharacterProperties }?,
2297     element extLst { a_CT_OfficeArtExtensionList }?
2298 a_CT_TextField =
2299     attribute id { s_ST_Guid },
2300     attribute type { xsd:string }?,

```

```

2301   element rPr { a_CT_TextCharacterProperties }?,
2302   element pPr { a_CT_TextParagraphProperties }?,
2303   element t { xsd:string }?
2304 a_EG_TextRun =
2305   element r { a_CT_RegularTextRun }
2306   | element br { a_CT_TextLineBreak }
2307   | element fld { a_CT_TextField }
2308 a_CT_RegularTextRun =
2309   element rPr { a_CT_TextCharacterProperties }?,
2310   element t { xsd:string }

```

B.4.1.1 Part Schemas

B.4.1.1.1 Table Styles Part

This schema is available in the file DrawingML_Table_Styles.rnc.

```

1  include "dml-main.rnc"
2  include "shared-relationshipReference.rnc"
3  include "dml-diagram.rnc"
4  include "shared-commonSimpleTypes.rnc"
5  include "dml-lockedCanvas.rnc"
6  include "any.rnc"
7  include "dml-chart.rnc"
8  include "dml-chartDrawing.rnc"
9  include "dml-picture.rnc"
10 start = a_tblStyleLst

```

B.4.1.1.2 Theme Part

This schema is available in the file DrawingML_Theme.rnc.

```

1  include "dml-main.rnc"
2  include "shared-relationshipReference.rnc"
3  include "dml-diagram.rnc"
4  include "shared-commonSimpleTypes.rnc"
5  include "dml-lockedCanvas.rnc"
6  include "any.rnc"
7  include "dml-chart.rnc"
8  include "dml-chartDrawing.rnc"
9  include "dml-picture.rnc"
10 start = a_theme

```

B.4.1.1.3 Theme Override Part

This schema is available in the file DrawingML_Theme_Override.rnc.

```

1  include "dml-main.rnc"
2  include "shared-relationshipReference.rnc"
3  include "dml-diagram.rnc"
4  include "shared-commonSimpleTypes.rnc"
5  include "dml-lockedCanvas.rnc"
6  include "any.rnc"
7  include "dml-chart.rnc"

```

```

8 include "dml-chartDrawing.rnc"
9 include "dml-picture.rnc"
10 start = a_themeOverride

```

B.4.2 DrawingML – Picture

This schema is available in the file dml-picture.rnc.

```

1 default namespace =
2   "http://purl.oclc.org/ooxml/drawingml/picture"
3 namespace a = "http://purl.oclc.org/ooxml/drawingml/main"
4 namespace dpct =
5   "http://purl.oclc.org/ooxml/drawingml/picture"
6 namespace o = "urn:schemas-microsoft-com:office:office"
7 namespace v = "urn:schemas-microsoft-com:vm1"
8 namespace w10 = "urn:schemas-microsoft-com:office:word"
9 namespace x = "urn:schemas-microsoft-com:office:excel"
10
11 dpct_CT_PictureNonVisual =
12   element cNvPr { a_CT_NonVisualDrawingProps },
13   element cNvPicPr { a_CT_NonVisualPictureProperties }
14 dpct_CT_Picture =
15   element nvPicPr { dpct_CT_PictureNonVisual },
16   element blipFill { a_CT_BlipFillProperties },
17   element spPr { a_CT_ShapeProperties }
18 dpct_pic = element pic { dpct_CT_Picture }

```

B.4.3 DrawingML - Locked Canvas

This schema is available in the file dml-lockedCanvas.rnc.

```

1 default namespace =
2   "http://purl.oclc.org/ooxml/drawingml/lockedCanvas"
3 namespace a = "http://purl.oclc.org/ooxml/drawingml/main"
4 namespace dlckcnv =
5   "http://purl.oclc.org/ooxml/drawingml/lockedCanvas"
6 namespace o = "urn:schemas-microsoft-com:office:office"
7 namespace r =
8   "http://purl.oclc.org/ooxml/officeDocument/relationships"
9 namespace v = "urn:schemas-microsoft-com:vm1"
10 namespace w10 = "urn:schemas-microsoft-com:office:word"
11 namespace x = "urn:schemas-microsoft-com:office:excel"
12
13 dlckcnv_lockedCanvas = element lockedCanvas { a_CT_GvmlGroupShape }

```

B.4.4 DrawingML - Wordprocessing Drawing

This schema is available in the file dml-wordprocessingDrawing.rnc.

```

1 default namespace =
2   "http://purl.oclc.org/ooxml/drawingml/wordprocessingDrawing"
3 namespace a = "http://purl.oclc.org/ooxml/drawingml/main"
4 namespace o = "urn:schemas-microsoft-com:office:office"
5 namespace dpct = "http://purl.oclc.org/ooxml/drawingml/picture"

```

```

6 namespace r = http://purl.oclc.org/ooxml/officeDocument/relationships
7 namespace v = "urn:schemas-microsoft-com:VML"
8 namespace w =
9     "http://purl.oclc.org/ooxml/wordprocessingml/main"
10 namespace w10 = "urn:schemas-microsoft-com:office:word"
11 namespace wp =
12     "http://purl.oclc.org/ooxml/drawingml/wordprocessingDrawing"
13 namespace x = "urn:schemas-microsoft-com:office:excel"
14
15 wp_CT_EffectExtent =
16     attribute l { a_ST_Coordinate },
17     attribute t { a_ST_Coordinate },
18     attribute r { a_ST_Coordinate },
19     attribute b { a_ST_Coordinate }
20 wp_ST_WrapDistance = xsd:unsignedInt
21 wp_CT_Inline =
22     attribute distT { wp_ST_WrapDistance }?,
23     attribute distB { wp_ST_WrapDistance }?,
24     attribute distL { wp_ST_WrapDistance }?,
25     attribute distR { wp_ST_WrapDistance }?,
26     element extent { a_CT_PositiveSize2D },
27     element effectExtent { wp_CT_EffectExtent }?,
28     element docPr { a_CT_NonVisualDrawingProps },
29     element cNvGraphicFramePr { a_CT_NonVisualGraphicFrameProperties }?,
30     a_graphic
31 wp_ST_WrapText = "bothSides" | "left" | "right" | "largest"
32 wp_CT_WrapPath =
33     attribute edited { xsd:boolean }?,
34     element start { a_CT_Point2D },
35     element lineTo { a_CT_Point2D }+
36 wp_CT_WrapNone = empty
37 wp_CT_WrapSquare =
38     attribute wrapText { wp_ST_WrapText },
39     attribute distT { wp_ST_WrapDistance }?,
40     attribute distB { wp_ST_WrapDistance }?,
41     attribute distL { wp_ST_WrapDistance }?,
42     attribute distR { wp_ST_WrapDistance }?,
43     element effectExtent { wp_CT_EffectExtent }?
44 wp_CT_WrapTight =
45     attribute wrapText { wp_ST_WrapText },
46     attribute distL { wp_ST_WrapDistance }?,
47     attribute distR { wp_ST_WrapDistance }?,
48     element wrapPolygon { wp_CT_WrapPath }
49 wp_CT_WrapThrough =
50     attribute wrapText { wp_ST_WrapText },
51     attribute distL { wp_ST_WrapDistance }?,
52     attribute distR { wp_ST_WrapDistance }?,
53     element wrapPolygon { wp_CT_WrapPath }
54 wp_CT_WrapTopBottom =
55     attribute distT { wp_ST_WrapDistance }?,
56     attribute distB { wp_ST_WrapDistance }?,
57     element effectExtent { wp_CT_EffectExtent }?
58 wp_EG_WrapType =

```

```

59     element wrapNone { wp_CT_WrapNone }
60     | element wrapSquare { wp_CT_WrapSquare }
61     | element wrapTight { wp_CT_WrapTight }
62     | element wrapThrough { wp_CT_WrapThrough }
63     | element wrapTopAndBottom { wp_CT_WrapTopBottom }
64 wp_ST_PositionOffset = xsd:int
65 wp_ST_AlignH = "left" | "right" | "center" | "inside" | "outside"
66 wp_ST_RelFromH =
67     "margin"
68     | "page"
69     | "column"
70     | "character"
71     | "leftMargin"
72     | "rightMargin"
73     | "insideMargin"
74     | "outsideMargin"
75 wp_CT_PosH =
76     attribute relativeFrom { wp_ST_RelFromH },
77     (element align { wp_ST_AlignH }
78     | element posOffset { wp_ST_PositionOffset })
79 wp_ST_AlignV = "top" | "bottom" | "center" | "inside" | "outside"
80 wp_ST_RelFromV =
81     "margin"
82     | "page"
83     | "paragraph"
84     | "line"
85     | "topMargin"
86     | "bottomMargin"
87     | "insideMargin"
88     | "outsideMargin"
89 wp_CT_PosV =
90     attribute relativeFrom { wp_ST_RelFromV },
91     (element align { wp_ST_AlignV }
92     | element posOffset { wp_ST_PositionOffset })
93 wp_CT_Anchor =
94     attribute distT { wp_ST_WrapDistance }?,
95     attribute distB { wp_ST_WrapDistance }?,
96     attribute distL { wp_ST_WrapDistance }?,
97     attribute distR { wp_ST_WrapDistance }?,
98     attribute simplePos { xsd:boolean }?,
99     attribute relativeHeight { xsd:unsignedInt },
100    attribute behindDoc { xsd:boolean },
101    attribute locked { xsd:boolean },
102    attribute layoutInCell { xsd:boolean },
103    attribute hidden { xsd:boolean }?,
104    attribute allowOverlap { xsd:boolean },
105    element simplePos { a_CT_Point2D },
106    element positionH { wp_CT_PosH },
107    element positionV { wp_CT_PosV },
108    element extent { a_CT_PositiveSize2D },
109    element effectExtent { wp_CT_EffectExtent }?,
110    wp_EG_WrapType,
111    element docPr { a_CT_NonVisualDrawingProps },

```

```

112     element cNvGraphicFramePr { a_CT_NonVisualGraphicFrameProperties }?,
113     a_graphic
114 wp_CT_TxbxContent = w_EG_BlockLevelElts+
115     wp_CT_TextboxInfo =
116
117     ## default value: 0
118     attribute id { xsd:unsignedShort }?,
119     element txbxContent { wp_CT_TxbxContent },
120     element extLst { a_CT_OfficeArtExtensionList }?
121 wp_CT_LinkedTextboxInformation =
122     attribute id { xsd:unsignedShort },
123     attribute seq { xsd:unsignedShort },
124     element extLst { a_CT_OfficeArtExtensionList }?
125 wp_CT_WordprocessingShape =
126
127     ## default value: false
128     attribute normalEastAsianFlow { xsd:boolean }?,
129     element cNvPr { a_CT_NonVisualDrawingProps }?,
130     (element cNvSpPr { a_CT_NonVisualDrawingShapeProps }
131     | element cNvCnPr { a_CT_NonVisualConnectorProperties } ),
132     element spPr { a_CT_ShapeProperties },
133     element style { a_CT_ShapeStyle }?,
134     element extLst { a_CT_OfficeArtExtensionList }?,
135     (element txbx { wp_CT_TextboxInfo }
136     | element linkedTxbx { wp_CT_LinkedTextboxInformation } )?,
137     element bodyPr { a_CT_TextBodyProperties }
138 wp_CT_GraphicFrame =
139     element cNvPr { a_CT_NonVisualDrawingProps },
140     element cNvFrPr { a_CT_NonVisualGraphicFrameProperties },
141     element xfrm { a_CT_Transform2D },
142     a_graphic,
143     element extLst { a_CT_OfficeArtExtensionList }?
144 wp_CT_WordprocessingContentPartNonVisual =
145     element cNvPr { a_CT_NonVisualDrawingProps }?,
146     element cNvContentPartPr { a_CT_NonVisualContentPartProperties }?
147 wp_CT_WordprocessingContentPart =
148     attribute bwMode { a_ST_BlackWhiteMode }?,
149     r_id,
150     element nvContentPartPr { wp_CT_WordprocessingContentPartNonVisual }?,
151     element xfrm { a_CT_Transform2D }?,
152     element extLst { a_CT_OfficeArtExtensionList }?
153 wp_CT_WordprocessingGroup =
154     element cNvPr { a_CT_NonVisualDrawingProps }?,
155     element cNvGrpSpPr { a_CT_NonVisualGroupDrawingShapeProps },
156     element grpSpPr { a_CT_GroupShapeProperties },
157     (wp_wsp
158     | element grpSp { wp_CT_WordprocessingGroup }
159     | element graphicFrame { wp_CT_GraphicFrame }
160     | dpct_pic
161     | element contentPart { wp_CT_WordprocessingContentPart } )*,
162     element extLst { a_CT_OfficeArtExtensionList }?
163 wp_CT_WordprocessingCanvas =
164     element bg { a_CT_BackgroundFormatting }?,

```

```

165   element whole { a_CT_WholeE2oFormatting }?,
166   (wp_wsp
167     | dpct_pic
168     | element contentPart { wp_CT_WordprocessingContentPart }
169     | wp_wgp
170     | element graphicFrame { wp_CT_GraphicFrame })*,
171   element extLst { a_CT_OfficeArtExtensionList }?
172   wp_wpc = element wpc { wp_CT_WordprocessingCanvas }
173   wp_wgp = element wgp { wp_CT_WordprocessingGroup }
174   wp_wsp = element wsp { wp_CT_WordprocessingShape }
175   wp_inline = element inline { wp_CT_Inline }
176   wp_anchor = element anchor { wp_CT_Anchor }

```

B.4.5 DrawingML - Spreadsheet Drawing

This schema is available in the file dml-spreadsheetDrawing.rnc.

```

1  default namespace =
2    "http://purl.oclc.org/ooxml/drawingml/spreadsheetDrawing"
3  namespace a = "http://purl.oclc.org/ooxml/drawingml/main"
4  namespace o = "urn:schemas-microsoft-com:office:office"
5  namespace r =
6    "http://purl.oclc.org/ooxml/officeDocument/relationships"
7  namespace v = "urn:schemas-microsoft-com:vml"
8  namespace w10 = "urn:schemas-microsoft-com:office:word"
9  namespace x = "urn:schemas-microsoft-com:office:excel"
10 namespace xdr =
11   "http://purl.oclc.org/ooxml/drawingml/spreadsheetDrawing"
12
13 xdr_from = element from { xdr_CT_Marker }
14 xdr_to = element to { xdr_CT_Marker }
15 xdr_CT_AnchorClientData =
16
17   ## default value: true
18   attribute fLocksWithSheet { xsd:boolean }?,
19
20   ## default value: true
21   attribute fPrintsWithSheet { xsd:boolean }?
22 xdr_CT_ShapeNonVisual =
23   element cNvPr { a_CT_NonVisualDrawingProps },
24   element cNvSpPr { a_CT_NonVisualDrawingShapeProps }
25 xdr_CT_Shape =
26   attribute macro { xsd:string }?,
27   attribute textlink { xsd:string }?,
28
29   ## default value: true
30   attribute fLocksText { xsd:boolean }?,
31
32   ## default value: false
33   attribute fPublished { xsd:boolean }?,
34   element nvSpPr { xdr_CT_ShapeNonVisual },
35   element spPr { a_CT_ShapeProperties },
36   element style { a_CT_ShapeStyle }?,

```

```

37     element txBdy { a_CT_TextBody }?
38 xdr_CT_ConnectorNonVisual =
39     element cNvPr { a_CT_NonVisualDrawingProps },
40     element cNvCxnSpPr { a_CT_NonVisualConnectorProperties }
41 xdr_CT_Connector =
42     attribute macro { xsd:string }?,
43
44     ## default value: false
45     attribute fPublished { xsd:boolean }?,
46     element nvCxnSpPr { xdr_CT_ConnectorNonVisual },
47     element spPr { a_CT_ShapeProperties },
48     element style { a_CT_ShapeStyle }?
49 xdr_CT_PictureNonVisual =
50     element cNvPr { a_CT_NonVisualDrawingProps },
51     element cNvPicPr { a_CT_NonVisualPictureProperties }
52 xdr_CT_Picture =
53     attribute macro { xsd:string }?,
54
55     ## default value: false
56     attribute fPublished { xsd:boolean }?,
57     element nvPicPr { xdr_CT_PictureNonVisual },
58     element blipFill { a_CT_BlipFillProperties },
59     element spPr { a_CT_ShapeProperties },
60     element style { a_CT_ShapeStyle }?
61 xdr_CT_GraphicalObjectFrameNonVisual =
62     element cNvPr { a_CT_NonVisualDrawingProps },
63     element cNvGraphicFramePr { a_CT_NonVisualGraphicFrameProperties }
64 xdr_CT_GraphicalObjectFrame =
65     attribute macro { xsd:string }?,
66
67     ## default value: false
68     attribute fPublished { xsd:boolean }?,
69     element nvGraphicFramePr { xdr_CT_GraphicalObjectFrameNonVisual },
70     element xfrm { a_CT_Transform2D },
71     a_graphic
72 xdr_CT_GroupShapeNonVisual =
73     element cNvPr { a_CT_NonVisualDrawingProps },
74     element cNvGrpSpPr { a_CT_NonVisualGroupDrawingShapeProps }
75 xdr_CT_GroupShape =
76     element nvGrpSpPr { xdr_CT_GroupShapeNonVisual },
77     element grpSpPr { a_CT_GroupShapeProperties },
78     (element sp { xdr_CT_Shape }
79     | element grpSp { xdr_CT_GroupShape }
80     | element graphicFrame { xdr_CT_GraphicalObjectFrame }
81     | element cxnSp { xdr_CT_Connector }
82     | element pic { xdr_CT_Picture })*
83 xdr_EG_ObjectChoices =
84     element sp { xdr_CT_Shape }
85     | element grpSp { xdr_CT_GroupShape }
86     | element graphicFrame { xdr_CT_GraphicalObjectFrame }
87     | element cxnSp { xdr_CT_Connector }
88     | element pic { xdr_CT_Picture }
89     | element contentPart { xdr_CT_Rel }

```



```

90 xdr_CT_Rel = r_id
91 xdr_ST_ColID = xsd:int { minInclusive = "0" }
92 xdr_ST_RowID = xsd:int { minInclusive = "0" }
93 xdr_CT_Marker =
94   element col { xdr_ST_ColID },
95   element colOff { a_ST_Coordinate },
96   element row { xdr_ST_RowID },
97   element rowOff { a_ST_Coordinate }
98 xdr_ST_EditAs = "twoCell" | "oneCell" | "absolute"
99 xdr_CT_TwoCellAnchor =
100
101   ## default value: twoCell
102   attribute editAs { xdr_ST_EditAs }?,
103   element from { xdr_CT_Marker },
104   element to { xdr_CT_Marker },
105   xdr_EG_ObjectChoices,
106   element clientData { xdr_CT_AnchorClientData }
107 xdr_CT_OneCellAnchor =
108   element from { xdr_CT_Marker },
109   element ext { a_CT_PositiveSize2D },
110   xdr_EG_ObjectChoices,
111   element clientData { xdr_CT_AnchorClientData }
112 xdr_CT_AbsoluteAnchor =
113   element pos { a_CT_Point2D },
114   element ext { a_CT_PositiveSize2D },
115   xdr_EG_ObjectChoices,
116   element clientData { xdr_CT_AnchorClientData }
117 xdr_EG_Anchor =
118   element twoCellAnchor { xdr_CT_TwoCellAnchor }
119   | element oneCellAnchor { xdr_CT_OneCellAnchor }
120   | element absoluteAnchor { xdr_CT_AbsoluteAnchor }
121 xdr_CT_Drawing = xdr_EG_Anchor*
122 xdr_wsDr = element wsDr { xdr_CT_Drawing }

```

B.5 DrawingML - Components

B.5.1 DrawingML – Chart

This schema is available in the file dml-chart.rnc.

```

1 default namespace =
2   "http://purl.oclc.org/ooxml/drawingml/chart"
3 namespace a = "http://purl.oclc.org/ooxml/drawingml/main"
4 namespace cdr =
5   "http://purl.oclc.org/ooxml/drawingml/chartDrawing"
6 namespace dchrt =
7   "http://purl.oclc.org/ooxml/drawingml/chart"
8 namespace o = "urn:schemas-microsoft-com:office:office"
9 namespace r =
10  "http://purl.oclc.org/ooxml/officeDocument/relationships"
11 namespace s =
12  "http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
13 namespace v = "urn:schemas-microsoft-com:vml"

```

```

14 namespace w10 = "urn:schemas-microsoft-com:office:word"
15 namespace x = "urn:schemas-microsoft-com:office:excel"
16
17 dchrt_CT_Boolean =
18
19     ## default value: true
20     attribute val { xsd:boolean }?
21 dchrt_CT_Double = attribute val { xsd:double }
22 dchrt_CT_UnsignedInt = attribute val { xsd:unsignedInt }
23 dchrt_CT_RelId = r_id
24 dchrt_CT_Extension =
25     attribute uri { xsd:token }?,
26     dchrt_CT_Extension_any
27 dchrt_CT_Extension_any =
28     element * - (o:* | v:* | w10:* | x:*) {
29         anyAttribute*,
30         mixed { anyElement* }
31     }
32 dchrt_CT_ExtensionList = element ext { dchrt_CT_Extension }*
33 dchrt_CT_NumVal =
34     attribute idx { xsd:unsignedInt },
35     attribute formatCode { s_ST_Xstring }?,
36     element v { s_ST_Xstring }
37 dchrt_CT_NumData =
38     element formatCode { s_ST_Xstring }?,
39     element ptCount { dchrt_CT_UnsignedInt }?,
40     element pt { dchrt_CT_NumVal }*,
41     element extLst { dchrt_CT_ExtensionList }?
42 dchrt_CT_NumRef =
43     element f { xsd:string },
44     element numCache { dchrt_CT_NumData }?,
45     element extLst { dchrt_CT_ExtensionList }?
46 dchrt_CT_NumDataSource =
47     element numRef { dchrt_CT_NumRef }
48     | element numLit { dchrt_CT_NumData }
49 dchrt_CT_StrVal =
50     attribute idx { xsd:unsignedInt },
51     element v { s_ST_Xstring }
52 dchrt_CT_StrData =
53     element ptCount { dchrt_CT_UnsignedInt }?,
54     element pt { dchrt_CT_StrVal }*,
55     element extLst { dchrt_CT_ExtensionList }?
56 dchrt_CT_StrRef =
57     element f { xsd:string },
58     element strCache { dchrt_CT_StrData }?,
59     element extLst { dchrt_CT_ExtensionList }?
60 dchrt_CT_Tx =
61     element strRef { dchrt_CT_StrRef }
62     | element rich { a_CT_TextBody }
63 dchrt_CT_TextLanguageID = attribute val { s_ST_Lang }
64 dchrt_CT_Lvl = element pt { dchrt_CT_StrVal }*
65 dchrt_CT_MultiLvlStrData =
66     element ptCount { dchrt_CT_UnsignedInt }?,

```

```

67     element lvl { dchrt_CT_Lvl }*,
68     element extLst { dchrt_CT_ExtensionList }?
69 dchrt_CT_MultiLvlStrRef =
70     element f { xsd:string },
71     element multiLvlStrCache { dchrt_CT_MultiLvlStrData }?,
72     element extLst { dchrt_CT_ExtensionList }?
73 dchrt_CT_AxDataSource =
74     element multiLvlStrRef { dchrt_CT_MultiLvlStrRef }
75     | element numRef { dchrt_CT_NumRef }
76     | element numLit { dchrt_CT_NumData }
77     | element strRef { dchrt_CT_StrRef }
78     | element strLit { dchrt_CT_StrData }
79 dchrt_CT_SerTx =
80     element strRef { dchrt_CT_StrRef }
81     | element v { s_ST_Xstring }
82 dchrt_ST_LayoutTarget = string "inner" | string "outer"
83 dchrt_CT_LayoutTarget =
84
85     ## default value: outer
86     attribute val { dchrt_ST_LayoutTarget }?
87 dchrt_ST_LayoutMode = string "edge" | string "factor"
88 dchrt_CT_LayoutMode =
89
90     ## default value: factor
91     attribute val { dchrt_ST_LayoutMode }?
92 dchrt_CT_ManualLayout =
93     element layoutTarget { dchrt_CT_LayoutTarget }?,
94     element xMode { dchrt_CT_LayoutMode }?,
95     element yMode { dchrt_CT_LayoutMode }?,
96     element wMode { dchrt_CT_LayoutMode }?,
97     element hMode { dchrt_CT_LayoutMode }?,
98     element x { dchrt_CT_Double }?,
99     element y { dchrt_CT_Double }?,
100    element w { dchrt_CT_Double }?,
101    element h { dchrt_CT_Double }?,
102    element extLst { dchrt_CT_ExtensionList }?
103 dchrt_CT_Layout =
104     element manualLayout { dchrt_CT_ManualLayout }?,
105     element extLst { dchrt_CT_ExtensionList }?
106 dchrt_CT_Title =
107     element tx { dchrt_CT_Tx }?,
108     element layout { dchrt_CT_Layout }?,
109     element overlay { dchrt_CT_Boolean }?,
110     element spPr { a_CT_ShapeProperties }?,
111     element txPr { a_CT_TextBody }?,
112     element extLst { dchrt_CT_ExtensionList }?
113 dchrt_ST_RotX = xsd:byte { minInclusive = "-90" maxInclusive = "90" }
114 dchrt_CT_RotX =
115
116     ## default value: 0
117     attribute val { dchrt_ST_RotX }?
118 dchrt_ST_HPercent = dchrt_ST_HPercentWithSymbol
119 dchrt_ST_HPercentWithSymbol =

```

```

120     xsd:string {
121         pattern = "0*([5-9])|([1-9][0-9])|([1-4][0-9][0-9])|500)%"
122     }
123     dchrt_CT_HPercent =
124
125         ## default value: 100%
126         attribute val { dchrt_ST_HPercent }?
127     dchrt_ST_RotY =
128         xsd:unsignedShort { minInclusive = "0" maxInclusive = "360" }
129     dchrt_CT_RotY =
130
131         ## default value: 0
132         attribute val { dchrt_ST_RotY }?
133     dchrt_ST_DepthPercent = dchrt_ST_DepthPercentWithSymbol
134     dchrt_ST_DepthPercentWithSymbol =
135         xsd:string {
136             pattern =
137                 "0*([2-9][0-9])|([1-9][0-9][0-9])|(1[0-9][0-9][0-9])|2000)%"
138         }
139     dchrt_CT_DepthPercent =
140
141         ## default value: 100%
142         attribute val { dchrt_ST_DepthPercent }?
143     dchrt_ST_Perspective =
144         xsd:unsignedByte { minInclusive = "0" maxInclusive = "240" }
145     dchrt_CT_Perspective =
146
147         ## default value: 30
148         attribute val { dchrt_ST_Perspective }?
149     dchrt_CT_View3D =
150         element rotX { dchrt_CT_RotX }?,
151         element hPercent { dchrt_CT_HPercent }?,
152         element rotY { dchrt_CT_RotY }?,
153         element depthPercent { dchrt_CT_DepthPercent }?,
154         element rAngAx { dchrt_CT_Boolean }?,
155         element perspective { dchrt_CT_Perspective }?,
156         element extLst { dchrt_CT_ExtensionList }?
157     dchrt_CT_Surface =
158         element thickness { dchrt_CT_Thickness }?,
159         element spPr { a_CT_ShapeProperties }?,
160         element pictureOptions { dchrt_CT_PictureOptions }?,
161         element extLst { dchrt_CT_ExtensionList }?
162     dchrt_ST_Thickness = dchrt_ST_ThicknessPercent
163     dchrt_ST_ThicknessPercent = xsd:string { pattern = "([0-9]+)%" }
164     dchrt_CT_Thickness = attribute val { dchrt_ST_Thickness }
165     dchrt_CT_DTable =
166         element showHorzBorder { dchrt_CT_Boolean }?,
167         element showVertBorder { dchrt_CT_Boolean }?,
168         element showOutline { dchrt_CT_Boolean }?,
169         element showKeys { dchrt_CT_Boolean }?,
170         element spPr { a_CT_ShapeProperties }?,
171         element txPr { a_CT_TextBody }?,
172         element extLst { dchrt_CT_ExtensionList }?

```

```

173 dchrt_ST_GapAmount = dchrt_ST_GapAmountPercent
174 dchrt_ST_GapAmountPercent =
175     xsd:string {
176         pattern = "0*([0-9])|([1-9][0-9])|([1-4][0-9][0-9])|500)%"
177     }
178 dchrt_CT_GapAmount =
179
180     ## default value: 150%
181     attribute val { dchrt_ST_GapAmount }?
182 dchrt_ST_Overlap = dchrt_ST_OverlapPercent
183 dchrt_ST_OverlapPercent = xsd:string { pattern = "(-?0*([0-9])|([1-9][0-9])|100))%" }
184 dchrt_CT_Overlap =
185
186     ## default value: 0%
187     attribute val { dchrt_ST_Overlap }?
188 dchrt_ST_BubbleScale = dchrt_ST_BubbleScalePercent
189 dchrt_ST_BubbleScalePercent =
190     xsd:string {
191         pattern = "0*([0-9])|([1-9][0-9])|([1-2][0-9][0-9])|300)%"
192     }
193 dchrt_CT_BubbleScale =
194
195     ## default value: 100%
196     attribute val { dchrt_ST_BubbleScale }?
197 dchrt_ST_SizeRepresents = string "area" | string "w"
198 dchrt_CT_SizeRepresents =
199
200     ## default value: area
201     attribute val { dchrt_ST_SizeRepresents }?
202 dchrt_ST_FirstSliceAng =
203     xsd:unsignedShort { minInclusive = "0" maxInclusive = "360" }
204 dchrt_CT_FirstSliceAng =
205
206     ## default value: 0
207     attribute val { dchrt_ST_FirstSliceAng }?
208 dchrt_ST_HoleSize = dchrt_ST_HoleSizePercent
209 dchrt_ST_HoleSizePercent = xsd:string { pattern = "0*([1-9]|([1-8][0-9])|90)%" }
210 dchrt_CT_HoleSize =
211
212     ## default value: 10%
213     attribute val { dchrt_ST_HoleSize }?
214 dchrt_ST_SplitType =
215     string "auto"
216     | string "cust"
217     | string "percent"
218     | string "pos"
219     | string "val"
220 dchrt_CT_SplitType =
221
222     ## default value: auto
223     attribute val { dchrt_ST_SplitType }?
224 dchrt_CT_CustSplit = element secondPiePt { dchrt_CT_UnsignedInt }*
225 dchrt_ST_SecondPieSize = dchrt_ST_SecondPieSizePercent

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```

226 dchrt_ST_SecondPieSizePercent =
227   xsd:string { pattern = "0*(([5-9])|([1-9][0-9])|(1[0-9][0-9])|200)%" }
228 dchrt_CT_SecondPieSize =
229
230   ## default value: 75%
231   attribute val { dchrt_ST_SecondPieSize }?
232 dchrt_CT_NumFmt =
233   attribute formatCode { s_ST_Xstring },
234   attribute sourceLinked { xsd:boolean }?
235 dchrt_ST_LblAlgn = string "ctr" | string "l" | string "r"
236 dchrt_CT_LblAlgn = attribute val { dchrt_ST_LblAlgn }
237 dchrt_ST_DLblPos =
238   string "bestFit"
239   | string "b"
240   | string "ctr"
241   | string "inBase"
242   | string "inEnd"
243   | string "l"
244   | string "outEnd"
245   | string "r"
246   | string "t"
247 dchrt_CT_DLblPos = attribute val { dchrt_ST_DLblPos }
248 dchrt_EG_DLblShared =
249   element numFmt { dchrt_CT_NumFmt }?,
250   element spPr { a_CT_ShapeProperties }?,
251   element txPr { a_CT_TextBody }?,
252   element dLblPos { dchrt_CT_DLblPos }?,
253   element showLegendKey { dchrt_CT_Boolean }?,
254   element showVal { dchrt_CT_Boolean }?,
255   element showCatName { dchrt_CT_Boolean }?,
256   element showSerName { dchrt_CT_Boolean }?,
257   element showPercent { dchrt_CT_Boolean }?,
258   element showBubbleSize { dchrt_CT_Boolean }?,
259   element separator { xsd:string }?
260 dchrt_Group_DLbl =
261   element layout { dchrt_CT_Layout }?,
262   element tx { dchrt_CT_Tx }?,
263   dchrt_EG_DLblShared
264 dchrt_CT_DLbl =
265   element idx { dchrt_CT_UnsignedInt },
266   (element delete { dchrt_CT_Boolean }
267    | dchrt_Group_DLbl),
268   element extLst { dchrt_CT_ExtensionList }?
269 dchrt_Group_DLbls =
270   dchrt_EG_DLblShared,
271   element showLeaderLines { dchrt_CT_Boolean }?,
272   element leaderLines { dchrt_CT_ChartLines }?
273 dchrt_CT_DLbls =
274   element dLbl { dchrt_CT_DLbl }*,
275   (element delete { dchrt_CT_Boolean }
276    | dchrt_Group_DLbls),
277   element extLst { dchrt_CT_ExtensionList }?
278 dchrt_ST_MarkerStyle =

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```

279     string "circle"
280     | string "dash"
281     | string "diamond"
282     | string "dot"
283     | string "none"
284     | string "picture"
285     | string "plus"
286     | string "square"
287     | string "star"
288     | string "triangle"
289     | string "x"
290     | string "auto"
291 dchrt_CT_MarkerStyle = attribute val { dchrt_ST_MarkerStyle }
292 dchrt_ST_MarkerSize =
293     xsd:unsignedByte { minInclusive = "2" maxInclusive = "72" }
294 dchrt_CT_MarkerSize =
295
296     ## default value: 5
297     attribute val { dchrt_ST_MarkerSize }?
298 dchrt_CT_Marker =
299     element symbol { dchrt_CT_MarkerStyle }?,
300     element size { dchrt_CT_MarkerSize }?,
301     element spPr { a_CT_ShapeProperties }?,
302     element extLst { dchrt_CT_ExtensionList }?
303 dchrt_CT_DPt =
304     element idx { dchrt_CT_UnsignedInt },
305     element invertIfNegative { dchrt_CT_Boolean }?,
306     element marker { dchrt_CT_Marker }?,
307     element bubble3D { dchrt_CT_Boolean }?,
308     element explosion { dchrt_CT_UnsignedInt }?,
309     element spPr { a_CT_ShapeProperties }?,
310     element pictureOptions { dchrt_CT_PictureOptions }?,
311     element extLst { dchrt_CT_ExtensionList }?
312 dchrt_ST_TrendlineType =
313     string "exp"
314     | string "linear"
315     | string "log"
316     | string "movingAvg"
317     | string "poly"
318     | string "power"
319 dchrt_CT_TrendlineType =
320
321     ## default value: linear
322     attribute val { dchrt_ST_TrendlineType }?
323 dchrt_ST_Order =
324     xsd:unsignedByte { minInclusive = "2" maxInclusive = "6" }
325 dchrt_CT_Order =
326
327     ## default value: 2
328     attribute val { dchrt_ST_Order }?
329 dchrt_ST_Period =
330     xsd:unsignedInt { minInclusive = "2" }
331 dchrt_CT_Period =

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332
333     ## default value: 2
334     attribute val { dchrt_ST_Period }?
335 dchrt_CT_TrendlineLbl =
336     element layout { dchrt_CT_Layout }?,
337     element tx { dchrt_CT_Tx }?,
338     element numFmt { dchrt_CT_NumFmt }?,
339     element spPr { a_CT_ShapeProperties }?,
340     element txPr { a_CT_TextBody }?,
341     element extLst { dchrt_CT_ExtensionList }?
342 dchrt_CT_Trendline =
343     element name { xsd:string }?,
344     element spPr { a_CT_ShapeProperties }?,
345     element trendlineType { dchrt_CT_TrendlineType },
346     element order { dchrt_CT_Order }?,
347     element period { dchrt_CT_Period }?,
348     element forward { dchrt_CT_Double }?,
349     element backward { dchrt_CT_Double }?,
350     element intercept { dchrt_CT_Double }?,
351     element dispRSqr { dchrt_CT_Boolean }?,
352     element dispEq { dchrt_CT_Boolean }?,
353     element trendlineLbl { dchrt_CT_TrendlineLbl }?,
354     element extLst { dchrt_CT_ExtensionList }?
355 dchrt_ST_ErrDir = string "x" | string "y"
356 dchrt_CT_ErrDir = attribute val { dchrt_ST_ErrDir }
357 dchrt_ST_ErrBarType = string "both" | string "minus" | string "plus"
358 dchrt_CT_ErrBarType =
359
360     ## default value: both
361     attribute val { dchrt_ST_ErrBarType }?
362 dchrt_ST_ErrValType =
363     string "cust"
364     | string "fixedVal"
365     | string "percentage"
366     | string "stdDev"
367     | string "stdErr"
368 dchrt_CT_ErrValType =
369
370     ## default value: fixedVal
371     attribute val { dchrt_ST_ErrValType }?
372 dchrt_CT_ErrBars =
373     element errDir { dchrt_CT_ErrDir }?,
374     element errBarType { dchrt_CT_ErrBarType },
375     element errValType { dchrt_CT_ErrValType },
376     element noEndCap { dchrt_CT_Boolean }?,
377     element plus { dchrt_CT_NumDataSource }?,
378     element minus { dchrt_CT_NumDataSource }?,
379     element val { dchrt_CT_Double }?,
380     element spPr { a_CT_ShapeProperties }?,
381     element extLst { dchrt_CT_ExtensionList }?
382 dchrt_CT_UpDownBar = element spPr { a_CT_ShapeProperties }?
383 dchrt_CT_UpDownBars =
384     element gapWidth { dchrt_CT_GapAmount }?,

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385     element upBars { dchrt_CT_UpDownBar }?,
386     element downBars { dchrt_CT_UpDownBar }?,
387     element extLst { dchrt_CT_ExtensionList }?
388 dchrt_EG_SerShared =
389     element idx { dchrt_CT_UnsignedInt },
390     element order { dchrt_CT_UnsignedInt },
391     element tx { dchrt_CT_SerTx }?,
392     element spPr { a_CT_ShapeProperties }?
393 dchrt_CT_LineSer =
394     dchrt_EG_SerShared,
395     element marker { dchrt_CT_Marker }?,
396     element dPt { dchrt_CT_DPt }*,
397     element dLbLs { dchrt_CT_DLbLs }?,
398     element trendline { dchrt_CT_Trendline }*,
399     element errBars { dchrt_CT_ErrBars }?,
400     element cat { dchrt_CT_AxDataSource }?,
401     element val { dchrt_CT_NumDataSource }?,
402     element smooth { dchrt_CT_Boolean }?,
403     element extLst { dchrt_CT_ExtensionList }?
404 dchrt_CT_ScatterSer =
405     dchrt_EG_SerShared,
406     element marker { dchrt_CT_Marker }?,
407     element dPt { dchrt_CT_DPt }*,
408     element dLbLs { dchrt_CT_DLbLs }?,
409     element trendline { dchrt_CT_Trendline }*,
410     element errBars { dchrt_CT_ErrBars }*,
411     element xVal { dchrt_CT_AxDataSource }?,
412     element yVal { dchrt_CT_NumDataSource }?,
413     element smooth { dchrt_CT_Boolean }?,
414     element extLst { dchrt_CT_ExtensionList }?
415 dchrt_CT_RadarSer =
416     dchrt_EG_SerShared,
417     element marker { dchrt_CT_Marker }?,
418     element dPt { dchrt_CT_DPt }*,
419     element dLbLs { dchrt_CT_DLbLs }?,
420     element cat { dchrt_CT_AxDataSource }?,
421     element val { dchrt_CT_NumDataSource }?,
422     element extLst { dchrt_CT_ExtensionList }?
423 dchrt_CT_BarSer =
424     dchrt_EG_SerShared,
425     element invertIfNegative { dchrt_CT_Boolean }?,
426     element pictureOptions { dchrt_CT_PictureOptions }?,
427     element dPt { dchrt_CT_DPt }*,
428     element dLbLs { dchrt_CT_DLbLs }?,
429     element trendline { dchrt_CT_Trendline }*,
430     element errBars { dchrt_CT_ErrBars }?,
431     element cat { dchrt_CT_AxDataSource }?,
432     element val { dchrt_CT_NumDataSource }?,
433     element shape { dchrt_CT_Shape }?,
434     element extLst { dchrt_CT_ExtensionList }?
435 dchrt_CT_AreaSer =
436     dchrt_EG_SerShared,
437     element pictureOptions { dchrt_CT_PictureOptions }?,

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438     element dPt { dchrt_CT_DPt }*,
439     element dLbls { dchrt_CT_DLbls }?,
440     element trendline { dchrt_CT_Trendline }*,
441     element errBars { dchrt_CT_ErrBars }*,
442     element cat { dchrt_CT_AxDataSource }?,
443     element val { dchrt_CT_NumDataSource }?,
444     element extLst { dchrt_CT_ExtensionList }?
445 dchrt_CT_PieSer =
446     dchrt_EG_SerShared,
447     element explosion { dchrt_CT_UnsignedInt }?,
448     element dPt { dchrt_CT_DPt }*,
449     element dLbls { dchrt_CT_DLbls }?,
450     element cat { dchrt_CT_AxDataSource }?,
451     element val { dchrt_CT_NumDataSource }?,
452     element extLst { dchrt_CT_ExtensionList }?
453 dchrt_CT_BubbleSer =
454     dchrt_EG_SerShared,
455     element invertIfNegative { dchrt_CT_Boolean }?,
456     element dPt { dchrt_CT_DPt }*,
457     element dLbls { dchrt_CT_DLbls }?,
458     element trendline { dchrt_CT_Trendline }*,
459     element errBars { dchrt_CT_ErrBars }*,
460     element xVal { dchrt_CT_AxDataSource }?,
461     element yVal { dchrt_CT_NumDataSource }?,
462     element bubbleSize { dchrt_CT_NumDataSource }?,
463     element bubble3D { dchrt_CT_Boolean }?,
464     element extLst { dchrt_CT_ExtensionList }?
465 dchrt_CT_SurfaceSer =
466     dchrt_EG_SerShared,
467     element cat { dchrt_CT_AxDataSource }?,
468     element val { dchrt_CT_NumDataSource }?,
469     element extLst { dchrt_CT_ExtensionList }?
470 dchrt_ST_Grouping =
471     string "percentStacked" | string "standard" | string "stacked"
472 dchrt_CT_Grouping =
473
474     ## default value: standard
475     attribute val { dchrt_ST_Grouping }?
476 dchrt_CT_ChartLines = element spPr { a_CT_ShapeProperties }?
477 dchrt_EG_LineChartShared =
478     element grouping { dchrt_CT_Grouping },
479     element varyColors { dchrt_CT_Boolean }?,
480     element ser { dchrt_CT_LineSer }*,
481     element dLbls { dchrt_CT_DLbls }?,
482     element dropLines { dchrt_CT_ChartLines }?
483 dchrt_CT_LineChart =
484     dchrt_EG_LineChartShared,
485     element hiLowLines { dchrt_CT_ChartLines }?,
486     element upDownBars { dchrt_CT_UpDownBars }?,
487     element marker { dchrt_CT_Boolean }?,
488     element smooth { dchrt_CT_Boolean }?,
489     element axId { dchrt_CT_UnsignedInt }+,
490     element extLst { dchrt_CT_ExtensionList }?

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491 dchrt_CT_Line3DChart =
492     dchrt_EG_LineChartShared,
493     element gapDepth { dchrt_CT_GapAmount }?,
494     element axId { dchrt_CT_UnsignedInt }+,
495     element extLst { dchrt_CT_ExtensionList }?
496 dchrt_CT_StockChart =
497     element ser { dchrt_CT_LineSer }+,
498     element dLbIs { dchrt_CT_DLbIs }?,
499     element dropLines { dchrt_CT_ChartLines }?,
500     element hiLowLines { dchrt_CT_ChartLines }?,
501     element upDownBars { dchrt_CT_UpDownBars }?,
502     element axId { dchrt_CT_UnsignedInt }+,
503     element extLst { dchrt_CT_ExtensionList }?
504 dchrt_ST_ScatterStyle =
505     string "none"
506     | string "line"
507     | string "lineMarker"
508     | string "marker"
509     | string "smooth"
510     | string "smoothMarker"
511 dchrt_CT_ScatterStyle =
512
513     ## default value: marker
514     attribute val { dchrt_ST_ScatterStyle }?
515 dchrt_CT_ScatterChart =
516     element scatterStyle { dchrt_CT_ScatterStyle },
517     element varyColors { dchrt_CT_Boolean }?,
518     element ser { dchrt_CT_ScatterSer }*,
519     element dLbIs { dchrt_CT_DLbIs }?,
520     element axId { dchrt_CT_UnsignedInt }+,
521     element extLst { dchrt_CT_ExtensionList }?
522 dchrt_ST_RadarStyle =
523     string "standard" | string "marker" | string "filled"
524 dchrt_CT_RadarStyle =
525
526     ## default value: standard
527     attribute val { dchrt_ST_RadarStyle }?
528 dchrt_CT_RadarChart =
529     element radarStyle { dchrt_CT_RadarStyle },
530     element varyColors { dchrt_CT_Boolean }?,
531     element ser { dchrt_CT_RadarSer }*,
532     element dLbIs { dchrt_CT_DLbIs }?,
533     element axId { dchrt_CT_UnsignedInt }+,
534     element extLst { dchrt_CT_ExtensionList }?
535 dchrt_ST_BarGrouping =
536     string "percentStacked"
537     | string "clustered"
538     | string "standard"
539     | string "stacked"
540 dchrt_CT_BarGrouping =
541
542     ## default value: clustered
543     attribute val { dchrt_ST_BarGrouping }?

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```

544 dchrt_ST_BarDir = string "bar" | string "col"
545 dchrt_CT_BarDir =
546
547     ## default value: col
548     attribute val { dchrt_ST_BarDir }?
549 dchrt_ST_Shape =
550     string "cone"
551     | string "coneToMax"
552     | string "box"
553     | string "cylinder"
554     | string "pyramid"
555     | string "pyramidToMax"
556 dchrt_CT_Shape =
557
558     ## default value: box
559     attribute val { dchrt_ST_Shape }?
560 dchrt_EG_BarChartShared =
561     element barDir { dchrt_CT_BarDir },
562     element grouping { dchrt_CT_BarGrouping }?,
563     element varyColors { dchrt_CT_Boolean }?,
564     element ser { dchrt_CT_BarSer }*,
565     element dLbls { dchrt_CT_DLbls }?
566 dchrt_CT_BarChart =
567     dchrt_EG_BarChartShared,
568     element gapWidth { dchrt_CT_GapAmount }?,
569     element overlap { dchrt_CT_Overlap }?,
570     element serLines { dchrt_CT_ChartLines }*,
571     element axId { dchrt_CT_UnsignedInt }+,
572     element extLst { dchrt_CT_ExtensionList }?
573 dchrt_CT_Bar3DChart =
574     dchrt_EG_BarChartShared,
575     element gapWidth { dchrt_CT_GapAmount }?,
576     element gapDepth { dchrt_CT_GapAmount }?,
577     element shape { dchrt_CT_Shape }?,
578     element axId { dchrt_CT_UnsignedInt }+,
579     element extLst { dchrt_CT_ExtensionList }?
580 dchrt_EG_AreaChartShared =
581     element grouping { dchrt_CT_Grouping }?,
582     element varyColors { dchrt_CT_Boolean }?,
583     element ser { dchrt_CT_AreaSer }*,
584     element dLbls { dchrt_CT_DLbls }?,
585     element dropLines { dchrt_CT_ChartLines }?
586 dchrt_CT_AreaChart =
587     dchrt_EG_AreaChartShared,
588     element axId { dchrt_CT_UnsignedInt }+,
589     element extLst { dchrt_CT_ExtensionList }?
590 dchrt_CT_Area3DChart =
591     dchrt_EG_AreaChartShared,
592     element gapDepth { dchrt_CT_GapAmount }?,
593     element axId { dchrt_CT_UnsignedInt }+,
594     element extLst { dchrt_CT_ExtensionList }?
595 dchrt_EG_PieChartShared =
596     element varyColors { dchrt_CT_Boolean }?,

```

```

597     element ser { dchrt_CT_PieSer }*,
598     element dLbIs { dchrt_CT_DLbIs }?
599 dchrt_CT_PieChart =
600     dchrt_EG_PieChartShared,
601     element firstSliceAng { dchrt_CT_FirstSliceAng }?,
602     element extLst { dchrt_CT_ExtensionList }?
603 dchrt_CT_Pie3DChart =
604     dchrt_EG_PieChartShared,
605     element extLst { dchrt_CT_ExtensionList }?
606 dchrt_CT_DoughnutChart =
607     dchrt_EG_PieChartShared,
608     element firstSliceAng { dchrt_CT_FirstSliceAng }?,
609     element holeSize { dchrt_CT_HoleSize }?,
610     element extLst { dchrt_CT_ExtensionList }?
611 dchrt_ST_OfPieType = string "pie" | string "bar"
612 dchrt_CT_OfPieType =
613
614     ## default value: pie
615     attribute val { dchrt_ST_OfPieType }?
616 dchrt_CT_OfPieChart =
617     element ofPieType { dchrt_CT_OfPieType },
618     dchrt_EG_PieChartShared,
619     element gapWidth { dchrt_CT_GapAmount }?,
620     element splitType { dchrt_CT_SplitType }?,
621     element splitPos { dchrt_CT_Double }?,
622     element custSplit { dchrt_CT_CustSplit }?,
623     element secondPieSize { dchrt_CT_SecondPieSize }?,
624     element serLines { dchrt_CT_ChartLines }*,
625     element extLst { dchrt_CT_ExtensionList }?
626 dchrt_CT_BubbleChart =
627     element varyColors { dchrt_CT_Boolean }?,
628     element ser { dchrt_CT_BubbleSer }*,
629     element dLbIs { dchrt_CT_DLbIs }?,
630     element bubble3D { dchrt_CT_Boolean }?,
631     element bubbleScale { dchrt_CT_BubbleScale }?,
632     element showNegBubbles { dchrt_CT_Boolean }?,
633     element sizeRepresents { dchrt_CT_SizeRepresents }?,
634     element axId { dchrt_CT_UnsignedInt }+,
635     element extLst { dchrt_CT_ExtensionList }?
636 dchrt_CT_BandFmt =
637     element idx { dchrt_CT_UnsignedInt },
638     element spPr { a_CT_ShapeProperties }?
639 dchrt_CT_BandFmts = element bandFmt { dchrt_CT_BandFmt }*
640 dchrt_EG_SurfaceChartShared =
641     element wireframe { dchrt_CT_Boolean }?,
642     element ser { dchrt_CT_SurfaceSer }*,
643     element bandFmts { dchrt_CT_BandFmts }?
644 dchrt_CT_SurfaceChart =
645     dchrt_EG_SurfaceChartShared,
646     element axId { dchrt_CT_UnsignedInt }+,
647     element extLst { dchrt_CT_ExtensionList }?
648 dchrt_CT_Surface3DChart =
649     dchrt_EG_SurfaceChartShared,

```

```

650     element axId { dchrt_CT_UnsignedInt }+,
651     element extLst { dchrt_CT_ExtensionList }?
652 dchrt_ST_AxPos = string "b" | string "l" | string "r" | string "t"
653 dchrt_CT_AxPos = attribute val { dchrt_ST_AxPos }
654 dchrt_ST_Crosses = string "autoZero" | string "max" | string "min"
655 dchrt_CT_Crosses = attribute val { dchrt_ST_Crosses }
656 dchrt_ST_CrossBetween = string "between" | string "midCat"
657 dchrt_CT_CrossBetween = attribute val { dchrt_ST_CrossBetween }
658 dchrt_ST_TickMark =
659     string "cross" | string "in" | string "none" | string "out"
660 dchrt_CT_TickMark =
661
662     ## default value: cross
663     attribute val { dchrt_ST_TickMark }?
664 dchrt_ST_TickLblPos =
665     string "high" | string "low" | string "nextTo" | string "none"
666 dchrt_CT_TickLblPos =
667
668     ## default value: nextTo
669     attribute val { dchrt_ST_TickLblPos }?
670 dchrt_ST_Skip = xsd:unsignedInt { minInclusive = "1" }
671 dchrt_CT_Skip = attribute val { dchrt_ST_Skip }
672 dchrt_ST_TimeUnit = string "days" | string "months" | string "years"
673 dchrt_CT_TimeUnit =
674
675     ## default value: days
676     attribute val { dchrt_ST_TimeUnit }?
677 dchrt_ST_AxisUnit = xsd:double { minExclusive = "0" }
678 dchrt_CT_AxisUnit = attribute val { dchrt_ST_AxisUnit }
679 dchrt_ST_BuiltInUnit =
680     string "hundreds"
681     | string "thousands"
682     | string "tenThousands"
683     | string "hundredThousands"
684     | string "millions"
685     | string "tenMillions"
686     | string "hundredMillions"
687     | string "billions"
688     | string "trillions"
689 dchrt_CT_BuiltInUnit =
690
691     ## default value: thousands
692     attribute val { dchrt_ST_BuiltInUnit }?
693 dchrt_ST_PictureFormat =
694     string "stretch" | string "stack" | string "stackScale"
695 dchrt_CT_PictureFormat = attribute val { dchrt_ST_PictureFormat }
696 dchrt_ST_PictureStackUnit = xsd:double { minExclusive = "0" }
697 dchrt_CT_PictureStackUnit = attribute val { dchrt_ST_PictureStackUnit }
698 dchrt_CT_PictureOptions =
699     element applyToFront { dchrt_CT_Boolean }?,
700     element applyToSides { dchrt_CT_Boolean }?,
701     element applyToEnd { dchrt_CT_Boolean }?,
702     element pictureFormat { dchrt_CT_PictureFormat }?,

```

```

703     element pictureStackUnit { dchrt_CT_PictureStackUnit }?
704 dchrt_CT_DispUnitsLbl =
705     element layout { dchrt_CT_Layout }?,
706     element tx { dchrt_CT_Tx }?,
707     element spPr { a_CT_ShapeProperties }?,
708     element txPr { a_CT_TextBody }?
709 dchrt_CT_DispUnits =
710     (element custUnit { dchrt_CT_Double }
711     | element builtInUnit { dchrt_CT_BuiltInUnit }?),
712     element dispUnitsLbl { dchrt_CT_DispUnitsLbl }?,
713     element extLst { dchrt_CT_ExtensionList }?
714 dchrt_ST_Orientation = string "maxMin" | string "minMax"
715 dchrt_CT_Orientation =
716
717     ## default value: minMax
718     attribute val { dchrt_ST_Orientation }?
719 dchrt_ST_LogBase =
720     xsd:double { minInclusive = "2" maxInclusive = "1000" }
721 dchrt_CT_LogBase = attribute val { dchrt_ST_LogBase }
722 dchrt_CT_Scaling =
723     element logBase { dchrt_CT_LogBase }?,
724     element orientation { dchrt_CT_Orientation }?,
725     element max { dchrt_CT_Double }?,
726     element min { dchrt_CT_Double }?,
727     element extLst { dchrt_CT_ExtensionList }?
728 dchrt_ST_LblOffset = dchrt_ST_LblOffsetPercent
729 dchrt_ST_LblOffsetPercent =
730     xsd:string {
731         pattern = "0*(([0-9])|([1-9][0-9])|([1-9][0-9][0-9])|1000)%"
732     }
733 dchrt_CT_LblOffset =
734
735     ## default value: 100%
736     attribute val { dchrt_ST_LblOffset }?
737 dchrt_EG_AxShared =
738     element axId { dchrt_CT_UnsignedInt },
739     element scaling { dchrt_CT_Scaling },
740     element delete { dchrt_CT_Boolean }?,
741     element axPos { dchrt_CT_AxPos },
742     element majorGridlines { dchrt_CT_ChartLines }?,
743     element minorGridlines { dchrt_CT_ChartLines }?,
744     element title { dchrt_CT_Title }?,
745     element numFmt { dchrt_CT_NumFmt }?,
746     element majorTickMark { dchrt_CT_TickMark }?,
747     element minorTickMark { dchrt_CT_TickMark }?,
748     element tickLblPos { dchrt_CT_TickLblPos }?,
749     element spPr { a_CT_ShapeProperties }?,
750     element txPr { a_CT_TextBody }?,
751     element crossAx { dchrt_CT_UnsignedInt },
752     (element crosses { dchrt_CT_Crosses }
753     | element crossesAt { dchrt_CT_Double })?
754 dchrt_CT_CatAx =
755     dchrt_EG_AxShared,

```

```

756     element auto { dchrt_CT_Boolean }?,
757     element lblAlign { dchrt_CT_LblAlign }?,
758     element lblOffset { dchrt_CT_LblOffset }?,
759     element tickLblSkip { dchrt_CT_Skip }?,
760     element tickMarkSkip { dchrt_CT_Skip }?,
761     element noMultiLvlLbl { dchrt_CT_Boolean }?,
762     element extLst { dchrt_CT_ExtensionList }?
763 dchrt_CT_DateAx =
764     dchrt_EG_AxShared,
765     element auto { dchrt_CT_Boolean }?,
766     element lblOffset { dchrt_CT_LblOffset }?,
767     element baseTimeUnit { dchrt_CT_TimeUnit }?,
768     element majorUnit { dchrt_CT_AxisUnit }?,
769     element majorTimeUnit { dchrt_CT_TimeUnit }?,
770     element minorUnit { dchrt_CT_AxisUnit }?,
771     element minorTimeUnit { dchrt_CT_TimeUnit }?,
772     element extLst { dchrt_CT_ExtensionList }?
773 dchrt_CT_SerAx =
774     dchrt_EG_AxShared,
775     element tickLblSkip { dchrt_CT_Skip }?,
776     element tickMarkSkip { dchrt_CT_Skip }?,
777     element extLst { dchrt_CT_ExtensionList }?
778 dchrt_CT_ValAx =
779     dchrt_EG_AxShared,
780     element crossBetween { dchrt_CT_CrossBetween }?,
781     element majorUnit { dchrt_CT_AxisUnit }?,
782     element minorUnit { dchrt_CT_AxisUnit }?,
783     element dispUnits { dchrt_CT_DispUnits }?,
784     element extLst { dchrt_CT_ExtensionList }?
785 dchrt_CT_PlotArea =
786     element layout { dchrt_CT_Layout }?,
787     (element areaChart { dchrt_CT_AreaChart }
788     | element area3DChart { dchrt_CT_Area3DChart }
789     | element lineChart { dchrt_CT_LineChart }
790     | element line3DChart { dchrt_CT_Line3DChart }
791     | element stockChart { dchrt_CT_StockChart }
792     | element radarChart { dchrt_CT_RadarChart }
793     | element scatterChart { dchrt_CT_ScatterChart }
794     | element pieChart { dchrt_CT_PieChart }
795     | element pie3DChart { dchrt_CT_Pie3DChart }
796     | element doughnutChart { dchrt_CT_DoughnutChart }
797     | element barChart { dchrt_CT_BarChart }
798     | element bar3DChart { dchrt_CT_Bar3DChart }
799     | element ofPieChart { dchrt_CT_OfPieChart }
800     | element surfaceChart { dchrt_CT_SurfaceChart }
801     | element surface3DChart { dchrt_CT_Surface3DChart }
802     | element bubbleChart { dchrt_CT_BubbleChart })+,
803     (element valAx { dchrt_CT_ValAx }
804     | element catAx { dchrt_CT_CatAx }
805     | element dateAx { dchrt_CT_DateAx }
806     | element serAx { dchrt_CT_SerAx })*,
807     element dTable { dchrt_CT_DTable }?,
808     element spPr { a_CT_ShapeProperties }?,

```



```

809     element extLst { dchrt_CT_ExtensionList }?
810 dchrt_CT_PivotFmt =
811     element idx { dchrt_CT_UnsignedInt },
812     element spPr { a_CT_ShapeProperties }?,
813     element txPr { a_CT_TextBody }?,
814     element marker { dchrt_CT_Marker }?,
815     element dLbl { dchrt_CT_DLbl }?,
816     element extLst { dchrt_CT_ExtensionList }?
817 dchrt_CT_PivotFmts = element pivotFmt { dchrt_CT_PivotFmt }*
818 dchrt_ST_LegendPos =
819     string "b" | string "tr" | string "l" | string "r" | string "t"
820 dchrt_CT_LegendPos =
821
822     ## default value: r
823     attribute val { dchrt_ST_LegendPos }?
824 dchrt_EG_LegendEntryData = element txPr { a_CT_TextBody }?
825 dchrt_CT_LegendEntry =
826     element idx { dchrt_CT_UnsignedInt },
827     (element delete { dchrt_CT_Boolean }
828     | dchrt_EG_LegendEntryData),
829     element extLst { dchrt_CT_ExtensionList }?
830 dchrt_CT_Legend =
831     element legendPos { dchrt_CT_LegendPos }?,
832     element legendEntry { dchrt_CT_LegendEntry }*,
833     element layout { dchrt_CT_Layout }?,
834     element overlay { dchrt_CT_Boolean }?,
835     element spPr { a_CT_ShapeProperties }?,
836     element txPr { a_CT_TextBody }?,
837     element extLst { dchrt_CT_ExtensionList }?
838 dchrt_ST_DisbBlanksAs = string "span" | string "gap" | string "zero"
839 dchrt_CT_DisbBlanksAs =
840
841     ## default value: zero
842     attribute val { dchrt_ST_DisbBlanksAs }?
843 dchrt_CT_Chart =
844     element title { dchrt_CT_Title }?,
845     element autoTitleDeleted { dchrt_CT_Boolean }?,
846     element pivotFmts { dchrt_CT_PivotFmts }?,
847     element view3D { dchrt_CT_View3D }?,
848     element floor { dchrt_CT_Surface }?,
849     element sideWall { dchrt_CT_Surface }?,
850     element backWall { dchrt_CT_Surface }?,
851     element plotArea { dchrt_CT_PlotArea },
852     element legend { dchrt_CT_Legend }?,
853     element plotVisOnly { dchrt_CT_Boolean }?,
854     element disbBlanksAs { dchrt_CT_DisbBlanksAs }?,
855     element showDLblsOverMax { dchrt_CT_Boolean }?,
856     element extLst { dchrt_CT_ExtensionList }?
857 dchrt_ST_Style =
858     xsd:unsignedByte { minInclusive = "1" maxInclusive = "48" }
859 dchrt_CT_Style = attribute val { dchrt_ST_Style }
860 dchrt_CT_PivotSource =
861     element name { s_ST_Xstring },

```

```

862     element fmtId { dchrt_CT_UnsignedInt },
863     element extLst { dchrt_CT_ExtensionList }*
864 dchrt_CT_Protection =
865     element chartObject { dchrt_CT_Boolean }?,
866     element data { dchrt_CT_Boolean }?,
867     element formatting { dchrt_CT_Boolean }?,
868     element selection { dchrt_CT_Boolean }?,
869     element userInterface { dchrt_CT_Boolean }?
870 dchrt_CT_HeaderFooter =
871
872     ## default value: true
873     attribute alignWithMargins { xsd:boolean }?,
874
875     ## default value: false
876     attribute differentOddEven { xsd:boolean }?,
877
878     ## default value: false
879     attribute differentFirst { xsd:boolean }?,
880     element oddHeader { s_ST_Xstring }?,
881     element oddFooter { s_ST_Xstring }?,
882     element evenHeader { s_ST_Xstring }?,
883     element evenFooter { s_ST_Xstring }?,
884     element firstHeader { s_ST_Xstring }?,
885     element firstFooter { s_ST_Xstring }?
886 dchrt_CT_PageMargins =
887     attribute l { xsd:double },
888     attribute r { xsd:double },
889     attribute t { xsd:double },
890     attribute b { xsd:double },
891     attribute header { xsd:double },
892     attribute footer { xsd:double }
893 dchrt_ST_PageSetupOrientation =
894     string "default" | string "portrait" | string "landscape"
895 dchrt_CT_ExternalData =
896     r_id,
897     element autoUpdate { dchrt_CT_Boolean }?
898 dchrt_CT_PageSetup =
899
900     ## default value: 1
901     attribute paperSize { xsd:unsignedInt }?,
902     attribute paperHeight { s_ST_PositiveUniversalMeasure }?,
903     attribute paperWidth { s_ST_PositiveUniversalMeasure }?,
904
905     ## default value: 1
906     attribute firstPageNumber { xsd:unsignedInt }?,
907
908     ## default value: default
909     attribute orientation { dchrt_ST_PageSetupOrientation }?,
910
911     ## default value: false
912     attribute blackAndWhite { xsd:boolean }?,
913
914     ## default value: false

```

```

915 attribute draft { xsd:boolean }?,
916
917 ## default value: false
918 attribute useFirstPageNumber { xsd:boolean }?,
919
920 ## default value: 600
921 attribute horizontalDpi { xsd:int }?,
922
923 ## default value: 600
924 attribute verticalDpi { xsd:int }?,
925
926 ## default value: 1
927 attribute copies { xsd:unsignedInt }?
928 dchrt_CT_PrintSettings =
929   element headerFooter { dchrt_CT_HeaderFooter }?,
930   element pageMargins { dchrt_CT_PageMargins }?,
931   element pageSetup { dchrt_CT_PageSetup }?
932 dchrt_CT_ChartSpace =
933   element date1904 { dchrt_CT_Boolean }?,
934   element lang { dchrt_CT_TextLanguageID }?,
935   element roundedCorners { dchrt_CT_Boolean }?,
936   element style { dchrt_CT_Style }?,
937   element clrMapOvr { a_CT_ColorMapping }?,
938   element pivotSource { dchrt_CT_PivotSource }?,
939   element protection { dchrt_CT_Protection }?,
940   element chart { dchrt_CT_Chart },
941   element spPr { a_CT_ShapeProperties }?,
942   element txPr { a_CT_TextBody }?,
943   element externalData { dchrt_CT_ExternalData }?,
944   element printSettings { dchrt_CT_PrintSettings }?,
945   element userShapes { dchrt_CT_RelId }?,
946   element extLst { dchrt_CT_ExtensionList }?
947 dchrt_chartSpace = element chartSpace { dchrt_CT_ChartSpace }
948 dchrt_userShapes = element userShapes { cdr_CT_Drawing }
949 dchrt_chart = element chart { dchrt_CT_RelId }

```

B.5.1.1 Part Schemas

B.5.1.1.1 Chart Part

This schema is available in the file DrawingML_Chart.rnc.

```

1 include "dml-chart.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-main.rnc"
4 include "dml-diagram.rnc"
5 include "shared-commonSimpleTypes.rnc"
6 include "dml-lockedCanvas.rnc"
7 include "any.rnc"
8 include "dml-picture.rnc"
9 include "dml-chartDrawing.rnc"
10 start = dchrt_chartSpace

```

B.5.1.1.2 Chart Drawing Part

This schema is available in the file DrawingML_Chart_Drawing.rnc.

```

1 include "dml-chart.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-main.rnc"
4 include "dml-diagram.rnc"
5 include "shared-commonSimpleTypes.rnc"
6 include "dml-lockedCanvas.rnc"
7 include "any.rnc"
8 include "dml-picture.rnc"
9 include "dml-chartDrawing.rnc"
10 start = dchrt_userShapes

```

B.5.2 DrawingML - Chart Drawing

This schema is available in the file dml-chartDrawing.rnc.

```

1 default namespace =
2   "http://purl.oclc.org/ooxml/drawingml/chartDrawing"
3 namespace a = "http://purl.oclc.org/ooxml/drawingml/main"
4 namespace cdr =
5   "http://purl.oclc.org/ooxml/drawingml/chartDrawing"
6 namespace o = "urn:schemas-microsoft-com:office:office"
7 namespace v = "urn:schemas-microsoft-com:vml"
8 namespace w10 = "urn:schemas-microsoft-com:office:word"
9 namespace x = "urn:schemas-microsoft-com:office:excel"
10
11 cdr_CT_ShapeNonVisual =
12   element cNvPr { a_CT_NonVisualDrawingProps },
13   element cNvSpPr { a_CT_NonVisualDrawingShapeProps }
14 cdr_CT_Shape =
15   attribute macro { xsd:string }?,
16   attribute textlink { xsd:string }?,
17
18   ## default value: true
19   attribute fLocksText { xsd:boolean }?,
20
21   ## default value: false
22   attribute fPublished { xsd:boolean }?,
23   element nvSpPr { cdr_CT_ShapeNonVisual },
24   element spPr { a_CT_ShapeProperties },
25   element style { a_CT_ShapeStyle }?,
26   element txBdy { a_CT_TextBody }?
27 cdr_CT_ConnectorNonVisual =
28   element cNvPr { a_CT_NonVisualDrawingProps },
29   element cNvCxnSpPr { a_CT_NonVisualConnectorProperties }
30 cdr_CT_Connector =
31   attribute macro { xsd:string }?,
32
33   ## default value: false
34   attribute fPublished { xsd:boolean }?,

```

```

35     element nvCxnSpPr { cdr_CT_ConnectorNonVisual },
36     element spPr { a_CT_ShapeProperties },
37     element style { a_CT_ShapeStyle }?
38 cdr_CT_PictureNonVisual =
39     element cNvPr { a_CT_NonVisualDrawingProps },
40     element cNvPicPr { a_CT_NonVisualPictureProperties }
41 cdr_CT_Picture =
42     attribute macro { xsd:string }?,
43
44     ## default value: false
45     attribute fPublished { xsd:boolean }?,
46     element nvPicPr { cdr_CT_PictureNonVisual },
47     element blipFill { a_CT_BlipFillProperties },
48     element spPr { a_CT_ShapeProperties },
49     element style { a_CT_ShapeStyle }?
50 cdr_CT_GraphicFrameNonVisual =
51     element cNvPr { a_CT_NonVisualDrawingProps },
52     element cNvGraphicFramePr { a_CT_NonVisualGraphicFrameProperties }
53 cdr_CT_GraphicFrame =
54     attribute macro { xsd:string }?,
55
56     ## default value: false
57     attribute fPublished { xsd:boolean }?,
58     element nvGraphicFramePr { cdr_CT_GraphicFrameNonVisual },
59     element xfrm { a_CT_Transform2D },
60     a_graphic
61 cdr_CT_GroupShapeNonVisual =
62     element cNvPr { a_CT_NonVisualDrawingProps },
63     element cNvGrpSpPr { a_CT_NonVisualGroupDrawingShapeProps }
64 cdr_CT_GroupShape =
65     element nvGrpSpPr { cdr_CT_GroupShapeNonVisual },
66     element grpSpPr { a_CT_GroupShapeProperties },
67     (element sp { cdr_CT_Shape }
68      | element grpSp { cdr_CT_GroupShape }
69      | element graphicFrame { cdr_CT_GraphicFrame }
70      | element cxnSp { cdr_CT_Connector }
71      | element pic { cdr_CT_Picture })*
72 cdr_EG_ObjectChoices =
73     element sp { cdr_CT_Shape }
74     | element grpSp { cdr_CT_GroupShape }
75     | element graphicFrame { cdr_CT_GraphicFrame }
76     | element cxnSp { cdr_CT_Connector }
77     | element pic { cdr_CT_Picture }
78 cdr_ST_MarkerCoordinate =
79     xsd:double { minInclusive = "0.0" maxInclusive = "1.0" }
80 cdr_CT_Marker =
81     element x { cdr_ST_MarkerCoordinate },
82     element y { cdr_ST_MarkerCoordinate }
83 cdr_CT_RelSizeAnchor =
84     element from { cdr_CT_Marker },
85     element to { cdr_CT_Marker },
86     cdr_EG_ObjectChoices
87 cdr_CT_AbsSizeAnchor =

```

```

88     element from { cdr_CT_Marker },
89     element ext { a_CT_PositiveSize2D },
90     cdr_EG_ObjectChoices
91 cdr_EG_Anchor =
92     element relSizeAnchor { cdr_CT_RelSizeAnchor }
93     | element absSizeAnchor { cdr_CT_AbsSizeAnchor }
94 cdr_CT_Drawing = cdr_EG_Anchor*

```

B.5.3 DrawingML – Diagrams

This schema is available in the file dml-diagram.rnc.

```

1  default namespace =
2    "http://purl.oclc.org/ooxml/drawingml/diagram"
3  namespace a = "http://purl.oclc.org/ooxml/drawingml/main"
4  namespace ddgrm =
5    "http://purl.oclc.org/ooxml/drawingml/diagram"
6  namespace o = "urn:schemas-microsoft-com:office:office"
7  namespace r =
8    "http://purl.oclc.org/ooxml/officeDocument/relationships"
9  namespace s =
10    "http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
11  namespace v = "urn:schemas-microsoft-com:vml"
12  namespace w10 = "urn:schemas-microsoft-com:office:word"
13  namespace x = "urn:schemas-microsoft-com:office:excel"
14
15  ddgrm_CT_CTName =
16    attribute lang { xsd:string }?,
17    attribute val { xsd:string }
18  ddgrm_CT_CTDescription =
19    attribute lang { xsd:string }?,
20    attribute val { xsd:string }
21  ddgrm_CT_CTCategory =
22    attribute type { xsd:anyURI },
23    attribute pri { xsd:unsignedInt }
24  ddgrm_CT_CTCategories = element cat { ddgrm_CT_CTCategory }*
25  ddgrm_ST_ClrAppMethod = "span" | "cycle" | "repeat"
26  ddgrm_ST_HueDir = "cw" | "ccw"
27  ddgrm_CT_Colors =
28
29    ## default value: span
30    attribute meth { ddgrm_ST_ClrAppMethod }?,
31
32    ## default value: cw
33    attribute hueDir { ddgrm_ST_HueDir }?,
34    a_EG_ColorChoice*
35  ddgrm_CT_CTStyleLabel =
36    attribute name { xsd:string },
37    element fillClrLst { ddgrm_CT_Colors }?,
38    element linClrLst { ddgrm_CT_Colors }?,
39    element effectClrLst { ddgrm_CT_Colors }?,
40    element txLinClrLst { ddgrm_CT_Colors }?,
41    element txFillClrLst { ddgrm_CT_Colors }?,

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42     element txEffectClrLst { ddgrm_CT_Colors }?,
43     element extLst { a_CT_OfficeArtExtensionList }?
44 ddgrm_CT_ColorTransform =
45     attribute uniqueId { xsd:string }?,
46
47     attribute minVer { xsd:string }?,
48     element title { ddgrm_CT_CTName }*,
49     element desc { ddgrm_CT_CTDescription }*,
50     element catLst { ddgrm_CT_CTCategories }?,
51     element styleLbl { ddgrm_CT_CTStyleLabel }*,
52     element extLst { a_CT_OfficeArtExtensionList }?
53 ddgrm_colorsDef = element colorsDef { ddgrm_CT_ColorTransform }
54 ddgrm_CT_ColorTransformHeader =
55     attribute uniqueId { xsd:string },
56
57     attribute minVer { xsd:string }?,
58
59     ## default value: 0
60     attribute resId { xsd:int }?,
61     element title { ddgrm_CT_CTName }+,
62     element desc { ddgrm_CT_CTDescription }+,
63     element catLst { ddgrm_CT_CTCategories }?,
64     element extLst { a_CT_OfficeArtExtensionList }?
65 ddgrm_colorsDefHdr =
66     element colorsDefHdr { ddgrm_CT_ColorTransformHeader }
67 ddgrm_CT_ColorTransformHeaderLst =
68     element colorsDefHdr { ddgrm_CT_ColorTransformHeader }*
69 ddgrm_colorsDefHdrLst =
70     element colorsDefHdrLst { ddgrm_CT_ColorTransformHeaderLst }
71 ddgrm_ST_PtType =
72     "node" | "asst" | "doc" | "pres" | "parTrans" | "sibTrans"
73 ddgrm_CT_Pt =
74     attribute modelId { ddgrm_ST_ModelId },
75
76     ## default value: node
77     attribute type { ddgrm_ST_PtType }?,
78
79     ## default value: 0
80     attribute cxnId { ddgrm_ST_ModelId }?,
81     element prSet { ddgrm_CT_ElemPropSet }?,
82     element spPr { a_CT_ShapeProperties }?,
83     element t { a_CT_TextBody }?,
84     element extLst { a_CT_OfficeArtExtensionList }?
85 ddgrm_CT_PtList = element pt { ddgrm_CT_Pt }*
86 ddgrm_ST_CxnType =
87     "parOf" | "presOf" | "presParOf" | "unknownRelationship"
88 ddgrm_CT_Cxn =
89     attribute modelId { ddgrm_ST_ModelId },
90
91     ## default value: parOf
92     attribute type { ddgrm_ST_CxnType }?,
93     attribute srcId { ddgrm_ST_ModelId },
94     attribute destId { ddgrm_ST_ModelId },

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95     attribute srcOrd { xsd:unsignedInt },
96     attribute destOrd { xsd:unsignedInt },
97
98     ## default value: 0
99     attribute parTransId { ddgrm_ST_ModelId }?,
100
101     ## default value: 0
102     attribute sibTransId { ddgrm_ST_ModelId }?,
103     attribute presId { xsd:string }?,
104     element extLst { a_CT_OfficeArtExtensionList }?
105 ddgrm_CT_CxnList = element cxn { ddgrm_CT_Cxn }*
106 ddgrm_CT_DataModel =
107     element ptLst { ddgrm_CT_PtList },
108     element cxnLst { ddgrm_CT_CxnList }?,
109     element bg { a_CT_BackgroundFormatting }?,
110     element whole { a_CT_WholeE2oFormatting }?,
111     element extLst { a_CT_OfficeArtExtensionList }?
112 ddgrm_dataModel = element dataModel { ddgrm_CT_DataModel }
113 ddgrm_AG_IteratorAttributes =
114
115     ## default value: none
116     attribute axis { ddgrm_ST_AxisTypes }?,
117
118     ## default value: all
119     attribute ptType { ddgrm_ST_ElementTypes }?,
120
121     ## default value: true
122     attribute hideLastTrans { ddgrm_ST_Booleans }?,
123
124     ## default value: 1
125     attribute st { ddgrm_ST_Ints }?,
126
127     ## default value: 0
128     attribute cnt { ddgrm_ST_UnsignedInts }?,
129
130     ## default value: 1
131     attribute step { ddgrm_ST_Ints }?
132 ddgrm_AG_ConstraintAttributes =
133     attribute type { ddgrm_ST_ConstraintType },
134
135     ## default value: self
136     attribute for { ddgrm_ST_ConstraintRelationship }?,
137     attribute forName { xsd:string }?,
138
139     ## default value: all
140     attribute ptType { ddgrm_ST_ElementType }?
141 ddgrm_AG_ConstraintRefAttributes =
142
143     ## default value: none
144     attribute refType { ddgrm_ST_ConstraintType }?,
145
146     ## default value: self
147     attribute refFor { ddgrm_ST_ConstraintRelationship }?,

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148     attribute refForName { xsd:string }?,
149
150     ## default value: all
151     attribute refPtType { ddgrm_ST_ElementType }?
152 ddgrm_CT_Constraint =
153     ddgrm_AG_ConstraintAttributes,
154     ddgrm_AG_ConstraintRefAttributes,
155
156     ## default value: none
157     attribute op { ddgrm_ST_BoolOperator }?,
158
159     ## default value: 0
160     attribute val { xsd:double }?,
161
162     ## default value: 1
163     attribute fact { xsd:double }?,
164     element extLst { a_CT_OfficeArtExtensionList }?
165 ddgrm_CT_Constraints = element constr { ddgrm_CT_Constraint }*
166 ddgrm_CT_NumericRule =
167     ddgrm_AG_ConstraintAttributes,
168
169     ## default value: NaN
170     attribute val { xsd:double }?,
171
172     ## default value: NaN
173     attribute fact { xsd:double }?,
174
175     ## default value: NaN
176     attribute max { xsd:double }?,
177     element extLst { a_CT_OfficeArtExtensionList }?
178 ddgrm_CT_Rules = element rule { ddgrm_CT_NumericRule }*
179 ddgrm_CT_PresentationOf =
180     ddgrm_AG_IteratorAttributes,
181     element extLst { a_CT_OfficeArtExtensionList }?
182 ddgrm_ST_LayoutShapeType = a_ST_ShapeType | ddgrm_ST_OutputShapeType
183 ddgrm_ST_Index1 = xsd:unsignedInt { minInclusive = "1" }
184 ddgrm_CT_Adj =
185     attribute idx { ddgrm_ST_Index1 },
186     attribute val { xsd:double }
187 ddgrm_CT_AdjLst = element adj { ddgrm_CT_Adj }*
188 ddgrm_CT_Shape =
189
190     ## default value: 0
191     attribute rot { xsd:double }?,
192
193     ## default value: none
194     attribute type { ddgrm_ST_LayoutShapeType }?,
195     r_blip?,
196
197     ## default value: 0
198     attribute zOrderOff { xsd:int }?,
199
200     ## default value: false

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201 attribute hideGeom { xsd:boolean }?,
202
203 ## default value: false
204 attribute lkTxEntry { xsd:boolean }?,
205
206 ## default value: false
207 attribute blipPhldr { xsd:boolean }?,
208 element adjLst { ddgrm_CT_AdjLst }?,
209 element extLst { a_CT_OfficeArtExtensionList }?
210 ddgrm_CT_Parameter =
211 attribute type { ddgrm_ST_ParameterId },
212 attribute val { ddgrm_ST_ParameterVal }
213 ddgrm_CT_Algorithm =
214 attribute type { ddgrm_ST_AlgorithmType },
215
216 ## default value: 0
217 attribute rev { xsd:unsignedInt }?,
218 element param { ddgrm_CT_Parameter }*,
219 element extLst { a_CT_OfficeArtExtensionList }?
220 ddgrm_CT_LayoutNode =
221 attribute name { xsd:string }?,
222 attribute styleLbl { xsd:string }?,
223
224 ## default value: b
225 attribute chOrder { ddgrm_ST_ChildOrderType }?,
226 attribute moveWith { xsd:string }?,
227 (element alg { ddgrm_CT_Algorithm }?
228 | element shape { ddgrm_CT_Shape }?
229 | element presOf { ddgrm_CT_PresentationOf }?
230 | element constrLst { ddgrm_CT_Constraints }?
231 | element ruleLst { ddgrm_CT_Rules }?
232 | element varLst { ddgrm_CT_LayoutVariablePropertySet }?
233 | element forEach { ddgrm_CT_ForEach }
234 | element layoutNode { ddgrm_CT_LayoutNode }
235 | element choose { ddgrm_CT_Choose }
236 | element extLst { a_CT_OfficeArtExtensionList }?)*
237 ddgrm_CT_ForEach =
238 attribute name { xsd:string }?,
239 attribute ref { xsd:string }?,
240 ddgrm_AG_IteratorAttributes,
241 (element alg { ddgrm_CT_Algorithm }?
242 | element shape { ddgrm_CT_Shape }?
243 | element presOf { ddgrm_CT_PresentationOf }?
244 | element constrLst { ddgrm_CT_Constraints }?
245 | element ruleLst { ddgrm_CT_Rules }?
246 | element forEach { ddgrm_CT_ForEach }
247 | element layoutNode { ddgrm_CT_LayoutNode }
248 | element choose { ddgrm_CT_Choose }
249 | element extLst { a_CT_OfficeArtExtensionList }?)*
250 ddgrm_CT_When =
251 attribute name { xsd:string }?,
252 ddgrm_AG_IteratorAttributes,
253 attribute func { ddgrm_ST_FunctionType },

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254
255   ## default value: none
256   attribute arg { ddgrm_ST_FunctionArgument }?,
257   attribute op { ddgrm_ST_FunctionOperator },
258   attribute val { ddgrm_ST_FunctionValue },
259   (element alg { ddgrm_CT_Algorithm }?
260     | element shape { ddgrm_CT_Shape }?
261     | element presOf { ddgrm_CT_PresentationOf }?
262     | element constrLst { ddgrm_CT_Constraints }?
263     | element ruleLst { ddgrm_CT_Rules }?
264     | element forEach { ddgrm_CT_ForEach }
265     | element layoutNode { ddgrm_CT_LayoutNode }
266     | element choose { ddgrm_CT_Choose }
267     | element extLst { a_CT_OfficeArtExtensionList }?)*
268 ddgrm_CT_Otherwise =
269   attribute name { xsd:string }?,
270   (element alg { ddgrm_CT_Algorithm }?
271     | element shape { ddgrm_CT_Shape }?
272     | element presOf { ddgrm_CT_PresentationOf }?
273     | element constrLst { ddgrm_CT_Constraints }?
274     | element ruleLst { ddgrm_CT_Rules }?
275     | element forEach { ddgrm_CT_ForEach }
276     | element layoutNode { ddgrm_CT_LayoutNode }
277     | element choose { ddgrm_CT_Choose }
278     | element extLst { a_CT_OfficeArtExtensionList }?)*
279 ddgrm_CT_Choose =
280   attribute name { xsd:string }?,
281   element if { ddgrm_CT_When }+,
282   element else { ddgrm_CT_Otherwise }?
283 ddgrm_CT_SampleData =
284
285   ## default value: false
286   attribute useDef { xsd:boolean }?,
287   element dataModel { ddgrm_CT_DataModel }?
288 ddgrm_CT_Category =
289   attribute type { xsd:anyURI },
290   attribute pri { xsd:unsignedInt }
291 ddgrm_CT_Categories = element cat { ddgrm_CT_Category }*
292 ddgrm_CT_Name =
293   attribute lang { xsd:string }?,
294   attribute val { xsd:string }
295 ddgrm_CT_Description =
296   attribute lang { xsd:string }?,
297   attribute val { xsd:string }
298 ddgrm_CT_DiagramDefinition =
299   attribute uniqueId { xsd:string }?,
300
301   attribute minVer { xsd:string }?,
302   attribute defStyle { xsd:string }?,
303   element title { ddgrm_CT_Name }*,
304   element desc { ddgrm_CT_Description }*,
305   element catLst { ddgrm_CT_Categories }?,
306   element sampData { ddgrm_CT_SampleData }?,

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307     element styleData { ddgrm_CT_SampleData }?,
308     element clrData { ddgrm_CT_SampleData }?,
309     element layoutNode { ddgrm_CT_LayoutNode },
310     element extLst { a_CT_OfficeArtExtensionList }?
311 ddgrm_layoutDef = element layoutDef { ddgrm_CT_DiagramDefinition }
312 ddgrm_CT_DiagramDefinitionHeader =
313     attribute uniqueId { xsd:string },
314
315     attribute minVer { xsd:string }?,
316     attribute defStyle { xsd:string }?,
317
318     ## default value: 0
319     attribute resId { xsd:int }?,
320     element title { ddgrm_CT_Name }+,
321     element desc { ddgrm_CT_Description }+,
322     element catLst { ddgrm_CT_Categories }?,
323     element extLst { a_CT_OfficeArtExtensionList }?
324 ddgrm_layoutDefHdr =
325     element layoutDefHdr { ddgrm_CT_DiagramDefinitionHeader }
326 ddgrm_CT_DiagramDefinitionHeaderLst =
327     element layoutDefHdr { ddgrm_CT_DiagramDefinitionHeader }*
328 ddgrm_layoutDefHdrLst =
329     element layoutDefHdrLst { ddgrm_CT_DiagramDefinitionHeaderLst }
330 ddgrm_CT_RelIds = r_dm, r_lo, r_qs, r_cs
331 ddgrm_relIds = element relIds { ddgrm_CT_RelIds }
332 ddgrm_ST_ParameterVal =
333     ddgrm_ST_DiagramHorizontalAlignment
334     | ddgrm_ST_VerticalAlignment
335     | ddgrm_ST_ChildDirection
336     | ddgrm_ST_ChildAlignment
337     | ddgrm_ST_SecondaryChildAlignment
338     | ddgrm_ST_LinearDirection
339     | ddgrm_ST_SecondaryLinearDirection
340     | ddgrm_ST_StartingElement
341     | ddgrm_ST_BendPoint
342     | ddgrm_ST_ConnectorRouting
343     | ddgrm_ST_ArrowheadStyle
344     | ddgrm_ST_ConnectorDimension
345     | ddgrm_ST_RotationPath
346     | ddgrm_ST_CenterShapeMapping
347     | ddgrm_ST_NodeHorizontalAlignment
348     | ddgrm_ST_NodeVerticalAlignment
349     | ddgrm_ST_FallbackDimension
350     | ddgrm_ST_TextDirection
351     | ddgrm_ST_PyramidAccentPosition
352     | ddgrm_ST_PyramidAccentTextMargin
353     | ddgrm_ST_TextBlockDirection
354     | ddgrm_ST_TextAnchorHorizontal
355     | ddgrm_ST_TextAnchorVertical
356     | ddgrm_ST_DiagramTextAlignment
357     | ddgrm_ST_AutoTextRotation
358     | ddgrm_ST_GrowDirection
359     | ddgrm_ST_FlowDirection

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360 | ddgrm_ST_ContinueDirection
361 | ddgrm_ST_Breakpoint
362 | ddgrm_ST_Offset
363 | ddgrm_ST_HierarchyAlignment
364 | xsd:int
365 | xsd:double
366 | xsd:boolean
367 | xsd:string
368 | ddgrm_ST_ConnectorPoint
369 ddgrm_ST_ModelId = xsd:int | s_ST_Guid
370 ddgrm_ST_PrSetCustVal = s_ST_Percentage
371 ddgrm_CT_ElemPropSet =
372     attribute presAssocID { ddgrm_ST_ModelId }?,
373     attribute presName { xsd:string }?,
374     attribute presStyleLbl { xsd:string }?,
375     attribute presStyleIdx { xsd:int }?,
376     attribute presStyleCnt { xsd:int }?,
377     attribute loTypeId { xsd:string }?,
378     attribute loCatId { xsd:string }?,
379     attribute qsTypeId { xsd:string }?,
380     attribute qsCatId { xsd:string }?,
381     attribute csTypeId { xsd:string }?,
382     attribute csCatId { xsd:string }?,
383     attribute coherent3DOff { xsd:boolean }?,
384     attribute phldrT { xsd:string }?,
385     attribute phldr { xsd:boolean }?,
386     attribute custAng { xsd:int }?,
387     attribute custFlipVert { xsd:boolean }?,
388     attribute custFlipHor { xsd:boolean }?,
389     attribute custSzX { xsd:int }?,
390     attribute custSzY { xsd:int }?,
391     attribute custScaleX { ddgrm_ST_PrSetCustVal }?,
392     attribute custScaleY { ddgrm_ST_PrSetCustVal }?,
393     attribute custT { xsd:boolean }?,
394     attribute custLinFactX { ddgrm_ST_PrSetCustVal }?,
395     attribute custLinFactY { ddgrm_ST_PrSetCustVal }?,
396     attribute custLinFactNeighborX { ddgrm_ST_PrSetCustVal }?,
397     attribute custLinFactNeighborY { ddgrm_ST_PrSetCustVal }?,
398     attribute custRadScaleRad { ddgrm_ST_PrSetCustVal }?,
399     attribute custRadScaleInc { ddgrm_ST_PrSetCustVal }?,
400     element presLayoutVars { ddgrm_CT_LayoutVariablePropertySet }?,
401     element style { a_CT_ShapeStyle }?
402 ddgrm_ST_Direction = "norm" | "rev"
403 ddgrm_ST_HierBranchStyle = "l" | "r" | "hang" | "std" | "init"
404 ddgrm_ST_AnimOneStr = "none" | "one" | "branch"
405 ddgrm_ST_AnimLvlStr = "none" | "lvl" | "ctr"
406 ddgrm_CT_OrgChart =
407
408     ## default value: false
409     attribute val { xsd:boolean }?
410 ddgrm_ST_NodeCount = xsd:int { minInclusive = "-1" }
411 ddgrm_CT_ChildMax =
412

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413     ## default value: -1
414     attribute val { ddgrm_ST_NodeCount }?
415 ddgrm_CT_ChildPref =
416
417     ## default value: -1
418     attribute val { ddgrm_ST_NodeCount }?
419 ddgrm_CT_BulletEnabled =
420
421     ## default value: false
422     attribute val { xsd:boolean }?
423 ddgrm_CT_Direction =
424
425     ## default value: norm
426     attribute val { ddgrm_ST_Direction }?
427 ddgrm_CT_HierBranchStyle =
428
429     ## default value: std
430     attribute val { ddgrm_ST_HierBranchStyle }?
431 ddgrm_CT_AnimOne =
432
433     ## default value: one
434     attribute val { ddgrm_ST_AnimOneStr }?
435 ddgrm_CT_AnimLvl =
436
437     ## default value: none
438     attribute val { ddgrm_ST_AnimLvlStr }?
439 ddgrm_ST_ResizeHandlesStr = "exact" | "rel"
440 ddgrm_CT_ResizeHandles =
441
442     ## default value: rel
443     attribute val { ddgrm_ST_ResizeHandlesStr }?
444 ddgrm_CT_LayoutVariablePropertySet =
445     element orgChart { ddgrm_CT_OrgChart }?,
446     element chMax { ddgrm_CT_ChildMax }?,
447     element chPref { ddgrm_CT_ChildPref }?,
448     element bulletEnabled { ddgrm_CT_BulletEnabled }?,
449     element dir { ddgrm_CT_Direction }?,
450     element hierBranch { ddgrm_CT_HierBranchStyle }?,
451     element animOne { ddgrm_CT_AnimOne }?,
452     element animLvl { ddgrm_CT_AnimLvl }?,
453     element resizeHandles { ddgrm_CT_ResizeHandles }?
454 ddgrm_CT_SDName =
455     attribute lang { xsd:string }?,
456     attribute val { xsd:string }
457 ddgrm_CT_SDDescription =
458     attribute lang { xsd:string }?,
459     attribute val { xsd:string }
460 ddgrm_CT_SDCategory =
461     attribute type { xsd:anyURI },
462     attribute pri { xsd:unsignedInt }
463 ddgrm_CT_SDCategories = element cat { ddgrm_CT_SDCategory }*
464 ddgrm_CT_TextProps = a_EG_Text3D?
465 ddgrm_CT_StyleLabel =

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466     attribute name { xsd:string },
467     element scene3d { a_CT_Scene3D }?,
468     element sp3d { a_CT_Shape3D }?,
469     element txPr { ddgrm_CT_TextProps }?,
470     element style { a_CT_StyleStyle }?,
471     element extLst { a_CT_OfficeArtExtensionList }?
472 ddgrm_CT_StyleDefinition =
473     attribute uniqueId { xsd:string }?,
474
475     attribute minVer { xsd:string }?,
476     element title { ddgrm_CT_SDName }*,
477     element desc { ddgrm_CT_SDDescription }*,
478     element catLst { ddgrm_CT_SDCategories }?,
479     element scene3d { a_CT_Scene3D }?,
480     element styleLbl { ddgrm_CT_StyleLabel }+,
481     element extLst { a_CT_OfficeArtExtensionList }?
482 ddgrm_styleDef = element styleDef { ddgrm_CT_StyleDefinition }
483 ddgrm_CT_StyleDefinitionHeader =
484     attribute uniqueId { xsd:string },
485
486     attribute minVer { xsd:string }?,
487
488     ## default value: 0
489     attribute resId { xsd:int }?,
490     element title { ddgrm_CT_SDName }+,
491     element desc { ddgrm_CT_SDDescription }+,
492     element catLst { ddgrm_CT_SDCategories }?,
493     element extLst { a_CT_OfficeArtExtensionList }?
494 ddgrm_styleDefHdr =
495     element styleDefHdr { ddgrm_CT_StyleDefinitionHeader }
496 ddgrm_CT_StyleDefinitionHeaderLst =
497     element styleDefHdr { ddgrm_CT_StyleDefinitionHeader }*
498 ddgrm_styleDefHdrLst =
499     element styleDefHdrLst { ddgrm_CT_StyleDefinitionHeaderLst }
500 ddgrm_ST_AlgorithmType =
501     "composite"
502     | "conn"
503     | "cycle"
504     | "hierChild"
505     | "hierRoot"
506     | "pyra"
507     | "lin"
508     | "sp"
509     | "tx"
510     | "snake"
511 ddgrm_ST_AxisType =
512     "self"
513     | "ch"
514     | "des"
515     | "desOrSelf"
516     | "par"
517     | "ancst"
518     | "ancstOrSelf"

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519 | "followSib"
520 | "precedSib"
521 | "follow"
522 | "preced"
523 | "root"
524 | "none"
525 ddgrm_ST_AxisTypes = list { ddgrm_ST_AxisType* }
526 ddgrm_ST_BoolOperator = "none" | "equ" | "gte" | "lte"
527 ddgrm_ST_ChildOrderType = "b" | "t"
528 ddgrm_ST_ConstraintType =
529     "none"
530     | "alignOff"
531     | "begMarg"
532     | "bendDist"
533     | "begPad"
534     | "b"
535     | "bMarg"
536     | "bOff"
537     | "ctrX"
538     | "ctrXOff"
539     | "ctrY"
540     | "ctrYOff"
541     | "connDist"
542     | "diam"
543     | "endMarg"
544     | "endPad"
545     | "h"
546     | "hArH"
547     | "hOff"
548     | "l"
549     | "lMarg"
550     | "lOff"
551     | "r"
552     | "rMarg"
553     | "rOff"
554     | "primFontSz"
555     | "pyraAcctRatio"
556     | "secFontSz"
557     | "sibSp"
558     | "secSibSp"
559     | "sp"
560     | "stemThick"
561     | "t"
562     | "tMarg"
563     | "tOff"
564     | "userA"
565     | "userB"
566     | "userC"
567     | "userD"
568     | "userE"
569     | "userF"
570     | "userG"
571     | "userH"

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572 | "userI"
573 | "userJ"
574 | "userK"
575 | "userL"
576 | "userM"
577 | "userN"
578 | "userO"
579 | "userP"
580 | "userQ"
581 | "userR"
582 | "userS"
583 | "userT"
584 | "userU"
585 | "userV"
586 | "userW"
587 | "userX"
588 | "userY"
589 | "userZ"
590 | "w"
591 | "wArH"
592 | "wOff"
593 ddgrm_ST_ConstraintRelationship = "self" | "ch" | "des"
594 ddgrm_ST_ElementType =
595   "all"
596   | "doc"
597   | "node"
598   | "norm"
599   | "nonNorm"
600   | "asst"
601   | "nonAsst"
602   | "parTrans"
603   | "pres"
604   | "sibTrans"
605 ddgrm_ST_ElementTypes = list { ddgrm_ST_ElementType* }
606 ddgrm_ST_ParameterId =
607   "horzAlign"
608   | "vertAlign"
609   | "chDir"
610   | "chAlign"
611   | "secChAlign"
612   | "linDir"
613   | "secLinDir"
614   | "stElem"
615   | "bendPt"
616   | "connRout"
617   | "begSty"
618   | "endSty"
619   | "dim"
620   | "rotPath"
621   | "ctrShpMap"
622   | "nodeHorzAlign"
623   | "nodeVertAlign"
624   | "fallback"

```

```

625 | "txDir"
626 | "pyraAcctPos"
627 | "pyraAcctTxMar"
628 | "txBldir"
629 | "txAnchorHorz"
630 | "txAnchorVert"
631 | "txAnchorHorzCh"
632 | "txAnchorVertCh"
633 | "parTxLTRAlign"
634 | "parTxRTLAlign"
635 | "shpTxLTRAlignCh"
636 | "shpTxRTLAlignCh"
637 | "autoTxRot"
638 | "grDir"
639 | "flowDir"
640 | "contDir"
641 | "bkpt"
642 | "off"
643 | "hierAlign"
644 | "bkPtFixedVal"
645 | "stBulletLvl"
646 | "stAng"
647 | "spanAng"
648 | "ar"
649 | "lnSpPar"
650 | "lnSpAfParP"
651 | "lnSpCh"
652 | "lnSpAfChP"
653 | "rtShortDist"
654 | "alignTx"
655 | "pyraLvlNode"
656 | "pyraAcctBkgdNode"
657 | "pyraAcctTxNode"
658 | "srcNode"
659 | "dstNode"
660 | "begPts"
661 | "endPts"
662 ddgrm_ST_Ints = list { xsd:int* }
663 ddgrm_ST_UnsignedInts = list { xsd:unsignedInt* }
664 ddgrm_ST_Booleans = list { xsd:boolean* }
665 ddgrm_ST_FunctionType =
666     "cnt"
667     | "pos"
668     | "revPos"
669     | "posEven"
670     | "posOdd"
671     | "var"
672     | "depth"
673     | "maxDepth"
674 ddgrm_ST_FunctionOperator = "equ" | "neq" | "gt" | "lt" | "gte" | "lte"
675 ddgrm_ST_DiagramHorizontalAlignment = "l" | "ctr" | "r" | "none"
676 ddgrm_ST_VerticalAlignment = "t" | "mid" | "b" | "none"
677 ddgrm_ST_ChildDirection = "horz" | "vert"

```

```

678 ddgrm_ST_ChildAlignment = "t" | "b" | "l" | "r"
679 ddgrm_ST_SecondaryChildAlignment = "none" | "t" | "b" | "l" | "r"
680 ddgrm_ST_LinearDirection = "fromL" | "fromR" | "fromT" | "fromB"
681 ddgrm_ST_SecondaryLinearDirection =
682     "none" | "fromL" | "fromR" | "fromT" | "fromB"
683 ddgrm_ST_StartingElement = "node" | "trans"
684 ddgrm_ST_RotationPath = "none" | "alongPath"
685 ddgrm_ST_CenterShapeMapping = "none" | "fNode"
686 ddgrm_ST_BendPoint = "beg" | "def" | "end"
687 ddgrm_ST_ConnectorRouting = "stra" | "bend" | "curve" | "longCurve"
688 ddgrm_ST_ArrowheadStyle = "auto" | "arr" | "noArr"
689 ddgrm_ST_ConnectorDimension = "1D" | "2D" | "cust"
690 ddgrm_ST_ConnectorPoint =
691     "auto"
692     | "bCtr"
693     | "ctr"
694     | "midL"
695     | "midR"
696     | "tCtr"
697     | "bL"
698     | "bR"
699     | "tL"
700     | "tR"
701     | "radial"
702 ddgrm_ST_NodeHorizontalAlignment = "l" | "ctr" | "r"
703 ddgrm_ST_NodeVerticalAlignment = "t" | "mid" | "b"
704 ddgrm_ST_FallbackDimension = "1D" | "2D"
705 ddgrm_ST_TextDirection = "fromT" | "fromB"
706 ddgrm_ST_PyramidAccentPosition = "bef" | "aft"
707 ddgrm_ST_PyramidAccentTextMargin = "step" | "stack"
708 ddgrm_ST_TextBlockDirection = "horz" | "vert"
709 ddgrm_ST_TextAnchorHorizontal = "none" | "ctr"
710 ddgrm_ST_TextAnchorVertical = "t" | "mid" | "b"
711 ddgrm_ST_DiagramTextAlignment = "l" | "ctr" | "r"
712 ddgrm_ST_AutoTextRotation = "none" | "upr" | "grav"
713 ddgrm_ST_GrowDirection = "tL" | "tR" | "bL" | "bR"
714 ddgrm_ST_FlowDirection = "row" | "col"
715 ddgrm_ST_ContinueDirection = "revDir" | "sameDir"
716 ddgrm_ST_Breakpoint = "endCnv" | "bal" | "fixed"
717 ddgrm_ST_Offset = "ctr" | "off"
718 ddgrm_ST_HierarchyAlignment =
719     "tL"
720     | "tR"
721     | "tCtrCh"
722     | "tCtrDes"
723     | "bL"
724     | "bR"
725     | "bCtrCh"
726     | "bCtrDes"
727     | "lT"
728     | "lB"
729     | "lCtrCh"
730     | "lCtrDes"

```

```

731 | "rT"
732 | "rB"
733 | "rCtrCh"
734 | "rCtrDes"
735 ddgrm_ST_FunctionValue =
736   xsd:int
737   | xsd:boolean
738   | ddgrm_ST_Direction
739   | ddgrm_ST_HierBranchStyle
740   | ddgrm_ST_AnimOneStr
741   | ddgrm_ST_AnimLvlStr
742   | ddgrm_ST_ResizeHandlesStr
743 ddgrm_ST_VariableType =
744   "none"
745   | "orgChart"
746   | "chMax"
747   | "chPref"
748   | "bulEnabled"
749   | "dir"
750   | "hierBranch"
751   | "animOne"
752   | "animLvl"
753   | "resizeHandles"
754 ddgrm_ST_FunctionArgument = ddgrm_ST_VariableType
755 ddgrm_ST_OutputShapeType = "none" | "conn"

```

B.5.3.1 Part Schemas

B.5.3.1.1 Diagram Colors Part

This schema is available in the file DrawingML_Diagram_Colors.rnc.

```

1 include "dml-diagram.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-main.rnc"
4 include "dml-lockedCanvas.rnc"
5 include "any.rnc"
6 include "shared-commonSimpleTypes.rnc"
7 include "dml-chart.rnc"
8 include "dml-chartDrawing.rnc"
9 include "dml-picture.rnc"
10 start = ddgrm_colorsDef

```

B.5.3.1.2 Diagram Data Part

This schema is available in the file DrawingML_Diagram_Data.rnc.

```

1 include "dml-diagram.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-main.rnc"
4 include "dml-lockedCanvas.rnc"
5 include "any.rnc"
6 include "shared-commonSimpleTypes.rnc"
7 include "dml-chart.rnc"

```

```

8 include "dml-chartDrawing.rnc"
9 include "dml-picture.rnc"
10 start = ddgrm_dataModel

```

B.5.3.1.3 Diagram Layout Definitions Part

This schema is available in the file DrawingML_Diagram_Layout_Definition.rnc.

```

1 include "dml-diagram.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-main.rnc"
4 include "dml-lockedCanvas.rnc"
5 include "any.rnc"
6 include "shared-commonSimpleTypes.rnc"
7 include "dml-chart.rnc"
8 include "dml-chartDrawing.rnc"
9 include "dml-picture.rnc"
10 start = ddgrm_layoutDef

```

B.5.3.1.4 Diagram Style Part

This schema is available in the file DrawingML_Diagram_Style.rnc.

```

1 include "dml-diagram.rnc"
2 include "shared-relationshipReference.rnc"
3 include "dml-main.rnc"
4 include "dml-lockedCanvas.rnc"
5 include "any.rnc"
6 include "shared-commonSimpleTypes.rnc"
7 include "dml-chart.rnc"
8 include "dml-chartDrawing.rnc"
9 include "dml-picture.rnc"
10 start = ddgrm_styleDef

```

B.6 Shared MLs

B.6.1 Math

This schema is available in the file shared-math.rnc.

```

1 default namespace m =
2   "http://purl.oclc.org/ooxml/officeDocument/math"
3 namespace o = "urn:schemas-microsoft-com:office:office"
4 namespace s =
5   "http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
6 namespace v = "urn:schemas-microsoft-com:vm1"
7 namespace w =
8   "http://purl.oclc.org/ooxml/wordprocessingml/main"
9 namespace w10 = "urn:schemas-microsoft-com:office:word"
10 namespace x = "urn:schemas-microsoft-com:office:excel"
11
12 m_ST_Integer255 =
13   xsd:integer { minInclusive = "1" maxInclusive = "255" }
14 m_CT_Integer255 = attribute m:val { m_ST_Integer255 }

```

```

15 m_ST_Integer2 = xsd:integer { minInclusive = "-2" maxInclusive = "2" }
16 m_CT_Integer2 = attribute m:val { m_ST_Integer2 }
17 m_ST_SpacingRule = xsd:integer { minInclusive = "0" maxInclusive = "4" }
18 m_CT_SpacingRule = attribute m:val { m_ST_SpacingRule }
19 m_ST_UnSignedInteger = xsd:unsignedInt
20 m_CT_UnSignedInteger = attribute m:val { m_ST_UnSignedInteger }
21 m_ST_Char = xsd:string { maxLength = "1" }
22 m_CT_Char = attribute m:val { m_ST_Char }
23 m_CT_OnOff = attribute m:val { s_ST_OnOff }?
24 m_CT_String = attribute m:val { s_ST_String }?
25 m_CT_XAlign = attribute m:val { s_ST_XAlign }
26 m_CT_YAlign = attribute m:val { s_ST_YAlign }
27 m_ST_Shp = string "centered" | string "match"
28 m_CT_Shp = attribute m:val { m_ST_Shp }
29 m_ST_FType = string "bar" | string "skw" | string "lin" | string "noBar"
30 m_CT_FType = attribute m:val { m_ST_FType }
31 m_ST_LimLoc = string "undOvr" | string "subSup"
32 m_CT_LimLoc = attribute m:val { m_ST_LimLoc }
33 m_ST_TopBot = string "top" | string "bot"
34 m_CT_TopBot = attribute m:val { m_ST_TopBot }
35 m_ST_Script =
36     string "roman"
37     | string "script"
38     | string "fraktur"
39     | string "double-struck"
40     | string "sans-serif"
41     | string "monospace"
42 m_CT_Script = attribute m:val { m_ST_Script }?
43 m_ST_Style = string "p" | string "b" | string "i" | string "bi"
44 m_CT_Style = attribute m:val { m_ST_Style }?
45 m_CT_ManualBreak = attribute m:alnAt { m_ST_Integer255 }?
46 m_EG_ScriptStyle =
47     element scr { m_CT_Script }?,
48     element sty { m_CT_Style }?
49 m_CT_RPR =
50     element lit { m_CT_OnOff }?,
51     (element nor { m_CT_OnOff }?
52     | m_EG_ScriptStyle),
53     element brk { m_CT_ManualBreak }?,
54     element aln { m_CT_OnOff }?
55 m_CT_Text = s_ST_String, xml_space?
56 m_CT_R =
57     element rPr { m_CT_RPR }?,
58     w_EG_RPr?,
59     (w_EG_RunInnerContent
60     | element t { m_CT_Text }?)*
61 m_CT_CtrlPr = w_EG_RPrMath?
62 m_CT_AccPr =
63     element chr { m_CT_Char }?,
64     element ctrlPr { m_CT_CtrlPr }?
65 m_CT_Acc =
66     element accPr { m_CT_AccPr }?,
67     element e { m_CT_OMathArg }

```

```

68 m_CT_BarPr =
69     element pos { m_CT_TopBot }?,
70     element ctrlPr { m_CT_CtrlPr }?
71 m_CT_Bar =
72     element barPr { m_CT_BarPr }?,
73     element e { m_CT_OMathArg }
74 m_CT_BoxPr =
75     element opEmu { m_CT_OnOff }?,
76     element noBreak { m_CT_OnOff }?,
77     element diff { m_CT_OnOff }?,
78     element brk { m_CT_ManualBreak }?,
79     element aln { m_CT_OnOff }?,
80     element ctrlPr { m_CT_CtrlPr }?
81 m_CT_Box =
82     element boxPr { m_CT_BoxPr }?,
83     element e { m_CT_OMathArg }
84 m_CT_BorderBoxPr =
85     element hideTop { m_CT_OnOff }?,
86     element hideBot { m_CT_OnOff }?,
87     element hideLeft { m_CT_OnOff }?,
88     element hideRight { m_CT_OnOff }?,
89     element strikeH { m_CT_OnOff }?,
90     element strikeV { m_CT_OnOff }?,
91     element strikeBLTR { m_CT_OnOff }?,
92     element strikeTLBR { m_CT_OnOff }?,
93     element ctrlPr { m_CT_CtrlPr }?
94 m_CT_BorderBox =
95     element borderBoxPr { m_CT_BorderBoxPr }?,
96     element e { m_CT_OMathArg }
97 m_CT_DPr =
98     element begChr { m_CT_Char }?,
99     element sepChr { m_CT_Char }?,
100    element endChr { m_CT_Char }?,
101    element grow { m_CT_OnOff }?,
102    element shp { m_CT_Shp }?,
103    element ctrlPr { m_CT_CtrlPr }?
104 m_CT_D =
105     element dPr { m_CT_DPr }?,
106     element e { m_CT_OMathArg }+
107 m_CT_EqArrPr =
108     element baseJc { m_CT_YAlign }?,
109     element maxDist { m_CT_OnOff }?,
110     element objDist { m_CT_OnOff }?,
111     element rSpRule { m_CT_SpacingRule }?,
112     element rSp { m_CT_UnSignedInteger }?,
113     element ctrlPr { m_CT_CtrlPr }?
114 m_CT_EqArr =
115     element eqArrPr { m_CT_EqArrPr }?,
116     element e { m_CT_OMathArg }+
117 m_CT_FPr =
118     element type { m_CT_FType }?,
119     element ctrlPr { m_CT_CtrlPr }?
120 m_CT_F =

```

```

121     element fPr { m_CT_FPr }?,
122     element num { m_CT_OMathArg },
123     element den { m_CT_OMathArg }
124 m_CT_FuncPr = element ctrlPr { m_CT_CtrlPr }?
125 m_CT_Func =
126     element funcPr { m_CT_FuncPr }?,
127     element fName { m_CT_OMathArg },
128     element e { m_CT_OMathArg }
129 m_CT_GroupChrPr =
130     element chr { m_CT_Char }?,
131     element pos { m_CT_TopBot }?,
132     element vertJc { m_CT_TopBot }?,
133     element ctrlPr { m_CT_CtrlPr }?
134 m_CT_GroupChr =
135     element groupChrPr { m_CT_GroupChrPr }?,
136     element e { m_CT_OMathArg }
137 m_CT_LimLowPr = element ctrlPr { m_CT_CtrlPr }?
138 m_CT_LimLow =
139     element limLowPr { m_CT_LimLowPr }?,
140     element e { m_CT_OMathArg },
141     element lim { m_CT_OMathArg }
142 m_CT_LimUppPr = element ctrlPr { m_CT_CtrlPr }?
143 m_CT_LimUpp =
144     element limUppPr { m_CT_LimUppPr }?,
145     element e { m_CT_OMathArg },
146     element lim { m_CT_OMathArg }
147 m_CT_MCPr =
148     element count { m_CT_Integer255 }?,
149     element mcJc { m_CT_XAlign }?
150 m_CT_MC = element mcPr { m_CT_MCPr }?
151 m_CT_MCS = element mc { m_CT_MC }+
152 m_CT_MPr =
153     element baseJc { m_CT_YAlign }?,
154     element plcHide { m_CT_OnOff }?,
155     element rSpRule { m_CT_SpacingRule }?,
156     element cGpRule { m_CT_SpacingRule }?,
157     element rSp { m_CT_UnSignedInteger }?,
158     element cSp { m_CT_UnSignedInteger }?,
159     element cGp { m_CT_UnSignedInteger }?,
160     element mcs { m_CT_MCS }?,
161     element ctrlPr { m_CT_CtrlPr }?
162 m_CT_MR = element e { m_CT_OMathArg }+
163 m_CT_M =
164     element mPr { m_CT_MPr }?,
165     element mr { m_CT_MR }+
166 m_CT_NaryPr =
167     element chr { m_CT_Char }?,
168     element limLoc { m_CT_LimLoc }?,
169     element grow { m_CT_OnOff }?,
170     element subHide { m_CT_OnOff }?,
171     element supHide { m_CT_OnOff }?,
172     element ctrlPr { m_CT_CtrlPr }?
173 m_CT_Nary =

```



```

174   element naryPr { m_CT_NaryPr }?,
175   element sub { m_CT_OMathArg },
176   element sup { m_CT_OMathArg },
177   element e { m_CT_OMathArg }
178 m_CT_PhantPr =
179   element show { m_CT_OnOff }?,
180   element zeroWid { m_CT_OnOff }?,
181   element zeroAsc { m_CT_OnOff }?,
182   element zeroDesc { m_CT_OnOff }?,
183   element transp { m_CT_OnOff }?,
184   element ctrlPr { m_CT_CtrlPr }?
185 m_CT_Phant =
186   element phantPr { m_CT_PhantPr }?,
187   element e { m_CT_OMathArg }
188 m_CT_RadPr =
189   element degHide { m_CT_OnOff }?,
190   element ctrlPr { m_CT_CtrlPr }?
191 m_CT_Rad =
192   element radPr { m_CT_RadPr }?,
193   element deg { m_CT_OMathArg },
194   element e { m_CT_OMathArg }
195 m_CT_SPrePr = element ctrlPr { m_CT_CtrlPr }?
196 m_CT_SPre =
197   element sPrePr { m_CT_SPrePr }?,
198   element sub { m_CT_OMathArg },
199   element sup { m_CT_OMathArg },
200   element e { m_CT_OMathArg }
201 m_CT_SSubPr = element ctrlPr { m_CT_CtrlPr }?
202 m_CT_SSub =
203   element sSubPr { m_CT_SSubPr }?,
204   element e { m_CT_OMathArg },
205   element sub { m_CT_OMathArg }
206 m_CT_SSubSupPr =
207   element alnScr { m_CT_OnOff }?,
208   element ctrlPr { m_CT_CtrlPr }?
209 m_CT_SSubSup =
210   element sSubSupPr { m_CT_SSubSupPr }?,
211   element e { m_CT_OMathArg },
212   element sub { m_CT_OMathArg },
213   element sup { m_CT_OMathArg }
214 m_CT_SSupPr = element ctrlPr { m_CT_CtrlPr }?
215 m_CT_SSup =
216   element sSupPr { m_CT_SSupPr }?,
217   element e { m_CT_OMathArg },
218   element sup { m_CT_OMathArg }
219 m_EG_OMathMathElements =
220   element acc { m_CT_Acc }
221   | element bar { m_CT_Bar }
222   | element box { m_CT_Box }
223   | element borderBox { m_CT_BorderBox }
224   | element d { m_CT_D }
225   | element eqArr { m_CT_EqArr }
226   | element f { m_CT_F }

```

```

227 | element func { m_CT_Func }
228 | element groupChr { m_CT_GroupChr }
229 | element limLow { m_CT_LimLow }
230 | element limUpp { m_CT_LimUpp }
231 | element m { m_CT_M }
232 | element nary { m_CT_Nary }
233 | element phant { m_CT_Phant }
234 | element rad { m_CT_Rad }
235 | element sPre { m_CT_SPre }
236 | element sSub { m_CT_SSub }
237 | element sSubSup { m_CT_SSubSup }
238 | element sSup { m_CT_SSup }
239 | element r { m_CT_R }
240 m_EG_OMathElements = m_EG_OMathMathElements | w_EG_PContentMath
241 m_CT_OMathArgPr = element argSz { m_CT_Integer2 }?
242 m_CT_OMathArg =
243   element argPr { m_CT_OMathArgPr }?,
244   m_EG_OMathElements*,
245   element ctrlPr { m_CT_CtrlPr }?
246 m_ST_Jc =
247   string "left"
248   | string "right"
249   | string "center"
250   | string "centerGroup"
251 m_CT_OMathJc = attribute m:val { m_ST_Jc }?
252 m_CT_OMathParaPr = element jc { m_CT_OMathJc }?
253 m_CT_TwipsMeasure = attribute m:val { s_ST_TwipsMeasure }
254 m_ST_BreakBin = string "before" | string "after" | string "repeat"
255 m_CT_BreakBin = attribute m:val { m_ST_BreakBin }?
256 m_ST_BreakBinSub = string "--" | string "-+" | string "+-"
257 m_CT_BreakBinSub = attribute m:val { m_ST_BreakBinSub }?
258 m_CT_MathPr =
259   element mathFont { m_CT_String }?,
260   element brkBin { m_CT_BreakBin }?,
261   element brkBinSub { m_CT_BreakBinSub }?,
262   element smallFrac { m_CT_OnOff }?,
263   element dispDef { m_CT_OnOff }?,
264   element lMargin { m_CT_TwipsMeasure }?,
265   element rMargin { m_CT_TwipsMeasure }?,
266   element defJc { m_CT_OMathJc }?,
267   element preSp { m_CT_TwipsMeasure }?,
268   element postSp { m_CT_TwipsMeasure }?,
269   element interSp { m_CT_TwipsMeasure }?,
270   element intraSp { m_CT_TwipsMeasure }?,
271   (element wrapIndent { m_CT_TwipsMeasure }
272     | element wrapRight { m_CT_OnOff }?),
273   element intLim { m_CT_LimLoc }?,
274   element naryLim { m_CT_LimLoc }?
275 m_mathPr = element mathPr { m_CT_MathPr }
276 m_CT_OMathPara =
277   element oMathParaPr { m_CT_OMathParaPr }?,
278   element oMath { m_CT_OMath }+
279 m_CT_OMath = m_EG_OMathElements*

```

```

280 m_oMathPara = element oMathPara { m_CT_OMathPara }
281 m_oMath = element oMath { m_CT_OMath }

```

B.6.2 Extended Properties

This schema is available in the file shared-documentPropertiesExtended.rnc.

```

1  default namespace =
2    "http://purl.oclc.org/ooxml/officeDocument/extendedProperties"
3  namespace o = "urn:schemas-microsoft-com:office:office"
4  namespace shdDcEP =
5    "http://purl.oclc.org/ooxml/officeDocument/extendedProperties"
6  namespace v = "urn:schemas-microsoft-com:vm1"
7  namespace vt =
8    "http://purl.oclc.org/ooxml/officeDocument/docPropsVTypes"
9  namespace w10 = "urn:schemas-microsoft-com:office:word"
10 namespace x = "urn:schemas-microsoft-com:office:excel"
11
12 shdDcEP_Properties = element Properties { shdDcEP_CT_Properties }
13 shdDcEP_CT_Properties =
14   element Template { xsd:string }?
15   & element Manager { xsd:string }?
16   & element Company { xsd:string }?
17   & element Pages { xsd:int }?
18   & element Words { xsd:int }?
19   & element Characters { xsd:int }?
20   & element PresentationFormat { xsd:string }?
21   & element Lines { xsd:int }?
22   & element Paragraphs { xsd:int }?
23   & element Slides { xsd:int }?
24   & element Notes { xsd:int }?
25   & element TotalTime { xsd:int }?
26   & element HiddenSlides { xsd:int }?
27   & element MMClips { xsd:int }?
28   & element ScaleCrop { xsd:boolean }?
29   & element HeadingPairs { shdDcEP_CT_VectorVariant }?
30   & element TitlesOfParts { shdDcEP_CT_VectorLpstr }?
31   & element LinksUpToDate { xsd:boolean }?
32   & element CharactersWithSpaces { xsd:int }?
33   & element SharedDoc { xsd:boolean }?
34   & element HyperlinkBase { xsd:string }?
35   & element HLinks { shdDcEP_CT_VectorVariant }?
36   & element HyperlinksChanged { xsd:boolean }?
37   & element DigSig { shdDcEP_CT_DigSigBlob }?
38   & element Application { xsd:string }?
39   & element AppVersion { xsd:string }?
40   & element DocSecurity { xsd:int }?
41 shdDcEP_CT_VectorVariant = vt_vector
42 shdDcEP_CT_VectorLpstr = vt_vector
43 shdDcEP_CT_DigSigBlob = vt_blob

```

B.6.2.1 Part Schemas

B.6.2.1.1 Extended File Properties Part

This schema is available in the file Shared_Extended_File_Properties.rnc.

```

1 include "shared-documentPropertiesExtended.rnc"
2 include "shared-documentPropertiesVariantTypes.rnc"
3 include "shared-commonSimpleTypes.rnc"
4 start = shdDcEP_Properties

```

B.6.3 Custom Properties

This schema is available in the file shared-documentPropertiesCustom.rnc.

```

1 default namespace =
2   "http://purl.oclc.org/ooxml/officeDocument/customProperties"
3 namespace o = "urn:schemas-microsoft-com:office:office"
4 namespace s =
5   "http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
6 namespace shdCstm =
7   "http://purl.oclc.org/ooxml/officeDocument/customProperties"
8 namespace v = "urn:schemas-microsoft-com:vm1"
9 namespace vt =
10  "http://purl.oclc.org/ooxml/officeDocument/docPropsVTypes"
11 namespace w10 = "urn:schemas-microsoft-com:office:word"
12 namespace x = "urn:schemas-microsoft-com:office:excel"
13
14 shdCstm_Properties = element Properties { shdCstm_CT_Properties }
15 shdCstm_CT_Properties = element property { shdCstm_CT_Property }*
16 shdCstm_CT_Property =
17   attribute fmtid { s_ST_Guid },
18   attribute pid { xsd:int },
19   attribute name { xsd:string }?,
20   attribute linkTarget { xsd:string }?,
21   (vt_vector
22     | vt_array
23     | vt_blob
24     | vt_oblob
25     | vt_empty
26     | vt_null
27     | vt_i1
28     | vt_i2
29     | vt_i4
30     | vt_i8
31     | vt_int
32     | vt_ui1
33     | vt_ui2
34     | vt_ui4
35     | vt_ui8
36     | vt_uint
37     | vt_r4
38     | vt_r8

```

```

39 | vt_decimal
40 | vt_lpstr
41 | vt_lpwstr
42 | vt_bstr
43 | vt_date
44 | vt_filetime
45 | vt_bool
46 | vt_cy
47 | vt_error
48 | vt_stream
49 | vt_ostream
50 | vt_storage
51 | vt_ostorage
52 | vt_vstream
53 | vt_clsid)

```

B.6.3.1 Part Schemas

B.6.3.1.1 Custom File Properties Part

This schema is available in the file Shared_Custom_File_Properties.rnc.

```

1 include "shared-documentPropertiesCustom.rnc"
2 include "shared-documentPropertiesVariantTypes.rnc"
3 include "shared-commonSimpleTypes.rnc"
4 start = shdCstm_Properties

```

B.6.4 Variant Types

This schema is available in the file shared-documentPropertiesVariantTypes.rnc.

```

1 default namespace =
2   "http://purl.oclc.org/ooxml/officeDocument/docPropsVTypes"
3 namespace o = "urn:schemas-microsoft-com:office:office"
4 namespace s =
5   "http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
6 namespace v = "urn:schemas-microsoft-com:vml"
7 namespace vt =
8   "http://purl.oclc.org/ooxml/officeDocument/docPropsVTypes"
9 namespace w10 = "urn:schemas-microsoft-com:office:word"
10 namespace x = "urn:schemas-microsoft-com:office:excel"
11
12 vt_ST_VectorBaseType =
13   string "variant"
14   | string "i1"
15   | string "i2"
16   | string "i4"
17   | string "i8"
18   | string "ui1"
19   | string "ui2"
20   | string "ui4"
21   | string "ui8"
22   | string "r4"
23   | string "r8"

```

```

24 | string "lpstr"
25 | string "lpwstr"
26 | string "bstr"
27 | string "date"
28 | string "filetime"
29 | string "bool"
30 | string "cy"
31 | string "error"
32 | string "clsid"
33 vt_ST_ArrayBaseType =
34   string "variant"
35   | string "i1"
36   | string "i2"
37   | string "i4"
38   | string "int"
39   | string "ui1"
40   | string "ui2"
41   | string "ui4"
42   | string "uint"
43   | string "r4"
44   | string "r8"
45   | string "decimal"
46   | string "bstr"
47   | string "date"
48   | string "bool"
49   | string "cy"
50   | string "error"
51 vt_ST_Cy = xsd:string { pattern = "\s*[0-9]*\.[0-9]{4}\s*" }
52 vt_ST_Error = xsd:string { pattern = "\s*0x[0-9A-Za-z]{8}\s*" }
53 vt_CT_Empty = empty
54 vt_CT_Null = empty
55 vt_CT_Vector =
56   attribute baseType { vt_ST_VectorBaseType },
57   attribute size { xsd:unsignedInt },
58   (vt_variant
59     | vt_i1
60     | vt_i2
61     | vt_i4
62     | vt_i8
63     | vt_ui1
64     | vt_ui2
65     | vt_ui4
66     | vt_ui8
67     | vt_r4
68     | vt_r8
69     | vt_lpstr
70     | vt_lpwstr
71     | vt_bstr
72     | vt_date
73     | vt_filetime
74     | vt_bool
75     | vt_cy
76     | vt_error

```

```

77 | vt_clsid)+
78 vt_CT_Array =
79   attribute lBounds { xsd:int },
80   attribute uBounds { xsd:int },
81   attribute baseType { vt_ST_ArrayBaseType },
82   (vt_variant
83     | vt_i1
84     | vt_i2
85     | vt_i4
86     | vt_int
87     | vt_ui1
88     | vt_ui2
89     | vt_ui4
90     | vt_uint
91     | vt_r4
92     | vt_r8
93     | vt_decimal
94     | vt_bstr
95     | vt_date
96     | vt_bool
97     | vt_error
98     | vt_cy)+
99 vt_CT_Variant =
100 vt_variant
101 | vt_vector
102 | vt_array
103 | vt_blob
104 | vt_oblob
105 | vt_empty
106 | vt_null
107 | vt_i1
108 | vt_i2
109 | vt_i4
110 | vt_i8
111 | vt_int
112 | vt_ui1
113 | vt_ui2
114 | vt_ui4
115 | vt_ui8
116 | vt_uint
117 | vt_r4
118 | vt_r8
119 | vt_decimal
120 | vt_lpstr
121 | vt_lpwstr
122 | vt_bstr
123 | vt_date
124 | vt_filetime
125 | vt_bool
126 | vt_cy
127 | vt_error
128 | vt_stream
129 | vt_ostream

```

```

130 | vt_storage
131 | vt_ostorage
132 | vt_vstream
133 | vt_clsid
134 vt_CT_Vstream =
135     xsd:base64Binary,
136     attribute version { s_ST_Guid }?
137 vt_variant = element variant { vt_CT_Variant }
138 vt_vector = element vector { vt_CT_Vector }
139 vt_array = element array { vt_CT_Array }
140 vt_blob = element blob { xsd:base64Binary }
141 vt_oblob = element oblob { xsd:base64Binary }
142 vt_empty = element empty { vt_CT_Empty }
143 vt_null = element null { vt_CT_Null }
144 vt_i1 = element i1 { xsd:byte }
145 vt_i2 = element i2 { xsd:short }
146 vt_i4 = element i4 { xsd:int }
147 vt_i8 = element i8 { xsd:long }
148 vt_int = element int { xsd:int }
149 vt_ui1 = element ui1 { xsd:unsignedByte }
150 vt_ui2 = element ui2 { xsd:unsignedShort }
151 vt_ui4 = element ui4 { xsd:unsignedInt }
152 vt_ui8 = element ui8 { xsd:unsignedLong }
153 vt_uint = element uint { xsd:unsignedInt }
154 vt_r4 = element r4 { xsd:float }
155 vt_r8 = element r8 { xsd:double }
156 vt_decimal = element decimal { xsd:decimal }
157 vt_lpstr = element lpstr { xsd:string }
158 vt_lpwstr = element lpwstr { xsd:string }
159 vt_bstr = element bstr { xsd:string }
160 vt_date = element date { xsd:dateTime }
161 vt_filetime = element filetime { xsd:dateTime }
162 vt_bool = element bool { xsd:boolean }
163 vt_cy = element cy { vt_ST_Cy }
164 vt_error = element error { vt_ST_Error }
165 vt_stream = element stream { xsd:base64Binary }
166 vt_ostream = element ostream { xsd:base64Binary }
167 vt_storage = element storage { xsd:base64Binary }
168 vt_ostorage = element ostorage { xsd:base64Binary }
169 vt_vstream = element vstream { vt_CT_Vstream }
170 vt_clsid = element clsid { s_ST_Guid }

```

B.6.5 Custom XML Data Properties

This schema is available in the file shared-customXmlDataProperties.rnc.

```

1 default namespace ds =
2     "http://purl.oclc.org/ooxml/officeDocument/customXml"
3 namespace o = "urn:schemas-microsoft-com:office:office"
4 namespace s =
5     "http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
6 namespace v = "urn:schemas-microsoft-com:vm1"
7 namespace w10 = "urn:schemas-microsoft-com:office:word"

```



```

8 namespace x = "urn:schemas-microsoft-com:office:excel"
9
10 ds_CT_DatastoreSchemaRef = attribute ds:uri { xsd:string }
11 ds_CT_DatastoreSchemaRefs =
12   element schemaRef { ds_CT_DatastoreSchemaRef }*
13 ds_CT_DatastoreItem =
14   attribute ds:itemID { s_ST_Guid },
15   element schemaRefs { ds_CT_DatastoreSchemaRefs }?
16 ds_datastoreItem = element datastoreItem { ds_CT_DatastoreItem }

```

B.6.5.1 Part Schemas

B.6.5.1.1 Custom XML Data Properties Part

This schema is available in the file Shared_Custom_XML_Data_Storage_Properties.rnc.

```

1 include "shared-customXmlDataProperties.rnc"
2 include "shared-commonSimpleTypes.rnc"
3 start = ds_datastoreItem

```

B.6.6 Bibliography

This schema is available in the file shared-bibliography.rnc.

```

1 default namespace =
2   "http://purl.oclc.org/ooxml/officeDocument/bibliography"
3 namespace o = "urn:schemas-microsoft-com:office:office"
4 namespace s =
5   "http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
6 namespace shrdBib =
7   "http://purl.oclc.org/ooxml/officeDocument/bibliography"
8 namespace v = "urn:schemas-microsoft-com:xml"
9 namespace w10 = "urn:schemas-microsoft-com:office:word"
10 namespace x = "urn:schemas-microsoft-com:office:excel"
11
12 shrdBib_ST_SourceType =
13   "ArticleInAPeriodical"
14   | "Book"
15   | "BookSection"
16   | "JournalArticle"
17   | "ConferenceProceedings"
18   | "Report"
19   | "SoundRecording"
20   | "Performance"
21   | "Art"
22   | "DocumentFromInternetSite"
23   | "InternetSite"
24   | "Film"
25   | "Interview"
26   | "Patent"
27   | "ElectronicSource"
28   | "Case"
29   | "Misc"
30 shrdBib_CT_NameListType = element Person { shrdBib_CT_PersonType }+

```

```

31 shrdBib_CT_PersonType =
32   element Last { s_ST_String }*,
33   element First { s_ST_String }*,
34   element Middle { s_ST_String }*
35 shrdBib_CT_NameType = element NameList { shrdBib_CT_NameListType }
36 shrdBib_CT_NameOrCorporateType =
37   (element NameList { shrdBib_CT_NameListType }
38    | element Corporate { s_ST_String })?
39 shrdBib_CT_AuthorType =
40   (element Artist { shrdBib_CT_NameType }
41    | element Author { shrdBib_CT_NameOrCorporateType }
42    | element BookAuthor { shrdBib_CT_NameType }
43    | element Compiler { shrdBib_CT_NameType }
44    | element Composer { shrdBib_CT_NameType }
45    | element Conductor { shrdBib_CT_NameType }
46    | element Counsel { shrdBib_CT_NameType }
47    | element Director { shrdBib_CT_NameType }
48    | element Editor { shrdBib_CT_NameType }
49    | element Interviewee { shrdBib_CT_NameType }
50    | element Interviewer { shrdBib_CT_NameType }
51    | element Inventor { shrdBib_CT_NameType }
52    | element Performer { shrdBib_CT_NameOrCorporateType }
53    | element ProducerName { shrdBib_CT_NameType }
54    | element Translator { shrdBib_CT_NameType }
55    | element Writer { shrdBib_CT_NameType })*
56 shrdBib_CT_SourceType =
57   (element AbbreviatedCaseNumber { s_ST_String }
58    | element AlbumTitle { s_ST_String }
59    | element Author { shrdBib_CT_AuthorType }
60    | element BookTitle { s_ST_String }
61    | element Broadcaster { s_ST_String }
62    | element BroadcastTitle { s_ST_String }
63    | element CaseNumber { s_ST_String }
64    | element ChapterNumber { s_ST_String }
65    | element City { s_ST_String }
66    | element Comments { s_ST_String }
67    | element ConferenceName { s_ST_String }
68    | element CountryRegion { s_ST_String }
69    | element Court { s_ST_String }
70    | element Day { s_ST_String }
71    | element DayAccessed { s_ST_String }
72    | element Department { s_ST_String }
73    | element Distributor { s_ST_String }
74    | element Edition { s_ST_String }
75    | element Guid { s_ST_String }
76    | element Institution { s_ST_String }
77    | element InternetSiteTitle { s_ST_String }
78    | element Issue { s_ST_String }
79    | element JournalName { s_ST_String }
80    | element LCID { s_ST_Lang }
81    | element Medium { s_ST_String }
82    | element Month { s_ST_String }
83    | element MonthAccessed { s_ST_String }

```

```

84 | element NumberVolumes { s_ST_String }
85 | element Pages { s_ST_String }
86 | element PatentNumber { s_ST_String }
87 | element PeriodicalTitle { s_ST_String }
88 | element ProductionCompany { s_ST_String }
89 | element PublicationTitle { s_ST_String }
90 | element Publisher { s_ST_String }
91 | element RecordingNumber { s_ST_String }
92 | element RefOrder { s_ST_String }
93 | element Reporter { s_ST_String }
94 | element SourceType { shrdBib_ST_SourceType }
95 | element ShortTitle { s_ST_String }
96 | element StandardNumber { s_ST_String }
97 | element StateProvince { s_ST_String }
98 | element Station { s_ST_String }
99 | element Tag { s_ST_String }
100 | element Theater { s_ST_String }
101 | element ThesisType { s_ST_String }
102 | element Title { s_ST_String }
103 | element Type { s_ST_String }
104 | element URL { s_ST_String }
105 | element Version { s_ST_String }
106 | element Volume { s_ST_String }
107 | element Year { s_ST_String }
108 | element YearAccessed { s_ST_String })*
109 shrdBib_Sources = element Sources { shrdBib_CT_Sources }
110 shrdBib_CT_Sources =
111   attribute SelectedStyle { s_ST_String }?,
112   attribute StyleName { s_ST_String }?,
113   attribute URI { s_ST_String }?,
114   element Source { shrdBib_CT_SourceType }*
```

B.6.6.1 Part Schemas

B.6.6.1.1 Bibliography Part

This schema is available in the file Shared_Bibliography.rnc.

```

1 include "shared-bibliography.rnc"
2 include "shared-commonSimpleTypes.rnc"
3 start = shrdBib_Sources
```

B.6.7 Additional Characteristics

This schema is available in the file shared-additionalCharacteristics.rnc.

```

1 default namespace =
2   "http://purl.oclc.org/ooxml/officeDocument/characteristics"
3 namespace o = "urn:schemas-microsoft-com:office:office"
4 namespace shrdChr =
5   "http://purl.oclc.org/ooxml/officeDocument/characteristics"
6 namespace v = "urn:schemas-microsoft-com:vml"
7 namespace w10 = "urn:schemas-microsoft-com:office:word"
8 namespace x = "urn:schemas-microsoft-com:office:excel"
```

```

9
10 shrdChr_CT_AdditionalCharacteristics =
11   element characteristic { shrdChr_CT_Characteristic }*
12 shrdChr_CT_Characteristic =
13   attribute name { xsd:string },
14   attribute relation { shrdChr_ST_Relation },
15   attribute val { xsd:string },
16   attribute vocabulary { xsd:anyURI }?
17 shrdChr_ST_Relation =
18   string "ge" | string "le" | string "gt" | string "lt" | string "eq"
19 shrdChr_additionalCharacteristics =
20   element additionalCharacteristics {
21     shrdChr_CT_AdditionalCharacteristics
22   }

```

B.6.7.1 Part Schemas

B.6.7.1.1 Additional Characteristics Part

This schema is available in the file Shared_Additional_Characteristics.rnc.

```

1 include "shared-additionalCharacteristics.rnc"
2 start = shrdChr_additionalCharacteristics

```

B.6.8 Office Document Relationships

This schema is available in the file shared-relationshipReference.rnc.

```

1 namespace o = "urn:schemas-microsoft-com:office:office"
2 namespace r =
3   "http://purl.oclc.org/ooxml/officeDocument/relationships"
4 namespace v = "urn:schemas-microsoft-com:vm1"
5 namespace w10 = "urn:schemas-microsoft-com:office:word"
6 namespace x = "urn:schemas-microsoft-com:office:excel"
7
8 r_ST_RelationshipId = xsd:string
9 r_id = attribute r:id { r_ST_RelationshipId }
10 r_embed = attribute r:embed { r_ST_RelationshipId }
11 r_link = attribute r:link { r_ST_RelationshipId }
12 r_dm = attribute r:dm { r_ST_RelationshipId }
13 r_lo = attribute r:lo { r_ST_RelationshipId }
14 r_qs = attribute r:qs { r_ST_RelationshipId }
15 r_cs = attribute r:cs { r_ST_RelationshipId }
16 r_blip = attribute r:blip { r_ST_RelationshipId }
17 r_pict = attribute r:pict { r_ST_RelationshipId }
18 r_href = attribute r:href { r_ST_RelationshipId }
19 r_topLeft = attribute r:topLeft { r_ST_RelationshipId }
20 r_topRight = attribute r:topRight { r_ST_RelationshipId }
21 r_bottomLeft = attribute r:bottomLeft { r_ST_RelationshipId }
22 r_bottomRight = attribute r:bottomRight { r_ST_RelationshipId }

```

B.6.9 Shared Simple Types

This schema is available in the file shared-commonSimpleTypes.rnc.

```

1 namespace o = "urn:schemas-microsoft-com:office:office"
2 namespace s =
3     "http://purl.oclc.org/ooxml/officeDocument/sharedTypes"
4 namespace v = "urn:schemas-microsoft-com:vml"
5 namespace w10 = "urn:schemas-microsoft-com:office:word"
6 namespace x = "urn:schemas-microsoft-com:office:excel"
7
8 s_ST_Lang = xsd:string
9 s_ST_HexColorRGB = xsd:hexBinary { length = "3" }
10 s_ST_Panose = xsd:hexBinary { length = "10" }
11 s_ST_CalendarType =
12     string "gregorian"
13     | string "gregorianUs"
14     | string "gregorianMeFrench"
15     | string "gregorianArabic"
16     | string "hijri"
17     | string "hebrew"
18     | string "taiwan"
19     | string "japan"
20     | string "thai"
21     | string "korea"
22     | string "saka"
23     | string "gregorianXlitEnglish"
24     | string "gregorianXlitFrench"
25     | string "none"
26 s_ST_Guid =
27     xsd:token {
28         pattern =
29             "\\{[0-9A-F]{8}-[0-9A-F]{4}-[0-9A-F]{4}-[0-9A-F]{4}-[0-9A-F]{12}\\}"
30     }
31 s_ST_OnOff = xsd:boolean
32 s_ST_String = xsd:string
33 s_ST_XmlName = xsd:NCName { minLength = "1" maxLength = "255" }
34 s_ST_UnsignedDecimalNumber = xsd:unsignedLong
35 s_ST_TwipsMeasure =
36     s_ST_UnsignedDecimalNumber | s_ST_PositiveUniversalMeasure
37 s_ST_VerticalAlignRun =
38     string "baseline" | string "superscript" | string "subscript"
39 s_ST_Xstring = xsd:string
40 s_ST_XAlign =
41     string "left"
42     | string "center"
43     | string "right"
44     | string "inside"
45     | string "outside"
46 s_ST_YAlign =
47     string "inline"
48     | string "top"
49     | string "center"
50     | string "bottom"
51     | string "inside"
52     | string "outside"
53 s_ST_ConformanceClass = string "strict" | string "transitional"

```

```

54 s_ST_UniversalMeasure =
55   xsd:string { pattern = "-?[0-9]+(\.[0-9]+)?(mm|cm|in|pt|pc|pi)" }
56 s_ST_PositiveUniversalMeasure =
57   xsd:string {
58     pattern = "-?[0-9]+(\.[0-9]+)?(mm|cm|in|pt|pc|pi)"
59     pattern = "[0-9]+(\.[0-9]+)?(mm|cm|in|pt|pc|pi)"
60   }
61 s_ST_Percentage = xsd:string { pattern = "-?[0-9]+(\.[0-9]+)?%" }
62 s_ST_FixedPercentage =
63   xsd:string {
64     pattern = "-?[0-9]+(\.[0-9]+)?%"
65     pattern = "-?((100)|([0-9][0-9]?))(\.[0-9][0-9]?)?%"
66   }
67 s_ST_PositivePercentage =
68   xsd:string {
69     pattern = "-?[0-9]+(\.[0-9]+)?%"
70     pattern = "[0-9]+(\.[0-9]+)?%"
71   }
72 s_ST_PositiveFixedPercentage =
73   xsd:string {
74     pattern = "-?[0-9]+(\.[0-9]+)?%"
75     pattern = "((100)|([0-9][0-9]?))(\.[0-9][0-9]?)?%"
76   }

```

B.7 Custom XML Schema References

This schema is available in the file shared-customXmlSchemaProperties.rnc.

```

1 namespace o = "urn:schemas-microsoft-com:office:office"
2 default namespace sl =
3   "http://purl.oclc.org/ooxml/schemaLibrary/main"
4 namespace v = "urn:schemas-microsoft-com:vm1"
5 namespace w10 = "urn:schemas-microsoft-com:office:word"
6 namespace x = "urn:schemas-microsoft-com:office:excel"
7
8 sl_CT_Schema =
9   attribute sl:uri { xsd:string }?,
10  attribute sl:manifestLocation { xsd:string }?,
11  attribute sl:schemaLocation { xsd:string }?,
12  attribute sl:schemaLanguage { xsd:token }?
13 sl_CT_SchemaLibrary = element schema { sl_CT_Schema }*
14 sl_schemaLibrary = element schemaLibrary { sl_CT_SchemaLibrary }

```

B.8 Additional Resources

B.8.1 Any

This schema is available in the file any.rnc.

```

1 anyElement = element * { anyAttribute*, text?, anyElement* }
2 anyAttribute = attribute * { text }

```

B.8.2 XML

This schema is available in the file xml.rnc.

```
1 xml_lang = attribute xml:lang { xsd:language | xsd:string "" }
2 xml_space = attribute xml:space { "default" | "preserve" }
3 xml_base = attribute xml:base { xsd:anyURI }
4 xml_id = attribute xml:id { xsd:ID }
5 xml_specialAttrs = xml_base?, xml_lang?, xml_space?, xml_id?
```

End of informative text.

Annex C.

(informative)

Additional Syntax Constraints

This clause is informative.

Although the set of normative XML Schemas included in the accompanying file named OfficeOpenXML-XMLSchema.zip (discussed in Annex A) specifies a majority of the requirements needed to ensure document conformance, there also exists a set of constraints that cannot easily be expressed in the XML Schema syntax (otherwise referred to as *additional syntax constraints*). These additional constraints are specified in the normative content of this Part of ECMA-376, and are included in the requirements for document conformance.

The following is a sample of such constraints specified in this Part of ECMA-376:

Subclause	Constraint
WordprocessingML Paragraphs	The caps element shall not be present with the smallCaps element on the same run, since they are mutually exclusive in terms of appearance.
WordprocessingML Headers and Footers	If the relationship type of the relationship specified by this element shall be present, have a TargetMode attribute value of Internal, and a Type attribute value of http://purl.oclc.org/ooxml/officeDocument/relationships/header .
WordprocessingML Annotations	Each "cross-structure" annotation shall have a start element whose id attribute value matches the id attribute value of the corresponding end element.
SpreadsheetML Formulas	The syntax of the value of a formula shall conform to the structure of a formula as defined in the Formulas subclause.
SpreadsheetML Styles	The xfId attribute on the cellStyles element shall specify an xf record which is present in the cellStyleXfs collection.
PresentationML Slides	Each sldId attribute in a sldLst shall have a unique value for its id attribute (within the scope of the collection).
PresentationML Slides	A customShow element specifies a range of slides (a start and end slide) in PresentationML to define the set of slides that define a slide show. There shall be slides in the presentation that have slide IDs referenced in these attributes and the start slide shall be before the end slide.
DrawingML Main	The id attribute on the stCxn and endCxn elements specifies the start and end shapes to be connected. Shapes with matching id attribute values shall exist elsewhere in the spTree.

End of informative text.

Annex D. (informative)

Namespace Prefix Mapping in Examples

This Annex is informative.

Throughout ECMA-376, XML syntax is provided to illustrate the concepts being documented. These examples leverage XML namespace prefixes, and, typically, for brevity, do not show the actual namespace mappings. This Annex lists the namespace prefix mappings that are used within these examples.

Prefix	Namespace
a	http://purl.oclc.org/ooxml/drawingml/main
b	http://purl.oclc.org/ooxml/officeDocument/bibliography
cp	http://purl.oclc.org/ooxml/drawingml/chartDrawing
cdr	http://schemas.openxmlformats.org/drawingml/2006/chartDrawing
dc	http://purl.org/dc/elements/1.1/
dcmitype	http://purl.org/dc/dcmitype/
dcterms	http://purl.org/dc/terms/
ds	http://purl.oclc.org/ooxml/officeDocument/customXml
m	http://purl.oclc.org/ooxml/officeDocument/math
o	urn:schemas-microsoft-com:office:office
p	http://purl.oclc.org/ooxml/presentationml/main
pic	http://purl.oclc.org/ooxml/drawingml/picture
pvm1	urn:schemas-microsoft-com:office:powerpoint
r	http://purl.oclc.org/ooxml/officeDocument/relationships
sl	http://purl.oclc.org/ooxml/schemaLibrary/main
v	urn:schemas-microsoft-com:vm1
ve	http://schemas.openxmlformats.org/markup-compatibility/2006
vt	http://purl.oclc.org/ooxml/officeDocument/docPropsVTypes
w	http://purl.oclc.org/ooxml/wordprocessingml/main

Prefix	Namespace
w10	urn:schemas-microsoft-com:office:word
wp	http://purl.oclc.org/ooxml/drawingml/wordprocessingDrawing
x	urn:schemas-microsoft-com:office:excel
xdr	http://purl.oclc.org/ooxml/drawingml/spreadsheetDrawing
xsd	http://www.w3.org/2001/XMLSchema
xsi	http://www.w3.org/2001/XMLSchema-instance

If no namespace prefix is specified, it should be assumed that that element or attribute is contained within the namespace defined by the parent subclause. For example, unprefixed elements in §18 are contained in the <http://purl.oclc.org/ooxml/spreadsheetml/main> namespace.

End informative Annex.

Annex E. (informative) WordprocessingML Custom XML Data Extraction

This Annex is informative.

The custom XML markup capabilities described in §17.5 allow a WordprocessingML document to contain custom XML semantics beyond those specified by ECMA-376. In order to extract those semantics from within WordprocessingML content, an application may employ any desired method.

As an example, an XSL transformation which performs this task is included below, which, when applied to the Main Document part, would extract any custom XML markup.

```
<?xml version="1.0" encoding="UTF-8" ?>
<xsl:stylesheet version="1.0"
xmlns:xsl="http://www.w3.org/1999/XSL/Transform"
xmlns:w="http://purl.oclc.org/ooxml/wordprocessingml/main">

  <!-- This parameter should have the same value as
  ignoreMixedContent settings (see 17.15.1.54 in Part 1) -->
  <xsl:param name="ignoreMixedContent" select="false()"/>

  <!-- Some document structure checks -->
  <xsl:template match="/">
    <xsl:if test="count(//w:customXml/ancestor-or-
self::w:customXml[last()]) > 1">
      <xsl:message>Produced XML document will not be WF and will have more
then one root element.</xsl:message>
    </xsl:if>
    <!-- Process content of document -->
    <xsl:apply-templates/>
  </xsl:template>

  <!-- copy over custom XML elements -->
  <xsl:template match="w:customXml">
    <xsl:element name="{@w:element}" namespace="{@w:uri}">
      <!-- copy over attribute values -->
```

```

    <xsl:for-each select="w:customXmlPr/w:attr">
      <xsl:attribute name="{@w:name}" namespace="{@w:uri}">
        <xsl:value-of select="@w:val"/>
      </xsl:attribute>
    </xsl:for-each>
    <!-- process content -->
    <xsl:apply-templates/>
  </xsl:element>
</xsl:template>

<!-- copy over only text inside custom XML -->
<xsl:template match="text()[ancestor::w:customXml[not(../w:customXml)]]"
priority="10">
  <xsl:value-of select="."/>
</xsl:template>

<!-- warn about mixed content -->
<xsl:template match="text()[ancestor::w:customXml]" priority="5">
  <xsl:choose>
    <xsl:when test="$ignoreMixedContent">
      <xsl:message>Stripping "<xsl:value-of select="."/>" from
output.</xsl:message>
      <xsl:message>This text is part of mixed content and would cause
non-valid result.</xsl:message>
    </xsl:when>
    <xsl:otherwise>
      <xsl:value-of select="."/>
    </xsl:otherwise>
  </xsl:choose>
</xsl:template>

<!-- warn about text which is not tagged -->
<xsl:template match="text()">
  <xsl:message>Stripping "<xsl:value-of select="."/>" from
output.</xsl:message>
  <xsl:message>This text is not enclosed by root element and would cause
non-WF result.</xsl:message>
</xsl:template>

<!-- do not pick up deleted content -->
<xsl:template match="w:del|w:moveFrom"/>

</xsl:stylesheet>

```

Once this custom markup is extracted, the resulting XML document can be validated separately from the WordprocessingML document.

For example, the custom XML for the example on p. 530, once extracted, would be:

```
<invoice xmlns="http://www.example.com/2006/invoice">  
  <customerName>Tristan Davis</customerName>  
</invoice>
```

An application can employ any desired method to find the appropriate schema(s) for validation. As an example, one such approach using information defined by this Standard might be:

- Locate the schema element (§23.2.1) in the Document Settings part whose uri attribute matches the namespace of the root element in the XML document extracted from custom XML markup
- If that element also specifies a schemaLocation attribute, the resulting path is used to locate the schema used for validation.
- Once this schema is located, validation should be triggered based on the value of doNotValidateAgainstSchema (§17.15.1.43).

End informative Annex.

Annex F.

(normative)

WordprocessingML Page Borders

This Office Open XML specification includes the definitions of all predefined WordprocessingML art borders, as referenced by the following simple types:

- ST_Border (§17.18.2)

The normative source files defining these borders resides in an accompanying file named OfficeOpenXML-WordprocessingMLArtBorders.zip, which is distributed in electronic form only.

Annex G. (normative) Predefined SpreadsheetML Style Definitions

This Office Open XML specification includes the definitions of all predefined SpreadsheetML styles that are referenced by the following elements:

- cellStyle (§18.8.7)
- tableStyle (§18.8.40)

The normative SpreadsheetML markup defining these styles resides in an accompanying file named OfficeOpenXML-SpreadsheetMLStyles.zip, which is distributed in electronic form only.

G.1 Built-in Table Styles

Following is a table of the built-in table style names and informative example of formatting. These style names shall be supported by applications implementing table styles.

Table Style	[Example: (informative)]			
TableStyleMedium28	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleMedium27	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22

Table Style	[Example: (informative)]			
TableStyleMedium26	Column1 ▼	Column2 ▼	Column3 ▼	Column4 ▼
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleMedium25	Column1 ▼	Column2 ▼	Column3 ▼	Column4 ▼
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleMedium24	Column1 ▼	Column2 ▼	Column3 ▼	Column4 ▼
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleMedium23	Column1 ▼	Column2 ▼	Column3 ▼	Column4 ▼
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22

Table Style	[Example: (informative)]			
TableStyleMedium22	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleMedium21	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleMedium20	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleMedium19	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22

Table Style	[Example: (informative)]			
TableStyleMedium18	<div>Column1 ▼Column2 ▼Column3 ▼Column4 ▼</div>			
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleMedium17	<div>Column1 ▼Column2 ▼Column3 ▼Column4 ▼</div>			
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleMedium16	<div>Column1 ▼Column2 ▼Column3 ▼Column4 ▼</div>			
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleMedium15	<div>Column1 ▼Column2 ▼Column3 ▼Column4 ▼</div>			
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22

Table Style	[Example: (informative)]			
TableStyleMedium14	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleMedium13	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleMedium12	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleMedium11	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22

Table Style	[Example: (informative)]			
TableStyleMedium10	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleMedium9	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleMedium8	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleMedium7	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22

Table Style	[Example: (informative)]			
TableStyleMedium6	<div>Column1 ▼Column2 ▼Column3 ▼Column4 ▼</div>			
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleMedium5	<div>Column1 ▼Column2 ▼Column3 ▼Column4 ▼</div>			
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleMedium4	<div>Column1 ▼Column2 ▼Column3 ▼Column4 ▼</div>			
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleMedium3	<div>Column1 ▼Column2 ▼Column3 ▼Column4 ▼</div>			
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22

Table Style	[Example: (informative)]			
TableStyleMedium2				
	Column1 ▼	Column2 ▼	Column3 ▼	Column4 ▼
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleMedium1				
	Column1 ▼	Column2 ▼	Column3 ▼	Column4 ▼
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleLight21				
	Column1 ▼	Column2 ▼	Column3 ▼	Column4 ▼
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleLight20				
	Column1 ▼	Column2 ▼	Column3 ▼	Column4 ▼
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22

Table Style	[Example: (informative)]			
TableStyleLight19	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleLight18	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleLight17	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleLight16	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22

Table Style	[Example: (informative)]			
TableStyleLight15	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleLight14	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleLight13	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleLight12	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22

Table Style	[Example: (informative)]			
TableStyleLight11	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleLight10	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleLight9	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleLight8	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleLight7	Column1 ▾	Column2 ▾	Column3 ▾	Column4 ▾
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22

Table Style	[Example: (informative)]			
TableStyleLight6	Column1▼	Column2▼	Column3▼	Column4▼
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleLight5	Column1▼	Column2▼	Column3▼	Column4▼
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleLight4	Column1▼	Column2▼	Column3▼	Column4▼
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleLight3	Column1▼	Column2▼	Column3▼	Column4▼
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleLight2	Column1▼	Column2▼	Column3▼	Column4▼
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22

Table Style	[Example: (informative)]			
TableStyleLight1	Column1 ▼	Column2 ▼	Column3 ▼	Column4 ▼
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleDark11	Column1 ▼	Column2 ▼	Column3 ▼	Column4 ▼
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleDark10	Column1 ▼	Column2 ▼	Column3 ▼	Column4 ▼
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleDark9	Column1 ▼	Column2 ▼	Column3 ▼	Column4 ▼
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22

Table Style	[Example: (informative)]			
ableStyleDark8	<div>Column1 ▼ Column2 ▼ Column3 ▼ Column4 ▼</div> <div>873.91 170 868.21 966.44</div> <div>98.19 184.94 151.71 735.36</div> <div>7.97 977.26 761.31 64.63</div> <div>711.95 485.05 560.74 323.35</div> <div>180.08 497.08 48 754.5</div> <div>506.47 801.79 465.29 624.22</div>			
TableStyleDark7	<div>Column1 ▼ Column2 ▼ Column3 ▼ Column4 ▼</div> <div>873.91 170 868.21 966.44</div> <div>98.19 184.94 151.71 735.36</div> <div>7.97 977.26 761.31 64.63</div> <div>711.95 485.05 560.74 323.35</div> <div>180.08 497.08 48 754.5</div> <div>506.47 801.79 465.29 624.22</div>			
TableStyleDark6	<div>Column1 ▼ Column2 ▼ Column3 ▼ Column4 ▼</div> <div>873.91 170 868.21 966.44</div> <div>98.19 184.94 151.71 735.36</div> <div>7.97 977.26 761.31 64.63</div> <div>711.95 485.05 560.74 323.35</div> <div>180.08 497.08 48 754.5</div> <div>506.47 801.79 465.29 624.22</div>			
TableStyleDark5	<div>Column1 ▼ Column2 ▼ Column3 ▼ Column4 ▼</div> <div>873.91 170 868.21 966.44</div> <div>98.19 184.94 151.71 735.36</div> <div>7.97 977.26 761.31 64.63</div> <div>711.95 485.05 560.74 323.35</div> <div>180.08 497.08 48 754.5</div> <div>506.47 801.79 465.29 624.22</div>			

Table Style	[Example: (informative)]			
TableStyleDark4	<div>Column1 ▼Column2 ▼Column3 ▼Column4 ▼</div>			
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleDark3	<div>Column1 ▼Column2 ▼Column3 ▼Column4 ▼</div>			
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleDark2	<div>Column1 ▼Column2 ▼Column3 ▼Column4 ▼</div>			
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22
TableStyleDark1	<div>Column1 ▼Column2 ▼Column3 ▼Column4 ▼</div>			
	873.91	170	868.21	966.44
	98.19	184.94	151.71	735.36
	7.97	977.26	761.31	64.63
	711.95	485.05	560.74	323.35
	180.08	497.08	48	754.5
	506.47	801.79	465.29	624.22

PivotTable Style	[Example: (informative)]		
PivotStyleMedium28	<div> <div>Country {All} ▾</div> <div>State {All} ▾</div> <div>City {All} ▾</div> </div> <div> <div>Sum of Sales Amount</div> <div>Column Labels ▾</div> <div>Row Labels ▾ 2001</div> <div>Grand Total</div> </div> <div> <div>[-] Bikes</div> <div>606184.7066 606184.7066</div> <div>[-] Mountain Bikes</div> <div>135499.6 135499.6</div> <div>July 64424.81 64424.81</div> <div>August 60899.82 60899.82</div> <div>September 10174.97 10174.97</div> <div>[-] Road Bikes</div> <div>470685.1066 470685.1066</div> <div>July 145228.0946 145228.0946</div> <div>August 161638.4692 161638.4692</div> <div>September 163818.5428 163818.5428</div> <div>Grand Total 606184.7066 606184.7066</div> </div>		
PivotStyleMedium27	<div> <div>Country {All} ▾</div> <div>State {All} ▾</div> <div>City {All} ▾</div> </div> <div> <div>Sum of Sales Amount</div> <div>Column Labels ▾</div> <div>Row Labels ▾ 2001</div> <div>Grand Total</div> </div> <div> <div>[-] Bikes</div> <div>606184.7066 606184.7066</div> <div>[-] Mountain Bikes</div> <div>135499.6 135499.6</div> <div>July 64424.81 64424.81</div> <div>August 60899.82 60899.82</div> <div>September 10174.97 10174.97</div> <div>[-] Road Bikes</div> <div>470685.1066 470685.1066</div> <div>July 145228.0946 145228.0946</div> <div>August 161638.4692 161638.4692</div> <div>September 163818.5428 163818.5428</div> <div>Grand Total 606184.7066 606184.7066</div> </div>		

PivotTable Style	[Example: (informative)]		
PivotStyleMedium26	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066
PivotStyleMedium25	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066

PivotTable Style	[Example: (informative)]		
PivotStyleMedium24	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	[-] Bikes	606184.7066	606184.7066
	[-] Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	[-] Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
Grand Total	606184.7066	606184.7066	
PivotStyleMedium23	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	[-] Bikes	606184.7066	606184.7066
	[-] Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	[-] Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
Grand Total	606184.7066	606184.7066	

PivotTable Style	[Example: (informative)]		
PivotStyleMedium22	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	[-] Bikes	606184.7066	606184.7066
	[-] Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	[-] Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
PivotStyleMedium21	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066
	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	[-] Bikes	606184.7066	606184.7066
	[-] Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	[-] Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066

PivotTable Style	[Example: (informative)]		
PivotStyleMedium20	<div>Country (All) ▾</div> <div>State (All) ▾</div> <div>City (All) ▾</div>		
	<div>Sum of Sales Amount Column Labels ▾</div> <div>Row Labels ▾ 2001 Grand Total</div> <div> <div>[-] Bikes 606184.7066 606184.7066</div> <div> <div>[-] Mountain Bikes 135499.6 135499.6</div> <div>July 64424.81 64424.81</div> <div>August 60899.82 60899.82</div> <div>September 10174.97 10174.97</div> </div> <div> <div>[-] Road Bikes 470685.1066 470685.1066</div> <div>July 145228.0946 145228.0946</div> <div>August 161638.4692 161638.4692</div> <div>September 163818.5428 163818.5428</div> </div> <div>Grand Total 606184.7066 606184.7066</div> </div>		
PivotStyleMedium19	<div>Country (All) ▾</div> <div>State (All) ▾</div> <div>City (All) ▾</div>		
	<div>Sum of Sales Amount Column Labels ▾</div> <div>Row Labels ▾ 2001 Grand Total</div> <div> <div>[-] Bikes 606184.7066 606184.7066</div> <div> <div>[-] Mountain Bikes 135499.6 135499.6</div> <div>July 64424.81 64424.81</div> <div>August 60899.82 60899.82</div> <div>September 10174.97 10174.97</div> </div> <div> <div>[-] Road Bikes 470685.1066 470685.1066</div> <div>July 145228.0946 145228.0946</div> <div>August 161638.4692 161638.4692</div> <div>September 163818.5428 163818.5428</div> </div> <div>Grand Total 606184.7066 606184.7066</div> </div>		

PivotTable Style	[Example: (informative)]		
PivotStyleMedium18	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066
PivotStyleMedium17	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066

PivotTable Style	[Example: (informative)]		
PivotStyleMedium16	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	[-] Bikes	606184.7066	606184.7066
	[-] Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	[-] Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066
PivotStyleMedium15	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	[-] Bikes	606184.7066	606184.7066
	[-] Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	[-] Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066

















PivotTable Style	[Example: (informative)]																																																
PivotStyleMedium14	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td colspan="2">Sum of Sales Amount</td><td>Column Labels</td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>	Country	{All}		State	{All}		City	{All}					Sum of Sales Amount		Column Labels	Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
Country	{All}																																																
State	{All}																																																
City	{All}																																																
Sum of Sales Amount		Column Labels																																															
Row Labels	2001	Grand Total																																															
Bikes	606184.7066	606184.7066																																															
Mountain Bikes	135499.6	135499.6																																															
July	64424.81	64424.81																																															
August	60899.82	60899.82																																															
September	10174.97	10174.97																																															
Road Bikes	470685.1066	470685.1066																																															
July	145228.0946	145228.0946																																															
August	161638.4692	161638.4692																																															
September	163818.5428	163818.5428																																															
Grand Total	606184.7066	606184.7066																																															
PivotStyleMedium13	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td colspan="2">Sum of Sales Amount</td><td>Column Labels</td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>	Country	{All}		State	{All}		City	{All}					Sum of Sales Amount		Column Labels	Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
Country	{All}																																																
State	{All}																																																
City	{All}																																																
Sum of Sales Amount		Column Labels																																															
Row Labels	2001	Grand Total																																															
Bikes	606184.7066	606184.7066																																															
Mountain Bikes	135499.6	135499.6																																															
July	64424.81	64424.81																																															
August	60899.82	60899.82																																															
September	10174.97	10174.97																																															
Road Bikes	470685.1066	470685.1066																																															
July	145228.0946	145228.0946																																															
August	161638.4692	161638.4692																																															
September	163818.5428	163818.5428																																															
Grand Total	606184.7066	606184.7066																																															

PivotTable Style	[Example: (informative)]																																																
PivotStyleMedium12	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td colspan="3">Sum of Sales Amount Column Labels</td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>	Country	{All}		State	{All}		City	{All}					Sum of Sales Amount Column Labels			Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
Country	{All}																																																
State	{All}																																																
City	{All}																																																
Sum of Sales Amount Column Labels																																																	
Row Labels	2001	Grand Total																																															
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Mountain Bikes	135499.6	135499.6																																															
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Road Bikes	470685.1066	470685.1066																																															
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August	161638.4692	161638.4692																																															
September	163818.5428	163818.5428																																															
Grand Total	606184.7066	606184.7066																																															
PivotStyleMedium11	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td colspan="3">Sum of Sales Amount Column Labels</td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>	Country	{All}		State	{All}		City	{All}					Sum of Sales Amount Column Labels			Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
Country	{All}																																																
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Row Labels	2001	Grand Total																																															
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Mountain Bikes	135499.6	135499.6																																															
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July	145228.0946	145228.0946																																															
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Grand Total	606184.7066	606184.7066																																															

PivotTable Style	[Example: (informative)]																																																
PivotStyleMedium10	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td colspan="3">Sum of Sales Amount Column Labels</td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>	Country	{All}		State	{All}		City	{All}					Sum of Sales Amount Column Labels			Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
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Mountain Bikes	135499.6	135499.6																																															
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August	60899.82	60899.82																																															
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September	163818.5428	163818.5428																																															
Grand Total	606184.7066	606184.7066																																															
PivotStyleMedium9	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td colspan="3">Sum of Sales Amount Column Labels</td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>	Country	{All}		State	{All}		City	{All}					Sum of Sales Amount Column Labels			Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
Country	{All}																																																
State	{All}																																																
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Sum of Sales Amount Column Labels																																																	
Row Labels	2001	Grand Total																																															
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Grand Total	606184.7066	606184.7066																																															

PivotTable Style	[Example: (informative)]																																																
PivotStyleMedium8	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td colspan="2">Sum of Sales Amount</td><td>Column Labels</td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>	Country	{All}		State	{All}		City	{All}					Sum of Sales Amount		Column Labels	Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
Country	{All}																																																
State	{All}																																																
City	{All}																																																
Sum of Sales Amount		Column Labels																																															
Row Labels	2001	Grand Total																																															
Bikes	606184.7066	606184.7066																																															
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September	163818.5428	163818.5428																																															
Grand Total	606184.7066	606184.7066																																															
PivotStyleMedium7	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td colspan="2">Sum of Sales Amount</td><td>Column Labels</td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>	Country	{All}		State	{All}		City	{All}					Sum of Sales Amount		Column Labels	Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
Country	{All}																																																
State	{All}																																																
City	{All}																																																
Sum of Sales Amount		Column Labels																																															
Row Labels	2001	Grand Total																																															
Bikes	606184.7066	606184.7066																																															
Mountain Bikes	135499.6	135499.6																																															
July	64424.81	64424.81																																															
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Road Bikes	470685.1066	470685.1066																																															
July	145228.0946	145228.0946																																															
August	161638.4692	161638.4692																																															
September	163818.5428	163818.5428																																															
Grand Total	606184.7066	606184.7066																																															

PivotTable Style	[Example: (informative)]		
PivotStyleMedium6	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount Column Labels		
	Row Labels	2001	Grand Total
	[-] Bikes	606184.7066	606184.7066
	[-] Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	[-] Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066
	PivotStyleMedium5	Country	{All}
State		{All}	
City		{All}	
Sum of Sales Amount Column Labels			
Row Labels		2001	Grand Total
[-] Bikes		606184.7066	606184.7066
[-] Mountain Bikes		135499.6	135499.6
July		64424.81	64424.81
August		60899.82	60899.82
September		10174.97	10174.97
[-] Road Bikes		470685.1066	470685.1066
July		145228.0946	145228.0946
August		161638.4692	161638.4692
September		163818.5428	163818.5428
Grand Total		606184.7066	606184.7066

PivotTable Style	[Example: (informative)]		
PivotStyleMedium4	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount Column Labels 		
	Row Labels 	2001	Grand Total
	 Bikes	606184.7066	606184.7066
	 Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	 Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total 606184.7066 606184.7066		
PivotStyleMedium3	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount Column Labels 		
	Row Labels 	2001	Grand Total
	 Bikes	606184.7066	606184.7066
	 Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	 Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total 606184.7066 606184.7066		

PivotTable Style	[Example: (informative)]		
PivotStyleMedium2	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount Column Labels		
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066
	PivotStyleMedium1	Country	{All}
State		{All}	
City		{All}	
Sum of Sales Amount Column Labels			
Row Labels		2001	Grand Total
Bikes		606184.7066	606184.7066
Mountain Bikes		135499.6	135499.6
July		64424.81	64424.81
August		60899.82	60899.82
September		10174.97	10174.97
Road Bikes		470685.1066	470685.1066
July		145228.0946	145228.0946
August		161638.4692	161638.4692
September		163818.5428	163818.5428
Grand Total		606184.7066	606184.7066

PivotTable Style	[Example: (informative)]		
PivotStyleLight28	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	[-] Bikes	606184.7066	606184.7066
	[-] Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	[-] Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066
PivotStyleLight27	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	[-] Bikes	606184.7066	606184.7066
	[-] Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	[-] Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066

PivotTable Style	[Example: (informative)]		
PivotStyleLight26	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	[-] Bikes	606184.7066	606184.7066
	[-] Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	[-] Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
PivotStyleLight25	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066
	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	[-] Bikes	606184.7066	606184.7066
	[-] Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	[-] Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066

PivotTable Style	[Example: (informative)]		
PivotStyleLight24	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	[-] Bikes	606184.7066	606184.7066
	[-] Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	[-] Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066
PivotStyleLight23	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	[-] Bikes	606184.7066	606184.7066
	[-] Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	[-] Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066

PivotTable Style	[Example: (informative)]		
PivotStyleLight22	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
Grand Total	606184.7066	606184.7066	
PivotStyleLight21	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
Grand Total	606184.7066	606184.7066	

PivotTable Style	[Example: (informative)]																																																
PivotStyleLight20	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td colspan="2">Sum of Sales Amount</td><td>Column Labels</td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>	Country	{All}		State	{All}		City	{All}					Sum of Sales Amount		Column Labels	Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
Country	{All}																																																
State	{All}																																																
City	{All}																																																
Sum of Sales Amount		Column Labels																																															
Row Labels	2001	Grand Total																																															
Bikes	606184.7066	606184.7066																																															
Mountain Bikes	135499.6	135499.6																																															
July	64424.81	64424.81																																															
August	60899.82	60899.82																																															
September	10174.97	10174.97																																															
Road Bikes	470685.1066	470685.1066																																															
July	145228.0946	145228.0946																																															
August	161638.4692	161638.4692																																															
September	163818.5428	163818.5428																																															
Grand Total	606184.7066	606184.7066																																															
PivotStyleLight19	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td colspan="2">Sum of Sales Amount</td><td>Column Labels</td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>	Country	{All}		State	{All}		City	{All}					Sum of Sales Amount		Column Labels	Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
Country	{All}																																																
State	{All}																																																
City	{All}																																																
Sum of Sales Amount		Column Labels																																															
Row Labels	2001	Grand Total																																															
Bikes	606184.7066	606184.7066																																															
Mountain Bikes	135499.6	135499.6																																															
July	64424.81	64424.81																																															
August	60899.82	60899.82																																															
September	10174.97	10174.97																																															
Road Bikes	470685.1066	470685.1066																																															
July	145228.0946	145228.0946																																															
August	161638.4692	161638.4692																																															
September	163818.5428	163818.5428																																															
Grand Total	606184.7066	606184.7066																																															

PivotTable Style	[Example: (informative)]																																																
PivotStyleLight18	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td colspan="2">Sum of Sales Amount</td><td>Column Labels</td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>	Country	{All}		State	{All}		City	{All}					Sum of Sales Amount		Column Labels	Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
Country	{All}																																																
State	{All}																																																
City	{All}																																																
Sum of Sales Amount		Column Labels																																															
Row Labels	2001	Grand Total																																															
Bikes	606184.7066	606184.7066																																															
Mountain Bikes	135499.6	135499.6																																															
July	64424.81	64424.81																																															
August	60899.82	60899.82																																															
September	10174.97	10174.97																																															
Road Bikes	470685.1066	470685.1066																																															
July	145228.0946	145228.0946																																															
August	161638.4692	161638.4692																																															
September	163818.5428	163818.5428																																															
Grand Total	606184.7066	606184.7066																																															
PivotStyleLight17	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td colspan="2">Sum of Sales Amount</td><td>Column Labels</td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>	Country	{All}		State	{All}		City	{All}					Sum of Sales Amount		Column Labels	Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
Country	{All}																																																
State	{All}																																																
City	{All}																																																
Sum of Sales Amount		Column Labels																																															
Row Labels	2001	Grand Total																																															
Bikes	606184.7066	606184.7066																																															
Mountain Bikes	135499.6	135499.6																																															
July	64424.81	64424.81																																															
August	60899.82	60899.82																																															
September	10174.97	10174.97																																															
Road Bikes	470685.1066	470685.1066																																															
July	145228.0946	145228.0946																																															
August	161638.4692	161638.4692																																															
September	163818.5428	163818.5428																																															
Grand Total	606184.7066	606184.7066																																															

PivotTable Style	[Example: (informative)]		
PivotStyleLight16	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount		Column Labels
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066
PivotStyleLight15	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount		Column Labels
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066

PivotTable Style	[Example: (informative)]		
PivotStyleLight14	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066
PivotStyleLight13	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066

PivotTable Style	[Example: (informative)]		
PivotStyleLight12	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066
PivotStyleLight11	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066

PivotTable Style	[Example: (informative)]																																																
PivotStyleLight10	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td>Sum of Sales Amount</td><td>Column Labels</td><td></td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>	Country	{All}		State	{All}		City	{All}					Sum of Sales Amount	Column Labels		Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
Country	{All}																																																
State	{All}																																																
City	{All}																																																
Sum of Sales Amount	Column Labels																																																
Row Labels	2001	Grand Total																																															
Bikes	606184.7066	606184.7066																																															
Mountain Bikes	135499.6	135499.6																																															
July	64424.81	64424.81																																															
August	60899.82	60899.82																																															
September	10174.97	10174.97																																															
Road Bikes	470685.1066	470685.1066																																															
July	145228.0946	145228.0946																																															
August	161638.4692	161638.4692																																															
September	163818.5428	163818.5428																																															
Grand Total	606184.7066	606184.7066																																															
PivotStyleLight9	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td>Sum of Sales Amount</td><td>Column Labels</td><td></td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>	Country	{All}		State	{All}		City	{All}					Sum of Sales Amount	Column Labels		Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
Country	{All}																																																
State	{All}																																																
City	{All}																																																
Sum of Sales Amount	Column Labels																																																
Row Labels	2001	Grand Total																																															
Bikes	606184.7066	606184.7066																																															
Mountain Bikes	135499.6	135499.6																																															
July	64424.81	64424.81																																															
August	60899.82	60899.82																																															
September	10174.97	10174.97																																															
Road Bikes	470685.1066	470685.1066																																															
July	145228.0946	145228.0946																																															
August	161638.4692	161638.4692																																															
September	163818.5428	163818.5428																																															
Grand Total	606184.7066	606184.7066																																															

PivotTable Style	[Example: (informative)]		
PivotStyleLight8	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount		
	Column Labels		
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
Grand Total			
606184.7066 606184.7066			
PivotStyleLight7	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount		
	Column Labels		
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
Grand Total			
606184.7066 606184.7066			

PivotTable Style	[Example: (informative)]		
PivotStyleLight6	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount Column Labels		
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066
PivotStyleLight5	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount Column Labels		
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066

PivotTable Style	[Example: (informative)]																																																
PivotStyleLight4	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td colspan="3">Sum of Sales Amount Column Labels</td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>	Country	{All}		State	{All}		City	{All}					Sum of Sales Amount Column Labels			Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
Country	{All}																																																
State	{All}																																																
City	{All}																																																
Sum of Sales Amount Column Labels																																																	
Row Labels	2001	Grand Total																																															
Bikes	606184.7066	606184.7066																																															
Mountain Bikes	135499.6	135499.6																																															
July	64424.81	64424.81																																															
August	60899.82	60899.82																																															
September	10174.97	10174.97																																															
Road Bikes	470685.1066	470685.1066																																															
July	145228.0946	145228.0946																																															
August	161638.4692	161638.4692																																															
September	163818.5428	163818.5428																																															
Grand Total	606184.7066	606184.7066																																															
PivotStyleLight3	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td colspan="3">Sum of Sales Amount Column Labels</td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>	Country	{All}		State	{All}		City	{All}					Sum of Sales Amount Column Labels			Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
Country	{All}																																																
State	{All}																																																
City	{All}																																																
Sum of Sales Amount Column Labels																																																	
Row Labels	2001	Grand Total																																															
Bikes	606184.7066	606184.7066																																															
Mountain Bikes	135499.6	135499.6																																															
July	64424.81	64424.81																																															
August	60899.82	60899.82																																															
September	10174.97	10174.97																																															
Road Bikes	470685.1066	470685.1066																																															
July	145228.0946	145228.0946																																															
August	161638.4692	161638.4692																																															
September	163818.5428	163818.5428																																															
Grand Total	606184.7066	606184.7066																																															

PivotTable Style	[Example: (informative)]																																																		
PivotStyleLight2	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td colspan="3">Sum of Sales Amount Column Labels</td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>			Country	{All}		State	{All}		City	{All}					Sum of Sales Amount Column Labels			Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
Country	{All}																																																		
State	{All}																																																		
City	{All}																																																		
Sum of Sales Amount Column Labels																																																			
Row Labels	2001	Grand Total																																																	
Bikes	606184.7066	606184.7066																																																	
Mountain Bikes	135499.6	135499.6																																																	
July	64424.81	64424.81																																																	
August	60899.82	60899.82																																																	
September	10174.97	10174.97																																																	
Road Bikes	470685.1066	470685.1066																																																	
July	145228.0946	145228.0946																																																	
August	161638.4692	161638.4692																																																	
September	163818.5428	163818.5428																																																	
Grand Total	606184.7066	606184.7066																																																	
PivotStyleLight1	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td colspan="3">Sum of Sales Amount Column Labels</td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>			Country	{All}		State	{All}		City	{All}					Sum of Sales Amount Column Labels			Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
Country	{All}																																																		
State	{All}																																																		
City	{All}																																																		
Sum of Sales Amount Column Labels																																																			
Row Labels	2001	Grand Total																																																	
Bikes	606184.7066	606184.7066																																																	
Mountain Bikes	135499.6	135499.6																																																	
July	64424.81	64424.81																																																	
August	60899.82	60899.82																																																	
September	10174.97	10174.97																																																	
Road Bikes	470685.1066	470685.1066																																																	
July	145228.0946	145228.0946																																																	
August	161638.4692	161638.4692																																																	
September	163818.5428	163818.5428																																																	
Grand Total	606184.7066	606184.7066																																																	

PivotTable Style	[Example: (informative)]		
PivotStyleDark28	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
PivotStyleDark27	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066
	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066

PivotTable Style	[Example: (informative)]		
PivotStyleDark26	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
August	161638.4692	161638.4692	
September	163818.5428	163818.5428	
Grand Total	606184.7066	606184.7066	
PivotStyleDark25	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
August	161638.4692	161638.4692	
September	163818.5428	163818.5428	
Grand Total	606184.7066	606184.7066	

PivotTable Style	[Example: (informative)]		
PivotStyleDark24	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066
PivotStyleDark23	Country	{All}	
	State	{All}	
	City	{All}	
	Sum of Sales Amount	Column Labels	
	Row Labels	2001	Grand Total
	Bikes	606184.7066	606184.7066
	Mountain Bikes	135499.6	135499.6
	July	64424.81	64424.81
	August	60899.82	60899.82
	September	10174.97	10174.97
	Road Bikes	470685.1066	470685.1066
	July	145228.0946	145228.0946
	August	161638.4692	161638.4692
	September	163818.5428	163818.5428
	Grand Total	606184.7066	606184.7066

PivotTable Style	[Example: (informative)]																																																		
PivotStyleDark22	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td>Sum of Sales Amount</td><td>Column Labels</td><td></td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>			Country	{All}		State	{All}		City	{All}					Sum of Sales Amount	Column Labels		Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
Country	{All}																																																		
State	{All}																																																		
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Sum of Sales Amount	Column Labels																																																		
Row Labels	2001	Grand Total																																																	
Bikes	606184.7066	606184.7066																																																	
Mountain Bikes	135499.6	135499.6																																																	
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August	60899.82	60899.82																																																	
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Road Bikes	470685.1066	470685.1066																																																	
July	145228.0946	145228.0946																																																	
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September	163818.5428	163818.5428																																																	
Grand Total	606184.7066	606184.7066																																																	
PivotStyleDark21	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td>Sum of Sales Amount</td><td>Column Labels</td><td></td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>			Country	{All}		State	{All}		City	{All}					Sum of Sales Amount	Column Labels		Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
Country	{All}																																																		
State	{All}																																																		
City	{All}																																																		
Sum of Sales Amount	Column Labels																																																		
Row Labels	2001	Grand Total																																																	
Bikes	606184.7066	606184.7066																																																	
Mountain Bikes	135499.6	135499.6																																																	
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August	60899.82	60899.82																																																	
September	10174.97	10174.97																																																	
Road Bikes	470685.1066	470685.1066																																																	
July	145228.0946	145228.0946																																																	
August	161638.4692	161638.4692																																																	
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PivotStyleDark3	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td>Sum of Sales Amount</td><td>Column Labels</td><td></td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>	Country	{All}		State	{All}		City	{All}					Sum of Sales Amount	Column Labels		Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
Country	{All}																																																
State	{All}																																																
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Sum of Sales Amount	Column Labels																																																
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July	64424.81	64424.81																																															
August	60899.82	60899.82																																															
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Road Bikes	470685.1066	470685.1066																																															
July	145228.0946	145228.0946																																															
August	161638.4692	161638.4692																																															
September	163818.5428	163818.5428																																															
Grand Total	606184.7066	606184.7066																																															

PivotTable Style	[Example: (informative)]																																																			
PivotStyleDark2	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td colspan="3">Sum of Sales Amount</td></tr><tr><td colspan="2">Column Labels</td><td></td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>	Country	{All}		State	{All}		City	{All}					Sum of Sales Amount			Column Labels			Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
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State	{All}																																																			
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Grand Total	606184.7066	606184.7066																																																		
PivotStyleDark1	<table><tr><td>Country</td><td>{All}</td><td></td></tr><tr><td>State</td><td>{All}</td><td></td></tr><tr><td>City</td><td>{All}</td><td></td></tr><tr><td colspan="3"></td></tr><tr><td colspan="3">Sum of Sales Amount</td></tr><tr><td colspan="2">Column Labels</td><td></td></tr><tr><td>Row Labels</td><td>2001</td><td>Grand Total</td></tr><tr><td>Bikes</td><td>606184.7066</td><td>606184.7066</td></tr><tr><td>Mountain Bikes</td><td>135499.6</td><td>135499.6</td></tr><tr><td>July</td><td>64424.81</td><td>64424.81</td></tr><tr><td>August</td><td>60899.82</td><td>60899.82</td></tr><tr><td>September</td><td>10174.97</td><td>10174.97</td></tr><tr><td>Road Bikes</td><td>470685.1066</td><td>470685.1066</td></tr><tr><td>July</td><td>145228.0946</td><td>145228.0946</td></tr><tr><td>August</td><td>161638.4692</td><td>161638.4692</td></tr><tr><td>September</td><td>163818.5428</td><td>163818.5428</td></tr><tr><td>Grand Total</td><td>606184.7066</td><td>606184.7066</td></tr></table>	Country	{All}		State	{All}		City	{All}					Sum of Sales Amount			Column Labels			Row Labels	2001	Grand Total	Bikes	606184.7066	606184.7066	Mountain Bikes	135499.6	135499.6	July	64424.81	64424.81	August	60899.82	60899.82	September	10174.97	10174.97	Road Bikes	470685.1066	470685.1066	July	145228.0946	145228.0946	August	161638.4692	161638.4692	September	163818.5428	163818.5428	Grand Total	606184.7066	606184.7066
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September	163818.5428	163818.5428																																																		
Grand Total	606184.7066	606184.7066																																																		

G.2 Built-in Cell Styles

Following is a listing of the built-in cell style names, corresponding builtInId value and informative example of formatting.

builtInId	Cell Style Name	[Example: (informative)]
0	Normal	Normal

builtinId	Cell Style Name	[Example: (informative)]
1	RowLevel_ + level #	Depends on level: 1 = RowLevel_1 2 = <i>RowLevel_2</i> 3 = RowLevel_3 4 = RowLevel_4 5 = RowLevel_5 6 = RowLevel_6 7 = RowLevel_7
2	ColLevel_ + level #	Depends on level: 1 = ColLevel_1 2 = <i>ColLevel_2</i> 3 = ColLevel_3 4 = ColLevel_4 5 = ColLevel_5 6 = ColLevel_6 7 = ColLevel_7
3	Comma	1,234.00
4	Currency	\$1,234.00
5	Percent	123400%
6	Comma [0]	1,234

builtinId	Cell Style Name	[Example: (informative)]
7	Currency [0]	\$ 1,234
8	Hyperlink	hyperlink
9	Followed Hyperlink	followed hyperlink
10	Note	Cell Style
11	Warning Text	Cell Style
15	Title	Cell Style
16	Heading 1	Cell Style
17	Heading 2	Cell Style
18	Heading 3	Cell Style
19	Heading 4	Cell Style
20	Input	Cell Style
21	Output	Cell Style
22	Calculation	Cell Style
23	Check Cell	Cell Style
24	Linked Cell	Cell Style
25	Total	Cell Style

builtinId	Cell Style Name	[Example: (informative)]
26	Good	Cell Style
27	Bad	Cell Style
28	Neutral	Cell Style
29	Accent1	Cell Style
30	20% - Accent1	Cell Style
31	40% - Accent1	Cell Style
32	60% - Accent1	Cell Style
33	Accent2	Cell Style
34	20% - Accent2	Cell Style
35	40% - Accent2	Cell Style
36	60% - Accent2	Cell Style
37	Accent3	Cell Style
38	20% - Accent3	Cell Style
39	40% - Accent3	Cell Style
40	60% - Accent3	Cell Style
41	Accent4	Cell Style
42	20% - Accent4	Cell Style

builtinId	Cell Style Name	[Example: (informative)]
43	40% - Accent4	Cell Style
44	60% - Accent4	Cell Style
45	Accent5	Cell Style
46	20% - Accent5	Cell Style
47	40% - Accent5	Cell Style
48	60% - Accent5	Cell Style
49	Accent6	Cell Style
50	20% - Accent6	Cell Style
51	40% - Accent6	Cell Style
52	60% - Accent6	Cell Style
53	Explanatory Text	Cell Style

G.3 Built-in PivotTable AutoFormats

Following is a table of the built-in PivotTable AutoFormats and informative examples of formatting.

autoFormatId	Description			
4096	SSN	(All)		
	Postal Code	State	City	Amount
	09999			54.97
		OR		54.97
			Portland	12.54
			Tillamook	42.43
	12345			195.51
		CA		195.51
			San Diego	195.51
	456789			244.12
		WA		244.12
			Everett	67.57
			Seattle	96.72
			Tacoma	79.83
	Grand Total			494.6

autoFormatId	Description			
4097	SSN	(All)		
	<div> <div>Postal Code</div> <div>State</div> <div>City</div> <div>Amount</div> </div>			
	<div> <div>09999</div> <div>OR</div> <div>Portland</div> <div>12.54</div> </div>			
	<div> <div>Tillamook</div> <div>42.43</div> </div>			
	<div> <div>OR Total</div> <div>54.97</div> </div>			
	<div> <div>09999 Total</div> <div>54.97</div> </div>			
	<div> <div>12345</div> <div>CA</div> <div>San Diego</div> <div>195.51</div> </div>			
	<div> <div>CA Total</div> <div>195.51</div> </div>			
	<div> <div>12345 Total</div> <div>195.51</div> </div>			
	<div> <div>456789</div> <div>WA</div> <div>Everett</div> <div>67.57</div> </div>			
	<div> <div>Seattle</div> <div>96.72</div> </div>			
	<div> <div>Tacoma</div> <div>79.83</div> </div>			
	<div> <div>WA Total</div> <div>244.12</div> </div>			
	<div> <div>456789 Total</div> <div>244.12</div> </div>			
	<div> <div>Grand Total</div> <div>494.6</div> </div>			

autoFormatId	Description			
4098	SSN		(All)	
	Postal Code	State	City	Amount
	09999			54.97
		OR		54.97
			Portland	12.54
			Tillamook	42.43
	12345			195.51
		CA		195.51
			San Diego	195.51
	456789			244.12
		WA		244.12
			Everett	67.57
			Seattle	96.72
			Tacoma	79.83
	Grand Total			494.6

autoFormatId	Description			
4099	SSN	(All)		
	Postal Code	State	City	Amount
	09999			
		OR		
		Portland	12.54	
		Tillamook	42.43	
		OR Total	54.97	
	09999 Total		54.97	
	12345			
		CA		
		San Diego	195.51	
		CA Total	195.51	
	12345 Total		195.51	
	456789			
		WA		
		Everett	67.57	
		Seattle	96.72	
		Tacoma	79.83	
		WA Total	244.12	
	456789 Total		244.12	
	Grand Total		494.6	

autoFormatId	Description			
4100	SSN	(All)		
	Postal Code	State	City	Amount
	09999			
		OR		
			Portland	12.54
			Tillamook	42.43
		OR Total		54.97
	09999 Total			54.97
	12345			
		CA		
			San Diego	195.51
		CA Total		195.51
	12345 Total			195.51
	456789			
		WA		
			Everett	67.57
			Seattle	96.72
			Tacoma	79.83
		WA Total		244.12
	456789 Total			244.12
	Grand Total			494.6

autoFormatId	Description																																																																
4101	<table><tr><td>SSN</td><td>(All)</td><td></td><td></td></tr><tr><td colspan="4"></td></tr><tr><td>Postal Code</td><td>State</td><td>City</td><td>Amount</td></tr><tr><td>09999</td><td></td><td></td><td>54.97</td></tr><tr><td></td><td>OR</td><td></td><td>54.97</td></tr><tr><td></td><td></td><td>Portland</td><td>12.54</td></tr><tr><td></td><td></td><td>Tillamook</td><td>42.43</td></tr><tr><td>12345</td><td></td><td></td><td>195.51</td></tr><tr><td></td><td>CA</td><td></td><td>195.51</td></tr><tr><td></td><td></td><td>San Diego</td><td>195.51</td></tr><tr><td>456789</td><td></td><td></td><td>244.12</td></tr><tr><td></td><td>WA</td><td></td><td>244.12</td></tr><tr><td></td><td></td><td>Everett</td><td>67.57</td></tr><tr><td></td><td></td><td>Seattle</td><td>96.72</td></tr><tr><td></td><td></td><td>Tacoma</td><td>79.83</td></tr><tr><td colspan="3">Grand Total</td><td>494.6</td></tr></table>	SSN	(All)							Postal Code	State	City	Amount	09999			54.97		OR		54.97			Portland	12.54			Tillamook	42.43	12345			195.51		CA		195.51			San Diego	195.51	456789			244.12		WA		244.12			Everett	67.57			Seattle	96.72			Tacoma	79.83	Grand Total			494.6
SSN	(All)																																																																
Postal Code	State	City	Amount																																																														
09999			54.97																																																														
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12345			195.51																																																														
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		San Diego	195.51																																																														
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	WA		244.12																																																														
		Everett	67.57																																																														
		Seattle	96.72																																																														
		Tacoma	79.83																																																														
Grand Total			494.6																																																														

autoFormatId	Description
4102	<div data-bbox="516 254 878 296">SSN (All) ▼</div> <div data-bbox="516 338 1154 380"> Postal Code ▼ State ▼ City ▼ Amount </div> <div data-bbox="516 380 1154 422"> 09999 </div> <div data-bbox="748 422 878 464">OR</div> <div data-bbox="878 464 1154 506">Portland 12.54</div> <div data-bbox="878 506 1154 548">Tillamook 42.43</div> <div data-bbox="748 548 1154 590">OR Total 54.97</div> <div data-bbox="516 621 1154 674"> 09999 Total 54.97 </div> <div data-bbox="516 716 743 758"> 12345 </div> <div data-bbox="748 758 878 800">CA</div> <div data-bbox="878 800 1154 842">San Diego 195.51</div> <div data-bbox="748 842 1154 884">CA Total 195.51</div> <div data-bbox="516 915 1154 968"> 12345 Total 195.51 </div> <div data-bbox="516 1010 743 1052"> 456789 </div> <div data-bbox="748 1052 878 1094">WA</div> <div data-bbox="878 1094 1154 1136">Everett 67.57</div> <div data-bbox="878 1136 1154 1178">Seattle 96.72</div> <div data-bbox="878 1178 1154 1220">Tacoma 79.83</div> <div data-bbox="748 1220 1154 1262">WA Total 244.12</div> <div data-bbox="516 1293 1154 1346"> 456789 Total 244.12 </div> <div data-bbox="516 1388 1154 1440"> Grand Total 494.6 </div>

autoFormatId	Description			
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		OR		
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			Tillamook	42.43
		OR Total		54.97
	09999 Total			54.97
	12345			
		CA		
			San Diego	195.51
		CA Total		195.51
	12345 Total			195.51
	456789			
		WA		
			Everett	67.57
			Seattle	96.72
			Tacoma	79.83
		WA Total		244.12
	456789 Total			244.12
	Grand Total			494.6

autoFormatId	Description																																																																
4104	<table><tr><td>SSN</td><td>(All)</td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td>Postal Code</td><td>State</td><td>City</td><td>Amount</td></tr><tr><td>09999</td><td></td><td></td><td>54.97</td></tr><tr><td></td><td>OR</td><td></td><td>54.97</td></tr><tr><td></td><td></td><td>Portland</td><td>12.54</td></tr><tr><td></td><td></td><td>Tillamook</td><td>42.43</td></tr><tr><td>12345</td><td></td><td></td><td>195.51</td></tr><tr><td></td><td>CA</td><td></td><td>195.51</td></tr><tr><td></td><td></td><td>San Diego</td><td>195.51</td></tr><tr><td>456789</td><td></td><td></td><td>244.12</td></tr><tr><td></td><td>WA</td><td></td><td>244.12</td></tr><tr><td></td><td></td><td>Everett</td><td>67.57</td></tr><tr><td></td><td></td><td>Seattle</td><td>96.72</td></tr><tr><td></td><td></td><td>Tacoma</td><td>79.83</td></tr><tr><td>Grand Total</td><td></td><td></td><td>494.6</td></tr></table>	SSN	(All)							Postal Code	State	City	Amount	09999			54.97		OR		54.97			Portland	12.54			Tillamook	42.43	12345			195.51		CA		195.51			San Diego	195.51	456789			244.12		WA		244.12			Everett	67.57			Seattle	96.72			Tacoma	79.83	Grand Total			494.6
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Grand Total			494.6																																																														
4105	<table><tr><td>SSN</td><td>(All)</td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td>Postal Code</td><td>State</td><td>City</td><td>Amount</td></tr><tr><td>09999</td><td></td><td></td><td>54.97</td></tr><tr><td></td><td>OR</td><td></td><td>54.97</td></tr><tr><td></td><td></td><td>Portland</td><td>12.54</td></tr><tr><td></td><td></td><td>Tillamook</td><td>42.43</td></tr><tr><td>12345</td><td></td><td></td><td>195.51</td></tr><tr><td></td><td>CA</td><td></td><td>195.51</td></tr><tr><td></td><td></td><td>San Diego</td><td>195.51</td></tr><tr><td>456789</td><td></td><td></td><td>244.12</td></tr><tr><td></td><td>WA</td><td></td><td>244.12</td></tr><tr><td></td><td></td><td>Everett</td><td>67.57</td></tr><tr><td></td><td></td><td>Seattle</td><td>96.72</td></tr><tr><td></td><td></td><td>Tacoma</td><td>79.83</td></tr><tr><td>Grand Total</td><td></td><td></td><td>494.6</td></tr></table>	SSN	(All)							Postal Code	State	City	Amount	09999			54.97		OR		54.97			Portland	12.54			Tillamook	42.43	12345			195.51		CA		195.51			San Diego	195.51	456789			244.12		WA		244.12			Everett	67.57			Seattle	96.72			Tacoma	79.83	Grand Total			494.6
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	OR		54.97																																																														
		Portland	12.54																																																														
		Tillamook	42.43																																																														
12345			195.51																																																														
	CA		195.51																																																														
		San Diego	195.51																																																														
456789			244.12																																																														
	WA		244.12																																																														
		Everett	67.57																																																														
		Seattle	96.72																																																														
		Tacoma	79.83																																																														
Grand Total			494.6																																																														

autoFormatId	Description				
4106	SSN	(All)			
	Amount	Postal Code			
	State	City	09999	12345	456789
	CA	San Diego		195.51	195.51
	CA Total			195.51	195.51
	OR	Portland		12.54	12.54
		Tillamook		42.43	42.43
	OR Total			54.97	54.97
	WA	Everett		67.57	67.57
		Seattle		96.72	96.72
		Tacoma		79.83	79.83
	WA Total			244.12	244.12
	Grand Total			54.97	195.51
				244.12	494.6
4107	SSN	(All)			
	Amount	Postal Code			
	State	City	09999	12345	456789
	CA	San Diego		195.51	195.51
	CA Total			195.51	195.51
	OR	Portland		12.54	12.54
		Tillamook		42.43	42.43
	OR Total			54.97	54.97
	WA	Everett		67.57	67.57
		Seattle		96.72	96.72
		Tacoma		79.83	79.83
	WA Total			244.12	244.12
	Grand Total			54.97	195.51
				244.12	494.6

autoFormatId	Description				
4108	SSN	(All)			
	Amount	Postal Code			
	State	City	09999	12345	456789
	CA	San Diego		195.51	195.51
	CA Total		195.51		195.51
	OR	Portland	12.54		12.54
		Tillamook	42.43		42.43
	OR Total		54.97		54.97
	WA	Everett		67.57	67.57
		Seattle		96.72	96.72
		Tacoma		79.83	79.83
	WA Total			244.12	244.12
	Grand Total		54.97	195.51	244.12
					494.6
4109	SSN	(All)			
	Amount	Postal Code			
	State	City	09999	12345	456789
	CA	San Diego		195.51	195.51
	CA Total			195.51	195.51
	OR	Portland	12.54		12.54
		Tillamook	42.43		42.43
	OR Total		54.97		54.97
	WA	Everett		67.57	67.57
		Seattle		96.72	96.72
		Tacoma		79.83	79.83
	WA Total			244.12	244.12
	Grand Total		54.97	195.51	244.12
					494.6

autoFormatId	Description			
4110	SSN	(All)		
	Amount	Postal Code		
	State	City	09999	Grand Total
	CA	San Diego	195.51	195.51
	CA Total		195.51	195.51
	OR	Portland	12.54	12.54
		Tillamook	42.43	42.43
	OR Total		54.97	54.97
	WA	Everett	67.57	67.57
		Seattle	96.72	96.72
		Tacoma	79.83	79.83
	WA Total		244.12	244.12
	Grand Total		54.97	494.6
			12345	
4111	SSN	(All)		
	Amount	Postal Code		
	State	City	09999	Grand Total
	CA	San Diego	195.51	195.51
	CA Total		195.51	195.51
	OR	Portland	12.54	12.54
		Tillamook	42.43	42.43
	OR Total		54.97	54.97
	WA	Everett	67.57	67.57
		Seattle	96.72	96.72
		Tacoma	79.83	79.83
	WA Total		244.12	244.12
	Grand Total		54.97	494.6
			456789	

autoFormatId	Description				
4112	SSN	(All)			
	Amount	Postal Code			
	State	City	09999	12345	456789
	CA	San Diego		195.51	195.51
	CA Total			195.51	195.51
	OR	Portland	12.54		12.54
		Tillamook	42.43		42.43
	OR Total		54.97		54.97
	WA	Everett		67.57	67.57
		Seattle		96.72	96.72
		Tacoma		79.83	79.83
	WA Total			244.12	244.12
	Grand Total		54.97	195.51	494.6
4113	SSN	(All)			
	Amount	Postal Code			
	State	City	09999	12345	456789
	CA	San Diego		195.51	195.51
	CA Total			195.51	195.51
	OR	Portland	12.54		12.54
		Tillamook	42.43		42.43
	OR Total		54.97		54.97
	WA	Everett		67.57	67.57
		Seattle		96.72	96.72
		Tacoma		79.83	79.83
	WA Total			244.12	244.12
	Grand Total		54.97	195.51	494.6

autoFormatId	Description			
4114	SSN	(All)		
	Amount	Postal Code		
	State	City	09999	Grand Total
	CA	San Diego	12345	195.51
	CA Total		456789	195.51
	OR	Portland		12.54
		Tillamook		42.43
	OR Total			54.97
	WA	Everett		67.57
		Seattle		96.72
		Tacoma		79.83
	WA Total			244.12
	Grand Total			494.6
4115	SSN	(All)		
	Amount	Postal Code		
	State	City	09999	Grand Total
	CA	San Diego	12345	195.51
	CA Total		456789	195.51
	OR	Portland		12.54
		Tillamook		42.43
	OR Total			54.97
	WA	Everett		67.57
		Seattle		96.72
		Tacoma		79.83
	WA Total			244.12
	Grand Total			494.6

autoFormatId	Description				
4116	SSN	(All)			
	Sum of Amount	Postal Code			
	State	City	09999	12345	456789
	CA	San Diego		195.51	195.51
	CA Total			195.51	195.51
	OR	Portland	12.54		12.54
		Tillamook	42.43		42.43
	OR Total		54.97		54.97
	WA	Everett		67.57	67.57
		Seattle		96.72	96.72
		Tacoma		79.83	79.83
	WA Total			244.12	244.12
	Grand Total		54.97	195.51	244.12
					494.6
4117	SSN	(All)			
	Amount	Postal Code			
	State	City	09999	12345	456789
	CA	San Diego		195.51	195.51
	CA Total			195.51	195.51
	OR	Portland	12.54		12.54
		Tillamook	42.43		42.43
	OR Total		54.97		54.97
	WA	Everett		67.57	67.57
		Seattle		96.72	96.72
		Tacoma		79.83	79.83
	WA Total			244.12	244.12
	Grand Total		54.97	195.51	244.12
					494.6

These formats are also provided in electronic form in the accompanying SpreadsheetML document
PivotTable_Autoformat.xlsx.

Annex H. (informative)

Example Predefined DrawingML Shape and Text Geometries

This clause is informative.

This Office Open XML specification includes an example definition for all predefined DrawingML shape geometries that are referenced by the following elements:

- prstGeom@prst (§20.1.9.18)
- prstTxWarp@prst (§20.1.9.19)

The informative sample DrawingML markup defining these shape and text geometries resides in an accompanying file named OfficeOpenXML-DrawingMLGeometries.zip, which is distributed in electronic form only.

End of informative text.

Annex I.

(informative)

Bidirectional Support

This Annex is informative.

I.1 Introduction

Office Open XML was designed to work with multilingual documents. It is capable of fully representing the information needed for different languages and scripts, including bidirectional (bidi) scripts (such as Arabic or Hebrew). Those scripts are written from right-to-left (RTL), while numbers and segments of text in other scripts are embedded from left-to-right (LTR). The Office Open XML standard allows users to explicitly apply and define the bidirectional characteristics of objects and text properties.

This document describes the syntax used to define these properties, going from the highest level to the most specific—that is from the document to the character (i.e., a run) level. Note that there are no bidirectional settings which affect the whole document. To accomplish this, styles can be used to allow these settings to be changed in a single location, and used throughout the content.

I.2 Shared (WordprocessingML and DrawingML)

Office Open XML provides markup which is used to provide bidirectional support within its constituent markup languages. This markup is used identically across its constituent languages, in order to ensure that its functionality is clearly indicated as common.

Specifically, the following properties are shared between both WordprocessingML and DrawingML, in order to provide identical bidirectional support:

At the paragraph level, the `bidi` element in WordprocessingML (§17.6.1) and the `rtl` attribute in Drawing ML (§21.1.2.2.7) specifies whether the base direction of the text within the paragraph is left-to-right or right-to-left. This element overrides the paragraph level; rules P2 and P3 of the “Unicode Bidirectional Algorithm” (see HL1 in the Unicode Standard Annex #9).

Element	Section	Description
<code>cs</code>	17.3.2.7 and 21.1.2.3.1	Treats the run as complex script run regardless of the content of the run.

Element	Section	Description
lang	17.3.2.20 and 21.1.2.3.9	<p>Since Arabic and Hebrew require different behavior for equation layout, the “lang” attribute is used to determine the resolution of the following neutral characters: the plus sign (+), the minus sign (-), and the solidus (/).</p> <p>For Arabic, these characters behave just as any other neutral character and can be impacted by the RTL property. Whereas for Hebrew, these characters are treated as numeral separators. Therefore, they will be resolved as EN (European Number) when surrounded by numerals.</p> <p>For example:</p> <pre><w:r> <w:rPr> <w:rFonts w:hint="cs" /> <w:rtl /> <w:lang w:bidl="he-IL" /> </w:rPr> <w:t>25-12-2007 25.12.2007 425-123-4567</w:t> </w:r></pre> <p>This shall generate the following layout:</p> <p>425-123-4567 25.12.2007 25-12-2007</p> <p>If lang is set to ar-SA, the text would layout as:</p> <p>4567-123-425 25.12.2007 2007-12-25</p>
rtl	17.3.2.30 and 21.1.2.2.8	<p>Specifies the reading order of the character run to be right-to-left, this controls the visual layout of the run. It is important to note the following:</p> <ul style="list-style-type: none"> • This element should not be used with strong LTR characters. The behavior resulting from using this element with a strong LTR character is unspecified. • Unlike Unicode’s embedding control characters, this element cannot be nested, instead it behaves as a toggle between LTR and RTL character runs. Therefore, it doesn’t increase the embedding level of the character runs beyond 0 or 1. The only exception is when numerals exist within a RTL character run in a LTR paragraph then these numerals will implicitly be embedding level 2. • This element is particularly useful when applications need to support the common scenario of users toggling the method of text entry from LTR to RTL. For example, typing characters using the English keyboard, then switching to Arabic or Hebrew and typing additional characters. Since many directional-neutral characters are common between these languages, this tag helps to disambiguate the reading order of these neutral characters using the direction of the keyboard language rather than of the surrounding characters.

Element	Section	Description
		<ul style="list-style-type: none"> This element provides information used to resolve the classifications of individual characters. Characters in RTL runs will be resolved as strong right-to-left characters or as numerals, while characters in LTR runs will be resolved as strong left-to-right characters or as numerals. Once this is determined, the line is displayed subject to the recommendation of the “Unicode Bidirectional Algorithm” (see HL3 in the Unicode Standard Annex #9) in reordering the resolved levels. <p>For example, to control the layout of a quote in the middle of a left-to-right paragraph (assume the lower-case text is English and the upper-case text is Arabic or Hebrew).</p> <pre><w:r> <w:t>he said: “</w:t> </w:r> <w:r> <w:rPr> <w:rtl /> </w:rPr> <w:t>IT COSTS 12.95 LIRAS</w:t> </w:r> <w:r> <w:t>”.</w:t> </w:r></pre> <p>The RTL and LTR elements resolves the classification of this run as follows:</p> <pre>he said: “IT COSTS 12.95 LIRAS”. LLLLLLLLLLLLRRRRRRRRRRRRRRRRRRRRRRRRLL NNNNN</pre> <p>Which generates the following levels:</p> <pre>he said: “IT COSTS 12.95 LIRAS”. 00000000001111111112222211111100</pre> <p>Which generates the following text layout:</p> <pre>he said: “SARIL 12.95 STSOC TI”.</pre>

I.3 WordprocessingML

Within the context of a word processing document, additional bidirectional support is specifically applicable, and is described below.

At the section level in WordprocessingML, the `bidirectional` element (see §17.6.1) specifies that the section is right-to-left. This affects the orientation of section level properties; the layout of the content within the

section is directly controlled as described below. For example, if the section has multiple columns, the flow of text within those columns is right-to-left.

The section also specifies the rtlGutter element (see §17.6.16), which places the page gutter margin on the right side of a group of pages; this ensure that if bound, the booklet can be read from right-to-left.

At the table level, the bidiVisual element (see §17.4.1) specifies the order in which the cells in the table are processed; either left-to-right or right-to-left (the syntactic model of tables stores the cells logically in the WordprocessingML, irrespective of the desired display order). This does not affect the direction of the text within the cells, but the visual order in which the cells are displayed. Individual table cell properties (e.g. the start and end border are applied based on the display order set by this element.

At the run level, the following properties are used to control direction:

Element	Section	Description
dir	§17.3.2.8	<p>Specifies an increase in the embedding level as described by the Bidirectional Unicode Algorithm (See Unicode Technical Report #9). This element can be nested and will cause the bidi levels to increase following the direction of the embedding. The rtl element within the embedding continues to provide classification resolution, but at the level reached by the dir embedding.</p> <p>Example: A left-to-right paragraph that has a quote in a right-to-left language, but the quote itself includes left-to-right text. In this case, the text layout within the quote should be read from right-to-left. Adding the “dir” element around the quote will result in the desired layout. (Assume the lower-case text is English and the upper-case text is Arabic or Hebrew.)</p> <pre> <w:r> <w:t>he said: “</w:t> </w:r> <w:dir w:val=”rtl”> <w:r> <w:rPr> <w:rtl /> </w:rPr> <w:t>I LEAVE FOR </w:t> </w:r> <w:r> <w:t>united states</w:t> </w:r> <w:r> <w:rPr> <w:rtl /> </w:rPr> <w:t xml:space=”preserve”> TOMORROW</w:t> </w:r> </w:dir> </pre>

Element	Section	Description
		<pre><w:r> <w:t>”.</w:t> </w:r></pre> <p>The alternating RTL and LTR elements help in resolving the classification of characters within this run as follows:</p> <pre>he said: “I LEAVE FOR united states TOMORROW”. LLLLLLLLLLLLRRRRRRRRRRLLLLLLLLLLLLLLLLLLLLLLLLRRRRRRRRRL</pre> <p>But the fact that the quote is enclosed in an RTL embedding; the following bidi levels will be generated:</p> <pre>he said: “I LEAVE FOR united states TOMORROW”. 0000000000111111111111222222222222111111111100</pre> <p>This generates the following text layout:</p> <pre>he said: “WORROMOT united states ROF EVAEL I”.</pre>
bdo	17.3.2.3	<p>This element forces a direction override for the enclosed text as described by the Bidirectional Algorithm (see Unicode Technical Report #9). For example, the right-to-left override can be used to force a product part number made of mixed English, digits, and Hebrew text written from right-to-left. (Assume the lower-case text is English and the upper-case text is Arabic or Hebrew.)</p> <pre><w:r> <w:t>part number: “</w:t> </w:r> <w:bdo w:val=”rtl”> <w:r> <w:t>ad-326D-FG</w:t> </w:r> </w:bdo></pre> <p>This generates the following text layout:</p> <pre>part number: GF-D623-da</pre>
bCs	17.3.2.2	Specifies the bold property for a complex script run of characters, this is applied when the “rtl” element is specified on a run. It is forced when the “cs” element is specified (see the “cs” element later in this table).
iCs	17.3.2.17	Specifies the italic property for a complex script run of characters, this is applied when the “rtl” element is specified on a run. It is forced when the “cs” element is specified (see the “cs” element later in this table).
szCs	17.3.2.39	Specifies the font size property for a complex script run of characters, this is applied when the “rtl” element is specified on a run. It is forced when the “cs”

Element	Section	Description
		element is specified (see the “cs” element later in this table).
rFonts	17.3.2.26	Specifies the font to be used for a run of characters. The complex script font is used to render runs with strong bidirectional characters or weak and neutrals marked with the rtl element.

I.4 SpreadsheetML

Within the context of a spreadsheet document, additional bidirectional support is specifically applicable, and is described below.

At the sheet view level in SpreadsheetML, the rightToLeft attribute (see §18.3.1.87) sets the sheet direction, i.e/ whether the columns progress from left-to-right, where column A is to the far left of the worksheet, or right-to-left, where column A is to the far right of the worksheet. This attribute does not affect the direction of the cells within the sheet (covered below). In addition, the location of objects within the sheet will be mirrored, but their content will not.

	A	B	C
1	LTR cell		
2		RTL cell	
3			

<... rightToLeft = “0” ...>

Left-to-right spreadsheet

C	B	A	
		LTR cell	1
	RTL cell		2
			3

<... rightToLeft = “1” ...>

Right-to-left spreadsheet

Note:

- Objects location in the sheet were mirrored
- Cell direction and alignment are not affected by this element

At the cell level in SpreadsheetML, the readingOrder attribute (see §18.8.1) indicates the baseline direction of all the paragraphs within the cell, which can be set to left-to-right, right-to-left, or context dependent. The latter will scan the text for the first non-whitespace character, and if it is a strong right-to-left character it sets a right-to-left direction for the cell; otherwise, the cell direction is set as left-to-right.

Within cell text, which is optimized for use in calculation logic, the following rules should be followed:

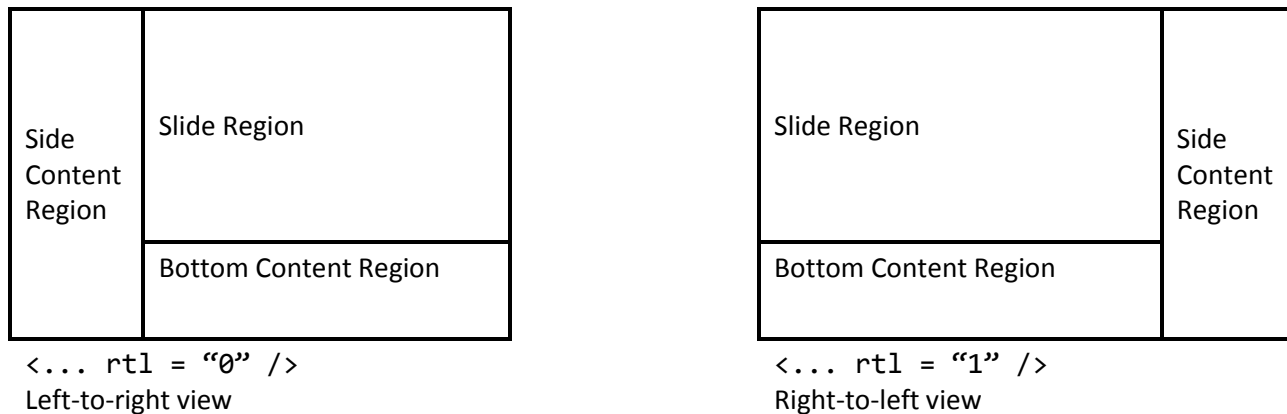
- The bidirectional algorithm, as recommended by Unicode UAX#9, should be used to display text.
- Text copied from WordprocessingML or DrawingML should be processed by an application, which should add Unicode markers to preserve the order of text.

I.5 PresentationML

Within the context of a presentation document, additional bidirectional support is specifically applicable, and is described below.

At the presentation level in PresentationML, the `rtl` attribute (see §19.2.1.26) specifies the orientation of the editing and slide show views of the user interface, either left-to-right or right-to-left. If this attribute is omitted, the user interface is automatically left-to-right. This attribute does not affect any other object within the presentation.

The following example shows the effect of the RTL attribute in the normal view:



I.6 DrawingML

At the body level in DrawingML, the `rtlCol` element (see §21.1.2.1.1) is used to indicate the order of text flow within multiple columns (either left-to-right or right-to-left). This setting does not affect the layout of paragraphs or text runs within the body (described below).

At the table level, the `rtl` attribute on the `tblPr` element (see §21.1.3.15) specifies the same logical display semantics as the WordprocessingML `bidiVisual` element described in §1.3 above.

I.7 The Unicode Bidirectional Algorithm and Office Open XML

Office Open XML provides explicit markup to specify the classification of character runs, as well as to apply embedding and override settings to text. Therefore, it is important to understand how to represent the Unicode Bidirectional Algorithm in Open XML.

Before displaying text contained within WordprocessingML documents, a consumer must resolve the classification of characters in each line using the Unicode Bidirectional Algorithm (<http://www.unicode.org/reports/tr9/>). Specifically, the sections that detail resolving weak types and resolving neutral types must be followed. After applying this algorithm, the higher-level protocol specified by the `rtl` element is used to set the directionality of all characters that are resolved as R, AN and EN. Note that AN and EN that remain after applying W7 in that document will be in the right-to-left context.

This table lists the recommended way to interpret Unicode control characters in Office Open XML:

Unicode	Equivalent markup	Comment
RLO (U+202E)	<w:bdo w:val="rtl">	These Unicode characters have equivalent should be represented by the equivalent markup within Office Open XML documents. The behavior resulting from directly embedding these discouraged characters within Office Open XML text is unspecified.
LRO (U+202D)	<w:bdo w:val="ltr">	
RLE (U+202B)	<w:dir w:val="rtl">	
LRE (U+202A)	<w:dir w:val="ltr">	
PDF (U+202C)	</w:bdo> or </w:dir>	
RLM (U+200F) and LRM (U+200E)	None	These characters affect resolving the surrounding neutral and weak types while classifying text as described above. Once the characters are resolved, R runs should be tagged with <w:rtl w:val="1"/>. It is up to the implementer to preserve these control characters in the text.
ZWJ (U+200D) and ZWNJ (U+200C)	None	These characters should be preserved as they impact the shaping process at text rendering time.

Example #1:

The following logical text fragment:

he said: "RLEI LEAVE FOR united states TOMORROWPDF".

would be represented using the following Office Open XML markup:

```
<w:r>
  <w:t>he said: "</w:t>
</w:r>
<w:dir w:val="rtl">
  <w:r>
    <w:rPr>
      <w:rtl />
    </w:rPr>
    <w:t xml:space="preserve">I LEAVE FOR </w:t>
  </w:r>
  <w:r>
    <w:t>united states</w:t>
  </w:r>
```

```

    <w:r>
      <w:rPr>
        <w:rtl />
      </w:rPr>
      <w:t xml:space="preserve"> TOMORROW</w:t>
    </w:r>
  </w:dir>
<w:r>
  <w:t>”.</w:t>
</w:r>

```

Example #2:

The following logical text fragment:

product number: RLoad-326D-FGPDF

would be represented using the following Office Open XML markup:

```

<w:r>
  <w:t>product number: “</w:t>
</w:r>
<w:bdo w:val=”rtl”>
  <w:r>
    <w:t>ad-326D-FG</w:t>
  </w:r>
</w:bdo>

```

This generates the following text layout:

part number: GF-D623-da.

Example #3:

The following logical text fragment:

FIRSTLRM,SECONDLRM,THIRD

would be represented using the following Office Open XML markup:

```

<w:r>
  <w:rPr>
    <w:rtl />
  </w:rPr>
  <w:t>FIRST</w:t>
</w:r>
<w:r>

```

```
<w:t>,</w:t>
</w:r>
<w:r>
  <w:rPr>
    <w:rtl />
  </w:rPr>
  <w:t>SECOND</w:t>
</w:r>
<w:r>
  <w:t>,</w:t>
</w:r>
<w:r>
  <w:rPr>
    <w:rtl />
  </w:rPr>
  <w:t>THIRD</w:t>
</w:r>
```

End informative Annex.

Annex J.

(informative)

Accessibility Best Practices

This annex is informative.

This annex is a collection of best practices for developers and document/template authors implementing ECMA-376, and for customers using such implementations, with the goal of maximizing the accessibility of Office Open XML documents.

Office Open XML provides a rich infrastructure for creating content that meets the needs of people with disabilities. Authors and developers are encouraged to follow these guidelines in order to enable users with disabilities to consume content or to extract the full meaning of Office Open XML documents.

J.1 The Value of Creating an Accessible Office Open XML Implementation

There are numerous benefits associated with creating an accessible Office Open XML implementation. Office Open XML provides a rich infrastructure for creating content that meets the needs by people with disabilities, and enables them to read, create, and edit documents with full access to all of the semantics captured by the documents' creators.

In addition to the moral and ethical reasons for creating accessible Office Open XML documents, it should be noted that failure to provide support for users with disabilities can have serious legal implications. Examples of these regulations include

- Section 508 of the U.S. Rehabilitation Act (508) (<http://www.section508.gov>)
- Section 255 of the U.S. Telecommunications Act of 1996 (http://www.fcc.gov/cgb/dro/telecom_language.html)
- International Organization for Standardization (ISO/TC 171)
- Authoring Tool Accessibility Guidelines (ATAG) (<http://www.w3.org/TR/ATAG10/>)
- Web Content Accessibility Guidelines (WCAG) <http://www.w3.org/TR/WCAG20/>
- User Agent Accessibility Guidelines (UAAG) <http://www.w3.org/TR/UAAG10/>
- Canadian Common Look and Feel (CLF) Guide 1.1 http://www.cio-dpi.gc.ca/clf-upe/1/1_e.asp

While there are laws (such as those above) designed to ensure that businesses do everything possible to maximize accessibility, there are other compelling reasons as well. Today, businesses are looking for solutions to empower and retain employees—and accessible technology can help do just that. Accessible technology helps businesses keep great employees, recruit from a larger pool of candidates,

and enhance team collaboration and communication among all employees—including those with disabilities.

J.2 Needs by Type of Disability

Disabilities can be thought of as fitting into one of five categories (with some needs spanning multiple categories). These include vision, dexterity, hearing, learning, and communication. Details on the definition of each category, and the technologies that exist to address the needs today, follow below.

J.2.1 Vision

Vision difficulties and impairments include low vision, color blindness, blindness, and even conditions such as presbyopia, which is associated with aging populations. For individuals with vision difficulties, there are many options to modify the computer display and appearance so it is more legible, or to receive information through sound or touch. Those who are blind cannot use a computer monitor but have the option to receive information from their computers through hearing or touch offered through screen readers and Braille displays, respectively.

People with vision difficulties and impairments might be interested in the following assistive technology:

1. Screen enlargers (or screen magnifiers) work like a magnifying glass. They enlarge a portion of the screen as the user moves the focus—increasing legibility for some users. Some screen enlargers allow a user to zoom in and out on a particular area of the screen.
2. Screen readers are software programs that present graphics and text as speech. A screen reader is used to verbalize, or "speak", everything on the screen including names and descriptions of control buttons, menus, text, and punctuation.
3. Speech recognition systems, also called voice recognition programs, allow people to give commands and enter data using their voices rather than a mouse or keyboard.
4. Speech synthesizers (often referred to as text-to-speech [TTS] systems) receive information going to the screen in the form of letters, numbers, and punctuation marks, and then "speak" it out loud. The use of speech synthesizers allows blind users to review their input as they type.
5. Refreshable Braille displays provide tactile output of information represented on the computer screen. The user reads the Braille letters with his or her fingers, and then, after a line is read, refreshes the display to read the next line.
6. Braille embossers transfer computer generated text into embossed Braille output. Braille translation programs convert text scanned in, or generated via, standard word processing programs into Braille, which can be printed on the embosser.
7. Talking word processors are software programs that use speech synthesizers to provide auditory feedback of what is typed.
8. Large-print word processors allow the user to view everything in large text without added screen enlargement.

J.2.2 Dexterity

Individuals with dexterity difficulties experience pain, discomfort, or complete loss of feeling in their fingers, hands, wrists, or arms, making it difficult to use a standard keyboard or mouse. Dexterity difficulties and impairments can be caused by a wide range of common illnesses and accidents such as carpal tunnel, arthritis, stroke, cerebral palsy, Parkinson's disease, multiple sclerosis, loss of limbs or digits, spinal cord injuries, and repetitive stress injury.

People with dexterity difficulties and impairments might be interested in the following assistive technology:

1. Speech recognition systems, also called voice recognition programs, allow people to give commands and enter data using their voices rather than a mouse or keyboard.
2. On-screen keyboard programs provide an image of a standard or modified keyboard on the computer screen. The user selects the keys with a mouse, touch screen, trackball, joystick, switch, or electronic pointing device.
3. Keyboard filters include typing aids, such as word prediction utilities and add-on spelling checkers. These products reduce the required number of keystrokes. Keyboard filters enable users to access quickly the letters they need and to avoid inadvertently selecting keys they don't want.
4. Touch screens are devices placed on the computer monitor (or built into it) that allow direct selection or activation of the computer by touching the screen.
5. Alternative input devices (including alternative keyboards, electronic pointing devices, sip-and-puff systems, wands and sticks, joysticks and trackballs) allow individuals to control their computers through means other than a standard keyboard or pointing device.

J.2.3 Hearing

Hearing difficulties and impairments encompass a wide range of conditions—from slight hearing loss to deafness. People with hearing difficulties and impairments might be able to hear some sound, but might not be able to distinguish words.

J.2.4 Learning Difficulties

Learning difficulties and impairments can range from conditions such as dyslexia and attention deficit disorder to retardation. Processing problems are the most common and have the most impact on a person's ability to use computer applications. These conditions interfere with the learning process. Many individuals with learning difficulties and impairments are of high intelligence and if information is presented to them in a form and at a pace that is appropriate, they are able to be much more productive. During the learning process, many individuals with learning difficulties benefit from having a multisensory experience of audio speech paired with a visual representation. Reducing visual and auditory distractions can also aid the learning process for many people. People with learning difficulties and impairments might be interested in the following:

1. Word prediction programs allow the user to select a desired word from an on-screen list located in the prediction window. This list, generated by the computer, predicts words from the first one or two letters typed by the user. The word can then be selected from the list and inserted into the text by typing a number, clicking the mouse or scanning with a switch. These programs help users increase written productivity and accuracy, and increase vocabulary skills through word prompting.
2. Reading comprehension programs focus on establishing or improving reading skills through ready-made activities, stories, exercises, or games. These programs can help users practice letter sound recognition and can increase the understanding of words by adding graphics, sound, and possibly animation.
3. Reading tools and learning disability programs include software designed to make text-based materials more accessible for people who struggle with reading. Options can include scanning, reformatting, navigating, or speaking text out loud. These programs help people who have difficulty seeing or manipulating conventional print materials; people who are developing new literacy skills or who are learning English as a foreign language; and people who comprehend better when they hear and see text highlighted simultaneously.
4. Speech synthesizers (often referred to as text-to-speech [TTS] systems) receive information going to the screen in the form of letters, numbers, and punctuation marks, and then "speak" it out loud. Individuals who have lost the ability to communicate orally can use a speech synthesizer to communicate by typing information and letting the speech synthesizer speak it out loud.
5. Speech recognition systems, also called voice recognition programs, allow people to give commands and enter data using their voices rather than a mouse or keyboard.

J.2.5 Communication

Language and communication difficulties and impairments include conditions such as aphasia (loss or impairment of the power to use or comprehend words, often as a result of brain damage), delayed speech (a symptom of cognitive impairment), and other conditions resulting in difficulties remembering, solving problems, or perceiving sensory information. For people who have these difficulties and impairments, complex or inconsistent visual displays or word choices can make using computers more difficult. People who have language or communication difficulties and impairments might be interested in the following assistive technology:

1. Keyboard filters include typing aids such as word prediction utilities and add-on spelling checkers. These products reduce the required number of keystrokes. Certain keyboard filters enable users to quickly access the letters they need and to avoid inadvertently selecting keys they don't want.
2. Speech recognition systems, also called voice recognition programs, allow people to give commands and enter data using their voices rather than a mouse or keyboard.
3. Screen review utilities make on-screen information available as synthesized speech and pairs the speech with a visual representation of a word, for example, highlighting a word as it is spoken. Screen review utilities convert the text that appears on screen into a computer voice. This helps

some people with language difficulties and impairments by giving them information visually and aurally at the same time.

4. Touch screens are devices placed on the computer monitor (or built into it) that allow direct selection or activation of the computer by touching the screen.
5. Speech synthesizers (often referred to as text-to-speech [TTS] systems) receive information going to the screen in the form of letters, numbers, and punctuation marks, and then "speak" it out loud.

J.3 Best Practices for Developers

Developers are encouraged to deliver a core set of functionality that can best enable customers to both produce and consume highly accessible documents.

J.3.1 Development Principles for Developing Highly Accessible Implementation

Here is the set of design principles that every developer should adhere to when implementing for accessibility:

1. Product UI controls and content should be accessible. This includes electronic forms, UI controls, self contained software products, scripts, applets, plug-ins, and all other programmatic elements that generate or interpret page content.
2. Product UI controls and content should be compatible with assistive technologies. A user can thus employ assistive technology, such as screen readers, magnifiers, voice recognition, and alternative input devices to help them use the product. However, if the product is a self-contained product such as a kiosk or cell phone, for example, it should not require that such a user add assistive technology in order to use the product.
3. If a product is an authoring tool, it should enable an author to edit the structure of a document, as well as all of the properties of each element and object, in an accessible fashion.
4. A product should address the needs of people with vision difficulties, hearing difficulties, cognitive difficulties, or motor difficulties. Specifically, the implementation should provide at least one mode of operation and information retrieval that does not require that a user be able to see, hear, speak, move with fine motor control, do two things at once, reach, or exert physical strength. Except in the case of a self-contained product, the product may accomplish this by facilitating the use of assistive technology developed by third-party vendors.

J.3.2 Navigation

There are numerous things a developer should consider with respect to navigation in order to create an accessible Office Open XML implementation. At a high level these include the following:

1. It should be possible to do everything using only the keyboard. There should be no functions that are dependent on the input of a mouse or other similar device.

2. It should also be efficient to do everything via the keyboard. For example, it is unreasonable to require keyboard users to press TAB to navigate through hundreds of controls, just to get to the control that interests them.
3. It should be possible to do everything using only one hand. Shortcut key sequences should be reasonable to perform with one hand.
4. Keyboard navigation should be consistent and reasonable. TAB should navigate from one control to another. ESC should cancel the current keyboard state. The most commonly used controls should be visited first in the TAB order. If there are numerous controls laid out in two dimensions, the arrow keys should also work for two-dimensional keyboard navigation.

J.3.3 Keyboard Focus

Users must know which object has the keyboard focus at anytime. Avoid confusion by hiding all visual focus indicators and dimming selections that are located in inactive windows (or panes). To highlight the keyboard focus, use colors, fonts, graphics such as rectangles, or magnification. Highlight the keyboard focus audibly by changing the volume, the pitch, or the tonal quality. In addition an accessible Office Open XML implementation should ensure that:

1. An object always has the keyboard focus, and the keyboard focus is always visible and obvious. When the focus moves to another element, the new position is obvious.
2. If a UI control currently has the focus, it is visually highlighted.
3. All selections are visually highlighted.
4. The keyboard focus is displayed independently of a selection, allowing support for multiple and non-contiguous selections.
5. The implementation can show a selection that exists in an inactive window or pane; this can be done, for example, by dimming the selection.
6. Only one keyboard focus indicator shows at any one time.
7. Users can place the focus anywhere within the textual content or on any UI control with which they can interact.

J.3.4 Existing Navigation Guidelines

An accessible Office Open XML implementation should follow the keystroke guidelines provided by the OS on which the application is built. Guidelines exist for most major operating systems including Windows, Macintosh, and Linux.

J.3.5 Themes and Contrast Support

Users often have unique demands of their computing environment (e.g., high contrast by default) and the settings associated with these demands should be followed by any accessible Office Open XML implementation. System-wide settings should never be disabled or disregarded by a product if they are intended to increase accessibility. Many users require specific high-contrast combinations, such as white text on a black background. Drawing these reversed, as black text on a white background, causes the background to bleed over the foreground and can make reading difficult, even painful, for some users. Text is most legible for everyone when drawn on a plain background of a contrasting color. Text

drawn over a variegated background, such as a wash of colors or a bitmap, can be difficult to read for the person without disabilities, and can be unreadable for users who have turned on a high contrast-like mode.

J.3.6 Assistive Technologies (AT)

Any accessible Office Open XML application should provide at least one mode that allows for full use of the product without the use of vision or by interacting directly with the users' assistive technologies. Failure to provide at least one of these options results in certain users having no means by which to use an application.

J.3.6.1 Programmatic Access

A programmatic accessibility technology is fundamentally a method of providing information to the AT through some publically defined API (or set of API's). Assistive Technologies should be able to identify and manipulate the elements of an application's user interface. The standard mechanisms of an application should ensure that AT has access to any content presented textually or through other visual representations on the screen. An accessible Office Open XML implantation should do this by:

1. Providing programmatic access through one of the many accessibility frameworks available through operating systems. An example of this would be UI Automation. UI Automation provides programmatic access to most user interface (UI) elements on the desktop, enabling assistive technology products such as screen readers to provide information about the UI to end users and to manipulate the UI by means other than standard input. UI Automation also allows automated test scripts to interact with the UI. UI Automation client applications can be written with the assurance that they will work on multiple frameworks. The UI Automation core masks any differences in the frameworks that underlie various pieces of UI. *[Example: The Content property of a WPF button, the Caption property of a Win32 button, and the ALT property of an HTML image are all mapped to a single property, Name, in the UI Automation view. end example]*
2. Other methods such as the use of a document object model (DOM). A DOM can be defined as the document-level information source. *[Example: The Document Object Model (DOM) as implemented in MSXML provides a programmatic representation of XML documents, fragments, nodes, or node-sets. It also provides an application programming interface for working with XML data. As an XML representation, it conforms to the W3C DOM specification. As a set of APIs, XML DOM objects are COM objects that implement interfaces and can be used in XML applications written in programming languages such as C/C++, Visual Basic, VBScript, and JScript. end example]*

J.3.6.2 Additional Programmatic Access

The following guidelines should be followed to ensure an accessible Office Open XML specification:

1. The system caret (the blinking vertical bar that users see when editing text) exposes the location of the keyboard focus for assistive technology. The system caret can be placed anywhere on the

screen and made any shape or size. It can also be made invisible and moved to indicate the keyboard focus location for the benefit of other applications without disturbing what the user sees on the screen. The system caret should be sized and positioned to cover the screen element's bounding rectangle, so that screen magnification tools can zoom in on any part of the complete object. This helps the user look for an object's label or judge its size, and it enables utilities to highlight the object that has the keyboard focus.

2. The application should provide programmatic access to all textual content and all text attributes.
3. The application associates a unique, meaningful title (and a description, if needed) with frames, objects, windows, and Web pages to facilitate identification and navigation.
4. The description associated with a frame, object, window, or Web page gives the purpose of the item and explains how that item relates to other items. (A description is necessary only if the purpose and relationship is not clear from the title alone.)
5. Vector drawings and elements have title and desc tags. The alternative text is reused as graphics.
6. The application should provide a mechanism by which the user can view headers (row and column) for each cell in a table.

J.3.7 Application Help

The help system of an Office Open XML system should also be accessible. In addition, developers should do everything possible to make access to a help system as easy possible. Advanced methods for achieving this include providing direct access to help topics via any features in the UI. Searchable help systems tend to be

J.4 Best Practices for Document and Template Authors

When generating documents and templates based on Office Open XML, there are a set of best practices that should be followed to best make use of the structure implicit in Office Open XML. The following paragraphs describe these practices. These practices are not necessarily the only way to enhance each scenario.

J.4.1 Understanding the Type of Document

The first step in being able to consume a document is to understand the type of document one will be consuming. Office Open XML supports three primary types of documents: documents, presentations and spreadsheets. The type of document is determined programmatically by looking at the content type of the start part.

The first step in getting the content type is to identify the target part of the 'officedocument' relationship. To do this, one needs to start in the `_rels\rels` file and identify the relationship of type `http://purl.oclc.org/ooxml/officeDocument/relationships/officeDocument`:

```

<Relationships
xmlns="http://schemas.openxmlformats.org/package/2006/relationships">
  <Relationship Id="rId3"

Type="http://purl.oclc.org/ooxml/officeDocument/relationships/extendedProperties"
    Target="docProps/app.xml"/>
  <Relationship Id="rId2"

Type="http://schemas.openxmlformats.org/package/2006/relationships/metadata/core-properties"
    Target="docProps/core.xml"/>
  <Relationship Id="rId1"

Type="http://purl.oclc.org/ooxml/officeDocument/relationships/officeDocument"
    Target="word/document.xml"/>
</Relationships>

```

Then, given the target of that relationship, in this case “word/document.xml,” the [Content_Types].xml file is used to look up the content type for this target. Given the following [Content_Types].xml file,

```

<Types xmlns="http://schemas.openxmlformats.org/package/2006/content-types">
  <Default Extension="rels" ContentType="application/vnd.openxmlformats-package.relationships+xml"/>
  <Default Extension="xml" ContentType="application/xml"/>
  <Override PartName="/word/document.xml"
    ContentType="application/vnd.openxmlformats-officedocument.wordprocessingml.document.main+xml"/>
  <Override PartName="/word/styles.xml"
    ContentType="application/vnd.openxmlformats-officedocument.wordprocessingml.styles+xml"/>
  <Override PartName="/docProps/app.xml"
    ContentType="application/vnd.openxmlformats-officedocument.extended-properties+xml"/>
  <Override PartName="/word/settings.xml"
    ContentType="application/vnd.openxmlformats-officedocument.wordprocessingml.settings+xml"/>
  <Override PartName="/word/theme/theme1.xml"
    ContentType="application/vnd.openxmlformats-officedocument.theme+xml"/>
  <Override PartName="/word/fontTable.xml"
    ContentType="application/vnd.openxmlformats-officedocument.wordprocessingml.fontTable+xml"/>

```

```

    <Override PartName="/word/webSettings.xml"
      ContentType="application/vnd.openxmlformats-
officedocument.wordprocessingml.webSettings+xml"/>
    <Override PartName="/docProps/core.xml"
      ContentType="application/vnd.openxmlformats-package.core-
properties+xml"/>
  </Types>

```

The content type is `application/vnd.openxmlformats-officedocument.wordprocessingml.document.main+xml`, which tells us that the file is a document file.

J.4.2 Understanding the Function of a Document

With the understanding that it is a futile exercise to attempt to categorize every type of document function, Office Open XML leaves it to developers, and document authors, to generate functionally-specific templates for use by themselves and others. It is in this spirit that the function of most documents can be hinted at by looking at the template used.

Consider a presentation is created using a template for 2008 External Pitch Books. By examining the application properties part (`\docProps\appdata.xml`), one can find the template element that defines the template used to create the presentation.

For example, the previously mentioned presentation's `appdata` would look like this:

```

<Properties xmlns =
  "http://purl.oclc.org/ooxml/officeDocument/extendedProperties"
  xmlns:vt =
    "http://purl.oclc.org/ooxml/officeDocument/docPropsVTypes">
  <Template>2008 External Pitch Book</Template>
  <TotalTime>0</TotalTime>
  <Words>4</Words>
  ...
</Properties>

```

By leveraging the template property in this way, developers and document authors have the flexibility to define the taxonomy of document functionalities that suits their particular needs.

It is worth pointing out that there are other mechanisms that can be used to evaluate the function of a document. An additional method would be to add a custom document property. The XML below adds a new property called "Document Function" in the `custom.xml` part that specifies the function of the current document.


```

<Properties
xmlns="http://purl.oclc.org/ooxml/officeDocument/customProperties"
xmlns:vt="http://purl.oclc.org/ooxml/officeDocument/docPropsVTypes">
  <property fmtid="{D5CDD505-2E9C-101B-9397-08002B2CF9AE}" pid="2"
    name="Document Function">
    <vt:lpwstr>Quarterly Sales Report</vt:lpwstr>
  </property>
</Properties>

```

J.4.3 Understanding the Length of a Document

Similarly, the length of a document is easy to ascertain using simple document properties. For a simple presentation, the Slides element in appdata.xml describes the number of slides in a presentation.

```

<Properties
xmlns="http://purl.oclc.org/ooxml/officeDocument/extendedProperties"
xmlns:vt="http://purl.oclc.org/ooxml/officeDocument/docPropsVTypes">
  <TotalTime>0</TotalTime>
  <Words>0</Words>
  <Application>Microsoft Office PowerPoint</Application>
  <PresentationFormat>On-screen Show (4:3)</PresentationFormat>
  <Paragraphs>0</Paragraphs>
  <Slides>21</Slides>
  <Notes>0</Notes>
  ...
</Properties>

```

Similar metrics for lengths of documents can be found for both documents and spreadsheets. Documents, for example, can express their lengths in a variety of ways, including, but not limited to, the number of pages, the number of words and even the number of characters.

```

<Properties
xmlns="http://purl.oclc.org/ooxml/officeDocument/extendedProperties"
xmlns:vt="http://purl.oclc.org/ooxml/officeDocument/docPropsVTypes">
  <Template>Disposition of Comment Template</Template>
  <TotalTime>0</TotalTime>
  <Pages>5</Pages>
  <Words>413</Words>
  <Characters>2356</Characters>
  ...
</Properties>

```

Higher-order constructs can also be used to denote length like the number of sections in documents, the number of slides in a custom show in presentations and the number of worksheets in spreadsheets.

Additionally, implementers of Office Open XML documents are allowed to provide their own set of length metrics by way of custom properties.

J.4.4 Understanding the Important Parts in a Document

Again, given the variety of documents that are created, it would be futile to create a structure that all documents need to fit into. Hence, it is recommended that the most effective way for developers to identify important parts of a document is based on common primitives in ECMA-376.

A prime example of this would be identifying the titles of each slide. Each slide can have a title placeholder that, generally, represents the title for that particular slide. The title itself is easily accessed by looking for the title placeholder in slide.xml.

By looking into the current slide's shape tree, one can evaluate each shape's non-visual properties to see which shape is the title placeholder:

```
<p:spTree>
  <p:nvGrpSpPr>...</p:nvGrpSpPr>
  <p:grpSpPr>...</p:grpSpPr>
  <p:sp>
    <p:nvSpPr>
      <p:cNvPr id="2" name="Title 1"/>
      <p:cNvSpPr>
        <a:spLocks noGrp="1"/>
      </p:cNvSpPr>
      <p:nvPr>
        <p:ph type="ctrTitle"/>
      </p:nvPr>
    </p:nvSpPr>
    <p:spPr/>
    <p:txBody>
      <a:bodyPr/>
      <a:lstStyle/>
      <a:p>
        <a:r>
          <a:rPr lang="en-US" dirty="0" smtClean="0"/>
          <a:t>Strategic Initiatives for Growth</a:t>
        </a:r>
        <a:endParaRPr lang="en-US" dirty="0"/>
      </a:p>
    </p:txBody>
  </p:sp>
  ...
</p:/spTree>
```

A similar approach can be used to identify which shapes on a slide are placeholders versus floating objects, or even which shapes on a slide are shapes which contain text and those which are shapes that don't contain text.

J.4.5 Understanding the Organization of a Table via Table Headings

Tables are an often-seen element of many documents. As tables become more complex, with multi-level headers, they can become unreadable to certain customers if multi-level headings are not supported in the document. Fortunately, Office Open XML does support multi-level headings.

Consider the following table:

(H1) Married filing jointly and you have -		
(H2) No Children	(H3) One Child	(H4) Two Children
(H5) Your Credit Is-		
\$100	\$200	\$400

The mark-up for such a table would be as follows:

```
...
<w:tr>
  <w:tc w:id= "H1">
    <w:tcPr>
      <w:colSpan w:val="3"/>
    </w:tcPr>
    <w:p>
      <w:r>
        <w:t>Married filing jointly and you have -</w:t>
      </w:r>
    </w:p>
  </w:tc>
</w:tr>

<w:tr>
  <w:tc w:id= "H2">
    <w:tcPr>
      <w:headers>
        <w:header w:val="H1"/>
      </w:headers>
    </w:tcPr>
```

```

    <w:p>
      <w:r>
        <w:t>No Children</w:t>
      </w:r>
    </w:p>
  </w:tc>

  <w:tc w:id= "H3">
    <w:tcPr>
      <w:headers>
        <w:header w:val="H1"/>
      </w:headers>
    </w:tcPr>
    <w:p>
      <w:r>
        <w:t>One Child</w:t>
      </w:r>
    </w:p>
  </w:tc>

  <w:tc w:id= "H4">
    <w:tcPr>
      <w:headers>
        <w:header w:val="H1"/>
      </w:headers>
    </w:tcPr>
    <w:p>
      <w:r>
        <w:t>Two Children</w:t>
      </w:r>
    </w:p>
  </w:tc>
</w:tr>

<w:tr>
  <w:tc w:id= "H5">
    <w:tcPr>
      <w:colSpan w:val="3"/>
    </w:tcPr>
    <w:p>
      <w:r>
        <w:t>Married filing jointly and you have -</w:t>
      </w:r>

```

```

    </w:p>
  </w:tc>
</w:tr>

<w:tr>
  <w:tc w:id= "H2">
    <w:tcPr>
      <w:headers>
        <w:header w:val="H1"/>
        <w:header w:val="H2"/>
        <w:header w:val="H5"/>
      </w:headers>
    </w:tcPr>
    <w:p>
      <w:r>

        <w:t>$100</w:t>
      </w:r>
    </w:p>
  </w:tc>

  <w:tc w:id= "H3">
    <w:tcPr>
      <w:headers>
        <w:header w:val="H1"/>
        <w:header w:val="H3"/>
        <w:header w:val="H5"/>
      </w:headers>
    </w:tcPr>
    <w:p>
      <w:r>
        <w:t>One Child</w:t>
      </w:r>
    </w:p>
  </w:tc>

  <w:tc w:id= "H4">
    <w:tcPr>
      <w:headers>
        <w:header w:val="H1"/>
        <w:header w:val="H4"/>
        <w:header w:val="H5"/>
      </w:headers>

```

```

    </w:tcPr>
    <w:p>
      <w:r>
        <w:t>Two Children</w:t>
      </w:r>
    </w:p>
  </w:tc>
</w:tr>

```

The cell with \$200 declares three headers:

H1 – Married filing jointly and you have -

H3 – One Child

H5 – Your Credit Is-

J.4.6 Delivering Predictable Navigation within Forms

Although it is often the case that navigating documents is simple by virtual of the natural flow of documents, it can become complex in the case of forms being found in the document. It is highly desirable for document and template authors to define those forms such that the navigation from control to control is both intelligent and predictable. Office Open XML provides a mechanism for defining the navigation flow (also known as tab order) for such controls.

Consider part of a well known form:

<p>1. Number of qualifying children: _____ × \$1,000. Enter the result.</p>	<table border="1"> <tr> <td>1</td> <td></td> </tr> </table>	1	
1			

The following mark up can be used to make the form controls on that line accessible:

```

<w:p>
  <w:sdt>
    <w:sdtPr>
      <w:id w:val="1" />
    </w:sdtPr>
    <w:sdtContent>
      <w:sdt>
        <w:sdtPr>
          <w:id w:val="2" />
        </w:sdtPr>
        <w:sdtContent>
          <w:r>
            <w:t>Number of qualifying children:</w:t>

```

```

        </w:r>
    </w:sdtContent>
</w:sdt>
...
<w:r>
    ...
    <w:fldChar w:fldCharType="begin">
        <w:ffData>
            <w:name w:val="NumberOfChildren" />
            <w:enabled />
            ...
            <w:textInput />
            <w:label w:val="2" />
            <w:tabIndex w:val="1" />
        </w:ffData>
    </w:fldChar>
</w:r>
...
<w:r>
    <w:t xml:space="preserve"> X $1,000</w:t>
</w:r>
</w:sdtContent>
</w:sdt>
</w:p>
<w:p>
    ...
    <w:sdt>
        <w:sdtPr>
            <w:id w:val="3" />
        </w:sdtPr>
        <w:sdtContent>
            <w:r>
                <w:t>Enter the result</w:t>
            </w:r>
        </w:sdtContent>
    </w:sdt>
</w:p>
<w:tbl>
    ...
    <w:sdt>
        <w:sdtPr>
            <w:id w:val="4" />
        </w:sdtPr>

```

```

<w:sdtContent>
  <w:tr>
    ...
    <w:tc>
      ...
      <w:p>
        <w:r>
          <w:t>1</w:t>
        </w:r>
      </w:p>
    </w:tc>
    <w:tc>
      ...
      <w:p>
        <w:r>
          <w:fldChar w:fldCharType="begin">
            <w:ffData>
              <w:name w:val="Line1Value" />
              <w:enabled />
              ...
              <w:textInput />
              <w:label w:val="1" />
              <w:label w:val="3" />
              <w:tabIndex w:val="2" />
            </w:ffData>
          </w:fldChar>
        </w:r>
        ...
      </w:p>
    </w:tc>
  </w:tr>
</w:sdtContent>
</w:sdt>
</w:tbl>

```

The first line of this form is broken up into two Form Text Fields and four content controls that are used as labels. The Form Text Field with a name of NumberOfChildren is associated in terms of its label with the content control that has an id value of 2. In this case, the Form Text Field with a name of NumberOfChildren has a label of Number of qualifying children:. According to the tabIndex element the first Form Text Field is navigated first.

J.4.7 Hierarchical Labels in Content Controls

It is often the case that content controls, for example, are used together such that they create hierarchical relationships. Labels can, and should be used, to clarify exactly what the intent is for each content control.

Consider the following collection of content controls:

Sender:

Home Address:

Address 1: 1 Cherry Lane

```
<w:p>
  <w:sdt>
    <w:sdtPr>
      <w:id w:val="55303308"/>
      <w:text/>
    </w:sdtPr>
    <w:sdtContent>
      <w:r>
        <w:t>Sender</w:t>
      </w:r>
    </w:sdtContent>
  </w:sdt>
  <w:r>
    <w:t>:</w:t>
  </w:r>
</w:p>
<w:p>
  <w:sdt>
    <w:sdtPr>
      <w:id w:val="55303309"/>
      <w:text/>
    </w:sdtPr>
    <w:sdtContent>
      <w:r>
        <w:t>Home Address</w:t>
      </w:r>
    </w:sdtContent>
  </w:sdt>
  <w:r>
    <w:t>:</w:t>
  </w:r>
```

```

</w:p>
<w:p>
  <w:r>
    <w:tab/>
  </w:r>
  <w:sdt>
    <w:sdtPr>
      <w:id w:val="55303310"/>
      <w:text/>
    </w:sdtPr>
    <w:sdtContent>
      <w:r>
        <w:t>Address 1</w:t>
      </w:r>
    </w:sdtContent>
  </w:sdt>
  <w:r>
    <w:t>:</w:t>
  </w:r>
  <w:r>
    <w:tab/>
  </w:r>
  <w:sdt>
    <w:sdtPr>
      <w:id w:val="55303307"/>
      <w:label w:val="55303308"/>
      <w:label w:val="55303309"/>
      <w:label w:val="55303310"/>
    </w:sdtPr>
    <w:sdtContent>
      <w:r>
        <w:t>1 Cherry Lane</w:t>
      </w:r>
    </w:sdtContent>
  </w:sdt>
</w:p>

```

In this example there are three controls: one for the sender, one for home address and one for the first line of the address. The labels are nested, from most generic to most specific.

J.5 Best Practices for Customers of Office Open XML Implementations

J.5.1 Using Common Accessibility Features

This version of the Office Open XML specification contains a rich set of primitives to expose additional and/or alternative data for many objects that can be included in such documents. Customers are encouraged to make sure of each of these when possible.

It is acknowledged that there are consistency issues with these primitives; generating consistency will be handled by way of maintenance.

J.5.1.1 VML Objects

Even when working with VML objects, customers of the Office Open XML specification can ensure that their documents take advantage of common accessibility features such as captions and long descriptions.

Consider the camera feature in SpreadsheetML. Although the camera is implemented using VML, customers can still assign captions and descriptions.

```
<v:shape id="_x0000_s1025" type="#_x0000_t75" alt="A camera object goes
here"
  title="Stock Sales" style='position:absolute;margin-left:237.75pt;margin-
top:79.5pt;width:96.75pt;
  height:45.75pt;z-index:1' filled="t" fillcolor="white [9]" stroked="t"
  strokecolor="windowText [64]" o:insetmode="auto">
<v:imagedata o:relid="rId1" o:title=""/>
<x:ClientData ObjectType="Pict">
  <x:SizeWithCells/>
  <x:Anchor> 4, 61, 5, 6, 6, 62, 8, 7</x:Anchor>
  <x:FmlaPict>$A$1:$B$3</x:FmlaPict>
  <x:CF>Pict</x:CF>
  <x:AutoPict/>
  <x:Camera/>
</x:ClientData>
</v:shape>
```

In the above mark up, the title attribute plays the traditional role of caption and the alt attribute plays the traditional role of long description.

J.5.1.2 External MLs

In situations where customers find themselves adding content to their documents using MLs that are not part of Office Open XML, they can still take advantage of the built-in accessibility primitives.

Consider the case where the customer elects to embed some external mark-up on a slide via the contentPart.

```

<p:spTree>
  ...
  <p:grpSp>
    <p:nvGrpSpPr>
      <p:cNvPr id="5" name="Group 4" descr="This object contains the math
equations, expressed as MathML, that dictate water flow over the surface of
the vehicle."
        title="Waterflow Equation"/>
      <p:cNvGrpSpPr/>
    <p:nvPr/>
  </p:nvGrpSpPr>
  <p:grpSpPr>...</p:grpSpPr>
  <p:contentPart r:id="smil01">...</p:contentPart>
</p:grpSp>
</p:spTree>

```

J.5.2 Using Explicit Structure When Possible

When authoring long or complex documents, structure can substantially improve the consumption experience for all readers. This is particularly true for those readers who make use of our accessibility features. For these readers, it is highly recommended that customers make use of many of the built-in document structure primitives found in Office Open XML.

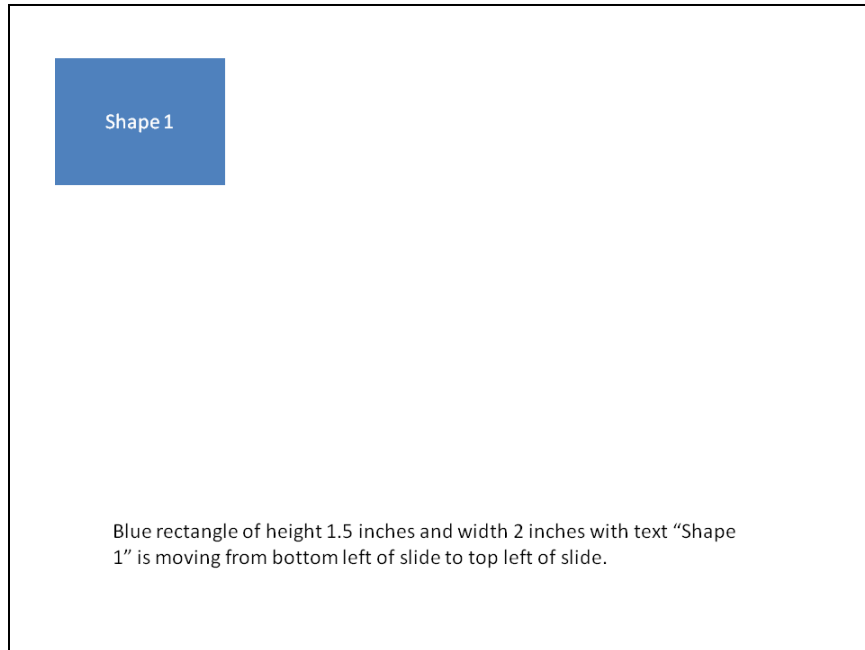
Examples of such primitives include page and section breaks, lists, headings, headers and footers and even frames.

J.5.3 Creating Accessible Animations

An Office Open XML-recommended approach for providing text equivalents for animations is to create a separate text box for each animation. Each text box should contain the desired closed caption for the animation. The exact specifics would naturally be left to the document author, but could include information such as a description of the object being animated, the type of animation, the visual effects, etc.

The text boxes that contain the text equivalent per animation would be arranged on the slide in a desired location; using the closed captioning model, centered along the bottom third of the screen is a standard example. Once positioned properly, the text boxes would be put on the animation timeline along with their animation, such that they appear when the animation starts and that they disappear when the animation concludes.

Consider a shape that is set to move vertically along the left-hand side of the slide. To provide a text equivalent for this animation, I would add a text box for the move animation. The slide may look like this:



In this scenario, there are two shapes on the slide, which will be animated. Both of these shapes can be found in the slide’s shape tree:

```
<p:spTree>
  <p:nvGrpSpPr>...</p:nvGrpSpPr>
  <p:grpSpPr>...</p:grpSpPr>
  <p:sp>
    <p:nvSpPr>
      <p:cNvPr id="5" name="Rectangle 4" descr="Blue rectangle of height
1.5 inches and width 2 inches with text “Shape 1”"
title="Blue Rectangle"/>
      <p:cNvSpPr/>
      <p:nvPr/>
    </p:nvSpPr>
    <p:spPr>
      <a:xfrm>...</a:xfrm>
      <a:prstGeom prst="rect"><a:avLst/></a:prstGeom>
      ...
    </p:spPr>
    <p:style>...</p:style>
    <p:txBody>
      ...
      <a:p>
        <a:pPr align="ctr"/>
        <a:r>
```

```

        <a:rPr lang="en-US" dirty="0" smtClean="0"/>
            <a:t>Shape 1</a:t>
        </a:r>
    <a:endParaRPr lang="en-US" dirty="0"/>
</a:p>
</p:txBody>
</p:sp>
<p:sp>
    <p:nvSpPr>
        <p:cNvPr id="8" name="TextBox 7" descr="Caption for
animations: Blue rectangle of height 1.5 inches and width 2 inches with
text "Shape 1" is moving from bottom left of slide to top left of slide
while fading in over 3 seconds."
        title="Animation Close Caption"/>
        <p:cNvSpPr txBox="1"/>
        <p:nvPr/>
    </p:nvSpPr>
    <p:spPr>
        <a:xfrm>...</a:xfrm>
        <a:prstGeom prst="rect"><a:avLst/></a:prstGeom>
        <a:noFill/>
    </p:spPr>
    <p:txBody>
        <a:bodyPr wrap="square" rtlCol="0">
            <a:spAutoFit/>
        </a:bodyPr>
        <a:lstStyle/>
        <a:p>
            <a:r>
                <a:rPr lang="en-US" dirty="0" smtClean="0"/>
                <a:t>Blue rectangle of height 1.5 inches and width 2 inches
with text "Shape 1" is moving from bottom left of slide to top left of
slide.</a:t>
            </a:r>
            <a:endParaRPr lang="en-US" dirty="0" smtClean="0"/>
        </a:p>
    </p:txBody>
</p:sp>
</p:spTree>

```

As the shape tree above shows, the animating shape has a shape ID of 5 and the closed caption text box has a shape ID of 8. With both shapes in the shape tree, they can be added to the slide timeline.

```

<p:timing>
...
<p:bldLst>
  <p:bldP spid="5" grpId="0" animBg="1"/>
  <p:bldP spid="8" grpId="1"/>
  <p:bldP spid="8" grpId="2"/>
</p:bldLst>
</p:timing>

```

There are three build steps in the timeline:

Animate the shape (move across the slide)

Animate the text box (appear)

Animation the text box (disappear)

This approach can be used in even more complex animations by reusing the general principle of associating a text box per animation.

J.5.4 Specifying Language to Enable Accessibility Tools

It is incredibly important for customers to always specify which language is being used to author a document. The rationale behind this is that speech synthesizers and Braille devices can automatically switch to the new language, making the document more accessible to multilingual users.

when an Office Open XML document uses different languages for text, a clear identification of the language used and its country is provided. The <w:lang/> tag is generated which indicates the language used in the paragraph and run.

```

<w:p>
  <w:r w:rsidR="0008256F">
    <w:t xml:space="preserve">multiple languages like </w:t>
  </w:r>
  <w:r w:rsidR="0008256F">
    <w:t>شفتنلا هو سشعیه شفتنلا هس</w:t>
  </w:r>
  <w:r w:rsidR="0008256F">
    <w:rPr>
      <w:rFonts w:hint="cs"/>
      <w:rtl/>
      <w:lang w:bidl="ar-DZ"/>
    </w:rPr>
    <w:t>شفتنلا هو شملتقش</w:t>
  </w:r>

```

```

<w:r w:rsidR="0008256F">
  <w:rPr>
    <w:rFonts w:hint="cs"/>
    <w:rtl/>
    <w:lang w:bidl="ar-EG"/>
  </w:rPr>
  <w:t>شفتىلا هو تلغف</w:t>
</w:r>
</w:p>

```

J.5.5 Using Styles when Possible

Although most people associate styles usage only with the goal of making a document look visually appealing, they can also be of particular use for those readers who are trying to read documents. If a customer authors a document such that it uses styles, the transform a reader can do to accommodate a visual impairment is substantially easier than the transform required for documents not based on a style: in the style case, a styles optimized for visual impaired readers can be quickly applied; in the non-style case, extensive direct formatting of the document must be done by the reader.

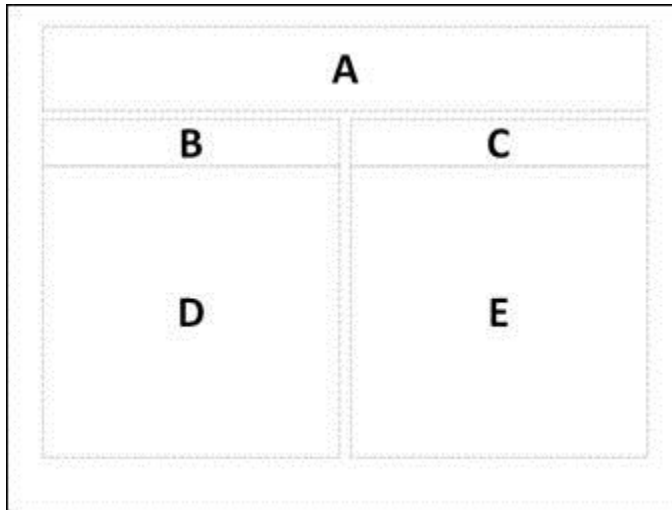
J.5.6 Techniques for Improving Document Navigation

It is highly desirable for customers to author their documents in such a way that there is predictability in terms of navigation. The following describes the techniques that the customer can use to make use built-in primitives in Office Open XML, as well as how such techniques change the underlying document data, to achieve the desired outcome.

J.5.6.1 Navigating Shapes on Slides

In cases where a reader is navigating slides, navigation is complicated by the 2D-nature of the slide. Office Open XML provides a remedy for this by allowing customers to define the reading order, or navigation order, of shapes on a slide through the use of z-order.

Consider the case that a presentation author elects to construct a slide that contains five placeholders: one for the title (A) , two for list headings (B, C) and two lists (D, E). Visually, this could be represented as follows:



Further, suppose that the default tab order (aka reading order) for such a slide, in a LTR-orientation, is A, B, D, C, E.

In DrawingML, this ordering is accomplished by the lexical ordering of the five shapes, A – E. In the shape tree for this slide, you would see this:

```
<p:spTree>
  <p:nvGrpSpPr>...</p:nvGrpSpPr>
  <p:grpSpPr>...</p:grpSpPr>
  <p:sp>
    ...
    <p:txBody>...
      <a:r>
        <a:rPr lang="en-US" sz="4800" b="1" dirty="0" smtClean="0"/>
        <a:t>A</a:t>
      </a:r>...
    </p:txBody>
  </p:sp>
  <p:sp>
    ...
    <p:txBody>...
      <a:r>
        <a:rPr lang="en-US" sz="4800" dirty="0" smtClean="0"/>
        <a:t>B</a:t>
      </a:r>...
    </p:txBody>
  </p:sp>
  <p:sp>
```

```

...
<p:txBody>...
  <a:r>
    <a:rPr lang="en-US" sz="4800" b="1" dirty="0" smtClean="0"/>
    <a:t>D</a:t>
  </a:r>...
</p:txBody>
</p:sp>
<p:sp>
  ...
  <p:txBody>...
    <a:r>
      <a:rPr lang="en-US" sz="4800" dirty="0" smtClean="0"/>
      <a:t>C</a:t>
    </a:r>...
  </p:txBody>
</p:sp>
<p:sp>
  ...
  <p:txBody>...
    <a:r>
      <a:rPr lang="en-US" sz="4800" b="1" dirty="0" smtClean="0"/>
      <a:t>E</a:t>
    </a:r>...
  </p:txBody>
</p:sp>
</p:spTree>

```

If this default reading order was not what the presentation author preferred, the author could specify the z-order for each shape to determine the ordering of the shapes in the shape tree, and by extension, the ordering that shapes would be read in the presentation. The shapes will show up in the shape tree starting with the shape farthest “back” and ending with the shape in the “front.”

Using our example above, if the author wanted to change the ordering of the shapes to facilitate a more RTL-like reading order (A, C, E, B, D), she could select shape E and send it to the back, then select shape C and send it to the back and finally select shape A and send it to the back. Naturally the user experience here is arbitrary; the important aspect is that the ordering of the shapes within the shape tree is changed to the preferred reading order. With these three changes, the shape tree is changed to this:

```

<p:spTree>
  <p:nvGrpSpPr>...</p:nvGrpSpPr>
  <p:grpSpPr>...</p:grpSpPr>
  <p:sp>
    ...

```

```

<p:txBody>...
  <a:r>
    <a:rPr lang="en-US" sz="4800" b="1" dirty="0" smtClean="0"/>
    <a:t>A</a:t>
  </a:r>...
</p:txBody>
</p:sp>
<p:sp>
...
<p:txBody>...
  <a:r>
    <a:rPr lang="en-US" sz="4800" dirty="0" smtClean="0"/>
    <a:t>C</a:t>
  </a:r>...
</p:txBody>
</p:sp>
<p:sp>
...
<p:txBody>...
  <a:r>
    <a:rPr lang="en-US" sz="4800" b="1" dirty="0" smtClean="0"/>
    <a:t>E</a:t>
  </a:r>...
</p:txBody>
</p:sp>
<p:sp>
...
<p:txBody>...
  <a:r>
    <a:rPr lang="en-US" sz="4800" dirty="0" smtClean="0"/>
    <a:t>B</a:t>
  </a:r>...
</p:txBody>
</p:sp>
<p:sp>
...
<p:txBody>...
  <a:r>
    <a:rPr lang="en-US" sz="4800" b="1" dirty="0" smtClean="0"/>
    <a:t>D</a:t>
  </a:r>...
</p:txBody>
</p:sp>

```

</p:spTree>

J.5.7 Creating Image Map-Like Functionality

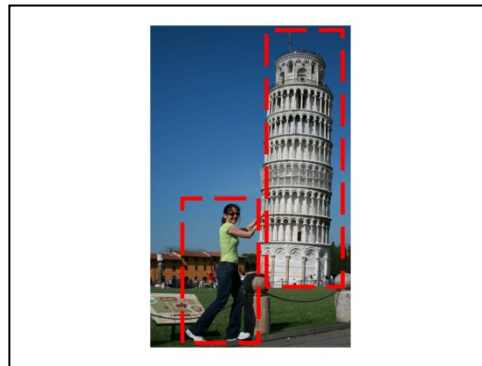
Although Office Open XML does not natively support image maps via a specific tag, the technology contained within Office Open XML can be used to deliver image map-like functionality. In short, to deliver image map-like functionality, four components are needed: an object to “map,” a clickable region, hit testing and a hyperlink.

By using an image as the object to be “mapped,” one can position no-fill, no-line DrawingML shapes over that image to define the clickable regions as well as to provide hit testing. It is often suggested that the shapes be grouped with the object, although that is not strictly required. A hyperlink per shape can be used to provide the actual hyperlink itself.

Consider the case where a slide has a picture that includes two objects, and the author wants to provide image map-like functionality. She can position shapes “over” the picture to get the desired functionality. This construction appears as follows:



Image file to be “mapped”



Shapes positioned over interactive areas

The following XML shows the three shapes in the shape tree: one for the image and two, one for each of the shapes that are positioned over the image.

```
<p:spTree>
  <p:nvGrpSpPr>
    <p:cNvPr id="1" name=""/>
    <p:cNvGrpSpPr/>
    <p:nvPr/>
  </p:nvGrpSpPr>
  <p:grpSpPr>
    <a:xfrm>...</a:xfrm>
    </p:grpSpPr>
    // This represents the “mapped” object
    <p:pic>
      <p:nvPicPr>
```

```

<p:cNvPr id="4" name="Picture 3" descr="A picture from our 2007 trip to
Pisa, Italy" title="Classic Pisa"/>
<p:cNvPicPr>...</p:cNvPicPr>
<p:nvPr/>
</p:nvPicPr>
<p:blipFill>
// The rel ID refers to the image that makes up the object
<a:blip r:embed="rId2"/>
<a:stretch><a:fillRect/></a:stretch>
</p:blipFill>
<p:spPr>...</p:spPr>
</p:pic>
// This represents the first shape positioned over the one of the
// "mapped" regions of object above.
<p:sp>
<p:nvSpPr>
// The hyperlink contains both the tooltip that provides
// hit-testing feedback is defined in the tooltip attribute;
// the hyperlink is defined by the relationship ID attribute.
<p:cNvPr id="5" name="Rectangle 4" descr="Rachel">
<a:hlinkClick r:id="rId3" tooltip="More information about Rachel"/>
</p:cNvPr>
<p:cNvSpPr/>
<p:nvPr/>
</p:nvSpPr>
<p:spPr>
<a:xfrm>...</a:xfrm>...
// The shapes to trigger the hyperlink and hit testing
// have no fill and no line applied to them.
<a:noFill/>
<a:ln><a:noFill/></a:ln>
</p:spPr>
<p:style>...</p:style>
<p:txBody>...</p:txBody>
</p:sp>
// This is the second shape positioned over the picture to provide hit
testing and hyperlink behavior
<p:sp>...
</p:sp>
</p:spTree>

```

```

<Relationships
xmlns="http://schemas.openxmlformats.org/package/2006/relationships">
  <Relationship Id="rId3"
Type="http://purl.oclc.org/ooxml/officeDocument/relationships/hyperlink"
Target="http://url2/" TargetMode="External"/>
  <Relationship Id="rId2"
Type="http://purl.oclc.org/ooxml/officeDocument/relationships/image"
Target="../media/image1.jpeg"/>
  <Relationship Id="rId1"
Type="http://purl.oclc.org/ooxml/officeDocument/relationships/slideLayout"
Target="../slideLayouts/slideLayout7.xml"/>
  <Relationship Id="rId4"
Type="http://purl.oclc.org/ooxml/officeDocument/relationships/hyperlink"
Target="http://url1/" TargetMode="External"/>
</Relationships>

```

J.5.8 Tables

There are two types of tables in Office Open XML: tables stored as WordprocessingML and tables stored as DrawingML. Both tables enable customers to provide captions and descriptions for their tables. Customers are strongly encouraged to ensure that all tables contain both captions and descriptions.

J.5.8.1 Using Captions and Long Descriptions in WordprocessingML Tables

Consider a simple table that contains both captions and long descriptions.

```

<w:body>
  <w:tbl>
    <w:tblPr>
      <w:tblStyle w:val="TableGrid"/>
      <w:tblW w:w="0" w:type="auto"/>
      <w:tblLook w:firstRow="true" w:firstColumn="true"
        w:noVBand="true"/>
      <w:tblCaption w:val="2004 Figures"/>
      <w:tblDescription w:val="This table shows that sales figure have been
rising for the past five quarters."/>
    </w:tblPr>
    ...
  </w:tbl>
  ...
</w:body>

```

J.5.8.2 Using Captions and Long Descriptions in DrawingML Tables

Consider a simple table that contains both captions and long descriptions.

```

<p:graphicFrame>
  <p:nvGraphicFramePr>
    <p:cNvPr id="4" name="Table 3" title="2004 Figures"
      descr="This table shows that sales figures have been rising for the
past five quarters."/>
    ...
  </p:nvGraphicFramePr>
  <p:xfrm>...</p:xfrm>
  <a:graphic>
    <a:graphicData uri="...">
      <a:tbl>
        ...
      </a:tbl>
    ...
  </a:graphicData>
</a:graphic>
</p:graphicFrame>

```

End informative annex.

Annex K. (informative) Root Element Locations

This clause is informative.

This clause provides the location of each part's root element (as identified in §16) within the set of normative XML Schema files provided in Annex A, based on both its part name and its XML Schema:

K.1 Grouped by Part Name

Part	Schema	Element Name
DrawingML Chart	dml-chart.xsd	chartSpace
DrawingML Chart Drawing	dml-chart.xsd	userShapes
DrawingML Diagram Colors	dml-diagram.xsd	colorsDef
DrawingML Diagram Data	dml-diagram.xsd	dataModel
DrawingML Diagram Layout Definition	dml-diagram.xsd	layoutDef
DrawingML Diagram Style	dml-diagram.xsd	styleDef
DrawingML Table Styles	dml-main.xsd	tblStyleLst
DrawingML Theme	dml-main.xsd	theme
DrawingML Theme Override	dml-main.xsd	themeOverride

Part	Schema	Element Name
PresentationML Comment Authors	pml.xsd	cmAuthorLst
PresentationML Comments	pml.xsd	cmLst
PresentationML Handout Master	pml.xsd	handoutMaster
PresentationML Notes Master	pml.xsd	notesMaster
PresentationML Notes Slide	pml.xsd	notes
PresentationML Presentation	pml.xsd	presentation
PresentationML Presentation Properties	pml.xsd	presentationPr
PresentationML Slide	pml.xsd	sld
PresentationML Slide Layout	pml.xsd	sldLayout

Part	Schema	Element Name
PresentationML Slide Master	pml.xsd	sldMaster
PresentationML Slide Synchronization Data	pml.xsd	sldSyncPr
PresentationML User-Defined Tags	pml.xsd	tagLst
PresentationML View Properties	pml.xsd	viewPr

Part	Schema	Element
Shared Additional Characteristics	shared-additionalCharacteristics.xsd	additionalCharact eristics
Shared Extended File Properties	shared- documentPropertiesExtended.xsd	Properties
Shared Bibliography	shared-bibliography.xsd	Sources
Shared Custom File Properties	shared- documentPropertiesCustom.xsd	Properties
Shared Custom XML Data Storage Properties	shared-customXmlDataProperties.xsd	datastoreItem

Part	Schema	Element Name
SpreadsheetML Calculation Chain	sml.xsd	calcChain
SpreadsheetML Chartsheet	sml.xsd	chartsheet
SpreadsheetML Comments	sml.xsd	comments
SpreadsheetML Connections	sml.xsd	connections
SpreadsheetML Custom XML Mappings	sml.xsd	MapInfo
SpreadsheetML Dialogsheet	sml.xsd	dialogsheets
SpreadsheetML Drawing	dml-spreadsheetDrawing.xsd	wsDr
SpreadsheetML External Workbook References	sml.xsd	externalLink
SpreadsheetML Metadata	sml.xsd	metadata
SpreadsheetML Pivot Table	sml.xsd	pivotTableDefinitio n
SpreadsheetML Pivot Table Cache Definition	sml.xsd	pivotCacheDefinitio n
SpreadsheetML Pivot Table Cache Records	sml.xsd	pivotCacheRecords
SpreadsheetML Query Table	sml.xsd	queryTable
SpreadsheetML Shared String Table	sml.xsd	sst

Part	Schema	Element Name
SpreadsheetML Shared Workbook Revision Headers	sml.xsd	header
SpreadsheetML Shared Workbook Revision Log	sml.xsd	revisions
SpreadsheetML Shared Workbook User Data	sml.xsd	users
SpreadsheetML Single Cell Table Definitions	sml.xsd	singleXmlCells
SpreadsheetML Styles	sml.xsd	styleSheet
SpreadsheetML Table Definitions	sml.xsd	table
SpreadsheetML Volatile Dependencies	sml.xsd	volTypes
SpreadsheetML Workbook	sml.xsd	workbook
SpreadsheetML Worksheet	sml.xsd	worksheet

Part	Schema	Element Name
WordprocessingML Comments	wml.xsd	comments
WordprocessingML Document Settings	wml.xsd	settings
WordprocessingML Endnotes	wml.xsd	endnotes
WordprocessingML Font Table	wml.xsd	fonts
WordprocessingML Footer	wml.xsd	fttr
WordprocessingML Footnotes	wml.xsd	footnotes
WordprocessingML Glossary Document	wml.xsd	glossaryDocument
WordprocessingML Header	wml.xsd	hdr
WordprocessingML Mail Merge Recipient Data	wml.xsd	recipientData
WordprocessingML Main Document	wml.xsd	document
WordprocessingML Numbering Definitions	wml.xsd	numbering
WordprocessingML Style Definitions	wml.xsd	styles
WordprocessingML Web Settings	wml.xsd	webSettings

K.2 Grouped by Schema Name

Schema	Part Name	Element
dml-chart.xsd	DrawingML Chart	chartSpace
	DrawingML Chart Drawing	userShapes
dml-diagram.xsd	DrawingML Diagram Colors	colorsDef

Schema	Part Name	Element
	DrawingML Diagram Data	dataModel
	DrawingML Diagram Layout Definition	layoutDef
	DrawingML Diagram Style	styleDef
dml-spreadsheetDrawing.xsd	SpreadsheetML Drawing	wsDr
dml-main.xsd	DrawingML Theme	theme
	DrawingML Theme Override	themeOverride
	DrawingML Table Styles	tblStyleLst

Schema	Part Name	Element
pml.xsd	PresentationML Comment Authors	cmAuthorLst
	PresentationML Comments	cmLst
	PresentationML Presentation	presentation
	PresentationML Presentation Properties	presentationPr
	PresentationML Handout Master	handoutMaster
	PresentationML Notes Master	notesMaster
	PresentationML Notes Slide	notes
	PresentationML Slide	sld
	PresentationML Slide Layout	sldLayout
	PresentationML Slide Master	sldMaster
	PresentationML Slide Synchronization Data	sldSyncPr
	PresentationML User-Defined Tags	tagLst
	PresentationML View Properties	viewPr

Schema	Part Name	Element
shared-additionalCharacteristics.xsd	Shared Additional Characteristics	additionalCharacteristics
shared-bibliography.xsd	Shared Bibliography	Sources
shared-customXmlDataProperties.xsd	Shared Custom XML Data Storage Properties	datastoreItem
shared-documentPropertiesCustom.xsd	Shared Custom File Properties	Properties
shared-documentPropertiesExtended.xsd	Shared Application-Defined File Properties	Properties

Schema	Part Name	Element
sml.xsd	SpreadsheetML Calculation Chain	calcChain
	SpreadsheetML Comments	comments
	SpreadsheetML Custom XML Mappings	MapInfo
	SpreadsheetML Connections	connections
	SpreadsheetML Pivot Table	pivotTableDefinition
	SpreadsheetML Pivot Table Cache Definition	pivotCacheDefinition
	SpreadsheetML Pivot Table Cache Records	pivotCacheRecords
	SpreadsheetML Query Table	queryTable
	SpreadsheetML Shared String Table	sst
	SpreadsheetML Shared Workbook Revision Headers	header
	SpreadsheetML Shared Workbook Revision Log	revisions
	SpreadsheetML Shared Workbook User Data	users
	SpreadsheetML Chartsheet	chartsheet
	SpreadsheetML Dialogsheet	dialogsheet
	SpreadsheetML Worksheet	worksheet
	SpreadsheetML Metadata	metadata
	SpreadsheetML Single Cell Table Definitions	singleXmlCells
	SpreadsheetML Styles	styleSheet
	SpreadsheetML External Workbook References	externalLink
	SpreadsheetML Table Definitions	table
	SpreadsheetML Volatile Dependencies	volTypes
	SpreadsheetML Workbook	workbook

Schema	Part Name	Element
wml.xsd	WordprocessingML Comments	comments
	WordprocessingML Document Settings	settings
	WordprocessingML Endnotes	endnotes
	WordprocessingML Font Table	fonts
	WordprocessingML Footer	fttr

Schema	Part Name	Element
	WordprocessingML Footnotes	footnotes
	WordprocessingML Glossary Document	glossaryDocument
	WordprocessingML Header	hdr
	WordprocessingML Mail Merge Recipient Data	recipientData
	WordprocessingML Main Document	document
	WordprocessingML Numbering Definitions	numbering
	WordprocessingML Style Definitions	styles
	WordprocessingML Web Settings	webSettings

End of informative text.

Annex L. (informative) Primer

This annex is informative.

This annex contains a detailed introduction to the following Office Open XML topics:

- WordprocessingML
- SpreadsheetML
- PresentationML
- DrawingML
- VML
- Various shared MLs

L.1 Introduction to WordprocessingML

This clause contains a detailed introduction to the structure of a WordprocessingML document.

L.1.1 Stories

A WordprocessingML document is composed of a collection of stories. Each *story* represents a distinct region of text within the document. The following kinds of region exist: comment (§L.1.14.5), endnote (§L.1.12.2), footer (§L.1.11.2), footnote (§L.1.12.1), frame, glossary document (§L.1.13), header (§L.1.11.1), main story (§L.1.2), subdocument (§L.1.18.2), and text box (§L.1.18.1).

With one exception (a glossary document), all stories in a document utilize a common set of properties that determine the presentation of the contents of each story. These properties include font information, style definitions, numbering definitions, and document settings.

L.1.2 Basic Document Structure

The main document story of the simplest WordprocessingML document consists of the following XML elements:

- document — The root element for a WordprocessingML's main document part, which defines the main document story.
- body — The container for the collection of block-level structures that comprise the main story.
- p — A paragraph.
- r — A run.
- t — A range of text.

A *run* is a region of text in a story with a common set of properties. The text in a WordprocessingML document must be contained within one or more runs. A *paragraph* is a collection of one or more runs that is displayed as a unit. A run must be contained within a paragraph.

Consider the following Main Document XML for a simple WordprocessingML document:

```
<?xml version="1.0"?>
<w:document xmlns:w="...">
  <w:body>
    <w:p>
      <w:r>
        <w:t>Hello, world.</w:t>
      </w:r>
    </w:p>
  </w:body>
</w:document>
```

L.1.3 Main Document Story

The contents of the main document story—the only story that is required for a WordprocessingML document to be conformant—are encapsulated within the body element. The content of the main document body is a collection of block-level structures, which are those WordprocessingML elements that can contain and/or be sibling elements with a WordprocessingML paragraph.

Within the document body, the valid set of block level content, as defined by the WordprocessingML schema, is:

- Paragraphs
- Tables
- Custom markup (custom XML, structured document tags)
- Section properties
- Annotations (comments, revision markers, range permission markers)
- Alternate format chunks

Each of these block-level content constructs (the 'building blocks' of WordprocessingML) is defined in the following subclauses.

L.1.3.1 Document Backgrounds

As well as containing a body, a document element can also contain the definition of the document's background via the background element and its contents. This background applies to all printed pages within this document. A document background in WordprocessingML can have a single color, as well as the application of various drawing effects such as color gradient or pattern, and a tiled or stretched image. A single background color is stored natively in WordprocessingML using the `bgColor` attribute. All other background effects are provided by DrawingML, which is wrapped in the WordprocessingML drawing element.

Consider a simple background in WordprocessingML, which consists of a single color with a gradient fill applied:

```
<w:background w:bgColor="5C83B4">
  <w:drawing>
    <wp:anchor>
      ...
    </wp:anchor>
  </w:drawing>
</w:background>
```

The background consists of two components: a background fill color of RGB value 5C83B4, and the background gradient stored as a DrawingML object.

L.1.4 Paragraphs and Rich Formatting

L.1.4.1 Paragraphs

The most basic unit of block-level content within a WordprocessingML document, *paragraphs* are stored using the `p` element. A *paragraph* defines a distinct division of content that begins on a new line. A paragraph can contain three pieces of information: optional paragraph properties, inline content (typically runs), and a set of optional revision IDs used to compare the content of two documents.

Consider the paragraph fragment "*The quick brown fox jumped ...*" which is centered on a paragraph. As all the text in the paragraph is emphasized using italics, in the XML, the contents of the paragraph have the justify-center property, and each run within the paragraph (as well as the run properties for the paragraph mark) stores the italics property; for example:

```
<w:p>
  <w:pPr>
    <w:jc w:val="center"/>
    <w:rPr>
      <w:i/>
    </w:rPr>
  </w:pPr>
  <w:r>
    <w:rPr>
      <w:i/>
    </w:rPr>
    <w:t>The quick brown fox jumped...</w:t>
  </w:r>
</w:p>
```

Notice that each run specifies the character formatting information for its contents, and the paragraph specifies the paragraph level formatting (the center-justification). As leading and trailing whitespace is not normally significant in XML, in cases where it is significant, runs require the `xml:space` attribute.

A paragraph's properties are specified via the pPr element. Some examples of paragraph properties are alignment, border, hyphenation override, indentation, line spacing, shading, text direction, and widow/orphan control.

It should also be noted that a pPr element can contain a set of run properties within a rPr element – these properties are applied to the run which contains the glyph which represents the paragraph mark and not the entire paragraph.

L.1.4.2 Runs

The next level of the document hierarchy is the *run*, which defines a region of text with a common set of properties. A run is represented by an r element, which allows the producer to combine breaks, styles, or formatting properties, applying the same information to all the parts of the run.

Just as a paragraph can have properties, so too can a run. All of the elements inside an r element have their properties controlled by a corresponding optional rPr run properties element, which must be the first child of the r element. In turn, the rPr element is a container for a set of property elements that are applied to the rest of the children of the r element. The elements inside the rPr container element allow the consumer to control whether the text in the following t elements is bold, underlined, or visible, for example. Some examples of run properties are bold, border, character style, color, font, font size, italic, kerning, disable spelling/grammar check, shading, small caps, strikethrough, text direction, and underline.

Consider the following run within a WordprocessingML document:

```
<w:r>
  <w:rPr>
    <w:b/>
    <w:i/>
  </w:rPr>
  <w:t>quick</w:t>
</w:r>
```

The run specifies two formatting properties in its run contents: bold and italic. These properties are therefore applied to all content within this run.

A producer can break a run into an arbitrary number of smaller runs, provided each smaller run uses the same set of properties, without changing the content of the document.

Consider the content "only one word is *emphasized*" in a WordprocessingML document. An efficient producer could choose to output this content using two runs, as follows:

```
<w:r>
  <w:t xml:space="preserve">only one word is </w:t>
</w:r>
```

```

<w:r>
  <w:rPr>
    <w:i/>
  </w:rPr>
  <w:t>emphasized</w:t>
</w:r>

```

However, a less efficient producer might use four runs, as follows:

```

<w:r>
  <w:t>only one</w:t>
</w:r>
<w:r>
  <w:t xml:space="preserve"> word is </w:t>
</w:r>
<w:r>
  <w:rPr>
    <w:i/>
  </w:rPr>
  <w:t>empha</w:t>
</w:r>
<w:r>
  <w:rPr>
    <w:i/>
  </w:rPr>
  <w:t>sized</w:t>
</w:r>

```

Although the latter example uses four runs rather than two, the net run information applied to each region of text is identical, and both are equally acceptable.

Of course, a run might need to be broken. For example, if the properties of some text in a run are changed, the changed part needs to be put into its own run. Another example involves the insertion of some sort of marker into the middle of an existing run. That requires the run be broken into two with the marker inserted between them.

The following run contains two sentences:

```

<w:r>
  <w:t>Hello, world. How are you, today?</w:t>
</w:r>

```

If the first two words are bolded in these sentences, the run needs to be broken into two runs in order to store the formatting, as follows:

```

<w:r>
  <w:rPr>
    <w:b/>
  </w:rPr>
  <w:t xml:space="preserve">Hello, world. </w:t>
</w:r>
<w:r>
  <w:t>How are you, today?</w:t>
</w:r>

```

Apart from text, a run can also contain numerous kinds of textual content (§L.1.4.3) A run can also contain a set of revision IDs used for document "merge and compare".

L.1.4.3 Run Content

The lowest level of this hierarchy is *run content*, that content that can be stored within a single run in a document. In WordprocessingML, the types of run content include:

- Text
- Deleted text
- Soft line breaks
- Field codes
- Deleted field codes
- Footnote/endnote reference marks
- Simple fields
- Page numbers
- Tabs
- Ruby text
- DrawingML content
- Embedded objects
- Pictures

L.1.4.3.1 Text

The most common run content is the *t* element, which is the container for the text that makes up the document's content. A *t* element can contain an arbitrary amount of text, up to and including the entire document's contents. However, typically, long runs of text are broken up into paragraphs and strings of text having different formats, or are interrupted by line breaks, graphics, tables, and other items. A *t* element must be enclosed within an *r* element; i.e., a run of text. An *r* element can contain multiple *t* elements, interspersed among other elements.

Aside from the *t* element, there are three types of text in WordprocessingML:

- *delText* - Deleted text
- *instrText* - Field codes

- delInstrText - Deleted field codes

These four types of text are defined using unique elements in WordprocessingML so that simple consumers can determine the text of the document simply by grabbing the contents of the t node, without needing to check where revisions start and end, etc. to determine the state of the text contents.

It is also notable that these are the only elements in a WordprocessingML document's main document part that can contain a XML text node.

L.1.4.4 Formatting Property Values

Most of the children of an rPr or pPr element have a single val attribute that is limited to a specific set of values. For example, the b (bold) element causes the text that follows it to be bold when the b element has a val attribute with value 1. If the val attribute isn't present for the b element, it defaults to "1". Therefore, <w:b/> is equivalent to <w:b w:val="1"/>.

Aside from the default values, which are documented with each element, this is particularly important when specifying the difference between omitting a formatting property and explicitly turning it off.

For example, consider the following run:

```
<w:r>
  <w:rPr>
    <w:b w:val="0"/>
  </w:rPr>
  <w:t xml:space="preserve">Hello, world. </w:t>
</w:r>
```

This run explicitly declares that the bold property is turned off for this text, as opposed to the following run:

```
<w:r>
  <w:t xml:space="preserve">Hello, world. </w:t>
</w:r>
```

This run says nothing about the bold property. This distinction is particularly important when dealing with content that is formatting using styles - if the content was not contained in a styled paragraph, both would be identical. However, in the case where the paragraph is styled, the former would never be bold regardless of the style information, whereas the latter would express the bold property as set by the style, since it's omission of the bold property means "whatever the underlying formatting is".

Some elements have val attributes that offer a richer set of choices than 1 and 0; the u (underline) element is one such element. In this case, the same rules apply, the omission of the property simply means use the underlying properties.

L.1.5 Tables

Another type of block-level content in WordprocessingML, A *table* is a set of paragraphs (and other block-level content) arranged in *rows* and *columns*.

L.1.5.1 Introduction

Tables in WordprocessingML are defined via the `tbl` element, which is analogous to the HTML `<table>` tag. The table element specifies the location of a table present in the document.

A `tbl` element has two elements that define its properties: `tblPr`, which defines the set of table-wide properties (such as style and width), and `tblGrid`, which defines the grid layout of the table. A `tbl` element can also contain an arbitrary non-zero number of rows, where each row is specified with a `tr` element. Each `tr` element can contain an arbitrary non-zero number of cells, where each cell is specified with a `tc` element.

Consider an empty one-cell table (i.e.,; a table with one row, one column) and 1 point borders on all sides:

--

This table is represented by the following WordprocessingML:

```

<w:tbl>
  <w:tblPr>
    <w:tblW w:w="5000" w:type="pct"/>
    <w:tblBorders>
      <w:top w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:start w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:bottom w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:end w:val="single" w:sz="4" w:space="0" w:color="auto"/>
    </w:tblBorders>
  </w:tblPr>
  <w:tblGrid>
    <w:gridCol w:w="10296"/>
  </w:tblGrid>
  <w:tr>
    <w:tc>
      <w:tcPr>
        <w:tcW w:w="0" w:type="auto"/>
      </w:tcPr>
      <w:p/>
    </w:tc>
  </w:tr>
</w:tbl>

```

This table specifies table-wide properties of 100% of page width (tblW's type attribute specifies how the width value in the w attribute must be interpreted—pct specifies a measurement of fiftieths of a percent) and the set of table borders (tblBorders), the table grid which defines a set of shared vertical edges within the table (discussed later), and a single row.

L.1.5.2 Table Properties

The tblPr element defines table-wide properties, properties which are applied to each row and cell in the table. The complete set of table-wide properties can be found on the definition for the tblPr element.

Consider the following simple WordprocessingML table:

--	--

This table defines outside and inside table borders, etc; and is set to 100% of page width - both table-wide properties. The resulting table is represented by the following WordprocessingML:

```

<w:tbl>
  <w:tblPr>
    <w:tblW w:w="0" w:type="auto"/>
    <w:tblBorders>
      <w:top w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:start w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:bottom w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:end w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:insideH w:val="single" w:sz="4" w:space="0" w:color="auto"/>
      <w:insideV w:val="single" w:sz="4" w:space="0" w:color="auto"/>
    </w:tblBorders>
  </w:tblPr>
  <w:tblGrid>
    ...
  </w:tblGrid>
  <w:tr>
    ...
  </w:tr>
</w:tbl>

```

In this example, the `tblW` element defines the total width of the table, which, in this case, is set to a type attribute value of `auto`, which specifies that the table should be sized to fit its contents. The `tblBorders` element specifies each of the table's borders, and specifies a one point border on the top, left, bottom, right and inside horizontal and vertical border. The table-wide properties can be overwritten on an individual row basis by specifying table property overrides within the table row properties.

L.1.5.3 Table Grid

The `tblGrid` element defines the *grid* for the table. All columns in the table (including the space before and after a row) reference this grid. Each `gridCol` defines a single grid column within the table's layout, which is used to define the presence of a vertical line within the table. A `tblGrid` element can contain an arbitrary number of `gridCol` elements, where each `gridCol` element represents one grid column in the table and defines a single grid entry. When cells are laid out within this table, as discussed below, all cells are forced to snap the shared column edges defined by this grid.

Returning to the earlier 'one-cell empty table' example, the table has one column with a width of 10,296 twentieths of a point. This measurement (twentieths of a point, or *twips*) is frequently used in WordprocessingML, and translates to 1/1440th of an inch (one-twentieth of a point, which is itself 1/72nd of an inch):.

```

<w:tblGrid>
  <w:gridCol w:w="10296"/>
</w:tblGrid>

```

Consider the following, more complex table that has two rows and two columns; the columns are not aligned:

This table is represented by laying out the cells on a table grid consisting of three table grid columns, each grid column representing a logical vertical column in the table:

The dashed lines represent the virtual vertical continuations of each table grid column, and the resulting table grid is represented as the following in WordprocessingML:

```
<w:tblGrid>
  <w:gridCol w:w="2952"/>
  <w:gridCol w:w="4416"/>
  <w:gridCol w:w="1488"/>
</w:tblGrid>
<w:tr>
  <w:tc>
    <w:tcPr>
      <w:tcW w:w="7368" w:type="dxa"/>
      <w:gridSpan w:val="2"/>
    </w:tcPr>
    <w:p/>
  </w:tc>
  <w:tc>
    <w:tcPr>
      <w:tcW w:w="1488" w:type="dxa"/>
    </w:tcPr>
    <w:p/>
  </w:tc>
</w:tr>
```



```

<w:tr>
  <w:tc>
    <w:tcPr>
      <w:tcW w:w="2952" w:type="dxa"/>
    </w:tcPr>
    <w:p/>
  </w:tc>
  <w:tc>
    <w:tcPr>
      <w:tcW w:w="5904" w:type="dxa"/>
      <w:gridSpan w:val="2"/>
    </w:tcPr>
    <w:p/>
  </w:tc>
</w:tr>

```

Notice that each of the cells which do not span one grid column (i.e., span two adjacent vertical lines) must specify this fact by supplying a `gridSpan` element with a value which determines how many grid columns this cell spans. Each `gridCol` element represents a shared 'column' in a table (to which the cells snap) even if it doesn't appear visually.

L.1.5.4 Table Rows and Cells

A table row is defined using a `tr` element, which is analogous to the HTML `<tr>` tag. The `tr` element acts as a container for a row of cells with the table's content.

A `tr` element has one formatting child element, `trPr`, which defines the row properties (such as the row's width) and whether it can split across a page. Each property is defined by an individual child element under the `trPr` element. The complete set of table row properties can be found on the definition for the `trPr` element. As well, a table row can contain two kinds of content: custom markup (custom XML or structured document tags), and table cells.

The cells in a row contain the table's content and are defined by `tc` elements, which are analogous to HTML `<td>` tags.

A `tc` element has one formatting child element, `tcPr`, which defines the properties for the cell. Each unique property is specified by a child element of this element. The complete set of table cell properties can be found on the definition for the `tcPr` element. As well, a table cell can contain any valid block-level content, as defined by the WordprocessingML schema, which allows for the nesting of paragraphs and tables within table cells.

In the example below, the `tcW` element defines the width of the cell, where the attribute `w` is the value in twips. Here the width of the cell is 8,856 units, where *units* are defined by the attribute type. In this case, `dxa` represents twips.

```

<w:tr>
  <w:tc>
    <w:tcPr>
      <w:tcW w:w="8856" w:type="dxa"/>
    </w:tcPr>
    <w:p/>
  </w:tc>
</w:tr>

```

The tc element contains the cell's content, which, in this case, is an empty p element.

Consider a table having one cell, which contains the text "Hello, world":

Hello, world

This table's content is represented by the following XML:

```

<w:tr>
  <w:tc>
    <w:tcPr>
      <w:tcW w:w="1770" w:type="dxa"/>
    </w:tcPr>
    <w:p>
      <w:r>
        <w:t>Hello, world</w:t>
      </w:r>
    </w:p>
  </w:tc>
</w:tr>

```

At both the row and cell levels, the properties must also specify how the rows and cells are placed on the table grid.

The trPr element contains information about the number of grid units which should be omitted ('skipped') before and after the row is complete using the gridBefore and gridAfter elements, allowing rows to start at different columns on the grid, as well as a preferred width for that leading/trailing space using the wBefore and wAfter elements. The tcPr element also contains grid information pertaining to how many grids a cell spans using the gridSpan element, which determines how many grid units are consumed by the current cell, as well as a preferred width for that cell using the tcW element.

In the earlier complex table having two rows of two differently sized cells, a consumer must represent that table containing three grid columns (one per distinct vertical line). Consider the following XML for the first row of that table:

```

<w:tr>
  <w:tc>
    <w:tcPr>
      <w:tcW w:w="7368" w:type="dxa" />
      <w:gridSpan w:val="2" />
    </w:tcPr>
    <w:p />
  </w:tc>
  <w:tc>
    <w:tcPr>
      <w:tcW w:w="1488" w:type="dxa" />
    </w:tcPr>
    <w:p/>
  </w:tc>
</w:tr>

```

Again, the gridSpan element is the number of grid columns that cell spans when being laid out on the table grid. In this example, the first cell of the first row contains two grid columns. As well, the cell specifies its preferred width using the tcW element, which tells the consumer the width desired by that cell at layout time.

It is important to note that every width in a table is a preferred width - because the table must satisfy the grid at all times, conflicting table properties must be resolved by overriding preferred widths in a specific manner, shown below.

L.1.5.5 Table Layout

Given the information shown in the table shown above, the table is specified as a series of properties:

- Table-level properties (e.g., preferred width)
- Table column grid
- Row-level properties (e.g., grid units before/after row start/end)
- Cell-level properties (e.g., number of grid units spanned)

In order to manipulate this set of properties into a table, the following logics are used, depending on the type of table:

L.1.5.6 Fixed Width Tables

The first type of table is a fixed width table, a table that does not dynamically resize based on its contents. In a fixed width table, the table information is used in the following manner:

- The table grid is used to create the set of shared columns in the table and their initial widths as defined in the tblGrid element
- The table's total width is defined based on the tblW property – if it is set to auto or nil, then the width is not yet determined and is specified using the row and cell information.

- The first table row is read and the initial number of grid units before the row starts is skipped. The width of the skipped grid columns is set using the `wBefore` property.
- The first cell is placed on the grid, and the width of the specified grid column span set by `gridSpan` is set based on the `tcW` property.
- Each additional cell is placed on the grid.
- If at any stage, the preferred width requested for the cells exceeds the preferred width of the table, then each grid column is proportionally reduced in size to fit the table width.
- If the grid is exceeded (e.g., `tblGrid` specifies three grid columns, but the second cell has a `gridSpan` of three), the grid is dynamically increased with a default width for the new grid column.
- For each subsequent row, cells are placed on the grid, and each grid column is adjusted to be the maximum value of the requested widths (if the widths do not agree) by adding width to the last cell that ends with that grid column. Again, if at any point, the space requested for the cells exceeds the width of the table, then each grid column is proportionally reduced in size to fit the table width.

L.1.5.7 AutoFit Tables

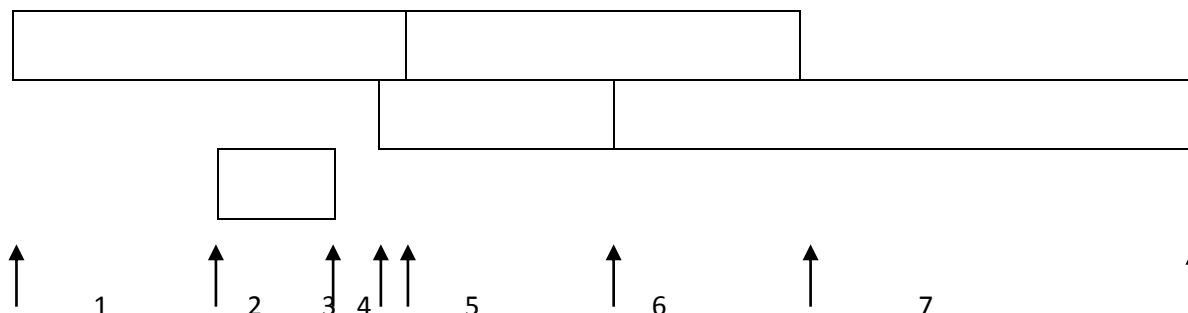
In an AutoFit table (one which specifies that it should “AutoFit to table contents”), the table information is used in the following manner:

- Perform the steps above to lay out the fixed width version of the table.
- Calculate the minimum content width - the width of the cell's contents including all possible line breaking locations (or the cell's width, if the width of the content is smaller), and the maximum content width - the width of the cell's contents (assuming no line breaking not generated by explicit line breaks).
- The minimum and maximum content width of all cells that span a single grid column is the minimum and maximum content width of that column.
- For cells which span multiple grid columns, enlarge all cells which it spans as needed to meet that cell's minimum width.
- If any cell in a grid column has a preferred width, the first such width overrides the maximum width of the column's contents.
- Place the text in the cells in the table, respecting the minimum content width of each cell's content. If a cell's minimum content width exceeds the cell's current width, preferences are overridden as follows:
 - First, override the column widths by making all other grid columns proportionally smaller until each it at its minimum width. This cell can then grow to any width between its own minimum and maximum width.
 - Next, override the preferred table width until the table reaches the page width.
 - Finally, force a line break in each cell's contents as needed

L.1.5.8 Complex Table Example

The properties above are best illustrated by example:

As shown above, table cells can be merged horizontally. This is represented with a single table cell whose `gridSpan` property defines the number of grid units consumed by that table cell for the current row. Consider the following fixed width table, which makes extensive use of resized and merged cells on what is actually just a seven-column grid. (The arrows point to each (invisible) vertical line of the grid and the numbers refer to the grid columns):



Although the table is visually complex, the standard rules apply: the first cell in the table is simply a cell which spans four grid units horizontally, as specified in the `gridSpan` element, and whose preferred width is 2952 twips, specified in the `tcW` element:

```
<w:tc>
  <w:tcPr>
    <w:tcW w:w="2952" w:type="dxa"/>
    <w:gridSpan w:val="4"/>
  </w:tcPr>
  <w:p/>
</w:tc>
```

Similarly, all cells indented from the start and end of the grid specify that indent using the `gridBefore` and `gridAfter` elements. For example, the XML for the second row in the table shows that that row starts three grid units into the table:

```
<w:tr>
  <w:trPr>
    <w:gridBefore w:val="3"/>
    <w:wBefore w:w="2748" w:type="dxa"/>
  </w:trPr>
  ...
</w:tr>
```

If we take this fixed width table and introduce a long string into the single cell in row 3, we see that the presence of this text does not affect cell widths:

longtextstringwithn obreakingcharacters	

If we now turn on the AutoFit property and insert text into the cell in row three, which spans only grid column two, we see that the algorithm for this AutoFit table causes all cells in grid column two to increase in size, proportionally decreasing the other grid columns' size to accommodate the long non-breaking string in the last cell:

longtextstringwithn obreakingcharacters	

Each of the other grid columns was reduced, but since all columns are not at their minimum size, the table width is not increased even though the table is not yet at the page width.

L.1.5.9 Vertically Merged Cells

Although the previous examples might have implied that tables have strict definition of rows, table cells can also be merged vertically. The tcPr element can contain the vMerge element that defines the extent of vertically merged grid columns within a table. A vMerge element with its val attribute set to restart marks the start of a vertically merged cell range. A vMerge element with the val attribute set to continue (the default value) marks the continuation of a vertically merged grid column. Cells between the first and last merged cell that are part of the vertical merge each must have a vMerge element to continue the vertical merge.

For example, consider a table with two rows and two columns:

First cell, first row	Last cell, first row
First cell, second row	Last cell, second row

Merging the two rows in the second column results in the following table:

First cell, first row	Last cell, first row
First cell, second row	Last cell, second row

The last cell in the first row starts a merge that is completed in the cell below it, resulting in the following WordprocessingML:

```
<w:tr>
  <w:tc>
    <w:p>
      <w:r>
        <w:t>First cell, first row</w:t>
      </w:r>
    </w:p>
  </w:tc>
  <w:tc>
    <w:tcPr>
      <w:vMerge w:val="restart"/>
    </w:tcPr>
    <w:p>
      <w:r>
        <w:t>Last cell, first row</w:t>
      </w:r>
    </w:p>
    <w:p>
      <w:r>
        <w:t>Last cell, second row</w:t>
      </w:r>
    </w:p>
  </w:tc>
</w:tr>
<w:tr>
  <w:tc>
    <w:p>
      <w:r>
        <w:t>First cell, second row</w:t>
      </w:r>
    </w:p>
  </w:tc>
```

```

    <w:tc>
      <w:tcPr>
        <w:vMerge/>
      </w:tcPr>
    <w:p/>
  </w:tc>
</w:tr>

```

As shown, the vMerge with a value of restart begins (or restarts) a merged region, and the cell with no value is merged with the one above.

L.1.6 Custom Markup

There are three distinct forms in which extra-standard semantics can be inserted into a WordprocessingML document, each with their own specific intended usage:

- Smart tags
- Custom XML markup
- Structured document tags (content controls)

The usage and presentation of each of these forms is described in the following sections.

L.1.6.1 Smart Tags

The first form of extra-standard semantics that can be embedded in a WordprocessingML document are smart tags. Smart tags allow semantic information to be added around an arbitrary run or set of runs within a document to provide information about the kind of data contained within.

Consider the following text in a WordprocessingML document, with a smart tag around the stock symbol 'CNTS' (where the smart tag is displayed using a purple dotted underline):

This is a stock symbol: CNTS

This text would translate to the following WordprocessingML markup:

```

<w:p w:rsidR="00672474" w:rsidRDefault="00672474">
  <w:r>
    <w:t xml:space="preserve">This is a stock symbol: </w:t>
  </w:r>
  <w:smartTag w:uri="http://purl.oclc.org/ooxml/smartTags"
    w:element="stockticker">
    <w:r>
      <w:t>MSFT</w:t>
    </w:r>
  </w:smartTag>
</w:p>

```


As shown above, the smart tag is delimited by the smartTag element, which surrounds the run (or runs) which contain the text which is part of the smart tag.

The smart tag itself carries two required pieces of information, which together contain the customer semantics for this smart tag.

The first of these is the namespace for this smart tag (contained in the uri attribute). This allows the smart tag to specify a URI which should be round-tripped with this smart tag and be available to a consumer. It is intended to be used to specify a family of smart tags to which this one belongs – for example, in the sample above, the smart tag belongs to the <http://purl.oclc.org/ooxml/smartTags> namespace.

The second of these is the element name for this smart tag (contained in the element attribute). This allows the smart tag to specify a name which should be round-tripped with this smart tag and again available to a consumer. It is intended to be used to specify a unique name for this class of smart tag – for example, in the sample above, the smart tag specifies that its data is of class stockticker.

As well as the required information specified above, a smart tag can also contain any number of additional properties in namespace/name/value sets by adding them to the smart tag's property bag.

Using the example above, adding a new property called fullCompanyName with no namespace and value Microsoft Corporation to the smart tag would mean augmenting the output to add the smartTagPr element with this new property as follows:

```
<w:smartTag w:uri="http://purl.oclc.org/ooxml/smartTags"
  w:element="stockticker">
  <w:smartTagPr>
    <w:attr w:name="fullCompanyName" w:val="Microsoft Corporation"/>
  </w:smartTagPr>
  <w:r>
    <w:t>MSFT</w:t>
  </w:r>
</w:smartTag>
```

The resulting XML, as seen above, simply adds an attr element which specifies the property and value for the property bag.

A producer can embed a smart tag around any run-level content in a WordprocessingML document in order to embed additional information about the family and class of the data contained within. This allows 'tagging' of specific regions of a document with these semantics without need to provide context beyond the information provided in the uri and element attributes.

A consumer can read this smart tag data and provide additional functionality around these namespace/element pairs, which might or might not be specific to that smart tag class in the document.

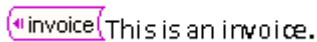
Examples of this functionality include: the ability to add/remove this markup via a user interface, ability to provide actions to operating in the context of this data classification, etc.

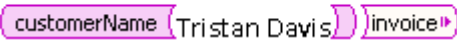
L.1.6.2 Custom XML Markup

The next form of extra-standard semantics that can be embedded in a WordprocessingML document is custom XML markup. Custom XML markup allows the application of the XML elements defined in any valid XML Schema file to be applied to the contents of a WordprocessingML document in one of two locations: around a paragraph or set of paragraphs (at the block level); or around an arbitrary run or set of runs within a document (at the inline level) to provide semantics to that content within the context and structures defined by the associated XML Schema definition file.

The distinction between custom XML markup and smart tags is based on the fact that custom XML markup corresponds with the contents of a custom XML schema; which means that as shown below, custom XML markup can be used at the block-level to mark up the contents of a document on levels beyond that of one or more runs as well as on the inline (run) level. It can also be validated against a custom XML schema by a producer at run time.

Consider a simple XML Schema which defines two elements: a root element of invoice, and a child element of customerName - the first defining that this file's contents are an invoice, and the second specifying that the enclosed text as a customer's name:

 `<invoice>This is an invoice.</invoice>`

And this is a customer name:  `<invoice><customerName>Tristan Davis</customerName></invoice>`

This output would translate to the following WordprocessingML markup:

```

<w:customXml w:uri="http://www.example.com/2006/invoice"
w:element="invoice">
  <w:p>
    <w:r>
      <w:t>This is an invoice.</w:t>
    </w:r>
  </w:p>
  <w:p>
    <w:r>
      <w:t xml:space="preserve">And this is a customer name: </w:t>
    </w:r>
    <w:customXml w:uri="http://www.example.com/2006/invoice"
w:element="customerName">
      <w:r>
        <w:t>Tristan Davis</w:t>
      </w:r>
    </w:customXml>
  </w:p>
</w:customXml>

```

As shown above, each of the XML elements from the customer-supplied XML schema is represented within the document output as a customXml element.

Similar to the smart tag example above, a custom XML element in a document has two required attributes.

The first is the uri attribute, whose contents specify the namespace of the custom XML element in the document. In the example above, the elements each belong to the `http://www.example.com/2006/invoice` namespace.

The second is the element attribute, whose contents specify the name of the custom XML element at this location in the document. In the example above, the root element is called `invoice` and the child element is called `customerName`.

As well as the required information specified above, custom XML elements can also specify any number of attributes (as specified in the associated XML Schema) on the element. To add this information, the `customXmlPr` (properties on the custom XML element) specify one or more `attr` elements.

Using the example above, we can add a type attribute to the `customerName` element as follows:

```

<w:customXml w:uri="http://www.example.com/2006/invoice"
w:element="customerName">
  <w:customXmlPr>
    <w:attr w:uri="http://www.example.com/2006/invoice" w:name="type"
w:val="individual"/>
  </w:customXmlPr>
  <w:r>
    <w:t>Tristan Davis</w:t>
  </w:r>
</w:customXml>

```

The resulting XML, as seen above, simply adds an attr element which specifies the attribute for the custom XML element.

A producer can embed a custom XML element around or with block-level or run-level content in a WordprocessingML document in order to embed the structure of the extra-standard XML Schema within the WordprocessingML content. This allows ‘tagging’ of specific regions of a document with the semantics from this schema, while ensuring that the resulting file can be validated to the WordprocessingML schemas.

A consumer can read this custom XML markup and provide additional functionality around this extra-standard XML markup, which might or might not be specific to that particular XML namespace. Examples of this functionality include: the ability to add/remove this XML markup via a user interface, ability to provide actions to operating in the context of this namespace, etc.

Each custom XML element is analogous to an XML element in the specified XML schema, and can be nested arbitrarily to any depth in the document. This facility is limited only by the XML Schema file itself, and the contents of the current document.

L.1.6.3 Structured Document Tags

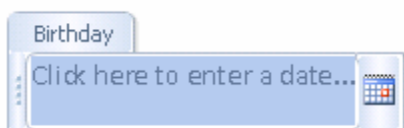
The final form of extra-standard semantics that can be embedded in a WordprocessingML document is the structured document tag (SDT).

As shown above, smart tags and custom XML markup each provide a facility for embedding customer-defined semantics into the document: smart tags, via the ability to provide a basic namespace/name for a run or set of runs within a documents; and custom XML markup, via the ability to tag the document with XML elements and attributes specified by any valid XML Schema file.

However, each of these techniques, while they each provide a way to add the desired semantic information, does not provide a way to affect the presentation or interaction within the document. To bridge these two worlds, structured document tags allow both the specification of customer semantics as well as the ability to influence the presentation of that data in the document.

This means that the customer can define the semantics and context of the tag, but can then use a rich set of pre-defined properties to define its behavior and appearance within the WordprocessingML document's presentation.

Consider a region which should be tagged with the semantic of "birthday", for the user to enter their date or birth into the document. Ideally, this region would also utilize a date picker to allow the user to enter the date from a calendar::



This content would translate to the following WordprocessingML markup:

```
<w:sdt>
  <w:sdtPr>
    <w:alias w:val="Birthday"/>
    <w:id w:val="8775518"/>
    <w:placeholder>
      <w:docPart w:val="DefaultPlaceholder_22479095"/>
    </w:placeholder>
    <w:showingPlcHdr/>
    <w:date>
      <w:dateFormat w:val="M/d/yyyy"/>
      <w:lid w:val="EN-US"/>
    </w:date>
  </w:sdtPr>
  <w:sdtContent>
    <w:p>
      <w:r>
        <w:rPr>
          <w:rStyle w:val="PlaceholderText"/>
        </w:rPr>
        <w:t>Click here to enter a date...</w:t>
      </w:r>
    </w:p>
  </w:sdtContent>
</w:sdt>
```

As shown above, each of the structured document tags in the WordprocessingML file is represented using the sdt element.

Within a structured document tag, there are two child elements which contain the definition and the content of this SDT. The first of these is the `sdtPr` element, which contains the set of properties specified for this structured document tag. The second is the `sdtContent` element, which contains all the content which is contained within this structured document tag.

L.1.6.3.1 Structured Document Tag Properties

Within the SDT's properties, various properties can be set which affect the appearance and behavior of this content in the document. These properties can be divided into four groups:

- Shared properties
- Locking properties
- Structured document tag type
- Structured document tag type-specific properties

The complete set of properties for a structured document tag (SDT) are found on the `sdtPr` element.

The first group is properties shared by all types of SDTs. These include, but are not limited to, the semantic name for the SDT, a unique ID (as an integer) that is round-tripped and allows the control to be uniquely identified across sessions, and a reference to a document building block that should be displayed as placeholder text.

The next group is the locking properties for the tag – these specify whether any consumer should allow the contents of the SDT to be edited, or the SDT itself to be deleted from the document.

The next group, the structured document tag's type, specifies how the content should be expressed in a document. These include: plain text (all contents are of one formatting), rich text, date picker, combo box, drop-down list, and image. Each of the SDT types provides user interface restrictions that restrict the contents to only those specified by the SDT type (e.g., the picture cannot contain text).

Finally, the SDT type-specific properties contain properties that are sensible in the context of that type. For example, the date format for a date picker or the drop-down list entries for a drop-down list/combo box. SDT type-specific properties are stored as children of the type's element.

Referring to the example above, the date properties are stored underneath the date element, as follows:

```
<w:sdtPr>
...
<w:date>
  <w:dateFormat w:val="M/d/yyyy"/>
  <w:lid w:val="EN-US"/>
</w:date>
</w:sdtPr>
```

This ensures that these properties are only available in the appropriate context(s).

L.1.6.3.2 Structured Document Tag Content

The second child of the sdt element is the sdtContent element, which contains all the content which is contained within this structured document tag.

L.1.6.3.3 XML Mapping

An additional property for SDTs allows their contents to be stored in another part (in particular, in the custom XML data storage within the file). The presence of the dataBinding element specifies that the contents of this SDT are simply a cache of the data stored at a particular XML element in a particular custom XML data storage part.

L.1.7 Sections

Within the main document story, there is also often a need for groupings of content on a basis larger than a paragraph (for example, ensuring that a specific set of paragraphs and tables are printed in landscape view, while ensuring that the remainder of the document is printed in portrait view). In order to group this content, a document can be divided into multiple *sections*, each of which defines a region of content in the document and allows the application of a set of section-level properties.

Consider a WordprocessingML document with two paragraphs of content, the first of which should be displayed on a page printed in portrait view, and the second of which should be displayed on a page printed in landscape view (the page content should be rotated 90 degrees to the left on the underlying page).

In order to have each of these paragraphs on different pages having different page orientation characteristics, this document would be split into two sections. Looking at the WordprocessingML for the example above:

```
<w:body>
  <w:p>
    <w:pPr>
      <w:sectPr>
        <w:pgSz w:w="12240" w:h="15840"/>
        <w:pgMar w:top="1440" w:right="1800" w:bottom="1440"
          w:left="1800" w:header="720" w:footer="720" w:gutter="0"/>
        <w:cols w:space="720"/>
        <w:docGrid w:linePitch="360"/>
      </w:sectPr>
    </w:pPr>
    <w:r>
      <w:t>This is sentence one.</w:t>
    </w:r>
  </w:p>
```

```

<w:p>
  <w:r>
    <w:t>This is sentence two.</w:t>
  </w:r>
</w:p>
<w:sectPr>
  <w:pgSz w:w="15840" w:h="12240" w:orient="landscape"/>
  <w:pgMar w:top="1800" w:right="1440" w:bottom="1800"
    w:left="1440" w:header="720" w:footer="720" w:gutter="0"/>
  <w:cols w:space="720"/>
  <w:docGrid w:linePitch="360"/>
</w:sectPr>
</w:body>

```

This syntax defines two sections using two distinct sectPr elements: the first has a page size of 12,240 twentieths of a point wide and 15,640 twentieths of a point tall; the second has a page size of 15,640 twentieths of a point wide and 12,240 twentieths of a point tall, and is oriented in landscape mode.

L.1.7.1 Section Properties

As shown above, the end of a section is defined as a set of properties applied to the last paragraph in that section—converting that paragraph mark into a *section break* (i.e., a paragraph that closes a section).

Those properties are contained in a sectPr element, which is located within the paragraph properties (the pPr element) for the final paragraph in that section. Within the definition of section properties, the properties to be applied to that section (including, but not limited to, page size and orientation, line numbering settings, margins, and columns) are specified. The complete set of section properties is located on the definition for the sectPr element.

The only exception to this rule is the final set of section properties in this document. These are stored as the last child of the body element. This is done because the document's last paragraph must specify paragraph properties, and this syntax enforces that the final set of section properties are specified.

Going back to our example, the first section break is defined within the last paragraph for that section, but the last section properties are stored after the final paragraph.

L.1.7.2 Section Breaks

As well as specifying the section's properties, the type of section break is specified using the type element. WordprocessingML supports four distinct types of section breaks:

- *Next page section breaks* (the default if type is not specified), which begin the new section on the following page.
- *Odd page section breaks*, which begin the new section on the next odd-numbered page.
- *Even page section breaks*, which begin the new section on the next even-numbered page.

- *Continuous section breaks*, which begin the new section on the following paragraph. This means that continuous section breaks might not specify certain page-level section properties, since they must be inherited from the following section. These breaks, however, can specify other section properties, such as line numbering and footnote/endnote settings.

L.1.8 Styles

After looking at the primary elements of block-level content in a WordprocessingML file, it is now necessary to look at the information stored in the document that affects how this content is displayed.

The first such group of information is *styles*. Within a WordprocessingML file, *styles* are predefined sets of paragraph and/or character properties which can be applied to text within the document. This allows the formatting properties to be stored and managed independently from the content, allowing the look of document content to be changed in a single location (e.g., the look of all first-level headings is changed by changing the style with styleId `Heading1` rather than looking for and changing each paragraph in the document).

The Normal paragraph style in a word processing document can have any number of formatting properties, e.g., font face = Times New Roman; font size = 12pt; paragraph justification = left). All paragraphs that reference this paragraph style would automatically inherit these properties.

L.1.8.1 Styles Part

Style information in a WordprocessingML document is stored in the Styles part within the package, which is stored via an implicit relationship from the Main Document or Glossary Document part of relationship type `http://purl.oclc.org/ooxml/officeDocument/relationships/styles` and has a content type of `vnd-openxmlformats-officedocument.wordprocessingml-styles+xml`.

The styles part stores two types of style information for the document:

- Style definitions
- Latent style information

L.1.8.2 Style Definitions

Each style defined within a WordprocessingML document requires a *style definition*. The style definition contains all of the information needed by a consumer to store and display that style within a WordprocessingML document, and is defined using the style element. The style definition for any style in WordprocessingML can be divided into three segments (Note: the complete definition of style properties can be found on the reference for the style element):

- Common style properties
- Style ‘types’
- Type specific properties

Common style properties refer to the set of properties which can be used regardless of the type of style; for example, the style name, additional aliases for the style, a style ID (used by the document content to refer to the style), if style is hidden, if style is locked, etc.

Consider a style called Heading 1 in a document as follows:

```
<w:style w:type="paragraph" w:styleId="Heading1">
  <w:name w:val="Heading 1"/>
  <w:basedOn w:val="Normal"/>
  <w:next w:val="Normal"/>
  <w:link w:val="Heading1Char"/>
  <w:uiPriority w:val="1"/>
  <w:qFormat/>
  <w:rsid w:val="00F303CE"/>
  ...
</w:style>
```

Above the formatting information specific to this style type are a set of common style properties which define information shared by all style types.

Style types refer to the property on a style that defines the type of style created with this style definition. WordprocessingML supports six types of style definitions:

- Paragraph styles
- Character styles
- Linked styles (paragraph + character)
- Table styles
- Numbering styles
- Default paragraph + character properties

Referring to the Heading 1 example above, the type attribute has a value of `paragraph`, which indicates that the following style definition is a paragraph style.

L.1.8.3 Paragraph Styles

The first type of style definition, *paragraph styles* are styles that apply to the contents of an entire paragraph as well as the paragraph mark. This definition implies that the style can define both character properties (properties that apply to text within the document) as well as paragraph properties (properties which apply to the positioning and appearance of the paragraph). Paragraph styles cannot be referenced by runs within a document, they must be referenced by the `pStyle` element within a paragraph's paragraph properties (`pPr`) element.

A paragraph style has three defining type-specific characteristics:

- The type attribute on the style has a value of `paragraph`, which indicates that the following style definition is a paragraph style.

- The next element defines an editing behavior which supplies the paragraph style to be automatically applied to the next paragraph when ENTER is pressed at the end of a paragraph of this style.
- The style specifies both paragraph-level and character-level properties using the pPr and rPr elements, respectively. In this case, the run properties are the set of properties applied to each run in the paragraph.

The paragraph style is then applied to paragraphs by referencing the styleId attribute value for this style in the paragraph properties' pStyle element.

Consider a paragraph style titled "Test Paragraph Style" which defines: paragraph spacing = double, paragraph indent = 1" (first line only); font = Algerian, font color = red, font size = 20 points. The resulting style definition would be:

```
<w:style w:type="paragraph" w:styleId="TestParagraphStyle">
  <w:name w:val="Test Paragraph Style"/>
  <w:qFormat/>
  <w:rsid w:val="00F85845"/>
  <w:pPr>
    <w:spacing w:line="480" w:lineRule="auto"/>
    <w:ind w:firstLine="1440"/>
  </w:pPr>
  <w:rPr>
    <w:rFonts w:ascii="Algerian" w:hAnsi="Algerian"/>
    <w:color w:val="ED1C24"/>
    <w:sz w:val="40"/>
  </w:rPr>
</w:style>
```

Notice that the character properties for the style are under the rPr element, and the paragraph properties are under the pPr element.

The document content for a paragraph of this style would be:

```
<w:p>
  <w:pPr>
    <w:pStyle w:val="TestParagraphStyle"/>
  </w:pPr>
  <w:r>
    <w:t xml:space="preserve">Here is some fancy Text</w:t>
  </w:r>
</w:p>
```

The pStyle element links the paragraph with the style definition.

L.1.8.4 Character Styles

The next type of style definition, *character styles* are styles which apply to the contents of one or more runs of text within a document's contents. This definition implies that the style can only define character properties (properties which apply to text within a paragraph) because it cannot be applied to paragraphs. Character styles can only be referenced by runs within a document, and they must be referenced by the rStyle element within a run's run properties element.

A character style has two defining type-specific characteristics:

- The type attribute on the style has a value of character, which indicates that the following style definition is a character style.
- The style specifies only character-level properties using the rPr element. In this case, the run properties are the set of properties applied to each run which is of this style.

The character style is then applied to runs by referencing the styleId attribute value for this style in the run properties' rStyle element.

Consider a character style titled "Test Character Style" which defines; font = Courier New, font color = yellow; underline. The resulting style definition would be:

```
<w:style w:type="character" w:styleId="TestCharacterStyle">
  <w:name w:val="Test Character Style"/>
  <w:uiPriority w:val="99"/>
  <w:qFormat/>
  <w:rsid w:val="00E77BF0"/>
  <w:rPr>
    <w:rFonts w:ascii="Courier New" w:hAnsi="Courier New"/>
    <w:color w:val="FFF200"/>
    <w:u w:val="single"/>
  </w:rPr>
</w:style>
```

Notice that the character properties applied using this style are under the rPr element. The document content for a paragraph with a run of this style would be:

```
<w:p>
  <w:r>
    <w:t xml:space="preserve">The following text is in the </w:t>
  </w:r>
  <w:r>
    <w:rPr>
      <w:rStyle w:val="TestCharacterStyle"/>
    </w:rPr>
    <w:t>character style</w:t>
  </w:r>
```

```

    <w:r>
      <w:t>.</w:t>
    </w:r>
  </w:p>

```

The rStyle element in the second run links that run with the style definition, inheriting the formatting properties for that run.

L.1.8.5 Linked Styles

The next type of style definition, *linked styles* are actually a paired combination of styles which can be applied to the contents of one or more runs of text within a document's contents or the entire contents of one or more paragraphs in a WordprocessingML document. This definition implies that the style can define both a set of character properties (properties which apply to text within a paragraph) as well as a set of paragraph properties (properties which apply to the positioning and appearance of the paragraph) because it must be possible to apply the style to paragraphs as well as characters.

In order to accomplish these dual uses, a linked style is actually a pairing of a paragraph style and a character style in the WordprocessingML document. Each style exists uniquely within the styles part, but is linked by the link element, which specifies that these styles are each half of a linked style definition and should be treated as one style at runtime.

A typical example of the use of a linked style is a quote style - if the style is applied to a paragraph, the quoted text should be indented additionally to create a block quote effect, but if the style is applied to text in a paragraph, only the character level effects should be applied.

Consider the following two styles which comprise a linked style pairing that defines the following: font is Arial, font color is green; paragraph spacing is double, and indent is 1 inch left. The resulting style definitions would be:

```

<w:style w:type="paragraph" w:styleId="TestLinkedStyle">
  <w:name w:val="Test Linked Style"/>
  <w:link w:val="TestLinkedStyleChar"/>
  <w:qFormat/>
  <w:rsid w:val="009C1646"/>
  <w:pPr>
    <w:spacing w:line="480" w:lineRule="auto"/>
    <w:ind w:left="1440"/>
  </w:pPr>
  <w:rPr>
    <w:rFonts w:ascii="Arial" w:hAnsi="Arial"/>
    <w:color w:val="22B14C"/>
  </w:rPr>
</w:style>

```

```

<w:style w:type="character" w:styleId="TestLinkedStyleChar">
  <w:name w:val="Test Linked Style Char"/>
  <w:link w:val="TestLinkedStyle"/>
  <w:rsid w:val="009C1646"/>
  <w:rPr>
    <w:rFonts w:ascii="Arial" w:hAnsi="Arial"/>
    <w:color w:val="22B14C"/>
  </w:rPr>
</w:style>

```

The link element in the paragraph style specifies TestLinkedStyleChar, the styleId of the paired character style, and the link element in the character style specifies TestLinkedStyle, the styleId of the paired paragraph style, creating a linked style combination.

Paragraph-level instances of linked styles can only be referenced by paragraphs within a document, and they must be referenced by the pStyle element within the paragraph's paragraph properties element (pPr), which must reference the paragraph version of the linked style. Character-level instances of linked styles can only be referenced by a run's run properties element (rPr) within a document, and they must be referenced by the rStyle element within the run properties element which must reference the character version of the linked style.

In the example above, the linked style definition is composed of the paragraph style, which specifies both the run and paragraph properties, and the character style, which specifies only the run properties. The document content for a paragraph with this linked style would be:

```

<w:p>
  <w:pPr>
    <w:pStyle w:val="TestLinkedStyle"/>
  </w:pPr>
  <w:r>
    <w:t xml:space="preserve">A para version of Test Linked Style.</w:t>
  </w:r>
</w:p>

```

The pStyle element in the paragraph's properties links the paragraph with the paragraph version of the linked style definition.

The document content for a paragraph with a run of this linked style would be:

```

<w:p>
  <w:r>
    <w:t xml:space="preserve">Next run is character version of </w:t>
  </w:r>

```

```

<w:r>
  <w:rPr>
    <w:rStyle w:val="TestLinkedStyleChar"/>
  </w:rPr>
  <w:t>Test Linked Style</w:t>
</w:r>
<w:r>
  <w:t>.</w:t>
</w:r>
</w:p>

```

The rStyle element in the second run's properties links the run with the character version of the linked style definition.

L.1.8.6 Numbering Styles

Numbering styles are style definitions which specify common style properties for a multi-level numbering format within a document. This means that a numbering style defines only a single paragraph property: a reference to a numbering definition stored in the document's numbering part, using the numPr element.

Unlike paragraph and character styles, numbering styles are never directly referenced by content in the document – instead, an abstract numbering definition (covered in the numbering topic of this section) specifies that it is actually the underlying numbering information for a numbering style.

Consider a numbering style "Test Numbering Style":

```

<w:style w:type="numbering" w:styleId="TestNumberingStyle">
  <w:name w:val="Test Numbering Style" />
  <w:uiPriority w:val="99" />
  <w:rsid w:val="0045009F" />
  <w:pPr>
    <w:numPr>
      <w:numId w:val="1" />
    </w:numPr>
  </w:pPr>
</w:style>

```

The only information specified in the numbering style definition is a reference to the numbering definition for the numbering information which is defined by this numbering style.

L.1.8.7 Table Styles

The last conventional type of style definition, table styles are styles which apply to the contents of zero or more tables within a document. This definition implies that the style can only define table properties (properties which apply to the table and its constituent rows and cells), however a table style can also

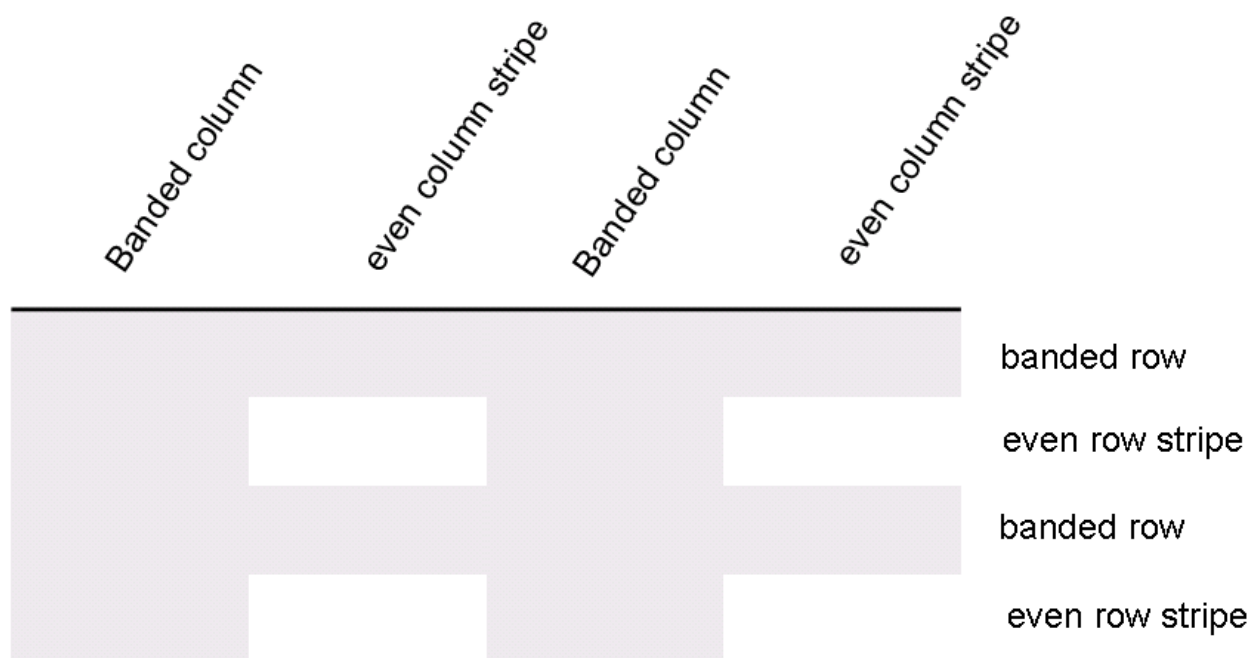
define paragraph properties (properties which apply to the positioning and appearance of paragraphs) as well as character properties (properties which apply to runs) for all of the paragraphs and runs within the specified table in the document. Table styles can only be referenced by tables within a document, and they must be referenced by the `tblStyle` element within a table's table properties (`tblPr`) element.

Like the style definitions discussed above, table styles specify all of the properties that can be applied to a table, as well as paragraph and character properties for the table's contents. However, unlike other style definitions, table styles allow for the definition of conditional formats for different regions of the table.

These table conditional formats are applied to different regions of the table as follows:

Top left cell	Header row	Top right cell
First column	Table body	Last column
Bottom left cell	Footer row	Bottom right cell

All rows in the table can also have conditional formatting on an alternating row/column basis as well as follows:



When specified, these conditional formats are applied in the following order (therefore subsequent formats override properties on previous formats):

- Whole table
- Banded columns, even column banding
- Banded rows, even row banding
- First row, last row
- First column, last column
- Top left, top right, bottom left, bottom right

Consider a table style “Test Table Style” defined as follows: all cells with 1pt table borders on all sides, 0.1” cell margins on left and right of cells, and 0” cell margins on top and bottom of cells, as well as header row specific formatting of: red shading, bold text as follows:

```
<w:style w:type="table" w:styleId="TestTableStyle">
  <w:name w:val="Test Table Style"/>
  <w:basedOn w:val="TableNormal"/>
  <w:uiPriority w:val="99"/>
  <w:rsid w:val="00340CC4"/>
```

```

<w:tblPr>
  <w:tblBorders>
    <w:top w:val="single" w:sz="4" w:space="0" w:color="auto"/>
    <w:left w:val="single" w:sz="4" w:space="0" w:color="auto"/>
    <w:bottom w:val="single" w:sz="4" w:space="0" w:color="auto"/>
    <w:right w:val="single" w:sz="4" w:space="0" w:color="auto"/>
    <w:insideH w:val="single" w:sz="4" w:space="0" w:color="auto"/>
    <w:insideV w:val="single" w:sz="4" w:space="0" w:color="auto"/>
  </w:tblBorders>
  <w:tblCellMar>
    <w:top w:w="0" w:type="dxa"/>
    <w:left w:w="108" w:type="dxa"/>
    <w:bottom w:w="0" w:type="dxa"/>
    <w:right w:w="108" w:type="dxa"/>
  </w:tblCellMar>
</w:tblPr>
<w:tblStylePr w:type="firstRow">
  <w:rPr>
    <w:b/>
  </w:rPr>
  <w:tcPr>
    <w:shd w:val="clear" w:color="auto" w:fill="ED1C24"/>
  </w:tcPr>
</w:tblStylePr>
</w:style>

```

The `tblPr` element holds the formatting which is applied to the entire table, and the `tblStylePr` element with a `type` attribute value of `firstRow` holds the formatting for the first table row, specifically the bold run property and red cell shading.

An individual instance of a table defines an association with a table style using the `tblStyle` element in the table's properties (`tblPr`), as discussed above. However, individual tables can choose whether to apply the following aspects of the table's conditional formats individually:

- First row
- Last row
- First column
- Last column
- Row banding
- Column banding

The use or omission conditional formats are specified using the `tblLook` element, which contains a number of attributes that indicate which properties are applied and omitted.

Consider two tables using the table style "Style2"; one which specifies that it should only use the header row and footer row conditional formatting properties from the table style, and the other which specifies that it should use the header row, footer row, and banded row conditional formatting:

```
<w:tbl>
  <w:tblPr>
    <w:tblStyle w:val="Style2"/>
    <w:tblW w:w="0" w:type="auto"/>
    <w:tblLook w:firstRow="true" w:lastRow="true"
      w:noHBand="true" w:noVBand="true"/>
  </w:tblPr>
  ...
</w:tbl>
...
<w:tbl>
  <w:tblPr>
    <w:tblStyle w:val="Style2"/>
    <w:tblW w:w="0" w:type="auto"/>
    <w:tblLook w:firstRow="true" w:lastRow="true"
      w:noVBand="true"/>
  </w:tblPr>
  ...
</w:tbl>
```

The tables each specify the appropriate set of conditional formats using the `tblLook` element, as seen by the identical table styles in the `tblStyle` element, and different `tblLook` values.

L.1.8.8 Default Document Paragraph and Character Properties

The final type of style in a WordprocessingML document is the default paragraph and character properties for the document. Although this is not a style in the strict sense of the word (because this property set cannot directly be applied to text) it defines the basic set of formatting properties which are inherited by paragraphs and runs in the document.

The following section, entitled *Style Inheritance*, explains exactly how the default document paragraph and character properties influence the appearance of all content in the document.

L.1.8.9 Style Inheritance

In order to compile the complete set of paragraph and character properties specified by any given style (as appropriate), a consumer must follow the rule of style inheritance to determine each property in that set.

Style inheritance states that styles of any given type can inherit from other styles of that type, and therefore a consumer must 'build up' the style information by following the inheritance tree. This inheritance is defined via the `basedOn` element, which specifies the `styleId` of the parent style.

The “Tristan Test” paragraph style can inherit properties from the “Heading 1” paragraph style, which itself can inherit properties from the “Normal” paragraph style.

To build up the resulting style, a consumer must trace the hierarchy (following each `basedOn` value) back to a style which has no `basedOn` element (is not based on another style). The resulting style is then constructed by following each level in the tree, applying the specified paragraph and/or character properties as appropriate. When properties conflict, they are overridden by each subsequent level (this includes turning OFF a property set at an earlier level). Properties which are not specified simply do not change those specified at earlier levels.

Consider a character style “Green” which specifies only that the text color is green, but inherits from another character style “Base” which defines a font face of Arial, as well as bold:

```
<w:style w:type="character" w:styleId="Green">
  <w:name w:val="Green" />
  <w:basedOn w:val="Base" />
  <w:rPr>
    <w:color w:val="22B14C" />
  </w:rPr>
</w:style>
...
<w:style w:type="character" w:styleId="Base">
  <w:name w:val="Base" />
  <w:rPr>
    <w:rFonts w:ascii="Arial" w:hAnsi="Arial" />
    <w:b />
  </w:rPr>
</w:style>
```

The definition of the Green character style has a `basedOn` element which specifies the Base style. This means that any use of the Green style is defined as bold, green, Arial text.

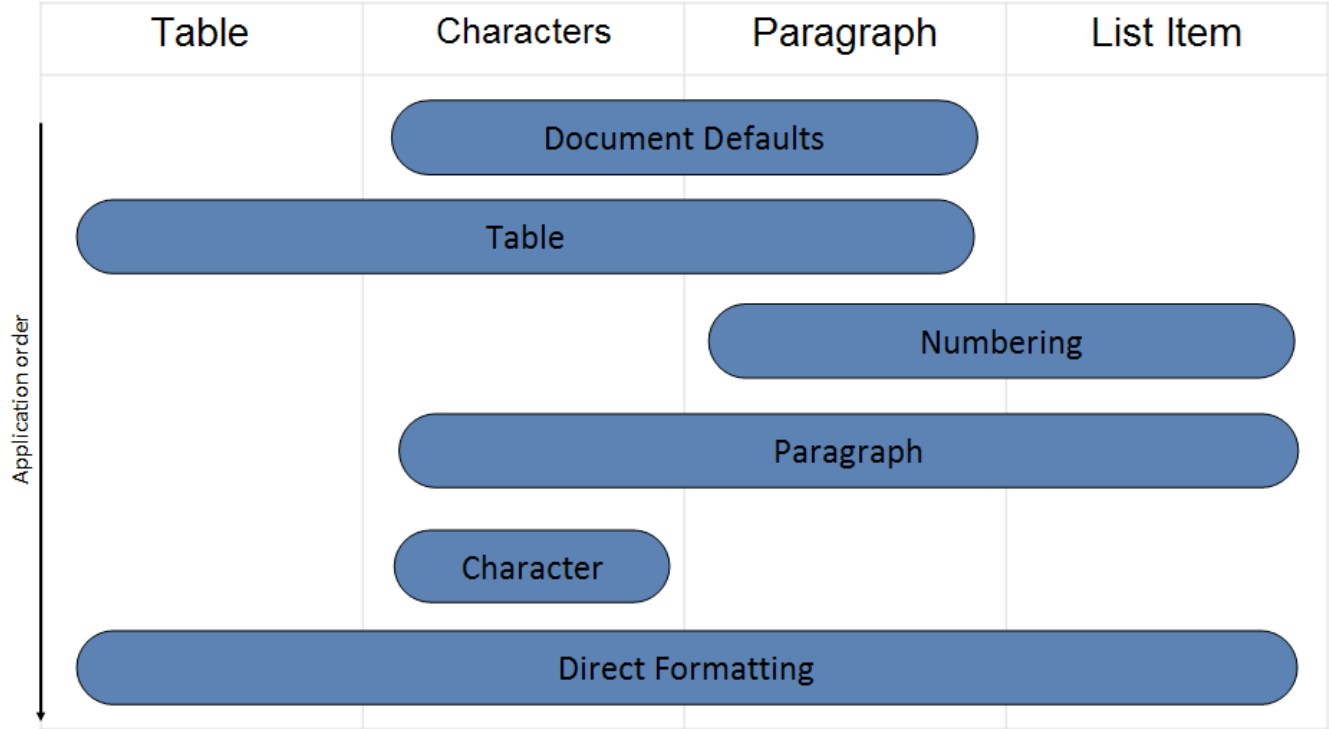
Conversely, a producer should not output any property on a style which has already been set by a previous level of the style hierarchy, as well as those which match the document defaults. This means that if the document defaults or any previous level in a style’s hierarchy specify a property which is unchanged at this level, that property should not be part of the style definition in the resulting WordprocessingML. Adding a property at multiple levels in the style hierarchy is not an error, but unnecessarily duplicative as the setting is already applied to the text, resulting in an unnecessary increase to file size.

If the document default font is Bauhaus 93 and the Heading 1 style also specifies the Bauhaus 93 font, then a producer should not output any `rFonts` element for the Heading 1 style definition, because that formatting is inherited from the document defaults.

L.1.8.10 **Style Application**

With the various flavors of styles available, multiple style types can be applied to the same content within a file, which means that properties must be applied in a specific deterministic order. As with inheritance, the resulting formatting properties set by one type can be unchanged, removed, or altered by following types.

The following table illustrates the order of application of these defaults, and which properties are impacted by each:



This process can be described as follows: First, the document defaults are applied to all runs and paragraphs in the document. Next, the table style properties are applied to each table in the document, following the conditional formatting inclusions and exclusions specified per table. Next, numbered item and paragraph properties are applied to each paragraph formatted with a numbering style. Next, paragraph and run properties are applied to each paragraph as defined by the paragraph style. Next, run properties are applied to each run with a specific character style applied. Finally, we apply direct formatting (paragraph or run properties not from styles).

L.1.8.11 **Latent Styles**

The final piece of information stored in the styles part in the document, aside from style definition information, is *latent style* information.

Latent styles are all styles contained in a document's template which have not yet been instantiated (used) in the current instance of the document.

In WordprocessingML, there are often properties which must be set on all styles in a document template regardless of whether they are being used: for example, whether or not the style can be applied in the current document (locked state), UI sorting priority, whether the style should be shown in the user interface, etc. In order for the document to function correctly, it is essential that this information is stored within the document, so that a consumer can determine the necessary style information from the document alone (without access to the template). However, it would be grossly inefficient for the document to store all style information for all styles simply to store this information, so latent styles are used to store just the necessary style properties without caching all style information in the document.

In order to do this efficiently, the document declares a `latentStyles` element in the styles part which defines the default properties applied to all latent styles in the document. All styles whose properties do not match the default for the set of style properties which must be defined for all styles are explicitly defined using the `lsdException` element.

Consider the following latent style information stored in a document's styles part:

```
<w:latentStyles w:defLockedState="0" w:defUIPriority="99"
  w:defSemiHidden="1" w:defUnhideWhenUsed="1" w:defQFormat="0"
  w:count="180">
  <w:lsdException w:name="Normal" w:unhideWhenUsed="0"
    w:qFormat="1"/>
  <w:lsdException w:name="heading 1" w:semiHidden="0" w:uiPriority="1"/>
  <w:lsdException w:name="heading 2" w:uiPriority="1"
    w:unhideWhenUsed="1"/>
  <w:lsdException w:name="heading 3" w:semiHidden="0"/>
  <w:lsdException w:name="heading 4" w:uiPriority="1" w:qFormat="1"/>
  <w:lsdException w:name="heading 5" w:uiPriority="1" w:qFormat="1"/>
  <w:lsdException w:name="heading 6" w:uiPriority="1" w:qFormat="1"/>
  <w:lsdException w:name="heading 7" w:uiPriority="1" w:qFormat="1"/>
  <w:lsdException w:name="heading 8" w:uiPriority="1" w:qFormat="1"/>
  <w:lsdException w:name="heading 9" w:uiPriority="1" w:qFormat="1"/>
  <w:lsdException w:name="Normal Indent" w:uiPriority="6" w:qformat="1"/>
</w:latentStyles>
```

The attributes on the `latentStyles` element define the properties applied to all latent styles for this document. All styles whose properties do not match the default latent styles properties are explicitly defined using the values on the `lsdException` elements.

L.1.9 Fonts

L.1.9.1 Font References

Within a WordprocessingML document, font face information can be referenced by any set of run properties, both as part of a style definition or direct formatting on one or more runs in the document's contents. This reference is established by referencing the primary name of the font face that is used in the `rFonts` element of the run properties, linking that run with the desired font face.

For example, consider a run of text that has been directly formatted to use the `Arial Black` font face. This setting would be specified as follows on the run's properties:

```
<w:r>
  <w:rPr>
    <w:rFonts w:ascii="Arial Black" w:hAnsi="Arial Black" />
  </w:rPr>
  <w:t>This run of text uses the Arial Black font face.</w:t>
</w:r>
```

The `rFonts` element specifies that the run should be formatted using the `Arial Black` font face. Applications can then look up and use the font with primary name of `Arial Black` when formatting this run.

L.1.9.2 Font Reference Types

In the example above, two attributes were present, both referring to the font face with primary name `Arial Black`. This simple case illustrates the ability for a WordprocessingML document to store up to four fonts which can be used on the contents of a run, as follows:

- ASCII font
- High ANSI font
- East Asian font
- Complex Script font

Each of these font faces is used to format the characters in the run that fall under their purview:

The *ASCII font* formats all characters in the ASCII range (Unicode character values U+0000–U+007F). This font is specified using the `ascii` attribute on the `rFonts` element.

The *East Asian font* formats all characters that belong to Unicode sub ranges for East Asian languages. This font is specified using the `eastAsia` attribute on the `rFonts` element.

The *complex script font* formats all characters that belong to Unicode sub ranges for complex script languages. This font is specified using the `cs` attribute on the `rFonts` element.

The *high ANSI font* formats all characters that belong to Unicode sub ranges other than those explicitly included by one of the groups above. This font is specified using the `hAnsi` attribute on the `rFonts` element.

For example, consider a run of text defined as follows:

```
<w:r>
  <w:rPr>
    <w:rFonts w:ascii="Arial Black" w:hAnsi="Arial Black" w:cs="Arial"
      w:eastAsia="SimSun"/>
  </w:rPr>
  ...
</w:r>
```

The `rFonts` element specifies that the contents of this run are formatted as follows:

- Complex script characters used the `Arial` font
- East Asian characters used the `SimSun` font
- All other characters used the `Arial Black` font

L.1.9.3 Ambiguous Characters

When classifying characters into one of the four slots defined above, it is likely that the classification of some characters is ambiguous (the resulting classification would be equally applicable for one or more font slots).

To handle this, the font face information can also include a hint, which specifies how ambiguous mappings are resolved into a font slot. This information is stored on the `hint` attribute on the `rFonts` element, and specifies the bucket into which these ambiguous characters fall.

For example, if the `hint` attribute has a value of `eastAsia`, then all ambiguous characters must be formatted using the East Asian font face.

L.1.9.4 Font Table

Within a document, the *font table* contains information about the fonts used in the document to allow:

- Applications to perform substitution with the most appropriate possible font when the desired font face is not available on the system. Since some fonts are commercially distributed, it is possible for a document to be formatted with one or more fonts that are not available depending on the machine opening the current system. This information allows the application that cannot locate the desired font to perform the most appropriate possible match.
- Embedding of fonts in the document to prevent the need for font substitution

The font table part is stored via an implicit relationship from either the main document part or the glossary document part, and has a relationship type of

<http://purl.oclc.org/ooxml/officeDocument/relationships/fontTable>, and a content type of `vnd-openxmlformats.officedocument.wordprocessingml-fontTable+xml`.

L.1.9.5 Font Substitution Data

The first classification of data stored in the font table are an optional set of font metrics which are queried from the font and stored in the document such that future applications can utilize them when the desired font is not available. If a particular font face cannot be located on the current system, then this data is used to substitute a font that most appropriately matches its characteristics.

For example, consider the font substitution data stored for the Arial Black font:

```
<w:font w:name="Arial Black">
  <w:panose1 w:val="020B0A04020102020204" />
  <w:charset w:val="00" />
  <w:family w:val="swiss" />
  <w:pitch w:val="variable" />
  <w:sig w:usb0="00000287" w:usb1="00000000" w:usb2="00000000"
    w:usb3="00000000" w:csb0="0000009F" w:csb1="00000000" />
</w:font>
```

This data is linked to the font face with a name of Arial Black via the name attribute, and stores the following information about the font (see the reference material on fonts for more details):

- The font's Panose-1 number
- The character set of the font
- The font's family
- The font's pitch
- The code pages and Unicode sub ranges supported by the font

L.1.9.6 Font Embedding

As well as providing information about the font's metrics, applications can be directed to embed the contents of a font (partially or as a whole) into a document, a process known as font embedding. *Font embedding* literally embeds an obfuscated version of the font into the file so that it can be retrieved and used to view the contents of this document - but the obfuscation ensures that the font cannot be extracted and used for any other document (as it might have a commercial license).

Within the font table, when a font is embedded there are explicit relationships to each font form needed:

- Regular
- Bold
- Italic
- Bold + Italic

Each form is obfuscated using the mechanism described in the reference material on this subject.

L.1.9.7 Theme Fonts

As well as storing standard font face information, run properties can store an abstraction for font face information known as theme fonts. *Theme fonts* are values that specify that the font face information for a run is not stored in the attribute value using the appropriate font face name, but is rather a reference into the document's theme part, allowing font face information to be stored and managed centrally as part of the theme data. It is appropriate to think of theme fonts as a "style for fonts" in the same way in which a style is a reference to the formatting that is stored centrally in another part.

Theme fonts are specified using the theme attribute variants in the `rFonts` element, rather than storing the actual font face name.

For example, consider a run of text defined as follows:

```
<w:r>
  <w:rPr>
    <w:rFonts w:asciiTheme="minorHAnsi" w:hAnsiTheme="minorHAnsi" />
  </w:rPr>
  ...
</w:r>
```

The `rFonts` element's attribute values of `asciiTheme` and `hAnsiTheme` both store a reference to a theme font stored in the document's theme part (i.e., there is no font with the primary name `minorHAnsi`).

Once this information has been established, it is combined with the theme language data stored in the document's settings to resolve the appropriate theme fonts from the theme part. The syntax and format of the theme part are stored in the DrawingML syntax and discussed in that section.

L.1.10 Numbering

Numbering in WordprocessingML refers to symbols—Arabic numerals, Roman numerals, symbol characters ("bullets"), text strings, etc.—that are used to label individual paragraphs of text.

The following two paragraphs each contain numbering as defined by WordprocessingML: the first uses an Arabic numeral, the second a symbol character:

1. This is a paragraph with numbering information.
- This is also a paragraph with numbering information.

L.1.10.1 Numbering Part

Numbering information in a WordprocessingML document is stored in the Numbering part within the package, which is stored via an implicit relationship from the Main Document part or Glossary Document part of relationship type

<http://purl.oclc.org/ooxml/officeDocument/relationships/numbering> and has a content type of `vnd-openxmlformats-officedocument.wordprocessingml-numbering+xml`.

L.1.10.2 Numbering Definitions

The specification of a specific set of numbering information is called a *numbering definition*. Numbering definitions are stored in two components:

- Abstract numbering definitions
- Numbering definition instances

As shown below, their relationship is (essentially) that of an abstract and an inherited class.

L.1.10.3 Abstract Numbering Definitions

An *abstract numbering definition* is the basis for all numbering information in a WordprocessingML document, as it defines the appearance and behavior of a specific set of numbered paragraphs in a document, and is defined using the `abstractNum` element. Although abstract numbering definitions contain all of the numbering information for one type of numbering, they cannot be directly referenced by content (hence their abstract designation), they must be inherited by a numbering definition instance, which itself can be referenced by content. A specific abstract numbering definition in WordprocessingML can be divided into two parts:

- Common numbering properties
- Numbering levels

The complete definition of all abstract numbering properties can be found in the reference for the `abstractNum` element.

Common numbering properties refer to the properties that can be specified by all abstract numbering definitions regardless of their contents. Examples of common numbering properties include: a numbering ID (which uniquely identifies a numbering definition), the numbering definition type (single level, multi-level, multi-level hybrid), the numbering name, and optional numbering style references, as discussed in detail later in this subclause.

Consider the following example of an abstract numbering definition in a WordprocessingML document:

```
<w:abstractNum w:abstractNumId="4">
  <w:nsid w:val="1DE04504" />
  <w:multilevelType w:val="hybridMultilevel" />
  <w:lvl w:ilvl="0" w:tplc="0409000F">
    ...
  </w:lvl>
  <w:lvl w:ilvl="1" w:tplc="04090019">
    ...
  </w:lvl>
```

```

<w:lvl w:ilvl="2" w:tplc="04090019">
  ...
</w:lvl>
<w:lvl w:ilvl="3" w:tplc="0409000F">
  ...
</w:lvl>
...
</w:abstractNum>

```

This numbering definition specifies two common properties: a numbering ID (using the `nsid` element) of `1DE04504`, and a list type (using the `multiLevelType` element) of `hybridMultilevel`, which specifies that this abstract numbering definition is more than one level and contains multiple numbering formats.

The other part of an abstract numbering definition is the specification of one or more numbering levels, each of which defines a unique set of formatting properties for one level in this numbering definition.

Consider three numbered paragraphs that reference the same numbering definition, but each, in turn, reference a different level within that list:

1. One
 - a. Two
 - i. Three

Although the paragraphs each reference the same abstract numbering definition (which is discussed later), each refers to a separate level within that abstract numbering definition, and therefore each has a unique set of paragraph and numbering properties.

It is important to note that the concept of levels in an abstract numbering definition refers to the levels as defined in the file format, and in no way the logical indentation of numbered paragraphs within a WordprocessingML document.

Consider another set of numbered paragraphs in WordprocessingML, where each subsequent paragraph is a different level but references the same abstract numbering definition:

- 1} Level one
 - a} Level two
 - i} Level three
 - {1} Level four
 - {a} Level five

In this example, the properties of each level of the numbering definition is such that the paragraphs for each level are indented arbitrarily. However, this is still a completely acceptable numbering definition, and the paragraphs each represent subsequent levels of the same numbering definition.

Within an abstract numbering level definition, each numbering level is represented by an `lvl` element that defines a single level of numbering information. Numbering levels specify the following properties: starting number value, a number format presentation code (e.g., 1 vs. the string literal One), an associated paragraph style, which previous level should cause this numbering level to restart, the numbering text, number justification, a paragraph properties indentation for this level, etc. The complete definition of all numbering level properties can be found on the reference for the `lvl` element.

Consider the following numbering level definition in WordprocessingML:

```
<w:lvl w:ilvl="1">
  <w:start w:val="4"/>
  <w:nfc w:val="3"/>
  <w:pStyle w:val="Heading1"/>
  <w:lvlText w:val="BEFORE %2 AFTER %1 END"/>
  <w:lvlJc w:val="start"/>
  <w:pPr>
    <w:tabs>
      <w:tab w:val="num" w:pos="2880"/>
    </w:tabs>
    <w:ind w:left="288" w:firstLine="1152"/>
  </w:pPr>
</w:lvl>
```

This particular numbering level defines the following information:

- This is level 1 (the second level) for this numbering definition
- Start at number 4
- Use number format 3 (which translates to 1, 2, 3, and so on)
- When this level is used, apply the `Heading1` style
- Use the following level text for the number: `BEFORE %2 AFTER %1 END`
- Left justify the number
- Set a left indent of 288 twentieths of a point, and a first line indent of 1152 twentieths of a point

This information is used to display the number for paragraphs of level 1 the reference this numbering definition.

Of particular significance is the `lvlText` element, which defines the content of the number text for each numbering level. Its syntax allows any string literal to be placed in the number (e.g., the `ARTICLE` in `ARTICLE I`, `ARTICLE II`, `ARTICLE III`, and so on), as well as the current value of the number for this or any previous level in the list.

Referring to the numbering level definition above, the `lvlText` is defined as follows:

```
<w:lvlText w:val="BEFORE %2 AFTER %1 END"/>
```

This level text specifies three literal strings (BEFORE, AFTER, END) mixed with the current numbering value from level 1 and level 0 in the document. Therefore, assuming level 0 is just a simple number, when inserted it would read:

```

1
  BEFORE 1 AFTER 1 END
  BEFORE 2 AFTER 1 END
  BEFORE 3 AFTER 1 END
2
  BEFORE 1 AFTER 2 END
  BEFORE 2 AFTER 2 END
...

```

The %1 and %2 values correspond to the value for level 0 and 1 of this list, respectively.

L.1.10.4 Numbering Definition Instances

A numbering definition instance is a specific instantiation of numbering information that can be referenced by zero or more paragraphs within the document. A numbering definition instance is defined using the num element. A specific numbering definition instance in WordprocessingML can be divided into two parts:

- An abstract numbering reference
- (Optional) level overrides

The definition of all numbering definition instance properties can be found on the reference for the num element.

The required piece of information in a numbering definition instance, the instance must reference an abstract numbering definition using the abstractNumId element. This element specifies the value of the abstractNumId attribute for the inherited abstract numbering definition information.

Consider the WordprocessingML for a document with four numbering definition instances, two of which reference the same underlying abstract numbering definition:

```

<w:numbering>
...
  <w:num w:numId="2">
    <w:abstractNumId w:val="0" />
  </w:num>
  <w:num w:numId="3">
    <w:abstractNumId w:val="1" />
  </w:num>
  <w:num w:numId="4">
    <w:abstractNumId w:val="4" />
  </w:num>

```

```

<w:num w:numId="5">
  <w:abstractNumId w:val="4" />
</w:num>
</w:numbering>

```

As shown above, the first two numbering definition instances reference abstractNumId values of 0 and 1 respectively, and the last two both reference the abstract numbering definition with an abstractNumId of 4.

The second (and optional) piece of information for a numbering definition instance is one or more numbering level overrides using the lvlOverride element. This element specifies a set of optional overrides applied to zero or more levels from the abstract numbering definition inherited by this instance.

Consider a numbering definition instance that inherits its information from the abstract numbering definition with abstractNumId of 4, but wishes to use a different set of properties for level 0 of the numbering definition. The resulting WordprocessingML would look like:

```

<w:num w:numId="6">
  <w:abstractNumId w:val="4" />
  <w:lvlOverride w:ilvl="0">
    <w:lvl w:ilvl="0">
      <w:start w:val="4" />
      <w:lvlText w:val="%1)" />
      <w:lvlJc w:val="start" />
      <w:pPr>
        <w:ind w:left="360" w:hanging="360" />
      </w:pPr>
    </w:lvl>
  </w:lvlOverride>
</w:num>

```

This level overrides level 0 of the list with the specified set of numbering properties, replacing those in the abstract numbering definition.

L.1.10.5 Applying Numbering to Paragraphs

Once numbering information is defined in the numbering part, this information must be associated with paragraphs within the document in order to display numbering on one or more paragraphs of content.

To accomplish this, numbered paragraphs are identified by the numPr element within the paragraph's properties element (the pPr element). The numbering properties within a paragraph are specified using two specific elements that specify the numbering definition information to use:

- A numbering definition instance reference
- A numbering level reference

The numbering definition instance reference is specified using the numId element. This element contains a reference to the numId attribute in a specific numbering definition instance within the numbering part, which links this paragraph to that numbering definition instance.

The numbering level reference is specified using the ilvl element. This element contains a reference to the ilvl attribute in the specified numbering definition instance's level information, which specifies the numbering level within the referenced numbering definition instance to be used by this numbered paragraph.

Consider the following numbered paragraphs in a WordprocessingML document:

1. Level one item one
 - a. Level two item one
2. Level one item two
 - a. Level two item one

These four numbered paragraphs, all referencing the same numbering definition, produce the following WordprocessingML:

```
<w:p>
  <w:pPr>
    <w:numPr>
      <w:ilvl w:val="0" />
      <w:numId w:val="5" />
    </w:numPr>
  </w:pPr>
  <w:r>
    <w:t>Level one item one</w:t>
  </w:r>
</w:p>
```



```

<w:p>
  <w:pPr>
    <w:numPr>
      <w:ilvl w:val="1" />
      <w:numId w:val="5" />
    </w:numPr>
  </w:pPr>
  <w:r>
    <w:t>Level two item one</w:t>
  </w:r>
</w:p>
<w:p>
  <w:pPr>
    <w:numPr>
      <w:ilvl w:val="0" />
      <w:numId w:val="5" />
    </w:numPr>
  </w:pPr>
  <w:r>
    <w:t>Level one item two</w:t>
  </w:r>
</w:p>
<w:p>
  <w:pPr>
    <w:numPr>
      <w:ilvl w:val="1" />
      <w:numId w:val="5" />
    </w:numPr>
  </w:pPr>
  <w:r>
    <w:t>Level two item one</w:t>
  </w:r>
</w:p>

```

In these numbered paragraphs, level 0 and 1 of the numbering definition are referenced through the `ilvl` element with a `val` attribute of 0 or 1, respectively, however, the `numId` element always references the numbering definition instance with a `val` of 5.

The numbering at any particular numbering level is restarted when a paragraph in the current document from the same numbering definition uses the level specified in the `lvlRestart` element for this numbering level.

Consider a set of numbered paragraphs in a WordprocessingML document where:

- Level 1 is set to restart after each level 0 (lvlRestart of 1)
- Level 2 is set to never restart (lvlRestart of 0)

- 1) Level one
 - a) Level two – restarts after each level one
 - i) Level three – never restarts
 - b) Level two – restarts after each level one
 - ii) Level three – never restarts
- 2) Level one
 - a) Level two – restarts after each level one
 - iii) Level three – never restarts
 - b) Level two – restarts after each level one
 - iv) Level three – never restarts

As the example shows, the numbering at level 1 (a, b, c, and so on) restarts after each level 0 is used, but level 2 (i, ii, iii, and so on) never restarts.

L.1.10.6 The Complete Story

To summarize the use of numbering information in a document, the paragraph properties specify a numPr element, which references a numbering definition instance via the numId element. The numbering definition instance specifies an inherited abstract numbering definition via the abstractNumId element. The paragraph then also specifies the list level from the numbering definition instance using the ilvl element.

Consider the following WordprocessingML for a numbered paragraph:

```
<w:p>
  <w:pPr>
    <w:numPr>
      <w:ilvl w:val="0" />
      <w:numId w:val="5" />
    </w:numPr>
  </w:pPr>
  <w:r>
    <w:t>Numbered paragraph</w:t>
  </w:r>
</w:p>
```

Based on the numId of 5, the paragraph uses the numbering definition instance with a numId of 5:

```

<w:numbering>
...
<w:num w:numId="5">
  <w:abstractNumId w:val="4" />
</w:num>
</w:numbering>

```

Based on the abstractNumId of 4, this instance inherits the abstract numbering definition with an abstractNumId of 4:

```

<w:numbering>
  <w:abstractNum w:abstractNumId="4">
    <w:nsid w:val="FFFFFF7F" />
    <w:multiLevelType w:val="singleLevel" />
    <w:lvl w:ilvl="0">
      <w:start w:val="1" />
      <w:lvlText w:val="%1." />
      <w:lvlJc w:val="start" />
      <w:pPr>
        <w:tabs>
          <w:tab w:val="num" w:pos="720" />
        </w:tabs>
        <w:ind w:left="720" w:hanging="360" />
      </w:pPr>
    </w:lvl>
  </w:abstractNum>
...
</w:numbering>

```

Since the numbering definition instance does not specify an override for ilvl 0, the definition for the corresponding level from the abstract numbering definition is applied to the text.

L.1.10.7 Numbering Styles

As stated earlier in the styles subclause (§L.1.8), numbering styles are style definitions which specify common formatting properties for a multi-level numbering format within a document. This means that a numbering style definition in the styles part defines only a single property: a reference to a numbering definition instance stored in the document's numbering part, using the numId element within the numPr element. That numbering definition instance specifies an abstract numbering style, which contains the numbering level information for the numbering style. It also specifies that it is the basis for the numbering style by back-referencing the numbering style's styleId attribute via the styleLink element.

Unlike paragraph and character styles, numbering styles are never directly referenced by content in the document—instead, an abstract numbering definition specifies that it contains the underlying

numbering information for a numbering style, and one or more numbering definition instances reference that abstract numbering definition.

L.1.10.8 Referencing Numbering Styles

To use a numbering style in a document, the paragraph properties for one or more paragraphs again specify a numPr element, which references a numbering definition instance via the numId element. The numbering definition instance itself again specifies an inherited abstract numbering definition via the abstractNumId element.

At this stage, the abstract numbering definition specifies that it is based on a numbering style via either of the following:

- The abstract numbering style contains no level data, and simply specifies a reference to the numbering style's styleId attribute via the numStyleLink element.
- The abstract numbering style contains the numbering level information for the numbering style, and specifies that it is the basis for the numbering style by referencing the numbering style's styleId attribute via the styleLink element.

Although the result of each method is identical, the following two examples illustrate each of the syntaxes:

Consider the first numbering style syntax, in which the numbering on a paragraph is based on an abstract numbering definition which simply references the numbering style via numStyleLink. The contents of the paragraph would consist of the following:

```
<w:p>
  <w:pPr>
    <w:numPr>
      <w:ilvl w:val="0" />
      <w:numId w:val="6" />
    </w:numPr>
  </w:pPr>
  <w:r>
    <w:t>This paragraph references a numbering style via
numStyleLink.</w:t>
  </w:r>
</w:p>
```

The numId element references a numbering definition instance with a value of 6, located in the numbering part:

```
<w:num w:numId="6">
  <w:abstractNumId w:val="0" />
</w:num>
```

Based on the abstractNumId of 0, this instance inherits the abstract numbering definition with an abstractNumId of 0:

```
<w:abstractNum w:abstractNumId="0">
  <w:nsid w:val="38901FA4" />
  <w:multilevelType w:val="multilevel" />
  <w:numStyleLink w:val="TestNumberingStyle" />
</w:abstractNum>
```

This abstract numbering definition contains no numbering information - it simply notes that it inherits the numbering information from the numbering style `TestNumberingStyle` by referencing the `styleId` attribute on that style:

```
<w:style w:type="numbering" w:styleId="TestNumberingStyle">
  <w:name w:val="Test Numbering Style" />
  <w:uiPriority w:val="99" />
  <w:rsid w:val="00DB3C4B" />
  <w:pPr>
    <w:numPr>
      <w:numId w:val="4" />
    </w:numPr>
  </w:pPr>
</w:style>
```

The style references a numbering definition instance, again via the `numId` element:

```
<w:num w:numId="4">
  <w:abstractNumId w:val="2" />
</w:num>
```

Based on the abstractNumId of 2, this instance inherits the abstract numbering definition with an abstractNumId of 2:

```

<w:abstractNum w:abstractNumId="2">
  <w:nsid w:val="46364EB7" />
  <w:multilevelType w:val="multilevel" />
  <w:styleLink w:val="TestNumberingStyle" />
  <w:lvl w:ilvl="0">
    <w:lvlText w:val="%1 %1 %1" />
    <w:lvlJc w:val="start" />
    <w:pPr>
      <w:tabs>
        <w:tab w:val="num" w:pos="360" />
      </w:tabs>
      <w:ind w:left="0" w:firstLine="0" />
    </w:pPr>
  </w:lvl>
  ...
</w:abstractNum>

```

This abstract numbering definition defines the properties for each level of the numbering format (levels 1 through 9 omitted for brevity). Since neither of the numbering definition instances specified overrides for level 0, the properties from abstract numbering format 2 are applied to level 0 in the resulting numbering definition instance and are applied to the text via the `ilvl` element.

Consider the second numbering style syntax, in which the numbering on a paragraph is based on an abstract numbering definition which defines the numbering information and references the numbering style via `styleLink`. The contents of the paragraph would consist of the following:

```

<w:p>
  <w:pPr>
    <w:numPr>
      <w:ilvl w:val="0" />
      <w:numId w:val="4" />
    </w:numPr>
  </w:pPr>
  <w:r>
    <w:t>This paragraph references a numbering style via styleLink.</w:t>
  </w:r>
</w:p>

```

The `numId` element references a numbering definition instance with a value of 4, located in the numbering part:

```

<w:num w:numId="4">
  <w:abstractNumId w:val="2" />
</w:num>

```

Based on the abstractNumId of 2, this instance inherits the abstract numbering definition with an abstractNumId of 2:

```
<w:abstractNum w:abstractNumId="2">
  <w:nsid w:val="46364EB7" />
  <w:multilevelType w:val="multilevel" />
  <w:styleLink w:val="TestNumberingStyle" />
  <w:lvl w:ilvl="0">
    <w:lvlText w:val="%1 %1 %1" />
    <w:lvlJc w:val="start" />
    <w:pPr>
      <w:tabs>
        <w:tab w:val="num" w:pos="360" />
      </w:tabs>
      <w:ind w:left="0" w:firstLine="0" />
    </w:pPr>
  </w:lvl>
  ...
</w:abstractNum>
```

This abstract numbering definition defines the properties for each level of the numbering format (levels 1 through 9 omitted for brevity) and specifies that it is the underlying numbering information for a numbering format by referencing the styleId of that numbering style via the styleLink element. Since the numbering definition instances specified no override for level 0, the properties from abstract numbering format 2 are applied to level 0 in the resulting numbering definition instance and are applied to the text via the ilvl element.

L.1.11 Headers and Footers

Headers and *footers* refer to text, graphics, or data (such as page number, date, document title, and so on) that can appear at the top or bottom of each page in a WordprocessingML document.

A *header* appears in the top margin (above the main document content on the page), while a *footer* appears in the bottom margin of a document page (below the main document content on the page); for example:



Since WordprocessingML is a flow-based format, headers and footers are applied by specifying the headers and footers for all pages in a particular section of a document.

L.1.11.1 Header Part

Header information in a WordprocessingML document is stored in a header part within the package, which is stored via an implicit relationship from the Main Document part or the Glossary Document part of relationship type <http://purl.oclc.org/ooxml/officeDocument/relationships/header> and has a content type of `vnd-openxmlformats.officedocument.wordprocessingml-header+xml`.

L.1.11.2 Footer Part

Footer information in a WordprocessingML document is stored in a footer part within the package, which is stored via an implicit relationship from the Main Document part or the Glossary Document part of relationship type <http://purl.oclc.org/ooxml/officeDocument/relationships/footer> and has a content type of `vnd-openxmlformats.officedocument.wordprocessingml-footer+xml`.

L.1.11.3 Headers and Footers

As described above, header and footer information is stored in one or more header or footer parts within the package.

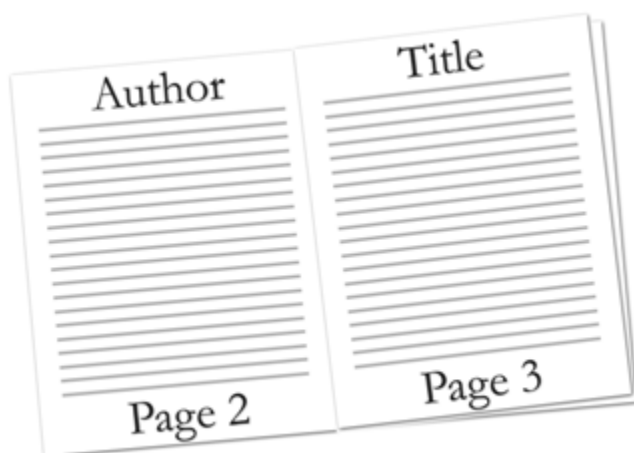
The `hdr` element defines a single header for the document, while the `ftn` element defines a single footer for the document. Headers and footers are just another document story in WordprocessingML. Within the root element of the header or footer, the content of the element is similar to the content of the body element, and contains what is referred to as *block-level markup* —markup that can exist as a sibling element to paragraphs in a WordprocessingML document.

Within each section of a document there can be up to three different types of headers and footers:

- First page header/footer
- Odd page header/footer
- Even page header/footer

First page headers and footers specify a unique header or footer that must appear on the first page of a section. *Odd page headers and footers* specify a unique header and footer that must appear on all odd numbered pages for a given section. *Even page headers and footers* specify a unique header and footer that must appear on all even numbered pages in a given section.

Different headers or footers can be useful for bounded documents like books, as shown in the figure below.



Consider the following simple one-page document with one header:

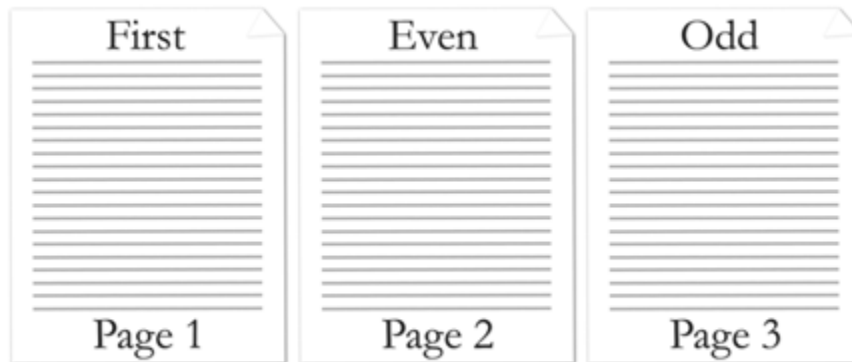


This document defines one header with the text `Header`. The header's content is stored in a unique Header part. The resulting header is represented by the following WordprocessingML:

```
<w:hdr>
  <w:p>
    <w:r>
      <w:t>Header</w:t>
    </w:r>
  </w:p>
</w:hdr>
```

Since headers are containers of block level contents, all block level contents can be used within them. In this particular example, the content is a single paragraph.

Consider a more complex three-page document with different first, odd, and even page headers defined:



This document defines three headers stored in three different header parts. The resulting headers are represented by the following WordprocessingML:

First page header part:

```
<w:hdr>
  <w:p>
    <w:r>
      <w:t>First</w:t>
    </w:r>
  </w:p>
</w:hdr>
```

Even page header part:

```
<w:hdr>
  <w:p>
    <w:r>
      <w:t>Even</w:t>
    </w:r>
  </w:p>
</w:hdr>
```

Odd page header part:

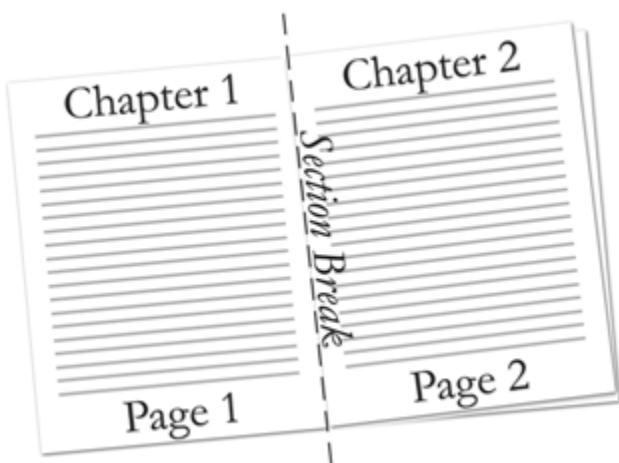
```

<w:hdr>
  <w:p>
    <w:r>
      <w:t>Odd</w:t>
    </w:r>
  </w:p>
</w:hdr>

```

L.1.11.4 Multiple Sections

Documents are capable of having multiple sections, where each section can define up to three headers and footers. By default, sections other than the first section inherit the previous header and footer references, unless that section specifies header and footer references.



Consider a two-page, two-section document with only the first section header defined. This document defines one header that is referenced in the first section. The document is represented by the following WordprocessingML:

```

<w:body>
  ...
  <w:p>
    <w:pPr>
      <w:sectPr>
        <w:headerReference r:id="rId6" />
        ...
      </w:sectPr>
    </w:pPr>
  ...
</w:p>
...

```

```

<w:sectPr>
...
</w:sectPr>
</w:body>

```

The second section does not explicitly reference a header. Instead, the second section inherits the header from the previous section.

L.1.11.5 Empty Header or Footer

Not specifying a header and footer reference in a section, other than the first section, causes the document to inherit the previous section's header and footer references. In order to declare an empty header or footer, a header or footer reference must be made to a null header or footer relationship, as follows:

```
<Relationship Id="rId2" Type="http:// .../header" Target="null" />
```

The null attribute value specifies that the header or footer must not be inherited from the previous section, and a blank header or footer must explicitly be used.

L.1.12 Footnotes and Endnotes

Footnotes and *endnotes* are separate text stories used in documents and books to show the source of borrowed material or to enter explanatory or supplementary information that does not interrupt the normal reading flow of the document.

Footnotes are typically located at the bottom of a page or beneath text being referenced, and *endnotes* are typically placed at the end of a document or at the end of a section. If document has been divided up into one or more sections, each section of a document can contain endnotes.

Both footnotes and endnotes consist of two parts:

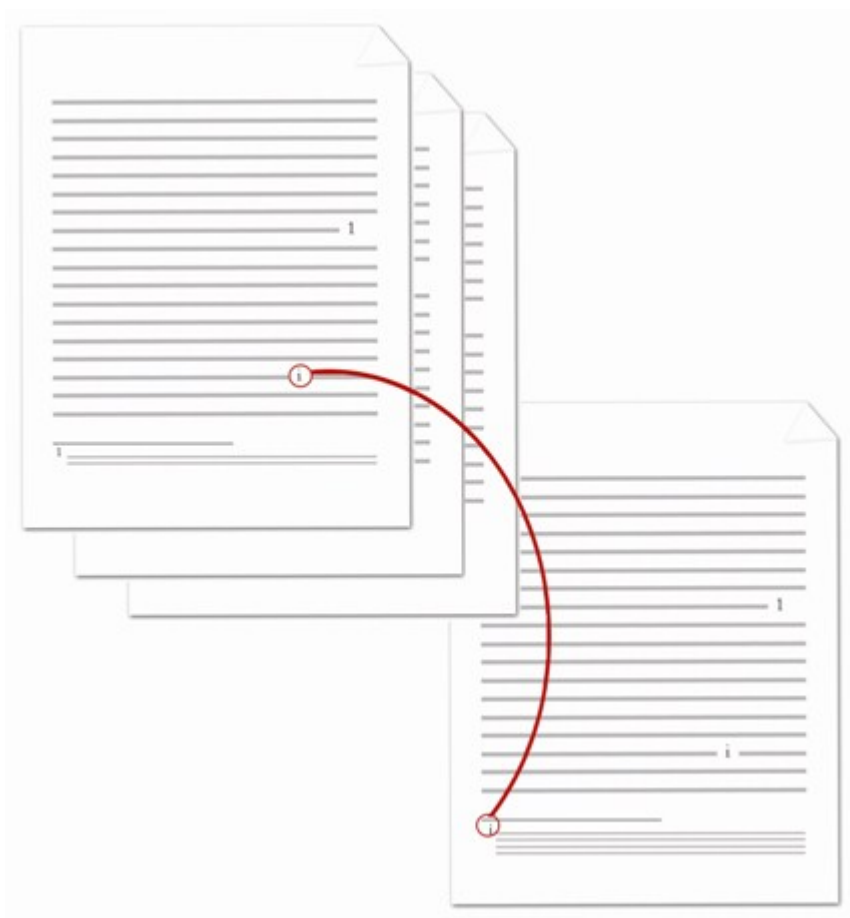
- A note reference mark in the body text to indicate that additional information is in a footnote or endnote, with a numbering system used for each to tell readers whether to look for the note at the end of the page or the end of the document or section.
- The actual footnote or endnote story content.

Here's an example of a footnote applied to text in a document:



The note reference mark follows the noted text and specifies that there is associated footnote information; the footnote itself is at the bottom of the current page.

Consider the following example of an endnote applied to text in a document:



The note reference mark follows the noted text and specifies that there is associated endnote information; the endnote itself is at the end of the current section.

L.1.1.12.1 Footnote Part

Footnote information in a WordprocessingML document is stored in the footnotes part within the package, which is stored via an implicit relationship from the Main Document part or Glossary Document part of relationship type <http://purl.oclc.org/ooxml/officeDocument/relationships/footnotes> and has a content type of `vnd-openxmlformats-officedocument.wordprocessingml-footnotes+xml`.

L.1.1.12.2 Endnote Part

Endnote information in a WordprocessingML document is stored in the Endnotes part within the package, which is stored via an implicit relationship from the Main Document part or Glossary Document part of relationship type <http://purl.oclc.org/ooxml/officeDocument/relationships/endnotes> and has a content type of `vnd-openxmlformats-officedocument.wordprocessingml-endnotes+xml`.

L.1.1.12.3 Footnotes and Endnotes

As described above, footnote and endnote information is stored in the corresponding footnotes and endnotes part within the package. The footnotes element below specifies three or more footnotes, each identified by the footnote element, for the document. The endnotes element specifies three or more endnotes, each identified by the endnote element, for the document. Each footnote or endnote element is associated with a unique ID, specified by the attribute `id`.

Consider three different types of footnotes, each identified by a footnote element, defined in the Footnotes part. The use of each type of footnote is defined in the next subclause:

```
<w:footnotes ...>
  <w:footnote w:type="separator" w:id="0">
    ...
  </w:footnote>
  <w:footnote w:type="continuationSeparator" w:id="1">
    ...
  </w:footnote>
  <w:footnote w:id="2">
    ...
  </w:footnote>
</w:footnotes>
```

Similarly consider three different types of endnotes, each identified by an endnote element, defined in the Endnotes part. The use of each type of endnote is defined in the next subclause:

```

<w:endnotes ...>
  <w:endnote w:type="separator" w:id="0">
    ...
  </w:endnote>
  <w:endnote w:type="continuationSeparator" w:id="1">
    ...
  </w:endnote>
  <w:endnote w:id="2">
    ...
  </w:endnote>
</w:endnotes>

```

Footnotes and endnotes are just another kind of paragraph in WordprocessingML. Within the footnote or endnote element, the footnote or endnote can contain any valid block-level content, as defined by the WordprocessingML schema.

L.1.12.4 Footnote and Endnote Types

There are four different types of footnotes and endnotes:

- Normal – contain the text of any footnote (or endnote) in the document.
- Separator – define the separator used to separate the footnote (or endnote) from the document text.
- Continuation separator – define the separator used to separate the footnote (or endnote) from the document text when the footnote or endnote is a continuation from the previous page.
- Continuation notice – define the notice text to let readers know that the footnote (or endnote) has continued on the next page.

The attribute type specifies the type of footnote or endnote. Normal footnotes or endnotes are specified by a type attribute value of `normal` or by omitting the type attribute. In conjunction, a footnote reference mark, specified by `footnoteRef` element, or endnote reference mark, specified by `endnoteRef` element, must be present within the footnote or endnote definition.



Consider the following page in a document, where some text is referenced by a footnote at the end of a page:

The footnote text at the bottom of the page is a normal footnote type, represented by the following WordprocessingML:

```
<w:footnote w:id="2">
  <w:p>
    <w:pPr>
      <w:pStyle w:val="FootnoteText" />
    </w:pPr>
    <w:r>
      <w:rPr>
        <w:rStyle w:val="FootnoteReference" />
      </w:rPr>
      <w:footnoteRef />
    </w:r>
    <w:r>
      <w:t>Cool reference</w:t>
    </w:r>
  </w:p>
</w:footnote>
```

Not specifying any type attribute in the footnote element defaults to being a normal type of footnote. In this example, the footnote has a unique ID of 2. The text of the footnote is contained in the text run. Like any paragraph, footnotes can be associated with a particular style, and, in this example, the paragraph uses the FootnoteText paragraph style. Similarly, like any run, footnotes can be associated with a particular style, and, in this example, the run uses the FootnoteReference run style.

Separator footnotes or endnotes are specified by separator. These types of footnotes or endnotes define the look of the separator used to separate document text from footnotes or endnotes. In conjunction to separator type, a footnote or endnote separator reference mark, specified by a separator element must be present within the footnote or endnote definition.

Consider the following page in a document, where some text is referenced by a footnote at the end of a page:



The line separating the document text from the footnote is represented by the following WordprocessingML:

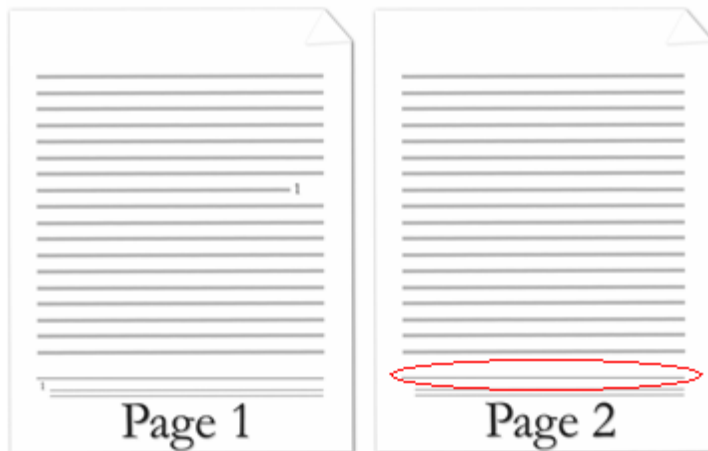
```
<w:footnote w:type="separator" w:id="0">
  <w:p>
    <w:pPr>
      <w:spacing w:after="0" w:line="240" w:lineRule="auto" />
    </w:pPr>
    <w:r>
      <w:separator />
    </w:r>
  </w:p>
</w:footnote>
```

In this example, the footnote has a unique ID of 0. The vertical spacing after the line separator is 0 twentieths of a point. The vertical spacing between the line separator and text is 240 twentieths of a point.

Continuation separator footnotes or endnotes are specified by continuationSeparator. These types of footnotes or endnotes define the look of the separator used to separate document text from footnotes or endnotes when the footnote or endnote continues the next page. In conjunction to a

continuationSeparator type, a footnote or endnote continuation separator reference mark, specified by continuationSeparator element must be present within the footnote or endnote definition.

Consider the following two pages in a document, where some text is referenced by a footnote that extends to the next page:



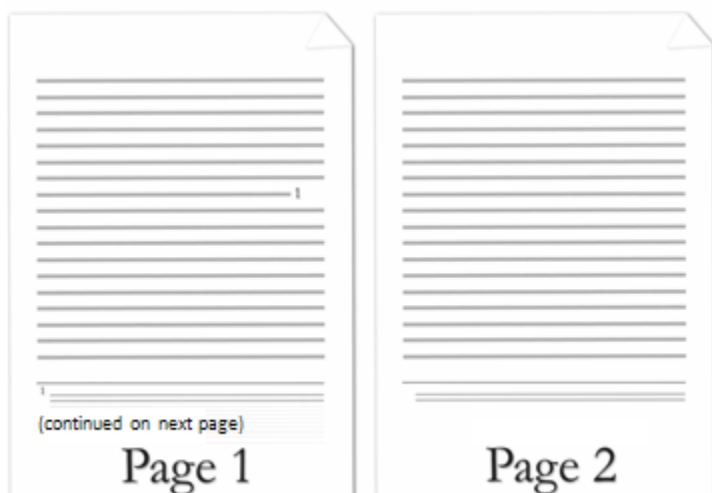
The line separating the document text from the footnote that is continued on the next page (circled in red in the image above) is the continuation separator footnote, and is represented by the following WordprocessingML:

```
<w:footnote w:type="continuationSeparator" w:id="1">
  <w:p >
    <w:pPr>
      <w:spacing w:after="0" w:line="240" w:lineRule="auto" />
    </w:pPr>
    <w:r>
      <w:continuationSeparator />
    </w:r>
  </w:p>
</w:footnote>
```

In this example, the footnote has a unique ID of 1. The vertical spacing after the line separator is 0 twentieths of a point. The vertical spacing between the line separator and text is 240 twentieths of a point.

Continuation notice footnotes or endnotes are specified by continuationNotice. These types of footnotes or endnotes specify the text to let readers know that the footnote or endnote is continued on the next page.

Consider the following two pages in a document, where some text is referenced by a footnote that extends to the next page. A continuation notice is given to readers to indicate that the footnote extends to the next page:



The continuation notice text is at the bottom of the footnote indicating that the footnote is continued to the next page (which reads `continued on next page` above) and is represented by the following WordprocessingML:

```
<w:footnote w:type="continuationNotice" w:id="3">
  <w:p >
    <w:pPr>
      <w:spacing w:after="0" w:line="240" w:lineRule="auto" />
    </w:pPr>
    <w:r>
      <w:t>(continued on next page)</w:t>
    </w:r>
  </w:p>
</w:footnote>
```

In this example, the footnote has a unique ID of 3. The text that shows up after the footnote text is `(continued on next page)`.

L.1.12.5 Footnote and Endnote Reference

Once footnote or endnote information is defined in the footnotes or endnotes part, this information must be associated with document text within the document in order to display the footnotes or endnotes. Each footnote or endnote is identified by a unique ID that references footnote or endnote definitions specified in the footnotes or endnotes part. Footnote or endnote references are identified by the `footnoteReference` or `endnoteReference` element within the text run's element (the `r` element). The `footnoteReference` or `endnoteReference` element points to the footnote or endnote ID defined in the footnotes or endnotes part.

Consider the following one-page document, where some text is referenced by a footnote at the end of the document page:



The footnote references text and is represented by the following WordprocessingML:

```
<w:p>
  <w:r>
    <w:t>Some referenced text</w:t>
  </w:r>
  <w:r>
    <w:rPr>
      <w:rStyle w:val="FootnoteReference" />
    </w:rPr>
    <w:footnoteReference w:id="2" />
  </w:r>
</w:p>
```

The footnote references the footnote in the footnotes part with ID equals to 2. Like any run, footnotes can be associated with a particular style, and, in this example, the run uses the FootnoteReference run style. The style of the footnote defines the look and numbering of the footnote.

L.1.13 Glossary Document

The introduction to a WordprocessingML document formally introduced the concept of stories, individual ranges of a word-processing document containing block-level content like paragraphs and tables. Some examples of stories in a WordprocessingML document include the following: the main document, headers, footers, comments, footnotes, and endnotes.

At that time, a story was defined by two characteristics:

- It is a unique region containing block-level content
- All document stories shared the same set of properties (e.g., style definitions, numbering definitions, and settings)

The glossary document, although it follows the first rule, actually defies the second.

Within a WordprocessingML file, the *glossary document* is a supplemental storage location for additional document content which must travel with the document, but which must not be displayed for printed as part of the main document until it is explicitly added to that document by deliberate action.

The glossary document must also be afforded a separate instance of all of the relationships that are provided on the main document part - this means that the glossary document must have its own style definitions, numbering definitions, comments, headers, footers, etc. within the WordprocessingML document.

Consider a document that must include ten optional clauses that can be inserted through a user interface. It is clearly not desirable to have these ten clauses appear in the main document story's contents before they are explicitly inserted, therefore each of them can be stored in the glossary document and inserted via the user interface as needed.

Within the glossary document, each distinct region of document content is referred to as a *glossary document entry*, and is defined via the docPart element. These document parts can contain any block-level WordprocessingML element, and can also have a set of classifications and behaviors applied to them via the glossary document entry's properties.

Consider the following definition for the contents of a glossary document part within a WordprocessingML document:

```
<w:glossaryDocument>
  <w:docParts>
    <w:docPart>
      <w:docPartPr>
        ...
      </w:docPartPr>
      <w:docPartBody>
        <w:p>
          <w:r>
            <w:t>Sample entry.</w:t>
          </w:r>
        </w:p>
      </w:docPartBody>
    </w:docPart>
```

```

    <w:docPart>
      ...
    </w:docPart>
  </w:docParts>
</w:glossaryDocument>

```

The `glossaryDocument` element defines the contents of the glossary document part. Within the glossary document, each `docPart` element contains the definition for one glossary document entry: in this case, there are two entries in the glossary document, the first of which contains a single paragraph with a single run of text.

Each glossary document entry consists of two components:

- The entry's properties, specified using the `docPartPr` element
- The entry's contents, specified using the `docPartBody` element

The first specifies information about the entry (e.g., its classification) for when it is inserted, the latter stores the block level content which constitutes the entry.

L.1.14 Annotations

L.1.14.1 Introduction

An *annotation* is one of various kinds of supplementary markup, which can be stored inside or around a region of text within the document's contents. The kinds of supplementary information stored within a document can include comments (§L.1.14.5), revisions (§L.1.14.7), spelling and/or grammatical errors (§L.1.14.10), bookmark information (§L.1.14.8), and optional editing permissions (§L.1.14.9).

Within a document's contents, annotations are stored in one of three different forms:

- Inline
- Cross-Structure
- Properties

These three forms are needed in order to maintain compatibility with both the legacy annotations functionality of current word-processing applications and the requirements of an XML-based format (i.e., well-formedness of the resulting XML markup). These three forms are referenced within the individual annotation types described in subclauses §L.1.14.2 through §L.1.14.4.

L.1.14.2 Inline Annotations

An *inline annotation* is a form of annotation that does not require special handling in order to maintain the XML well-formedness requirements of the resulting WordprocessingML output. In these cases, a single XML element must encapsulate the entire contents of the document content which is being annotated.

Consider the following WordprocessingML markup for a paragraph that reads The quick brown fox jumps over the jet lagged dog., where jet lagged replaced the previous text lazy when the editing application was tracking revisions:

```
<w:p>
  <w:r>
    <w:t xml:space="preserve">The quick brown fox jumps over the </w:t>
  </w:r>
  <w:del ... >
    <w:r>
      <w:delText>lazy</w:delText>
    </w:r>
  </w:del>
  <w:ins ... >
    <w:r>
      <w:t>jet lagged</w:t>
    </w:r>
  </w:ins>
  <w:r>
    <w:t xml:space="preserve"> dog.</w:t>
  </w:r>
</w:p>
```

The del and ins elements each fully encapsulate the extent of their respective annotations (a marked deletion and insertion, respectively), as they are inline annotations.

L.1.14.3 Cross-Structure Annotations

A *cross-structure annotation* is a form of annotation that can span portions of WordprocessingML markup. (Cross-structure annotations can span parts of multiple paragraphs, one half of a custom XML markup element's contents, and so on.) In these cases, the annotation's region is delimited by two elements, a start element and an end element, which mark the start and end points of the annotated content, respectively, but do not contain it. Matching start and end markers have the same id attribute value.

Consider the following WordprocessingML markup for two paragraphs, each reading Example Text, where a bookmark has been added spanning the second word in paragraph one, and the first word in paragraph two:

```

<w:p>
  <w:r>
    <w:t>Example</w:t>
  </w:r>
  <w:bookmarkStart w:id="0" w:name="sampleBookmark" />
  <w:r>
    <w:t xml:space="preserve"> text.</w:t>
  </w:r>
</w:p>
<w:p>
  <w:r>
    <w:t>Example</w:t>
  </w:r>
  <w:bookmarkEnd w:id="0" />
  <w:r>
    <w:t xml:space="preserve"> text.</w:t>
  </w:r>
</w:p>

```

The `bookmarkStart` and `bookmarkEnd` elements specify the location where the bookmark starts and ends, but cannot contain that bookmark because it spans parts of two paragraphs. They are part of one group because the `id` attribute value specifies 0 for both.

L.1.14.4 Property Annotations

A *property annotation* is a form of annotation that is stored as a property on an object (Property annotations can appear on paragraph properties, run properties, table rows, and so on.) In these cases, the annotation's semantics are defined by the property, as they can affect content and/or formatting.

Consider the following WordprocessingML markup for a paragraph reading `Example Text`, where the first word had the bold property applied when the editing application was tracking revisions:

```

<w:p>
  <w:r>
    <w:rPr>
      <w:b/>
      <w:rPrChange ... >
        <w:rPr/>
      </w:rPrChange>
    </w:rPr>
    <w:t>Example</w:t>
  </w:r>

```



```

<w:r>
  <w:t xml:space="preserve"> text.</w:t>
</w:r>
</w:p>

```

The `rPrChange` element contains the set of previously applied revision properties associated with a particular author at a particular time. It is stored itself as a property on the parent run which was modified.

L.1.14.5 Comments

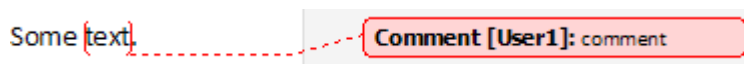
A *comment* is an annotation that is anchored to a region of document content, but which contains an arbitrary amount of block-level content stored in its own separate document story. Within a WordprocessingML document, comments are stored in a separate comments part within the document package.

A comment in a WordprocessingML document is divided into two components:

- The comment anchor (the text to which the comment applies)
- The comment content (the contents of the comment)

The *comment anchor* is the cross-structure annotation that defines the region of text on which the comment is anchored. The *comment content* is the text of the comment.

Consider a paragraph in a WordprocessingML document whose second word is annotated with a comment:



The first component to this comment is the document content, which defines the extents of the comment and references the specific comment in the comments part:

```

<w:p>
  <w:r>
    <w:t xml:space="preserve">Some </w:t>
  </w:r>
  <w:commentRangeStart w:id="0" />
  <w:r>
    <w:t>text.</w:t>
  </w:r>
  <w:commentRangeEnd w:id="0" />
  <w:r>
    <w:commentReference w:id="0" />
  </w:r>
</w:p>

```

The `commentRangeStart` and `commentRangeEnd` elements delimit the run content to which the comment with an id of 0 applies (in this case, the single run of text). The `commentReference` element that follows links the preceding run content with a comment in the comments part having an id of 0. Without all three of these elements, the range and comment cannot be linked (although the first two elements are optional, in which case the comment must be anchored at the comment reference mark)

The second component to this comment is the comment content, which defines the text in the comment:

```
<w:comment w:id="0" w:author="Joe Smith"
  w:date="2006-04-06T13:50:00Z" w:initials="User">
  <w:p>
    <w:pPr>
      <w:pStyle w:val="CommentText" />
    </w:pPr>
    <w:r>
      <w:rPr>
        <w:rStyle w:val="CommentReference" />
      </w:rPr>
      <w:annotationRef />
    </w:r>
    <w:r>
      <w:t>comment</w:t>
    </w:r>
  </w:p>
</w:comment>
```

In this example, the comment specifies that it was inserted by author Joe Smith with the initials User via the author and date attributes. It is linked to the run content via the id attribute, which matches the value of 0 specified using the `commentReference` element above. The block-level content of the comment specifies that its text is comment and the style of the comment content is based off of the character style with the name `CommentReference`.

L.1.14.6 Comments Part

Comment information in a WordprocessingML document is stored in the Comments part within the package, which is stored via an implicit relationship from the Main Document or Glossary Document part of relationship type `http://.../comments` and has a content type of `vnd-openxmlformats-officedocument.wordprocessingml-comments+xml`.

L.1.14.7 Revisions

A *revision* provides a mechanism for storing information about the evolution of the document (i.e., the set of modifications made to a document by one of more authors). When an application adds revisions

to the content of a WordprocessingML document, depending on the revision type they are specifying this by storing either:

- The current state of the document (a deletion stores the current state of the text as deleted, and implies that its original state was the content that used to exist)
- The initial state of the document (a run's initial properties are explicitly stored in a previous run properties block, as the current run properties are always those that are the child of the rPr element)

A revision consists of two required pieces of information:

- The revision type (specified via the name of the revision element)
- A unique revision identifier (used to uniquely identify revisions)

As well as optional information:

- The author of the revision
- The date and time of the revision

A revision is stored using the inline annotation format or the property annotation format.

Consider a paragraph of text in a WordprocessingML document in which one word has been inserted, as follows:

Some text

This paragraph has the word `text` marked inserted as a revision, and is represented as the following WordprocessingML:

```
<w:p>
  <w:r>
    <w:t xml:space="preserve">Some </w:t>
  </w:r>
  <w:ins w:id="0" w:author="Joe Smith" w:date="2006-03-31T12:50:00Z">
    <w:r>
      <w:t>text</w:t>
    </w:r>
  </w:ins>
</w:p>
```

The `ins` element contains all of the content that must be treated as revision marked as inserted (i.e., the word `text`).

This means that it contains both required pieces of information: the revision type, specified by the name of the revision element (`ins`); and a unique revision identifier of `0`.

The element also stores the optional information about the revision: the word `text` was inserted by Joe Smith on March 31, 2006 at 12:50 pm.

Within a WordprocessingML document, the following types of revisions can be used to track the changes to a document (each annotation's form in parentheses):

- Insertions (inline annotations for run content, property annotations for tables and paragraphs)
- Deletions (inline annotations for run content, property annotations for tables and paragraphs)
- Moves (inline annotations)
- Changes to run/paragraph/table/numbering/section properties (property annotations)
- Changes to custom XML markup (property annotations)

L.1.14.8 Bookmarks

A *bookmark* refers to an arbitrary region of content that is bounded and has a unique name associated with it.

Because bookmarks are a legacy word-processing function that predates the concepts of XML and well-formedness, they can start and end at any location within a document's contents and, therefore, must use the cross-structure annotation format described in §L.1.14.3.

Consider the following WordprocessingML markup for two paragraphs, each reading `Example Text`, where a bookmark has been added spanning the second word in paragraph one and the first word in paragraph two:

```
<w:p>
  <w:r>
    <w:t>Example</w:t>
  </w:r>
  <w:bookmarkStart w:id="0" w:name="sampleBookmark" />
  <w:r>
    <w:t xml:space="preserve"> text.</w:t>
  </w:r>
</w:p>
<w:p>
  <w:r>
    <w:t>Example</w:t>
  </w:r>
  <w:bookmarkEnd w:id="0" />
  <w:r>
    <w:t xml:space="preserve"> text.</w:t>
  </w:r>
</w:p>
```

The `bookmarkStart` and `bookmarkEnd` elements specify the location where the bookmark starts and ends, but cannot contain it using a single tag because it spans parts of two paragraphs. However, the two tags are part of one group because the `id` attribute value specifies `0` for both.

L.1.14.9 Range Permissions

A *range permission* refers to a special type of bookmark used to control which subset(s) of users can edit a particular region of a document. Range permissions specify the user, or set of users, that are allowed to edit all content between them whenever the document protection specified by the `documentProtection` element is enabled and set to `readOnly` or `comments`.

Like bookmarks, range permissions are a legacy word-processing function that predates the concepts of XML and well-formedness, so they can start and end at any location within a document's contents and, therefore, must use the cross-structure annotation format described in §L.1.14.3.

Consider the following WordprocessingML markup for a single paragraph, where a range permission has been added spanning the words `range permission`:

```
<w:p>
  <w:r>
    <w:t xml:space="preserve">This is a </w:t>
  </w:r>
  <w:permStart w:id="0" w:edGrp="everyone"/>
  <w:r>
    <w:t>range permission</w:t>
  </w:r>
  <w:permEnd w:id="0"/>
  <w:r>
    <w:t>.</w:t>
  </w:r>
</w:p>
```

The `permStart` and `permEnd` elements specify the location where the range permission starts and ends. The two tags are part of one group because the `id` attribute value specifies `0` for both.

If document protection was enabled, then no content in this document must be editable except for this range permission, which is editable by all users that open the document (specified using an editor group of everyone).

L.1.14.10 Spelling and Grammar

A *spelling and grammar error* is an annotation used to specify the locations of an existing spelling and/or grammatical error within the contents of a document. Spelling and grammar errors use the cross-structure annotation format.

Rationale: When a WordprocessingML document is saved, applications can choose to save currently flagged spelling and grammar errors, for two reasons:

- In order to increase the performance subsequent loads of the document (as those load operations can rely on the persisted proofing state of the document)
- In order to store words which must not be marked as proofing errors regardless of how they would normally be flagged by the proofing tools engine (i.e., to store spelling and grammar exceptions).

Consider the following paragraph consisting of two misspelled words, where the second word has been explicitly flagged as not being a spelling error. This paragraph would consist of the following WordprocessingML markup:

```
<w:p>
  <w:proofErr w:val="spellStart"/>
  <w:r>
    <w:t>erqwt</w:t>
  </w:r>
  <w:proofErr w:val="spellEnd"/>
  <w:r>
    <w:t xml:space="preserve"> werewr</w:t>
  </w:r>
</w:p>
```

The proofErr elements, with a val attribute value of spellStart and spellEnd, respectively, delimit the start and end of the content in this paragraph that is stored as a spelling error. Since the second word is not included in that range, it is not stored as a spelling error.

L.1.15 Mail Merge

Mail merge refers to a process by which a WordprocessingML document is connected to and populated with external data by a conforming hosting application and/or data source access application. A WordprocessingML document that contains the necessary data to connect to an external data source during a Mail Merge is known as a source document. In other words, a source document is a WordprocessingML document containing the elements and attributes necessary to enable the document to connect to an external data source, but not yet merged with any data.

Applications leverage source documents to generate new documents containing the static content contained in the merged document as well as data from the specified external data source. The documents that result from importing external data into a source document are known as merged documents. How source documents and merged documents are specified is explained in the following sections.

L.1.15.1 Mail Merge, WordprocessingML, and Hosting Applications

The two key parts of the mail merge process are:

1. Connecting to an external data source
2. Populating mail merge fields with external data

It is important to note that aspects of the mail merge process outside of connecting to an external data source and populating mail merge fields with external data, are at the discretion of the hosting application.

As an additional example, WordprocessingML provides an element to be used as a flag by hosting applications to specify action to be taken on the merged documents that are generated by a mail merge. In other words, performing actions such as:

- creating a new document for each merged document
- generating and sending emails containing merged document
- printing merged documents

can be specified through WordprocessingML, but what if any specific action is taken on merged documents is determined by the application.

L.1.15.2 Connecting Documents to an External Data Source

As mentioned, a source document is the single WordprocessingML document that contains the data necessary to be connected to an external data source by a conforming hosting application and/or data source access application. The presence and parameters of this connection are specified within the mailMerge element. This element enables WordprocessingML documents to be connected to an external data source by specifying the following data:

- Where the external data is located (e.g., file path)
- What type of data the external data source contains (e.g., database and spreadsheet)
- How the data is accessed

Consider a document containing static WordprocessingML constructs such as paragraphs in addition to two WordprocessingML mail merge fields calling for Courtesy Title and Last Name data.

Dear {MERGEFIELD "Courtesy Title" \m}
 {MERGEFIELD "Last Name" \m},

Sample text. Sample text. Sample text.
 Sample text. Sample text. Sample text. Sample
 text. Sample text. Sample text. Sample text.
 Sample text. Sample text. Sample text. Sample
 text. Sample text. Sample text. Sample text.
 Sample text. Sample text. Sample text. Sample
 text. Sample text. Sample text. Sample text.
 Sample text.

Sincerely,

If the following WordprocessingML was added to this document, this document would become a source document rather than just a standard WordprocessingML document, as the mailMerge element specifies the elements and attributes necessary to enable the hosting applications and/or data source access applications to connect the document to an external data source.

```
<w:mailMerge>
...
<w:dataType w:val="database" />
<w:query w:val="SELECT * FROM Table1" />
<w:dataSource r:id="rId1" />
...
</w:mailMerge>
```

Here, the dataType and dataSource elements specify that the given document must be connected to the external data source referenced by the r:id attribute's value of rId1. While connected to the external data source, the merged document together with the hosting application and/or data source access application can extract data from the external data source as specified by the connectString and query elements.

L.1.15.3 Populating Merged Documents with External Data

Before the hosting application can populate merged documents with external data, mail merge fields must be inserted into the *merged* document and mapped to the external data. How external data is mapped to given mail merge fields is determined by the WordprocessingML element fieldMapData.

Consider the example merged document from the previous example which contained the two mail merge fields calling for `Courtesy Title` and `Last Name`. The WordprocessingML below demonstrates how mapping of the external data to the merged document's mail merge fields occurs:

```
<w:fieldMapData>
  <w:type w:val="dbColumn" />
  <w:name w:val="Customer Title" />
  <w:mappedName w:val="Courtesy Title" />
  <w:column w:val="9" />
</w:fieldMapData>
<w:fieldMapData>
  <w:type w:val="dbColumn" />
  <w:name w:val="Customer Last Name" />
  <w:mappedName w:val="Last Name" />
  <w:column w:val="10" />
</w:fieldMapData>
```

Within the first `fieldMapData` element, the child elements `column`, `name`, `type`, and `mappedName` specify that the data contained within tenth column titled 'Customer Title', in the specified external database, is to be mapped to the mail merge field calling for 'Courtesy Title' data, respectively. Within the second `fieldMapData` element, the child elements `column`, `name`, `type`, and `mappedName` specify that the data contained within eleventh column in the specified external database is to be mapped to the merge field titled `Customer Last Name` or the predefined merge field name `Last Name`.

Once a merged document's mail merge fields have been mapped to external data, the hosting application and/or data source access application can populate the respective fields with applicable external data.

Consider a conforming hosting application and/or data source access application that wishes to populate the mail merge fields within the merged document from the previous example with applicable external data. In addition, consider that the specified external data source contains two records—one for Mr. John Doe and one for Ms. Jane Smith. With external data from the `Customer Title` column mapped to the Mail Merge field calling for `Courtesy Title` data, and the `Customer Last Name` column mapped to the Mail Merge field calling for `Last Name` data to populate the fields within this merged document with external data.

The mail merge process then runs through the specified external database and populate the mail merge fields with the data from the `Customer Title` and `Customer Last Name` columns in the specified database, and generate two of merged documents containing the specified external data as well as the static contents of the source document (illustrated in the table below):

Source Document	Merged document populated with first external data source entry	Merged document populated with second external data source entry
<p>Dear{MERGEFIELD "Courtesy Title" \m} {MERGEFIELD "Last Name" \m},</p> <p>Sample text. Sample text. Sample text. Sample text. Sample text. Sample text. Sample text. Sample text. Sample text. Sample text. Sample text. Sample text.</p> <p>Sincerely,</p>	<p>Dear Mr. Doe:</p> <p>Sample text. Sample text. Sample text. Sample text. Sample text. Sample text. Sample text. Sample text. Sample text. Sample text. Sample text. Sample text.</p> <p>Sincerely,</p>	<p>Dear Ms. Smith:</p> <p>Sample text. Sample text. Sample text. Sample text. Sample text. Sample text. Sample text. Sample text. Sample text. Sample text. Sample text. Sample text.</p> <p>Sincerely,</p>

L.1.16 Settings

A *setting* specifies a stored preference that must be used when processing the contents of the document. In other words, settings refer to specified behaviors that must be applied to WordprocessingML documents on a document by document basis. Just like paragraphs and text runs have properties specified that apply to their contents, entire WordprocessingML documents leverage settings to specify properties and behaviors that apply to the entire document.

These settings are typically divided into three categories:

- *Document Settings* — Settings that influence the appearance and behavior of the current document, as well as storing document-level state.
- *Compatibility Settings* — Settings that tell applications to perform behaviors which are designed to maintain visual output of previous word-processing applications.
- *Web Settings* — Settings that affect how a document must be handled when it is saved as HTML.

L.1.16.1 Document Settings

A *document setting* specifies a document-level property that affects the handling of a given document, and influences the appearance and behavior of the current document, as well as the stored document-level state. All document settings are found in the Document Settings part.

Consider a document in which the document setting `doNotHyphenateCaps` is applied. As a document setting this element specifies whether words comprised of all capitalized letters must be hyphenated or not throughout the given document.. Specifically, if words in ALL CAPITAL LETTERS must not be hyphenated, this requirement would be specified by adding the following WordprocessingML to the settings part:

```
<w:doNotHyphenateCaps w:val="true"/>
```

Specifying that words comprised of ALL CAPITAL LETTERS must be hyphenated, as illustrated below:

THIS IS A HYPHENATION EXAMPLE. THIS IS A SHORT HYPHENATION EXAMPLE. THIS IS A SHORT HYPHENATION EXAMPLE.

If this element is omitted, then words in ALL CAPITAL LETTERS must be hyphenated when the document is hyphenated, as illustrated below:

THIS IS A HYPHENATION EXAMPLE. THIS IS A SHORT HYPHENATION EXAMPLE. THIS IS A SHORT HYPHENATION EXAMPLE.

L.1.16.2 Compatibility Settings

A *compatibility setting* is an optional setting used to mimic behavior of documents created in earlier word-processing applications. It is recommended that new WordprocessingML documents contain no compatibility settings. If compatibility settings are needed, they are stored in the Document Settings part (§L.1.16.1).

Consider a document in which the compatibility setting `ww11IndentRules` is applied. As a compatibility setting, this element specifies an indentation behavior to be applied throughout the given document to preserve visual fidelity with an earlier word processing application. Specifically, if the indentation applied to numbering when positioned next to a wrapped object must not be suppressed, this requirement would be specified by adding the following WordprocessingML to the settings part

```
<w:compat>
  <w:ww11IndentRules />
</w:compat>
```

Specifying that indentation applied to numbering when positioned next to a wrapped object must not be suppressed, as illustrated below:

1. Example



2. Example
3. Example
4. Example
5. Example

If this element is omitted, then indentation applied to numbering when positioned next to a wrapped object must be suppressed, as illustrated below:

1. Example



2. Example
3. Example
4. Example
5. Example

L.1.16.3 Web Settings

A *web setting* is a setting used to specify a document-level property that is applicable when saving a web page as a WordprocessingML document, or when saving a WordprocessingML document as a webpage. Thus, if a given WordprocessingML document was not created from a web page, and never becomes a web page, no web settings are needed within the document. If they are needed, web settings are stored in the Web Settings part.

Consider a document in which the web setting allowPNG is applied. As a web setting, this element specifies if the PNG graphics format is used for persisting images when saving the document as a web page. Specifically, if the PNG graphics format is used when saving a document as a web page, this requirement would be specified by adding the following WordprocessingML to the settings part:

```
<w:webSettings>
  <w:allowPNG />
</w:webSettings>
```

If this element is omitted, then the JPEG graphics format is used for persisting images when saving the document as a web page.

L.1.17 Fields and Hyperlinks

L.1.17.1 Fields

Most text in a word processing document is static; that is, unless it is directly changed as the result of editing, its contents remain the same, no matter how the rest of the document might change. However, certain useful pieces of information can change value over the life of a document. Consider the case of a reference to a page number, as in "For more information on this topic, see page 56." Clearly, hard coding the page number as 56 means that that number needs to be manually replaced as the document's size or layout is changed. Even a simple change to any margin, line spacing, or font size can invalidate such references.

Fields provide a mechanism for placeholders, such as page reference numbers, that can be added to a document such that those placeholders are replaced by their corresponding values when the document is rendered for display or print. Other applications for fields include, but are not limited to, automatic numbering of tables and figures, document creation and current date and time, document author information, and the computation of totals for a table column.

A *field* is a set of codes that instructs a WordprocessingML consumer to insert text, graphics, page numbers, and other material into a document automatically. (The DATE field causes the current date to

be inserted.) The text or graphics inserted into a document when a consumer carries out a field's codes is referred to as the *field result* for that field. The act of carrying out a field's codes is referred to as a *field update*. As to how or when any field is updated is outside the scope of ECMA-376.

L.1.17.2 Hyperlinks

As well as allowing for dynamic run content using fields, a WordprocessingML document can contain one or more *hyperlinks*, which allow for the linking of two disparate regions of WordprocessingML content (analogous to hyperlinks in HTML pages). WordprocessingML hyperlinks can be any of the following:

- Intradocument: A hyperlink can target any bookmark contained within the current WordprocessingML document.
- Interdocument: A hyperlink can target another WordprocessingML package, as well as specify a bookmark within that package.
- Other destinations: A hyperlink can target any other URI location.

L.1.18 Miscellaneous Topics

L.1.18.1 Text Boxes

All VML-based drawing objects (except for connectors) support the addition of rich WordprocessingML content within their extents. When WordprocessingML contents have been added to a drawing object, the resulting text is contained within a *text box*.

When WordprocessingML content is contained within a text box, the text is represented within a single `txbxContent` element that contains all of the desired WordprocessingML content. Text box content cannot contain references to other document stories, nor can it contain other `txbxContent` elements. That is, nested shapes cannot have rich content.

L.1.18.2 Subdocuments

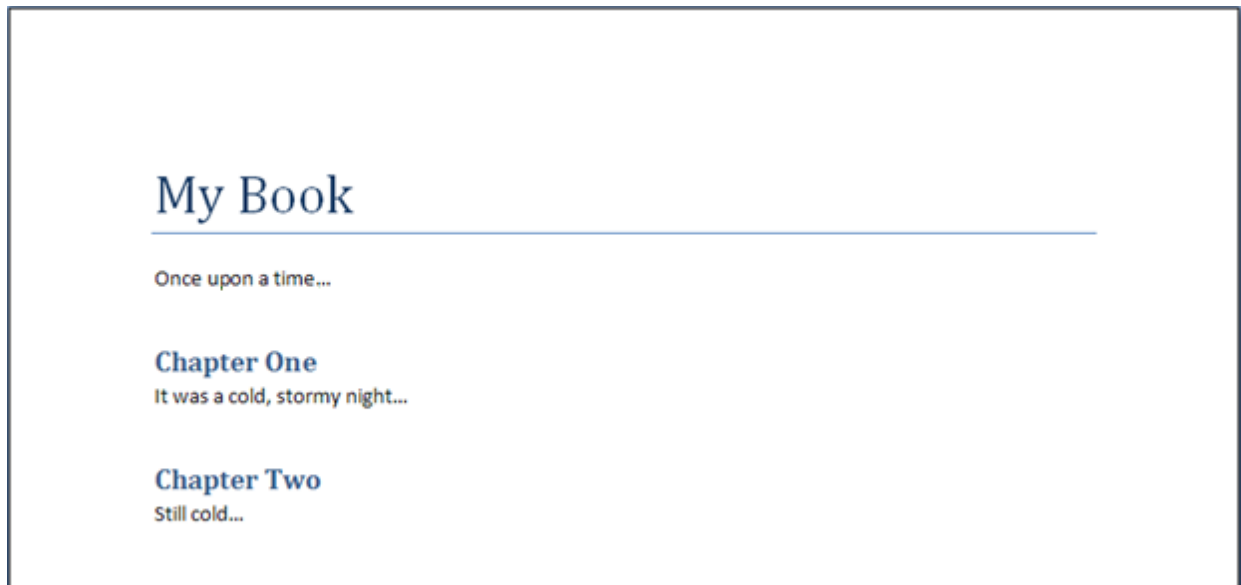
Within a WordprocessingML document, it is sometimes necessary to break a large document into two or more separate WordprocessingML document files, allowing each of these files to be distributed, edited, and handled independently.

A book might consist of five chapters, each edited by a separate author. The editor for the book would therefore desire to create six WordprocessingML documents - one for each author to work on their chapter, and a main document which collates the content of the five chapters appropriately.

When a WordprocessingML document is composed of other WordprocessingML documents in this way, the resulting documents are a master document and its subdocuments.

- A *master document* is a document which incorporates one or more subdocuments (as well as optional WordprocessingML content) to create a larger document
- A *subdocument* is a WordprocessingML document—there is no specific information in a document which classifies it as such

Consider a WordprocessingML document, which is being used to write a book:



To allow this document to be written by multiple authors, each chapter in the book is placed in a separate file (the sections highlighted in red below):



The result is three WordprocessingML documents:

- A master document (containing the title of the book, the first paragraph, and references to the subdocuments for each chapter)
- Two subdocuments (one for each chapter)

L.1.18.3 Importing External Content

When generating WordprocessingML documents, it is sometimes necessary to include existing document content (henceforth called *external content*) within the document. External content in a document is typically included because it was stored in a format other than the WordprocessingML format defined by this Office Open XML specification.

In order to facilitate the inclusion of such content without requiring its conversion as a prerequisite to its inclusion in a document, WordprocessingML includes the facility for applications to implement the import of external content in any format as part of a WordprocessingML document. This functionality, called *external content import*, allows the inclusion of content of an arbitrary content type within the WordprocessingML package, which can then be opened and merged into the main document when the package is consumed by applications which understand that content type.

Consider a WordprocessingML document which is being created based on the following existing HTML content:

```
<html ... >
  <body style="margin-left:200px;margin-top:50px">
    <p>Paragraph one.</p>
    <blockquote style="border:5px solid #00FFFF">Paragraph in a
blockquote.</blockquote>
    <p>Paragraph two.</p>
  </body>
</html>
```

This content can be converted to its WordprocessingML equivalents using the XML syntax defined by this Office Open XML specification, or a more basic tool can use the external content import to include the HTML document within a WordprocessingML package, allowing a subsequent consumer of that content to import the resulting HTML. When the resulting WordprocessingML package is opened, if it is an alternate format understood by the consuming application, the HTML document must be opened and migrated into the appropriate location in the main WordprocessingML document.

L.1.18.4 Roundtripping Alternate Content

Office Open XML defines a mechanism for the storage of content which is not defined by this Office Open XML specification, for example extensions developed by future software applications which leverage the Office Open XML formats. This mechanism allows for the storage of a series of alternative representations of content, of which the consuming application can use the first alternative whose requirements are met.

Consider an application which creates a new paragraph property intended to make the colors of its text change randomly when it is displayed. This functionality is not defined in this Office Open XML specification, and so the application might choose to create an alternative representation setting a

different manual color on each character for clients which do not understand this extension using an AlternateContent block as follows:

```
<ve:AlternateContent xmlns:ve="...">
  <ve:Choice Requires="colors" xmlns:colors="urn:randomTextColors">
    <w:p>
      <w:pPr>
        <colors:random colors:val="true" />
      </w:pPr>
      <w:r>
        <w:t>Random colors!</w:t>
      </w:r>
    </w:p>
  </ve:Choice>
  <ve:Fallback>
    <w:p>
      <w:r>
        <w:rPr>
          <w:color w:val="FF0000" />
        </w:rPr>
        <w:t>R</w:t>
      </w:r>
      <w:r>
        <w:rPr>
          <w:color w:val="00FF00" />
        </w:rPr>
        <w:t>a</w:t>
      </w:r>
      ...
    </w:p>
  </ve:Fallback>
</ve:AlternateContent>
```

The Choice element that requires the new color extensions uses the random element in its namespace, and the Fallback element allows clients that do not support this namespace to see an appropriate alternative representation.

These alternate content blocks can occur at any location within a WordprocessingML document, and applications must handle and process them appropriately (taking the appropriate choice).

However, WordprocessingML does not explicitly define a set of locations where applications must attempt to store and roundtrip all non-taken choices whenever possible.

If an application does not understand the colors extension, the resulting file (if alternate choices are to be preserved) would appear as follows:


```

<ve:AlternateContent xmlns:ve="...">
  <ve:Choice Requires="colors" xmlns:colors="urn:randomTextColors">
    ...
  </ve:Choice>
  <ve:Fallback>
    ...
  </ve:Fallback>
</ve:AlternateContent>

```

The file would then appear as follows after the choice is processed:

```

<w:p>
  <w:r>
    <w:rPr>
      <w:color w:val="FF0000" />
    </w:rPr>
    <w:t>R</w:t>
  </w:r>
  <w:r>
    <w:rPr>
      <w:color w:val="00FF00" />
    </w:rPr>
    <w:t>a</w:t>
  </w:r>
  ...
</w:p>

```

L.1.18.5 Use of Different Calendar Systems

Office Open XML supports the use of the following calendars:

- Gregorian
- Hebrew Lunar
- Hijri Lunar
- Japanese Emperor Era
- Korean Tangun Era
- Saka Era
- Taiwanese
- Thai Buddhist

These calendars are enumerated in the ST_CalendarType simple type, and can be used in WordprocessingML, e.g.:

Structured Document Tag calendar formats (§17.5.2.3)

Date-based Fields (§17.16.5.11, §17.16.5.13, §17.16.5.47, §17.16.5.53)

As an illustration, the calendars supported by ST_CalendarType (§22.9.2.1) can be displayed through the date and time fields as shown below:

Calendar Type	Field Instructions	Result (on 2007-12-17T00:00.00)
Gregorian	DATE \@ "d MMMM yyyy"	17 December 2007
Hebrew Lunar	DATE \@ "d MMMM yyyy" \h The language component of the BCP 47 language code used by the lang element (§17.3.2.20) on the run containing the field instructions equals he.	8 Tevet 5768
Hijri Lunar	DATE \@ "d MMMM yyyy" \h The language component of the BCP 47 language code used by the lang element (§17.3.2.20) on the run containing the field instructions equals ar.	8 Thoul Hijjah 1428
Japanese Emperor Era	DATE \@ "d MMMM ee"	17 December 19
Korean Tangun Era	DATE \@ "d MMMM ggg" The language component of the BCP 47 language code used by the lang element (§17.3.2.20) on the run containing the field instructions equals ko.	17 December 단기
Saka Era	DATE \@ "d MMMM yyyy" \s	26 Agrahayana 1929
Taiwanese	DATE \@ "d MMMM ggg" The lang element (§17.3.2.20) on the run containing the field instructions equals zh-TW.	17 December 平成
Thai Buddhist Era	DATE \@ "d MMMM bbbb"	17 ธันวาคม 2550

L.2 Introduction to SpreadsheetML

This clause contains a detailed introduction to the structure of a SpreadsheetML document.

L.2.1 Workbook

L.2.1.1 Overview

A *workbook* is composed of book-level properties and a collection of one or more *sheets*. The sheets are the central working surface for a spreadsheet application. The workbook part and corresponding properties comprise data used to set application- and workbook-level operational state. The workbook also serves to bind all the sheets and child objects into an organized single file. The workbook properties include information about what application last saved the file, where and how the windows of the workbook were positioned, and an enumeration of the worksheets in the workbook.

L.2.1.2 Minimum Workbook Scenario

For the sake of simplicity, it is important to minimize the required set of workbook properties that must be present to compose a conformant SpreadsheetML workbook. The smallest possible (blank) workbook must contain the following:

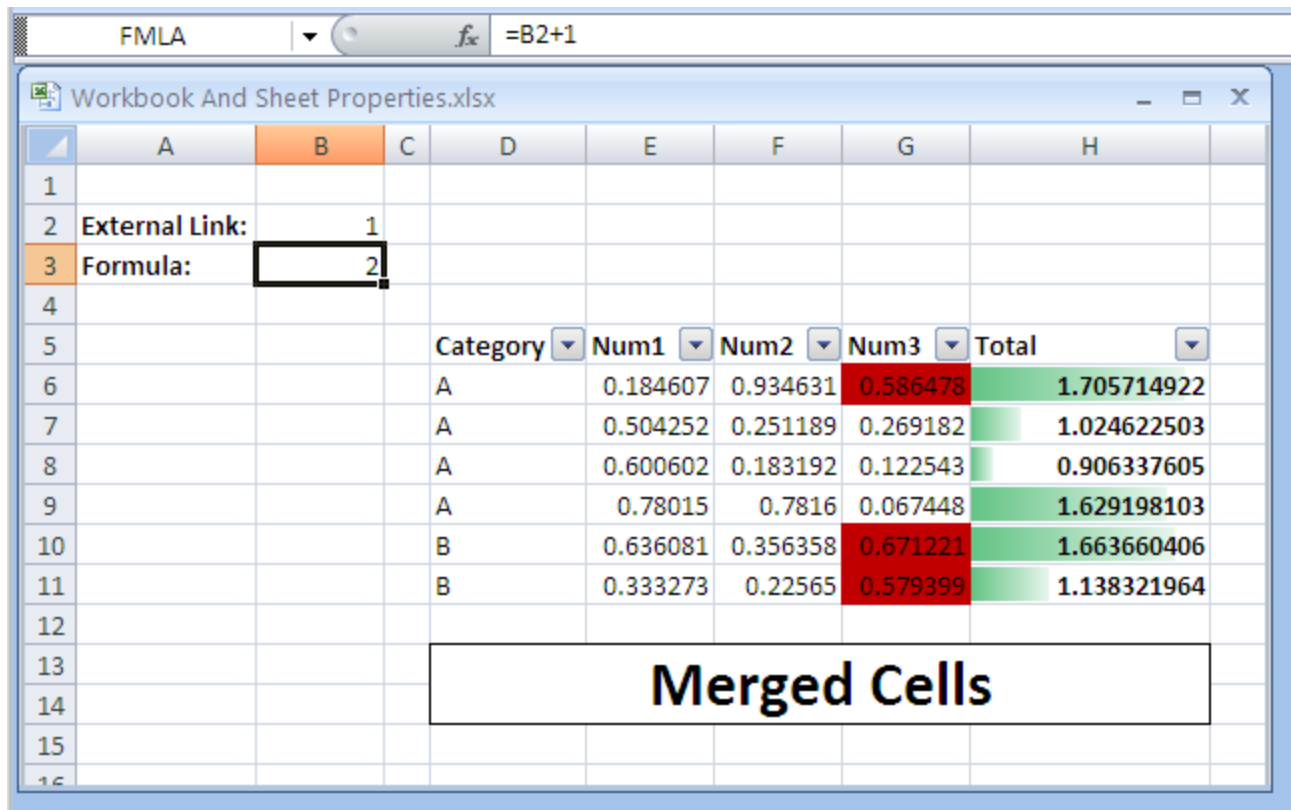
- A single sheet
- A sheet ID
- A relationship Id that points to the location of the sheet definition

For example:

```
<workbook>
  <sheets>
    <sheet name="Sheet1" sheetId="1" r:id="rId1"/>
  </sheets>
</workbook>
```

L.2.1.3 Example Workbook Properties

Consider the following graphical representation of a workbook:



The above example has the following workbook properties definition:

```
<workbook>
  <fileVersion lastEdited="4" lowestEdited="4" rupBuild="3814"/>
  <workbookPr backupFile="1" saveExternalLinkValues="0"
updateLinks="never"/>
  <calcPr calcId="122211" calcMode="manual" iterate="1"/>
  <bookViews>
    <workbookView showHorizontalScroll="0" showVerticalScroll="0"
      showSheetTabs="0" xWindow="45" yWindow="15" windowWidth="9420"
      windowHeight="5460" tabRatio="701"/>
  </bookViews>
  <sheets>
    <sheet name="Sheet1" sheetId="1" sh:id="rId1"/>
    <sheet name="Sheet2" sheetId="2" sh:id="rId2"/>
    <sheet name="Sheet3" sheetId="3" sh:id="rId3"/>
  </sheets>
</workbook>
```

The elements and attributes used here are discussed in more detail in the following subclauses.

L.2.1.4 fileVersion

This contains file versioning properties, as follows.

- lastEdited – The version of the application that last saved the file.
- lowestEdited – The earliest version of the application that saved the file. This value is reset any time an application that understands all data in the file saves the file.
- rupBuild – An incremental public release of the application (e.g., RTM version or SP1 version).
- workbookPr – A group of various workbook properties.
- backupFile – A flag that indicates whether the application should create a backup of the file in question during a save operation.
- saveExternalLinkValues – A flag that indicates whether the application should cache values retrieved from other workbooks via an externally linking formula during save. If yes, a supporting part is written out containing a cached cell table from the external workbook.
- updateLinks – A flag that dictates how external links are handled upon opening the file. In this example, never means don't ask the user if they want to refresh the cached values from an external workbook, and in fact, don't ever do it until the user initiates the action.
- calcPr – Various calculation properties grouped together.
- calcId – The version of the calculation engine used to calculate values in the workbook. When a newer version of the application opens a file with an older calcId value, the application performs a full calculation of all formulas immediately after opening the workbook, to ensure proper calculation results.
- calcMode – A flag that indicates when the application should calculate formulas:
 - Manual means to wait for the user to initiate the action.
 - Automatic means to perform only the needed calculations whenever a cell value changes.
- Iterate – When formula references are circular (i.e., they refer back on themselves for required input), the iterate flag specifies that this is an intended state. Further properties not discussed here control the number of iterative calculations to perform before stopping calculation.
- bookViews – A collection of views.

L.2.1.5 workbookView

A single view definition represented using the following flags:

- showHorizontalScroll – Controls visibility of the horizontal scroll bar of the application. In the example above, it is set to not being visible.
- showVerticalScroll – Controls visibility of the vertical scroll bar of the application. In the example above, it is set to not being visible.
- showSheetTabs – Controls visibility of the worksheet tabs in the application. In the example above, they are set to not being visible.
- xWindow – Specifies the x coordinate (in twips) of the upper right corner of the workbook window.

- `yWindow` – Specifies the y coordinate (in twips) of the upper right corner of the workbook window.
- `windowWidth` – Specifies the width of the workbook window.
- `windowHeight` – Specifies the height of the workbook window.
- `tabRatio` – Specifies the ratio between the workbook tabs bar and the horizontal scroll bar.
- `Sheets` – A collection of worksheets in the workbook.
- `Sheet` – A single sheet definition (book-level).
- `Name` – The name of the worksheet. These must be unique within the workbook.
- `sheetId` – The internal Id of the sheet. These must be unique within the workbook.
- `Id` – The relationship Id that points to the sheet part definition.

L.2.2 Sheets

Sheets are the central structures within a workbook, and are where a user does most of his spreadsheet work. The most common type of sheet is the *worksheet*, which is represented as a grid of cells. Worksheet cells can contain text, numbers, dates, and formulas. Cells can also be formatted. A workbook usually contains more than one sheet. To aid in the analysis of data and the making of informed decisions, spreadsheet applications often implement features and objects which help calculate, sort, filter, organize, and graphically display information. Since these features are often connected very tightly with the spreadsheet grid, these are also included in the sheet definition on disk.

Other types of sheets include *chart sheets* and *dialog sheets*.

L.2.2.1 Minimum Worksheet Scenario

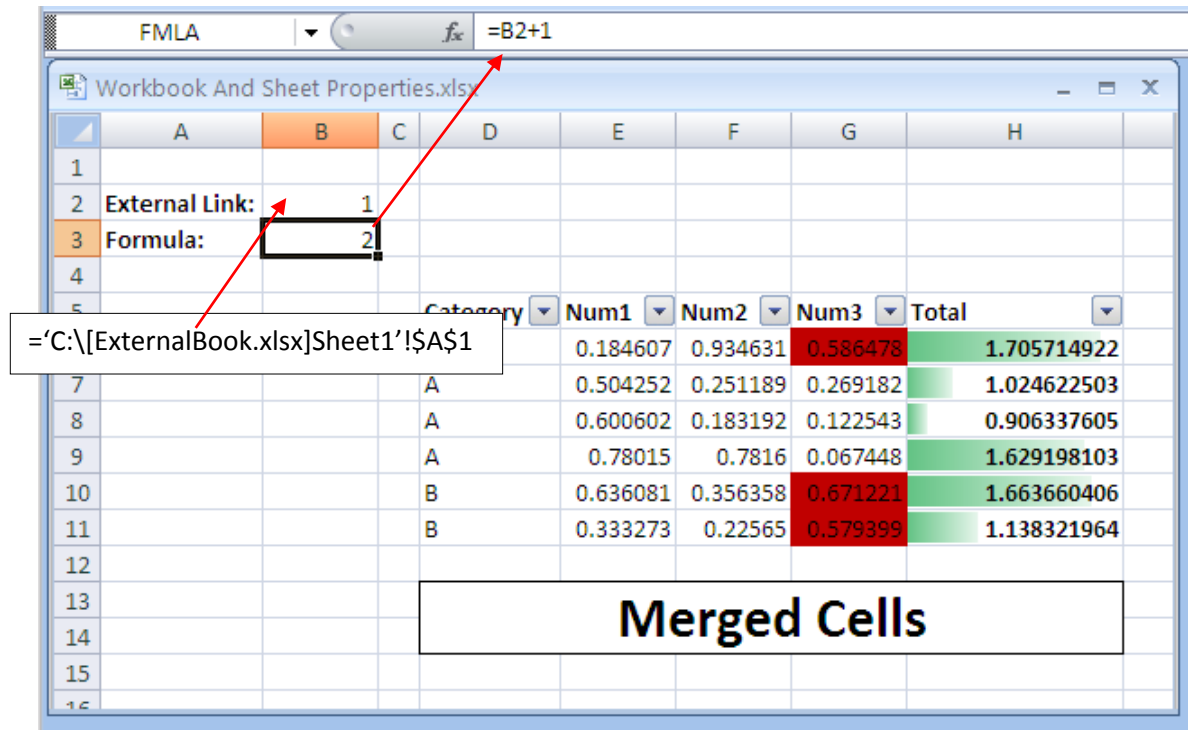
The smallest possible (blank) sheet is as follows:

```
<worksheet>
  <sheetData/>
</worksheet>
```

The empty `sheetData` collection represents an empty grid; this element is required. As defined in the schema, some optional sheet property collections can appear before `sheetData`, and some can appear after. To simplify the logic required to insert a new `sheetData` collection into an existing (but empty) sheet, the `sheetData` collection is required, even when empty.

L.2.2.2 Example Sheet

Consider the following graphical representation of a worksheet:



Notice that cells A2 and A3 contain text. Cell B1 contains a formula linking to another workbook, whose value is 1. Cell B2 contains a formula as well; this formula appears in the formula bar (top of picture) because it is the active cell. Cells D5:H5 contain bold-faced text that serves as headers for the table of data residing in D6:H11. The table of data has a filter feature applied to it (evidenced by drop down arrows in the header row), and columns G and H have different types of conditional formatting applied. Finally, cells D13:H14 are part of a merged cell feature, where a series of cells behave together as a single, larger cell.

When saved, the above example has the syntax below written out in the corresponding sheet part. Sheet information is organized into three main sections:

1. Top-level sheet properties (everything before sheetData)
2. The cell table (sheetData)
3. Supporting sheet features (everything after sheetData)

Therefore, the XML for the above example would look like this, broken into three sections:

L.2.2.3 Sheet Properties

```
<worksheet>
  <sheetPr filterMode="1"/>
  <dimension ref="A2:H14"/>
```

```

<sheetViews>
  <sheetView tabSelected="1" workbookViewId="0">
    <selection activeCell="B3" sqref="B3"/>
  </sheetView>
</sheetViews>
<sheetFormatPr defaultRowHeight="15"/>
<cols>
  <col min="1" max="1" width="12.85546875" bestFit="1" customWidth="1"/>
  <col min="3" max="3" width="3.28515625" customWidth="1"/>
  <col min="4" max="4" width="11.140625" bestFit="1" customWidth="1"/>
  <col min="8" max="8" width="17.140625" style="1" customWidth="1"/>
</cols>

```

L.2.2.4 Sheet Data

sheetData, which represents the cell table, directly after the cols collection:

```

<sheetData>
  <row r="2" spans="1:2" customFormat="1">
    <c r="A2" s="1" t="s">
      <v>0</v>
    </c>
    <c r="B2">
      <f>[1]Sheet1!$A$1</f>
      <v>1</v>
    </c>
  </row>
  <row r="3" spans="1:8" customFormat="1">
    <c r="A3" s="1" t="s">
      <v>1</v>
    </c>
    <c r="B3">
      <f>B2+1</f>
      <v>2</v>
    </c>
    <c r="H3" s="1"/>
  </row>
  <row r="4" spans="1:8">
    <c r="H4"/>
  </row>
  <row r="5" spans="4:8">
    <c r="D5" s="1" t="s">
      <v>4</v>
    </c>

```



```

<c r="E5" s="1" t="s">
  <v>5</v>
</c>
<c r="F5" s="1" t="s">
  <v>6</v>
</c>
<c r="G5" s="1" t="s">
  <v>7</v>
</c>
<c r="H5" s="1" t="s">
  <v>8</v>
</c>
</row>
<row r="6" spans="4:8">
  <c r="D6" t="s">
    <v>2</v>
  </c>
  <c r="E6">
    <v>0.18460660235998017</v>
  </c>
  <c r="F6">
    <v>0.93463071023892952</v>
  </c>
  <c r="G6">
    <v>0.58647760893211043</v>
  </c>
  <c r="H6" s="1">
    <f ce="1">SUM(E6:G6)</f>
    <v>1.7057149215310201</v>
  </c>
</row>
<row r="7" spans="4:8">
  <c r="D7" t="s">
    <v>2</v>
  </c>
  <c r="E7">
    <v>0.50425224796279555</v>
  </c>
  <c r="F7">
    <v>0.25118866081991786</v>
  </c>

```

```

    <c r="G7">
      <v>0.26918159410869791</v>
    </c>
    <c r="H7" s="1">
      <f t="shared" ref="H7:H11" ce="1" si="0">SUM(E7:G7)</f>
      <v>1.0246225028914113</v>
    </c>
  </row>
  <row r="8" spans="4:8">
    <c r="D8" t="s">
      <v>2</v>
    </c>
    <c r="E8">
      <v>0.6006019062877066</v>
    </c>
    <c r="F8">
      <v>0.18319235857964333</v>
    </c>
    <c r="G8">
      <v>0.12254334000604317</v>
    </c>
    <c r="H8" s="1">
      <f t="shared" ce="1" si="0">SUM(E8:G8)</f>
      <v>0.9063376048733931</v>
    </c>
  </row>
  <row r="9" spans="4:8" hidden="1">
    <c r="D9" t="s">
      <v>2</v>
    </c>
    <c r="E9">
      <v>0.78015011938458589</v>
    </c>
    <c r="F9">
      <v>0.78159963723670689</v>
    </c>
    <c r="G9">
      <v>6.7448346870105036E-2</v>
    </c>

```

```

<c r="H9" s="1">
  <f t="shared" ce="1" si="0">SUM(E9:G9)</f>
  <v>1.6291981034913978</v>
</c>
</row>
<row r="10" spans="4:8" hidden="1">
  <c r="D10" t="s">
    <v>3</v>
  </c>
  <c r="E10">
    <v>0.63608141933645479</v>
  </c>
  <c r="F10">
    <v>0.35635845012920608</v>
  </c>
  <c r="G10">
    <v>0.67122053637107193</v>
  </c>
  <c r="H10" s="1">
    <f t="shared" ce="1" si="0">SUM(E10:G10)</f>
    <v>1.6636604058367328</v>
  </c>
</row>
<row r="11" spans="4:8" hidden="1">
  <c r="D11" t="s">
    <v>3</v>
  </c>
  <c r="E11">
    <v>0.33327331908137214</v>
  </c>
  <c r="F11">
    <v>0.2256497329592122</v>
  </c>
  <c r="G11">
    <v>0.5793989116090501</v>
  </c>
  <c r="H11" s="1">
    <f t="shared" ce="1" si="0">SUM(E11:G11)</f>
    <v>1.1383219636496344</v>
  </c>
</row>

```

```

<row r="13" spans="4:8">
  <c r="D13" s="2" t="s">
    <v>9</v>
  </c>
  <c r="E13" s="3"/>
  <c r="F13" s="3"/>
  <c r="G13" s="3"/>
  <c r="H13" s="4"/>
</row>
<row r="14" spans="4:8">
  <c r="D14" s="5"/>
  <c r="E14" s="6"/>
  <c r="F14" s="6"/>
  <c r="G14" s="6"/>
  <c r="H14" s="7"/>
</row>
</sheetData>

```

L.2.2.5 Supporting Features

The supporting feature definitions follow the cell table data:

```

<sheetProtection objects="0" scenarios="0"/>
<autoFilter ref="D5:H11">
  <filterColumn colId="0">
    <filters>
      <filter val="A"/>
    </filters>
  </filterColumn>
  <filterColumn colId="1">
    <customFilters and="1">
      <customFilter operator="greaterThan" val="0"/>
      <customFilter operator="lessThan" val="0.7"/>
    </customFilters>
  </filterColumn>
</autoFilter>
<mergeCells>
  <mergeCell ref="D13:H14"/>
</mergeCells>
<conditionalFormatting sqref="H6:H11">
  <cfRule type="dataBar" priority="3" stopIfTrue="0">
    <formula>MAX(IF(ISBLANK(H6:H11), "", IF(ISERROR(H6:H11), "",
      H6:H11)))</formula>
    <formula>MIN(IF(ISBLANK(H6:H11), "", IF(ISERROR(H6:H11), "",
      H6:H11)))</formula>
  </cfRule>
</conditionalFormatting>

```

```

    <dataBar minLength="10" maxLength="90" showValue="1">
      <cfvo type="min" val="0"/>
      <cfvo type="max" val="0"/>
      <color rgb="FF63C384"/>
    </dataBar>
  </cfRule>
</conditionalFormatting>
<conditionalFormatting sqref="G6:G11">
  <cfRule type="cellIs" dxfid="0" priority="1" stopIfTrue="0"
    operator="greaterThan">
    <formula>0.5</formula>
  </cfRule>
</conditionalFormatting>
<printOptions/>
<pageMargins left="0.7" right="0.7" top="0.75" bottom="0.75"
  header="0.3" footer="0.3"/>
<pageSetup orientation="portrait" horizontalDpi="300" verticalDpi="300"/>
<headerFooter/>

```

These elements are discussed in more detail in the following subclauses.

L.2.2.6 Sheet Properties

Referring back to §L.2.2.3, note that several sheet-level properties are expressed before the sheetData cell table is encountered.

sheetPr indicates that an AutoFilter has been applied on this sheet. Dimension indicates the used range on this sheet. There should be no data or formulas outside this range. The sheetViews collection indicates which cell is active on the sheet, and indicates whether this particular sheet is the active sheet in the workbook.

A collection of column-level settings appears in the cols collection.

Finally, within sheetFormatPr, a default row height is set.

L.2.2.7 sheetData Cell Table

The cell table is the core structure of a worksheet. It consists of all the text, numbers, and formulas in the grid.

L.2.2.8 Row

```

<row r="2" spans="1:2" customFormat="1">
  <c r="A2" s="1" t="s">
    <v>0</v>
  </c>

```

```

    <c r="B2">
      <f>[1]Sheet1!$A$1</f>
      <v>1</v>
    </c>
  </row>

```

The cells in the cell table are organized by row. Each row has an index (attribute *r*) so that empty rows need not be written out. Each row indicates the number of cells defined for it, as well as their relative position in the sheet. In this example, the first row of data is row 2.

L.2.2.9 Cell

```

    <c r="B3">
      <f>B2+1</f>
      <v>2</v>
    </c>

```

The cell itself is expressed by the *c* collection. Each cell indicates its location in the grid using A1-style reference notation. A cell can also indicate a style identifier (attribute *s*) and a data type (attribute *t*). The cell types include string, number, and Boolean. In order to optimize load/save operations, default data values are not written out.

L.2.2.9.1 Cell Values

Cells contain values, whether the values were directly entered (e.g., cell A2 in our example has the value `External Link:`) or are the result of a calculation (e.g., cell B3 in our example has the formula `B2+1`).

String values in a cell are not stored in the cell table unless they are the result of a calculation.

Therefore, instead of seeing `External Link:` as the content of the cell's *v* node, instead you see a zero-based index into the shared string table where that string is stored uniquely. This is done to optimize load/save performance and to reduce duplication of information. To determine whether the 0 in *v* is a number or an index to a string, the cell's data type must be examined. When the data type indicates string, then it is an index and not a numeric value.

L.2.2.9.2 Formulas

Cells can contain formulas, which calculate results. Formulas are expressed in the file the same way the user sees them at runtime of the application. This is specifically a design choice meant to aid in creation and processing of workbook contents.

A formula can have attributes on it indicating how to handle calculation of the cell.

L.2.2.9.2.1 Shared Formulas

```

<row r="7" spans="4:8">
  <c r="H7" s="1">
    <f t="shared" ref="H7:H11" ce="1" si="0">SUM(E7:G7)</f>
    <v>1.0246225028914113</v>
  </c>
</row>
<row r="8" spans="4:8">
  <c r="H8" s="1">
    <f t="shared" ce="1" si="0">SUM(E8:G8)</f>
    <v>0.9063376048733931</v>
  </c>
</row>

```

Just as strings in cells can be extremely pervasive and redundant in a sheet (and therefore must be optimized), formulas are also extremely pervasive in a sheet, and often can be optimized. Consider the table in the above example, where column H contains a formula that sums the numbers in columns E through G, for each row. The only difference between the formulas in H6:H12 is that the reference increases by 1 row from one row to the next. Therefore, an optimization is created where only the formula in H6 needs to be written out, with some additional information indicating how far to propagate the formula once loaded. This enables the loading application to load and parse only the first of the shared formulas, and then more quickly apply the necessary transforms to produce the additional related formulas in subsequent cells.

Note that while formulas can be shared, it is desirable to enable easy access to the contents of a cell. Therefore, it is allowed that all formulas can be written out, but only the primary formula in a shared formula need be loaded and parsed.

L.2.2.9.2.2 External Referencing Formulas

```

<c r="B2">
  <f>[1]Sheet1!$A$1</f>
  <v>1</v>
</c>

```

In the above example, cell B2 contains a formula that references a cell in another workbook, namely 'C:\[ExternalBook.xlsx]Sheet1'!\$A\$1. This formula is referencing ExternalBook.xlsx located at c:\. Furthermore, the formula is requesting the value of cell A1 on Sheet1 of that particular workbook.

Instead of writing 'C:\[ExternalBook.xlsx]Sheet1'!\$A\$1 directly in the formula, it is desirable to make all external references much more accessible, especially given the potentially enormous size of a cell table. Therefore, the URL and file location is persisted using the relationships semantic, in a

relationship file, and then referenced inline with the formula: `[1]Sheet1!A1`. In this way, external resource files can more easily be determined and updated if needed.

Note that whenever a workbook contains a formula referencing another workbook, some values from that external workbook are also cached with the referencing workbook. This is done so that if a recalculation of the workbook is needed and the workbook isn't accessible, a cached value can be used to complete the calculation.

L.2.2.10 Supporting Sheet Features

L.2.2.11 Defined Names

```
<definedNames>
  <definedName name="FMLA">Sheet1!$B$3</definedName>
  <definedName name="SheetLevelName" comment="This name is scoped to
Sheet1"
    localSheetId="0">Sheet1!$B$3</definedName>
</definedNames>
```

Defined names can be used in place of cell references in formulas. For example, instead of using `B3+1` to add 1 to the value that's in B3, one could define a name, as in FMLA, and assign it to B3. Then `FMLA+1` can be used to perform the calculation.

Names can be defined and assigned to a cell location or range or to a formula or constant value. Names can be referenced in formulas. Names can be scoped to either the entire workbook (default) or just the local sheet. Names scoped to the local sheet cannot be referenced from other sheets. Names scoped to the workbook can be referenced from any sheet.

Defined names are actually stored in the workbook part, but are discussed here in the context of the sheet because they are so closely related to cells and formulas.

L.2.2.12 AutoFilter

```
<autoFilter ref="D5:H11">
  <filterColumn colId="0">
    <filters>
      <filter val="A"/>
    </filters>
  </filterColumn>
  <filterColumn colId="1">
    <customFilters and="1">
      <customFilter operator="greaterThan" val="0"/>
      <customFilter operator="lessThan" val="0.7"/>
    </customFilters>
  </filterColumn>
</autoFilter>
```


AutoFilters specify criteria for which cells in a table should be displayed. In this example, the first column (zero-based index colId) in the table (cells D5:D11) has a criterion specifying that only rows in the table whose values in column D are equal to A are shown. The rest of the rows are *hidden*.

A second criterion is specified as well, on the 2nd column, E: only rows whose values in column E are greater than 0 and less than 0.7.

The resulting grid could be rendered like this:

The screenshot shows an Excel spreadsheet titled 'Workbook And Sheet Properties.xlsx'. The formula bar at the top displays '=B2+1'. The spreadsheet contains a table with columns A through H. Rows 1 through 4 are visible, with row 2 containing 'External Link: 1' and row 3 containing 'Formula: 2'. Below these, a table is displayed with columns: Category, Num1, Num2, Num3, and Total. The table has three rows of data, all with 'A' in the Category column. The values in the Num1, Num2, and Num3 columns are 0.184607, 0.934631, and 0.586478 respectively for the first row, 0.504252, 0.251189, and 0.269182 for the second, and 0.600602, 0.183192, and 0.122543 for the third. The Total column shows 1.705714922, 1.024622503, and 0.906337605 respectively. The cells D13:H14 are merged and contain the text 'Merged Cells'.

	A	B	C	D	E	F	G	H
1								
2	External Link:	1						
3	Formula:	2						
4								
5				Category	Num1	Num2	Num3	Total
6				A	0.184607	0.934631	0.586478	1.705714922
7				A	0.504252	0.251189	0.269182	1.024622503
8				A	0.600602	0.183192	0.122543	0.906337605
12								
13				Merged Cells				
14								
15								
16								
17								
18								
19								

L.2.2.13 Merged Cells

```
<mergeCells>
  <mergeCell ref="D13:H14"/>
</mergeCells>
```

In the example, cells D13:H14 have been merged into a single, larger cell. Note that the cell table itself doesn't reflect this merge, but it does reflect the data content and formatting. Specifically, the top-left cell in a merged collection of cells contains the value, and all the cells reflect the various border formatting.

L.2.2.14 Conditional Formatting

```
<conditionalFormatting sqref="H6:H11">
  <cfRule type="dataBar" priority="3" stopIfTrue="0">
    <formula>MAX(IF(ISBLANK(H6:H11), "", IF(ISERROR(H6:H11), "",
      H6:H11)))</formula>
    <formula>MIN(IF(ISBLANK(H6:H11), "", IF(ISERROR(H6:H11), "",
      H6:H11)))</formula>
    <dataBar minLength="10" maxLength="90" showValue="1">
      <cfvo type="min" val="0"/>
      <cfvo type="max" val="0"/>
      <color rgb="FF63C384"/>
    </dataBar>
  </cfRule>
</conditionalFormatting>
<conditionalFormatting sqref="G6:G11">
  <cfRule type="cellIs" dxflId="0" priority="1" stopIfTrue="0"
operator="greaterThan">
    <formula>0.5</formula>
  </cfRule>
</conditionalFormatting>
```

There are two conditional formats applied: one to the table of data in column H and the other to the table of data in column G.

In column G, a red fill is applied to any cell whose value is greater than 0.5. Notice that `sqref` specifies the range to which the rule applies. The formatting is specified by `dxflId`, which is a reference to a formatting expression in the central styles part.

In column H there is a `dataBar` formatting rule, which applies a variable length bar to the cell background, where the length of the bar depends on the relative value of the cell.

L.2.3 Shared String Table

L.2.3.1 Overview

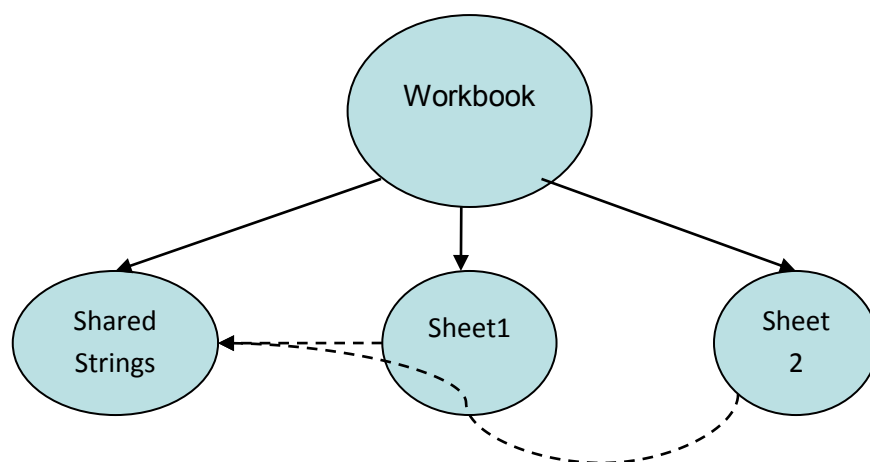
A workbook can contain thousands of cells containing string (non-numeric) data. Furthermore, this data is very likely to be repeated across many rows or columns. The goal of implementing a single string table that is shared across the workbook is to improve performance in opening and saving the file by only reading and writing the repetitive information once.

For example, consider a workbook summarizing information for cities within various countries. There can be a column for the name of the country, a column for the name of each city in that country, and a column containing the data for each city:

	A	B	C	D
1				
2		Country	City	Data
3		United States	Seattle	469.83
4		United States	Denver	36.16
5		United States	New York	114.38
6		United States	Philadelphia	540.95
7		United States	Houton	649.07
8		United States	San Diego	258.4
9		United States	San Francisco	686.05
10		Argentina	Buenos Aires	14.08
11		Argentina	San Juan	28.17
12		Argentina	Salta	757.31
13		Argentina	Rosario	246.23
14		Argentina	La Plata	947.63
15		Japan	Tokyo	597.55
16		Japan	Nagoya	619.01
17		Japan	Yokohama	525.14
18		Japan	Sendai	611.74
19				

In this case, the country name is repetitive, being duplicated in many cells. In many cases, the repetition is extensive, and a tremendous savings is realized by making use of a shared string table when saving the workbook.

L.2.3.2 File Architecture



There is a single shared strings part for all the strings in a workbook. This part is related to the workbook. Each cell (in sheet1.xml, for example) containing a string value refers by index to a string

expressed in the shared strings part. The solid arrows represent relationships among the parts and the dotted arrows represent references by index to a string in the shared strings part.

L.2.3.3 Example: Plain Text

This first example demonstrates plain text in cells. Note that in this example, some of the cells are formatted (e.g., the column headers "Country", "City", and "Data" are bold faced). Since the formatting is applied at the cell level, cell styles and formatting is used to describe the formatting, rather than using text formatting on the text itself.

A later example demonstrates how to handle a variety of text formatting (rich text) within a single cell.

L.2.3.4 Illustration

Consider the example in the introduction:

	A	B	C	D
1				
2		Country	City	Data
3		United States	Seattle	469.83
4		United States	Denver	36.16
5		United States	New York	114.38
6		United States	Philadelphia	540.95
7		United States	Houton	649.07
8		United States	San Diego	258.4
9		United States	San Francisco	686.05
10		Argentina	Buenos Aires	14.08
11		Argentina	San Juan	28.17
12		Argentina	Salta	757.31
13		Argentina	Rosario	246.23
14		Argentina	La Plata	947.63
15		Japan	Tokyo	597.55
16		Japan	Nagoya	619.01
17		Japan	Yokohama	525.14
18		Japan	Sendai	611.74
19				

In this example, the country names in the column titled 'Country'—"United States", "Argentina", and "Japan"—would appear a single time in the shared strings part. Additionally, all the city names (in the column titled 'City') would appear a single time in the shared strings part, as would the column titles themselves in B2:D2. The numeric values in the 'Data' column would be expressed inline with the cell table definition (e.g., in Sheet1.xml).

L.2.3.5 The XML

The shared string table XML for this example looks like this:

<sst ... count="35" uniqueCount="22">

<si>
 <t>United States</t>
</si>
<si>
 <t>Seattle</t>
</si>
<si>
 <t>Denver</t>
</si>
<si>
 <t>New York</t>
</si>
<si>
 <t>Philadelphia</t>
</si>
<si>
 <t>Houston</t>
</si>
<si>
 <t>San Diego</t>
</si>
<si>
 <t>San Francisco</t>
</si>
<si>
 <t>Argentina</t>
</si>
<si>
 <t>Buenos Aires</t>
</si>
<si>
 <t>San Juan</t>
</si>
<si>
 <t>Salta</t>
</si>
<si>
 <t>Rosario</t>
</si>
<si>
 <t>La Plata</t>
</si>

```

<si>
  <t>Japan</t>
</si>
<si>
  <t>Tokyo</t>
</si>
<si>
  <t>Nagoya</t>
</si>
<si>
  <t>Yokohama</t>
</si>
<si>
  <t>Sendai</t>
</si>
<si>
  <t>Country</t>
</si>
<si>
  <t>City</t>
</si>
<si>
  <t>Data</t>
</si>
</sst>

```

The cell table for this example looks like this:

```

<sheetData>
  <row r="2" spans="2:4" customFormat="1">
    <c r="B2" s="1" t="s">
      <v>19</v>
    </c>
    <c r="C2" s="1" t="s">
      <v>20</v>
    </c>
    <c r="D2" s="1" t="s">
      <v>21</v>
    </c>
  </row>
  <row r="3" spans="2:4" customFormat="1">
    <c r="B3" t="s">
      <v>0</v>
    </c>

```

```

<c r="C3" t="s">
  <v>1</v>
</c>
<c r="D3">
  <f t="shared" ref="D3:D18" ca="1" si="0">ROUND(RAND()*1000,2)</f>
  <v>374.9</v>
</c>
</row>
<row r="4" spans="2:4" customFormat="1">
  <c r="B4" t="s">
    <v>0</v>
  </c>
  <c r="C4" t="s">
    <v>2</v>
  </c>
  <c r="D4">
    <f t="shared" ca="1" si="0"/>
    <v>452.82</v>
  </c>
</row>
<row r="5" spans="2:4" customFormat="1">
  <c r="B5" t="s">
    <v>0</v>
  </c>
  <c r="C5" t="s">
    <v>3</v>
  </c>
  <c r="D5">
    <f t="shared" ca="1" si="0"/>
    <v>632.1</v>
  </c>
</row>
<row r="6" spans="2:4" customFormat="1">
  <c r="B6" t="s">
    <v>0</v>
  </c>
  <c r="C6" t="s">
    <v>4</v>
  </c>

```

```

    <c r="D6">
      <f t="shared" ca="1" si="0"/>
      <v>886.37</v>
    </c>
  </row>
  <row r="7" spans="2:4" customFormat="1">
    <c r="B7" t="s">
      <v>0</v>
    </c>
    <c r="C7" t="s">
      <v>5</v>
    </c>
    <c r="D7">
      <f t="shared" ca="1" si="0"/>
      <v>291.14</v>
    </c>
  </row>
  <row r="8" spans="2:4" customFormat="1">
    <c r="B8" t="s">
      <v>0</v>
    </c>
    <c r="C8" t="s">
      <v>6</v>
    </c>
    <c r="D8">
      <f t="shared" ca="1" si="0"/>
      <v>114.97</v>
    </c>
  </row>
  <row r="9" spans="2:4" customFormat="1">
    <c r="B9" t="s">
      <v>0</v>
    </c>
    <c r="C9" t="s">
      <v>7</v>
    </c>
    <c r="D9">
      <f t="shared" ca="1" si="0"/>
      <v>291.99</v>
    </c>
  </row>

```



```

<row r="10" spans="2:4" customFormat="1">
  <c r="B10" t="s">
    <v>8</v>
  </c>
  <c r="C10" t="s">
    <v>9</v>
  </c>
  <c r="D10">
    <f t="shared" ca="1" si="0"/>
    <v>335.42</v>
  </c>
</row>
<row r="11" spans="2:4" customFormat="1">
  <c r="B11" t="s">
    <v>8</v>
  </c>
  <c r="C11" t="s">
    <v>10</v>
  </c>
  <c r="D11">
    <f t="shared" ca="1" si="0"/>
    <v>664.72</v>
  </c>
</row>
<row r="12" spans="2:4" customFormat="1">
  <c r="B12" t="s">
    <v>8</v>
  </c>
  <c r="C12" t="s">
    <v>11</v>
  </c>
  <c r="D12">
    <f t="shared" ca="1" si="0"/>
    <v>992.62</v>
  </c>
</row>
<row r="13" spans="2:4" customFormat="1">
  <c r="B13" t="s">
    <v>8</v>
  </c>
  <c r="C13" t="s">
    <v>12</v>
  </c>

```

```

    <c r="D13">
      <f t="shared" ca="1" si="0"/>
      <v>148.5</v>
    </c>
  </row>
  <row r="14" spans="2:4" customFormat="1">
    <c r="B14" t="s">
      <v>8</v>
    </c>
    <c r="C14" t="s">
      <v>13</v>
    </c>
    <c r="D14">
      <f t="shared" ca="1" si="0"/>
      <v>193.53</v>
    </c>
  </row>
  <row r="15" spans="2:4" customFormat="1">
    <c r="B15" t="s">
      <v>14</v>
    </c>
    <c r="C15" t="s">
      <v>15</v>
    </c>
    <c r="D15">
      <f t="shared" ca="1" si="0"/>
      <v>849.36</v>
    </c>
  </row>
  <row r="16" spans="2:4" customFormat="1">
    <c r="B16" t="s">
      <v>14</v>
    </c>
    <c r="C16" t="s">
      <v>16</v>
    </c>
    <c r="D16">
      <f t="shared" ca="1" si="0"/>
      <v>765.46</v>
    </c>
  </row>

```

```

<row r="17" spans="2:4" customFormat="1">
  <c r="B17" t="s">
    <v>14</v>
  </c>
  <c r="C17" t="s">
    <v>17</v>
  </c>
  <c r="D17">
    <f t="shared" ca="1" si="0"/>
    <v>350.26</v>
  </c>
</row>
<row r="18" spans="2:4" customFormat="1">
  <c r="B18" t="s">
    <v>14</v>
  </c>
  <c r="C18" t="s">
    <v>18</v>
  </c>
  <c r="D18">
    <f t="shared" ca="1" si="0"/>
    <v>979.22</v>
  </c>
</row>
</sheetData>

```

L.2.3.6 Shared String Table

```

<sst ... count="35" uniqueCount="22">
  <si>
    <t>United States</t>
  </si>
  <si>
    <t>Seattle</t>
  </si>
  <si>
    <t>Denver</t>
  </si>
</sst>

```

Examining the XML for the shared string part, it can be found that the first entry in the string table is "United States", residing in position 0. The value "Seattle" can be found in position 1 and "Denver" can be found in position 2.

L.2.3.7 Cell Table

```
<row r="2" spans="2:4" customFormat="1">
  <c r="B2" s="1" t="s">
    <v>19</v>
  </c>
  <c r="C2" s="1" t="s">
    <v>20</v>
  </c>
  <c r="D2" s="1" t="s">
    <v>21</v>
  </c>
</row>
```

The first cell in our spreadsheet that contains data is B2. The XML indicates that it is of data type 'string' (t="s"). This indicates that the numeric value found inside the <v> element is an index to a string in the string table rather than an actual number in the spreadsheet. The value for cell B2 is '19'. The 19th entry in the shared string table (counting the first entry as 0) has a value of "Country". Therefore, cell B2 contains the word "Country".

```
<row r="3" spans="2:4" customFormat="1">
  <c r="B3" t="s">
    <v>0</v>
  </c>
  <c r="C3" t="s">
    <v>1</v>
  </c>
  <c r="D3">
    <f t="shared" ref="D3:D18" ca="1" si="0">ROUND(RAND()*1000,2)</f>
    <v>374.9</v>
  </c>
</row>
```

Cell B3 (<c @r="B3"...>) is also of data type string, and the '0' inside the v element refers to the 0th item in the string table, which corresponds to the string value "United States". Cell C3 is a string type of cell and references the shared string found in position 1 in the string table, corresponding to the value "Seattle". Cell D3 contains an f element, indicating a formula.

```
<row r="4" spans="2:4" customFormat="1">
  <c r="B4" t="s">
    <v>0</v>
  </c>
  <c r="C4" t="s">
    <v>2</v>
  </c>
```

```

<c r="D4">
  <f t="shared" ca="1" si="0"/>
  <v>452.82</v>
</c>
</row>

```

Examining the cell table entries for the data in row 4 of the spreadsheet, we see that cell B4 also contains the string value "United States". This is the 2nd occurrence of the value "United States" in this example. Since this value only occurs once in the string table, again the cell is using an index of 0 to reference the string item in the string table. Cell C4 is of data type string and an index value of '2' indicates that "Denver" is the value of this cell.

L.2.3.8 Example: Rich Text

In this example, a single string cell value has multiple types of text formatting applied to various parts of the text.

L.2.3.9 Illustration

F
This string has a variety of formatting applied

L.2.3.10 Shared String Table

The main difference between plain text and rich text is seen in the string table itself. The si element is capable of containing rich text expressions:

```

<si>
  <r>
    <t xml:space="preserve">This </t>
  </r>
  <r>
    <rPr>
      <b/>
      <sz val="11"/>
      <color theme="1"/>
      <rFont val="Calibri"/>
      <family val="2"/>
      <scheme val="minor"/>
    </rPr>
    <t xml:space="preserve">string </t>
  </r>

```

```

<r>
  <rPr>
    <sz val="11"/>
    <color rgb="FFFF0000"/>
    <rFont val="Calibri"/>
    <family val="2"/>
    <scheme val="minor"/>
  </rPr>
  <t>has</t>
</r>
<r>
  <rPr>
    <sz val="11"/>
    <color theme="1"/>
    <rFont val="Calibri"/>
    <family val="2"/>
    <scheme val="minor"/>
  </rPr>
  <t xml:space="preserve"> a </t>
</r>
<r>
  <rPr>
    <i/>
    <sz val="11"/>
    <color rgb="FF00B050"/>
    <rFont val="Calibri"/>
    <family val="2"/>
    <scheme val="minor"/>
  </rPr>
  <t>variety</t>
</r>
<r>
  <rPr>
    <sz val="11"/>
    <color theme="1"/>
    <rFont val="Calibri"/>
    <family val="2"/>
    <scheme val="minor"/>
  </rPr>
  <t xml:space="preserve"> of </t>
</r>
<r>

```

```

    <rPr>
      <u/>
      <sz val="11"/>
      <color theme="1"/>
      <rFont val="Calibri"/>
      <family val="2"/>
      <scheme val="minor"/>
    </rPr>
    <t>formatting</t>
  </r>
  <r>
    <rPr>
      <sz val="11"/>
      <color theme="1"/>
      <rFont val="Calibri"/>
      <family val="2"/>
      <scheme val="minor"/>
    </rPr>
    <t xml:space="preserve"> applied</t>
  </r>
</si>

```

Reading the string from left to right as it appears in the cell, each word represents a change in formatting. This change in formatting corresponds to separate run elements `r` to separate the text with different formatting. Every word is expressed using a run element `r`, which expresses the properties of the text `rPr` and the text itself `t`.

Since there are no properties associated with the first word "This", the text inherits the default formatting for the cell.

The rich text expression for the second string "string" contains a bold faced font element indicator `b` in the run properties `rPr`, therefore this text has bold face applied. While other text formatting properties are expressed, they are the same as the cell formatting. This additional information is expressed for the sake of clarity and completeness of expression.

The rich text expression for the third string "has" contains a color element indicator `color` in the run properties `rPr`. Therefore, the color of the text associated with this set of run properties is red, according to the color value expressed.

The formatting for the remaining words in this rich text string can be deduced in a similar manner, such that "a" has default formatting applied, "variety" is both italicized and green, "of" has default formatting applied, "formatting" is underlined, and "applied" has default formatting applied.

L.2.4 Tables

L.2.4.1 Overview

A table helps organize and provide structure to lists of information in a worksheet. Tables enable users to sort, analyze, format, manage, add, and delete information. Here's an example of what a table can look like:

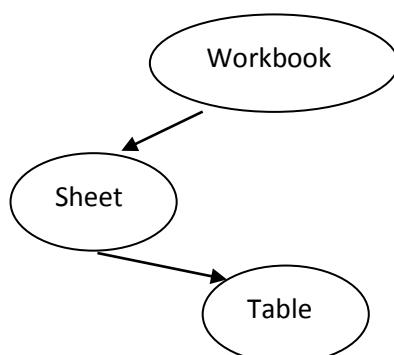
	A	B	C	D
1				
2		State ▼	City ▼	Zipcode ▼
3		WA	Seattle	98101
4		WA	Seattle	98102
5		WA	Tacoma	98467
6		OR	Portland	97204
7		OR	Portland	97205
8		ID	Post Falls	83854
9		Count		6

Notice that this table has column headings "State", "City", and "Zipcode". There is a row summarizing the data, in this case a count of zip codes. The formatting helps make clear where the column headings are (Bold faced, bordered on top and bottom all the way across), where the data region is (banded row stripes), and where the totals row is (double border separating data from totals, bold face totals label).

Because the table feature has been applied to this data, special behaviors can be applied which help the user perform useful actions. For example, if the user enters additional data in row 10, the table can expand and automatically add that data to the data region of the table. Similarly, adding a column is as easy as typing a new column heading to the right or left of the current column headings. Filter and sort abilities are automatically surfaced to the user via the drop down arrows. Special calculated columns can be created which summarize or calculate data in the table. These columns have the ability to expand and shrink according to size of the table, and maintain proper formula referencing.

Tables can be made from data already present in the worksheet. Tables can also be the result of an external data query. Finally, tables can be the result of mapping a collection of repeating XML elements to a worksheet range.

L.2.4.2 File Architecture



Each table is referred to by a relationship from a sheet to the table. The relationship is found in the sheet's _rels directory. The sheet XML also references the ID of this relationship, because there can be more than one table in a sheet.

The sheet XML stores the numeric and textual data. The table XML records the various attributes for the particular table object.

L.2.4.3 Example: Table

This example demonstrates a table created from data that was previously entered in the sheet. (See §L.2.15 for a discussion of Tables with XML data bindings.)

L.2.4.4 Illustration

Consider the example provided in §L.2.4.1 above:

	A	B	C	D
1				
2				
3		State ▼	City ▼	Zipcode ▼
4		WA	Seattle	98101
5		WA	Seattle	98102
6		WA	Tacoma	98467
7		OR	Portland	97204
8		OR	Portland	97205
9		ID	Post Falls	83854
10		Count		6
11				

Notice that this table has column headings "State", "City", and "Zipcode". There is a row summarizing the data, in this case a count of Zip codes. In the "State" column abbreviations of United States State names are listed. In the City column are listed names of Cities within those states. Finally, within the Zipcode column are postal codes residing within those cities.

The table has a style applied, which provides unique formatting for:

- The column heading area, with bold facing and top and bottom borders
- The data area, with banded striping
- The total row area, with a top double border and bold facing
- The last column area, with a solid background fill of blue.

L.2.4.5 The Sheet XML

The sheet XML for this example references the table definition part:

```
<worksheet>
  ...
  <tableParts count="1">
    <tablePart r:id="rId1"/>
  </tableParts>
</worksheet>
```

L.2.4.6 The Table XML

The tableParts collection appears after the sheetData section of the sheet. This sheet references a table whose relationship Id r:id value is rId1.

The Table definition XML for this example:

```
<table xmlns= ... id="8" name="Table19" displayName="Table19" ref="B3:D10"
  totalsRowCount="1">
  <autoFilter ref="B3:D10"/>
  <tableColumns count="3">
    <tableColumn id="1" name="State" totalsRowLabel="Count"
      totalsRowDxfId="0"/>
    <tableColumn id="2" name="City"/>
    <tableColumn id="3" name="Zipcode" totalsRowFunction="count"/>
  </tableColumns>
  <tableStyleInfo name="TableStyleMedium16" showFirstColumn="0"
    showLastColumn="1"
    showRowStripes="1" showColumnStripes="0"/>
</table>
```

name indicates that the Table's name is Table19, and the ref value indicates that it occupies the range B3:D10 on the relevant sheet. totalsRowCount value of 1 indicates that this Table's total row is visible.

The autoFilter element indicates that the autoFilter feature is applied to the range B3:D10. The tableColumns collection indicates there are 3 columns in the table, whose names are "State", "City", and "Zipcode". Furthermore, the column titled "State" has a label in the total row, whose caption is "Count", and the column titled "Zipcode" has a total row function applied, whose function is "count".

The tableStyleInfo element indicates various attributes of this Table's style and formatting. In this example, name indicates that the Table style named "TableStyleMedium16" has been applied. Additionally, even though formatting has been defined by this table style to indicate uniquely the first column of the table, since showFirstColumn is set to 0 (false), this first column formatting is not applied to the table. The same is true for column stripes. Since showColumnStripes is set to 0 (false), even though formatting for column stripes is defined by the table style, it is not applied to this table.

However, both row striping and last column formatting is set to be applied to this table, as indicated by `showRowStripes` and `showLastColumn`.

L.2.5 Calculation Chain

L.2.5.1 Overview

The Calculation Chain part specifies the order in which cells in the workbook were last calculated. It only records information about cells containing formulas. It does *not* include any information about the formula-dependency calculation tree. In other words, the Calculation Chain part does not indicate the dependencies that formulas have on other cell values; it only indicates the order in which the cells were last calculated.

Any particular calculation event can cause the calculation chain order to be rearranged or altered. For example, adding more formulas to the workbook adds references in the Calculation Chain part.

Another example of how the calculation order can be updated involves the idea of partial calculation. *Partial calculation* is an optimization a spreadsheet application can implement to calculate only those cells that are dependent on other cells whose values have changed, and to ignore other formulas in the workbook. This helps to avoid redundantly recalculating results that are already known. Therefore, if a set of formulas that were previously ignored during a calculation become required for calculation (due to a cell's value changing), then these formulas move to "first" on the calculation chain so they can be evaluated.

While calculation chain information can be loaded by a spreadsheet application, it is not required. A calculation chain can be constructed in memory at load-time based on the formulas and their interdependence, if the spreadsheet application finds this information useful. The order expressed in the Calculation Chain part does not force or dictate to the implementing application the order in which calculations must be performed at runtime.

L.2.5.2 Example

Consider the following set of formulas in a workbook:

	A		B		C		D	
1	1	1	11	11				
2	=A1+1	2	=B1+1	12				
3	=A2+1	3	=B2+1	13				
4	=A3+1	4	=B3+1	14				
5	=A4+1	5	=B4+1	15				
6	=A5+1	6	=B5+1	16				
7	=A6+1	7	=B6+1	17				
8	=A7+1	8	=B7+1	18				
9	=A8+1	9	=B8+1	19				
10	=A9+1	10	=B9+1	20	=B10+A10	30	=C10+10	40
11								

Note that the content of each cell is displayed on the left side of the cell, and the evaluated value is superimposed on the right side of each cell.

Cell A1 contains the numeric constant 1. Cell A2 contains the formula =A1+1, and this formula is filled down to A10. Cell B1 contains the numeric constant 11. Cell B2 contains the formula =B1+1, and this formula is filled down to B10. C10 contains the formula =B10+A10, whose current value is 30. D10 contains the formula =C10+10, whose current value is 40.

Because dependencies among formulas do affect calculation order, dependencies are discussed briefly here. The formula in D10 depends on the result from C10. The formula in C10 depends on the results from both A10 and B10. The formulas in column A each depend on the cell above them, ultimately depending on the constant value in A1. The formulas in column B each depend on the cell above them, ultimately depending on the constant value in B1.

This example was created by first entering the values in A1 then B1. Next, typing the formula in A2, and filling that across to B2. Then the formulas in A2 and B2 were concurrently filled down to A10:B10. Next, the formula was entered into C10, and finally the formula in D10 was entered. The application was in automatic/partial calculation mode when this information was entered.

L.2.5.2.1 Partial Calculation

The calculation chain might be saved after initially entering the data and saving the workbook, as follows:

```
<calcChain xmlns="...">
  <c r="D10" i="1"/>
  <c r="C10"/>
  <c r="A3"/>
  <c r="B3"/>
```

```

<c r="A4"/>
<c r="B4"/>
<c r="A5"/>
<c r="B5"/>
<c r="A6"/>
<c r="B6"/>
<c r="A7"/>
<c r="B7"/>
<c r="A8"/>
<c r="B8"/>
<c r="A9"/>
<c r="B9"/>
<c r="A10"/>
<c r="B10"/>
<c r="B2"/>
<c r="A2"/>
</calcChain>

```

Every `c` element represents a cell containing a formula. The first cell calculated appears first (top-to-bottom), and so on. The reference attribute `r` indicates the cell's address in the sheet. The index attribute `i` indicates the index of the sheet with which that cell is associated. The sub-chain attribute `s` (not present in this first example) indicates that this cell can be treated as a sub chain of the preceding cell. Sub-chains can be useful when calculation can be multi-threaded or calculated concurrently. Whenever a cell does not contain an `i` or `s` attribute, it is understood to inherit these values from the previous cell.

Because of the way in which the workbook was initially created and saved, cell D10 should be the first cell calculated. The reason for this, which cannot be determined from examining the XML, is that cell D10 is the only cell that needs calculating, due to the partial calculation optimization. Since the cells A2:B10 and C10 were previously calculated (as a result of entering formulas in those cells), when entering the formula in D10, D10 is the only cell that needs to be calculated.

This calculation chain indicates that after D10 is calculated, C10 can be evaluated. In looking at the dependencies, it is understood that during a full calculation, C10 would be evaluated before D10 can be evaluated. However, because of the partial calculation optimization, at the time C10 was entered, it was placed first on the calculation chain to be evaluated. Subsequent to that, D10 was entered, and so C10 was moved to second position in the calculation chain, and that is why it is currently in the second place.

Moving through the rest of the cells with this same logic, just before C10 was entered, A3, then B3, then A4, then B4, and so on up to A10 and B10 were added and then evaluated as part of the fill-down operation.

Finally, cells A2 and B2 were the first formulas to be added and calculated. All formulas in the workbook were added after A2 and B2 were evaluated. Since A2 and B2 didn't need to be re-evaluated (due to the partial calculation optimization) after that, they eventually settled to the end of the calculation chain.

L.2.5.2.2 First Full Calculation

Below is how the calculation chain looks after changing the values of A1 and B1, or after forcing the application to perform a full calculation on the entire set of formulas:

```
<calcChain xmlns="...">
  <c r="B2" i="1"/>
  <c r="B3" s="1"/>
  <c r="B4" s="1"/>
  <c r="B5" s="1"/>
  <c r="B6" s="1"/>
  <c r="B7" s="1"/>
  <c r="B8" s="1"/>
  <c r="B9" s="1"/>
  <c r="B10" s="1"/>
  <c r="C10" s="1"/>
  <c r="D10" s="1"/>
  <c r="A2"/>
  <c r="A3" s="1"/>
  <c r="A4" s="1"/>
  <c r="A5" s="1"/>
  <c r="A6" s="1"/>
  <c r="A7" s="1"/>
  <c r="A8" s="1"/>
  <c r="A9" s="1"/>
  <c r="A10" s="1"/>
</calcChain>
```

Now the order of calculation seems more in line with the way in which the formulas depend on each other: cells B2:B10 are calculated in order, and cells A2:A10 are calculated in order.

Additionally, the application has discovered that the formulas in column B can be calculated in parallel with the formulas in column A (i.e., they don't depend on each other). This is evidenced by the presence of s="1" on the cell element for cells B2:B10, indicating that B2:10 are part of a "child-chain" starting with B2. Note also that C10 and B10 are included in that child chain, even though these formulas do, in fact, depend on calculated values from column A. This is due to the multi-threaded nature of the calculation engine. Currently the chain on which C10 and D10 reside can be calculated concurrently with the chain on which A2:A10 reside because by the time C10 and D10 need to be calculated (e.g., by CPU #1), A10 has already been calculated (e.g., by CPU #2). In some future calculation, the timing might be different, and at that time, the application needs to resort to moving C10 and D10 to a new calculation level (see §L.2.5.2.3).

L.2.5.2.3 Twentieth 20th Full Calculation

After several full calculation iterations, this particular calculation chain settles into a stable state. For example:

```
<calcChain xmlns="...">
  <c r="B2" i="1"/>
  <c r="B3" s="1"/>
  <c r="B4" s="1"/>
  <c r="B5" s="1"/>
  <c r="B6" s="1"/>
  <c r="B7" s="1"/>
  <c r="B8" s="1"/>
  <c r="B9" s="1"/>
  <c r="B10" s="1"/>
  <c r="A2"/>
  <c r="A3" s="1"/>
  <c r="A4" s="1"/>
  <c r="A5" s="1"/>
  <c r="A6" s="1"/>
  <c r="A7" s="1"/>
  <c r="A8" s="1"/>
  <c r="A9" s="1"/>
  <c r="A10" s="1"/>
  <c r="C10" l="1"/>
  <c r="D10" s="1"/>
</calcChain>
```

The difference introduced here is the concept of a dependency-level attribute *l*. This flag indicates that all chain and child chain concurrent calculation must be completed (and all cells have newly calculated values) before proceeding with calculation.

In this example, cells C10 and D10 are marked to exist in a new and separate dependency level from the cells A2:A10 and B2:B10. This makes sense given how the dependencies for these formulas are set up: A2:A10 can be calculated concurrently with B2:B10 because they do not depend on each other. A2:A10 exists as one calculation chain, and B2:B10 exist as another parallel calculation chain. However, C10 and D10 are both dependent on calculated results from the two parallel chains, and so can only be calculated after the first set of parallel calculations are completed.

Dependency-Level *l* flags indicate where calculation must wait for all concurrent threads to complete before continuing with calculation

L.2.6 Comments

L.2.6.1 Overview

A *comment* is a rich text note that is attached to, and associated with, a cell, separate from other cell content. Comment content is stored separate from the cell, and is displayed in a drawing object (like a text box) that is separate from, but associated with, a cell. Comments are used as reminders, such as noting how a complex formula works, or to provide feedback to other users. Comments can also be used to explain assumptions made in a formula or to call out something special about the cell.

L.2.6.2 Example

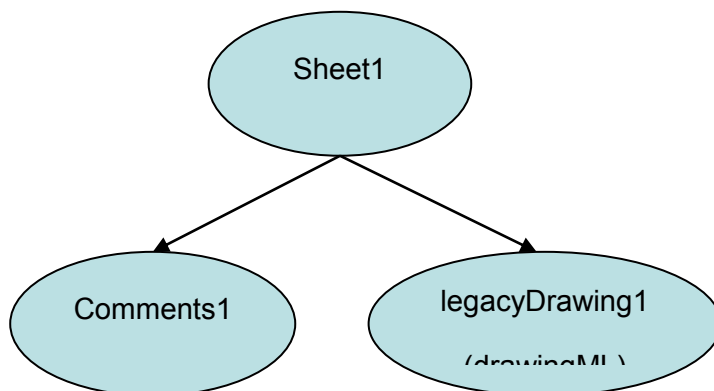
Consider the following graphic representation of a worksheet:

	A	B	C	D	E	F	G	H	I	J
1										
2				Q1	Q2	Q3	Q4			
3		Revenue		412.52	515.34	866.74				524.92
4		Expenses		697.37						546.44
5		Total		\$1,109.89						\$1,071.36
6										
7										

Note that cells D4 and J4 have comments.

L.2.6.3 File Architecture

Inside the file, the comment content ("Comments1") is expressed separately from the sheet information ("Sheet1"), and separately from the drawing information ("legacyDrawing1") for the containing object:



The parts are related using relationships from the sheet to the comments and drawings parts. Comments are stored together at the sheet-level. Therefore, if there are five worksheets in a workbook, and three of those contain cells with associated comments, then there are three comment parts in the file, one for each sheet.

L.2.6.4 The XML

```

<comments>
  <authors>
    <author>Chad</author>
    <author>CBR</author>
  </authors>
  <commentList>
    <comment ref="D4" authorId="0">
      <text>
        <r>
          <rPr>
            <b/>
            <sz val="8"/>
            <color indexed="81"/>
            <rFont val="Calibri"/>
            <charset val="1"/>
            <scheme val="minor"/>
          </rPr>
          <t>Chad:</t>
        </r>
        <r>
          <rPr>
            <sz val="8"/>
            <color indexed="81"/>
            <rFont val="Calibri"/>
            <charset val="1"/>
            <scheme val="minor"/>
          </rPr>
          <t xml:space="preserve">Why such high expense?</t>
        </r>
      </text>
    </comment>
  </commentList>
</comments>

```

```

    <comment ref="J4" authorId="1">
      <text>
        <r>
          <rPr>
            <b/>
            <sz val="8"/>
            <color indexed="81"/>
            <rFont val="Calibri"/>
            <charset val="1"/>
            <scheme val="minor"/>
          </rPr>
          <t>CBR:</t>
        </r>
        <r>
          <rPr>
            <sz val="8"/>
            <color indexed="81"/>
            <rFont val="Calibri"/>
            <charset val="1"/>
            <scheme val="minor"/>
          </rPr>
          <t xml:space="preserve">
            Pending a couple expenses in December.</t>
          </r>
        </text>
      </comment>
    </commentList>
  </comments>

```

L.2.6.5 Authors

```

<comments>
  <authors>
    <author>Chad</author>
    <author>CBR</author>
  </authors>

```

The authors collection is a unique list of author names for all comments on a particular sheet. In this example, there are two authors listed. Each comment definition references the authors collection by zero-based index.

L.2.6.6 Comments

```

<commentList>
  <comment ref="D4" authorId="0">
    <text>
      <r>
        <rPr>
          <b/>
          <sz val="8"/>
          <color indexed="81"/>
          <rFont val="Calibri"/>
          <charset val="1"/>
          <scheme val="minor"/>
        </rPr>
        <t>Chad:</t>
      </r>
      <r>
        <rPr>
          <sz val="8"/>
          <color indexed="81"/>
          <rFont val="Calibri"/>
          <charset val="1"/>
          <scheme val="minor"/>
        </rPr>
        <t xml:space="preserve">
          Why such high expense?</t>
        </r>
      </text>
    </comment>
  
```

commentList is a listing of all comments on a sheet. The first comment in this example has ref="D4" and authorId="0". This indicates that the comment is associated with cell D4 and is associated with the author "Chad".

The content of comment is rich text, following the rich text schematics, including the author name and actual comment.

L.2.7 Styles

L.2.7.1 Overview

There are several ways to express formatting applied to objects in a worksheet. SpreadsheetML supports the concepts of Styles, Themes, and Direct Formatting applied to cell ranges, Tables, PivotTables, Charts, and Shapes.

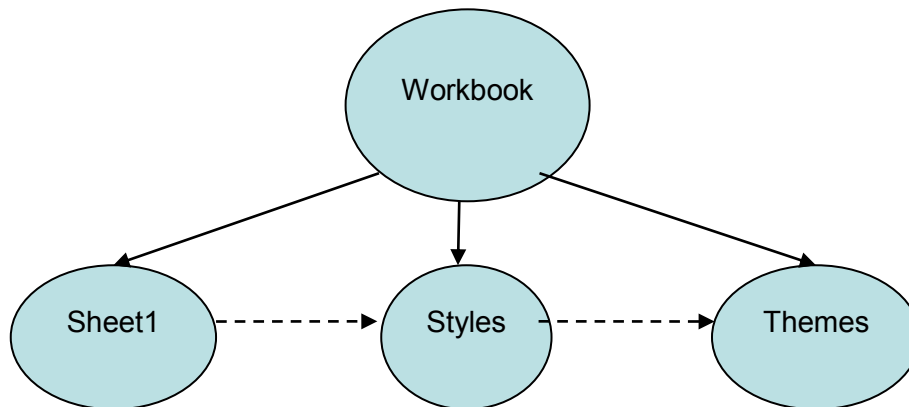
A *Style* is a named collection of formatting elements. A *cell style* can specify number format, cell alignment, font information, cell border specifications, colors, and background / foreground fills. *Table styles* specify formatting elements for the regions of a table (e.g. make the header row & totals bold face, and apply light gray fill to alternating rows in the data portion of the table to achieve striped or banded rows). *PivotTable styles* specify formatting elements for the regions of a PivotTable (e.g. 1st & 2nd level subtotals, row axis, column axis, and page fields).

A *Style* can specify color, fonts, and shape effects directly, or these elements can be referenced indirectly by referring to a *Theme* definition. Using *styles* allows for quicker application of formatting and more consistently stylized documents.

Themes define a set of colors, font information, and effects on shapes (including Charts). If a style or formatting element defines its color, font, or effect by referencing a theme, then picking a new theme switches all the colors, fonts, and effects for that formatting element.

Applying *Direct Formatting* means that particular elements of formatting (e.g. a bold font face or a number format) have been applied, but the elements of formatting have been chosen individually instead of collectively by choosing a named *Style*. Note that when applying direct formatting, themes can still be referenced, causing those elements to change as the theme is changed.

L.2.7.2 File Architecture



For a workbook, a single Styles part holds all its formatting definitions. Similarly, a single Themes part defines the theme information used in the workbook. These parts are referenced by relationship from the Workbook part. Each of the formatted objects refers by index to a master formatting definition record expressed in the Styles part. This master formatting record references additional supporting formatting element collections in the Styles part. If the formatting element in the Styles part is defined in terms of a theme, then this formatting element references an index to a theme element defined in the Theme part. The solid arrows denote that there are relationships expressed from the Workbook part to each of the Sheet1, Styles, and Themes parts. The dotted arrow from the Sheet1 part to the Styles part indicates that there are references in the Sheet1 part's markup that refer, by index, to elements defined in the markup in the Styles part. Similarly, the dotted arrow from the Styles part to the Themes

part indicates that there are references in the Styles part's markup that refer, by index, to elements defined in the markup in the Themes part.

L.2.7.3 Organization in the Styles Part

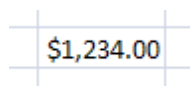
The Styles part is organized into element collections as described in the following subclauses. The element collections must appear in the order presented below. The element collections are siblings in the Styles part XML definition, whose parent, the root node of this part, is `<styleSheet>`.

Please refer to the reference material or schemas themselves for more precise descriptions on the required order of elements.

L.2.7.3.1 Number Format Expressions

This is where cell number formats used in this workbook are expressed. This collection never references a theme. In this collection the `numFmtId` attribute is an actual ID, unlike the other sibling collections. That is, instead of relying on the order in which a particular `numFmt` appears, it is referenced elsewhere by calling out the `numFmtId` value. Then the corresponding `numFmt` record can be found by finding the `numFmt` record with the matching `numFmtId` value. In the case of number formats, a set of `numFmtId` values are predefined and fixed by ECMA-376. These values map to actual number formatting expressions.

The following XML would format a cell containing the value 1234 to look like this:



```
<numFmts count="1">
  <numFmt numFmtId="165" formatCode="",$"#,##0.00"/>
</numFmts>
```

A `<numFmt>` definition is referenced by ID (`numFmtId`) from either a `<cellXf>` or a `<cellStyleXf>`.

To read more about how to interpret number format codes like the value found in `formatCode` above, please read the reference section on `numFmt`, in the Styles section.

L.2.7.3.2 Font Definitions

This is where font definitions used in this workbook are expressed. Elements of the font definition can reference theme definitions.

```
<fonts count="1">
  <font>
    <b/>
    <sz val="11"/>
    <color theme="1"/>
    <name val="Calibri"/>
    <family val="2"/>
```

```

    </font>
</fonts>

```

This font definition specifies bold face, font size of "11", a font color specified in the Theme part, specifically the color whose index is "1" in the <clrScheme> collection, a font name of "Calibri", and whose font family value is "2" (for more explanation on font family, please refer to the Styles reference material). A definition is referenced by index (fontId) from either a <cellXf> or a <cellStyleXf>.

A font record is referenced by zero-based index, meaning the numerical order in which the font appears under fonts.

L.2.7.3.3 Fill Definitions

This is where fills used in the workbook are expressed.

```

<fills count="1">
  <fill>
    <patternFill patternType="solid">
      <fgColor theme="4"/>
      <bgColor theme="4"/>
    </patternFill>
  </fill>
</fills>

```

This fill definition specifies a solid pattern fill, whose color uses a themed color, whose index is "4" in the <clrScheme> collection of the Theme part. A <fill> definition is referenced by index (fillId) from either a <cellXf> or a <cellStyleXf>.

A fill record is referenced by zero-based index, meaning the numerical order in which the fill appears under fills.

L.2.7.3.4 Borders Definitions

This is where border formats are specified.

```

<borders count="1">
  <border>
    <left/>
    <right/>
    <top/>
    <bottom/>
    <diagonal/>
  </border>
</borders>

```

This example specifies a cell with left, right, top, and bottom borders. A <border> definition is referenced by index (borderId) from either a <cellXf> or a <cellStyleXf>.

A border record is referenced by zero-based index, meaning the numerical order in which the border appears under borders.

L.2.7.3.5 Master Records - Cell Styles

The 'master' cell style record (<xf>) ties together all the formatting (e.g. number format, font information, and fill) for a named cell style. An <xf> inside <cellStyleXfs> is referenced by zero-based index (not ID) (xfId) from a <cellStyle> definition, which names a particular cell style.

```
<cellStyleXfs count="1">
  <xf numFmtId="0" fontId="0" fillId="0" borderId="0"/>
</cellStyleXfs>
```

L.2.7.3.6 Master Records - Formatting

The 'master' cell style record (<xf>) ties together all the formatting (e.g. number format, font information, and fill) for a cell's direct formatting. An <xf> inside <cellXfs> is referenced by zero-based index (not ID) (s) from a cell definition (<c>) in one of the sheets.

```
<cellXfs count="1">
  <xf numFmtId="0" fontId="0" fillId="0" borderId="0" xfId="0"/>
</cellXfs>
```

L.2.7.3.7 Cell Styles

This is a collection of cell styles used in the workbook.

```
<cellStyles count="1">
  <cellStyle name="Accent1" xfId="1" builtinId="29"/>
</cellStyles>
```

L.2.7.3.8 Differential Formatting Records

"Differential formatting" enables subsets of formatting to be specified, without overriding other elements of formatting. For example, if it is desired to express "add bold face to whatever formatting is already there", then a <dx> definition can be used. <dx> definitions are used to express additional (or "differential") formatting that is applied via Table styles or PivotTable styles. <dx> definitions are referenced by index (dxId) from a <tableStyleElement>. The formatting elements used in a <dx> definition are subsets of formatting collections described above.

A dx record is referenced by zero-based index, meaning the numerical order in which the dx appears under dxfs.

```

<dxfs count="1">
  <dxfs>
    <font>
      <b/>
      <color theme="0"/>
    </font>
    <fill>
      <patternFill patternType="solid">
        <fgColor theme="5"/>
        <bgColor theme="5"/>
      </patternFill>
    </fill>
  </dxfs>
</dxfs>

```

L.2.7.3.9 Custom Table Style Definitions

Built-in Table and PivotTable styles are not saved out, only custom-defined styles are saved out. In this example, a custom table style defines formatting for an element of a table, the "whole table" region.

```

<tableStyles count="1" defaultTableStyle="TableStyleMedium9"
defaultPivotStyle="PivotStyleLight16">
  <tableStyle name="TableStyleMedium10 - Custom" pivot="0" count="1">
    <tableStyleElement type="wholeTable" dxfId="6"/>
  </tableStyle>
</tableStyles>

```

L.2.7.4 Example

L.2.7.4.1 Illustration

For this example, consider this graphic representation of a worksheet:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1															
2				Q1	Q2	Q3	Q4					Column1	Column2	Column3	Column4
3		Revenue		412.52	515.21	866.74	524.92					A	381.41	513.27	357.29
4		Expenses		697.37	539.72	149.51	546.44					B	470.33	411.76	723.52
5		Total		\$1,109.89	\$1,054.93	\$1,016.25	\$1,071.36					C	624.47	287.49	365.38
6												D	17.77	775.36	969.69
7															
8															
9												Column4	(All)		
10															
11															
12															
13															
14															
15															
16															
17															

Looking at the top left region of the illustration, cells D2, F2, H2, J2, and B3:B4 have the cell style "Accent1" applied to them. "Accent1" is a theme-driven style, and results in a blue cell fill and white / Calibri font formatting. Additionally these cells have direct border formatting applied which isn't specified as part of the "Accent1" cell style.

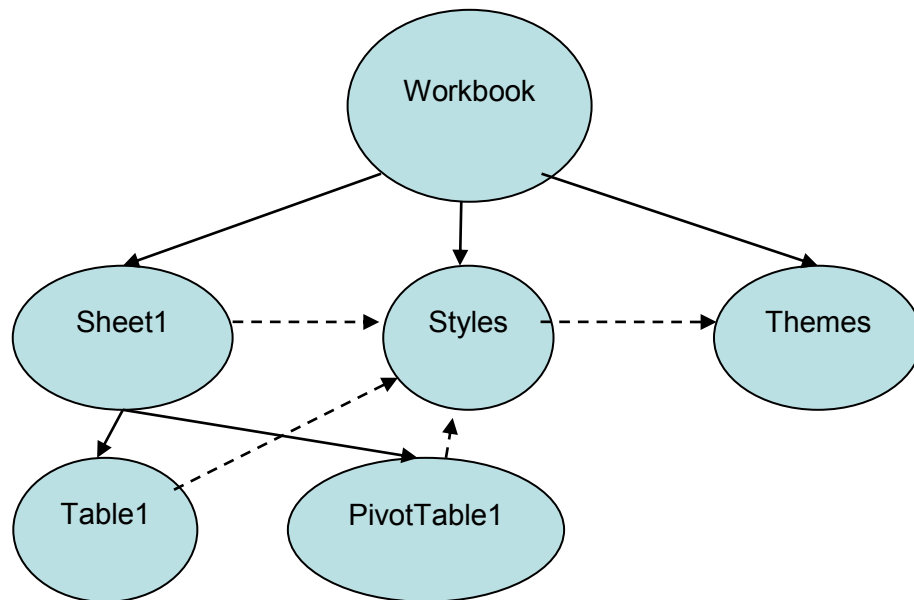
Cells D3:D4, F3:F4, H3:H4, and J3:J4 have a light blue cell fill applied. The light blue color is part of a themed color scheme, and updates when a new theme is selected.

Cells D5, F5, H5, and J5 have a currency number format applied as well as a green cell fill. While the cell fill is a themed color, the number format is fixed and does not vary or change if a new theme is selected.

The table in L2:O6 has a table style applied, called "TableStyleMedium10", which specifies formatting for the header row, row striping, and total row (even though the total row isn't shown in this example).

The PivotTable in L9:N17 has a PivotTable style applied, called "PivotStyleMedium10", which specifies formatting for the regions of a PivotTable, including the page field area in L9:M9, the header row area in L11:N12, the totals row in L17:N17, and the body of data in L13:N16.

L.2.7.4.2 File Architecture



All of the cells illustrated are defined in the "Sheet1" part in this example. The table is defined in the "Table1" part and the PivotTable is defined in the part named "PivotTable1". Each of the formatted objects refers to a set of formatting definitions which are expressed in the "Styles" part. If the formatting element is part of a themed set, the element references a theme element defined in the "Themes" part. The solid arrows represent relationships among the parts, the dotted arrows represent references by Id or index to various elements in the target part.

L.2.7.4.3 The XML For This Example

```

<styleSheet>
  <numFmts count="1">
    <numFmt numFmtId="164" formatCode=""$$";#,##0.00"/>
  </numFmts>
  <fonts count="5">
    <font>
      <sz val="11"/>
      <color theme="1"/>
      <name val="Calibri"/>
      <scheme val="minor"/>
    </font>
    <font>
      <b/>
      <sz val="11"/>
      <color theme="1"/>
      <name val="Calibri"/>
      <family val="2"/>
    </font>
  </font>

```

```

<font>
  <b/>
  <sz val="8"/>
  <color indexed="81"/>
  <name val="Calibri"/>
  <charset val="1"/>
  <scheme val="minor"/>
</font>
<font>
  <sz val="8"/>
  <color indexed="81"/>
  <name val="Calibri"/>
  <charset val="1"/>
  <scheme val="minor"/>
</font>
<font>
  <sz val="11"/>
  <color theme="0"/>
  <name val="Calibri"/>
  <scheme val="minor"/>
</font>
</fonts>
<fills count="5">
  <fill>
    <patternFill patternType="none"/>
  </fill>
  <fill>
    <patternFill patternType="gray125"/>
  </fill>
  <fill>
    <patternFill patternType="solid">
      <fgColor theme="4"/>
      <bgColor theme="4"/>
    </patternFill>
  </fill>
  <fill>
    <patternFill patternType="solid">
      <fgColor theme="6" tint="0.59999389629810485"/>
      <bgColor indexed="65"/>
    </patternFill>
  </fill>
  <fill>
    <patternFill patternType="solid">

```

```

        <fgColor theme="4" tint="0.79998168889431442"/>
        <bgColor indexed="65"/>
    </patternFill>
</fill>
</fills>
<borders count="5">
    <border>
        <left/>
        <right/>
        <top/>
        <bottom/>
        <diagonal/>
    </border>
    <border>
        <left/>
        <right/>
        <top/>
        <bottom style="double">
            <color indexed="64"/>
        </bottom>
        <diagonal/>
    </border>
    <border>
        <left style="thick">
            <color auto="1"/>
        </left>
        <right style="thick">
            <color auto="1"/>
        </right>
        <top style="thick">
            <color auto="1"/>
        </top>
        <bottom style="thick">
            <color auto="1"/>
        </bottom>
        <diagonal/>
    </border>
    <border>
        <left style="thick">
            <color auto="1"/>
        </left>
        <right style="thick">
            <color auto="1"/>

```

```

        </right>
        <top style="thick">
            <color auto="1"/>
        </top>
        <bottom/>
        <diagonal/>
    </border>
    <border>
        <left style="thick">
            <color auto="1"/>
        </left>
        <right style="thick">
            <color auto="1"/>
        </right>
        <top/>
        <bottom style="thick">
            <color auto="1"/>
        </bottom>
        <diagonal/>
    </border>
</borders>
<cellStyleXfs count="2">
    <xf numFmtId="0" fontId="0" fillId="0" borderId="0"/>
    <xf numFmtId="0" fontId="4" fillId="2" borderId="0"
applyNumberFormat="0" applyBorder="0" applyAlignment="0"
applyProtection="0">
        <protection/>
    </xf>
</cellStyleXfs>
<cellXfs count="14">
    <xf numFmtId="0" fontId="0" fillId="0" borderId="0" xfId="0"/>
    <xf numFmtId="0" fontId="1" fillId="0" borderId="0" xfId="0"
applyFont="1"/>
    <xf numFmtId="4" fontId="0" fillId="0" borderId="0" xfId="0"
applyNumberFormat="1" applyBorder="1"/>
    <xf numFmtId="164" fontId="0" fillId="0" borderId="0" xfId="0"
applyNumberFormat="1" applyBorder="1"/>
    <xf numFmtId="0" fontId="0" fillId="0" borderId="0" xfId="0"
pivotButton="1"/>
    <xf numFmtId="0" fontId="0" fillId="0" borderId="0" xfId="0"
applyAlignment="1">
        <alignment horizontal="left"/>
    </xf>

```

```

        <xf numFmtId="0" fontId="0" fillId="0" borderId="0" xfId="0"
        applyNumberFormat="1"/>
        <xf numFmtId="0" fontId="4" fillId="2" borderId="2" xfId="1"
        applyBorder="1"/>
        <xf numFmtId="0" fontId="4" fillId="2" borderId="3" xfId="1"
        applyBorder="1"/>
        <xf numFmtId="0" fontId="4" fillId="2" borderId="4" xfId="1"
        applyBorder="1"/>
        <xf numFmtId="0" fontId="1" fillId="3" borderId="0" xfId="0"
        applyFont="1" applyFill="1"/>
        <xf numFmtId="164" fontId="0" fillId="3" borderId="0" xfId="0"
        applyNumberFormat="1" applyFill="1" applyBorder="1"/>
        <xf numFmtId="4" fontId="0" fillId="4" borderId="0" xfId="0"
        applyNumberFormat="1" applyFill="1" applyBorder="1"/>
        <xf numFmtId="4" fontId="0" fillId="4" borderId="1" xfId="0"
        applyNumberFormat="1" applyFill="1" applyBorder="1"/>
    </cellXfs>
    <cellStyles count="2">
        <cellStyle name="Accent1" xfId="1" builtinId="29"/>
        <cellStyle name="Normal" xfId="0" builtinId="0"/>
    </cellStyles>
    <dxfs count="7">
        <dxfs>
            <fill>
                <patternFill patternType="solid">
                    <fgColor theme="0" tint="-
0.14999847407452621"/>
                    <bgColor theme="0" tint="-
0.14999847407452621"/>
                </patternFill>
            </fill>
        </dxfs>
        <dxfs>
            <fill>
                <patternFill patternType="solid">
                    <fgColor theme="0" tint="-
0.14999847407452621"/>
                    <bgColor theme="0" tint="-
0.14999847407452621"/>
                </patternFill>
            </fill>
        </dxfs>
    </dxfs>

```

```

<font>
  <b/>
  <color theme="0"/>
</font>
<fill>
  <patternFill patternType="solid">
    <fgColor theme="5"/>
    <bgColor theme="5"/>
  </patternFill>
</fill>
</dxfg>
<dxfg>
  <font>
    <b/>
    <color theme="0"/>
  </font>
  <fill>
    <patternFill patternType="solid">
      <fgColor theme="5"/>
      <bgColor theme="5"/>
    </patternFill>
  </fill>
</dxfg>
<dxfg>
  <border>
    <top style="double">
      <color theme="1"/>
    </top>
  </border>
</dxfg>
<dxfg>
  <font>
    <b/>
    <color theme="0"/>
  </font>
  <fill>
    <patternFill patternType="solid">
      <fgColor theme="5"/>
      <bgColor theme="5"/>
    </patternFill>
  </fill>
  <border>
    <bottom style="medium">

```

```

        <color theme="1"/>
    </bottom>
</border>
</dxfs>
<dxfs>
    <font>
        <color theme="1"/>
    </font>
    <border>
        <top style="medium">
            <color theme="1"/>
        </top>
        <bottom style="medium">
            <color theme="1"/>
        </bottom>
    </border>
</dxfs>
</dxfs>
<tableStyles count="1" defaultTableStyle="TableStyleMedium9"
defaultPivotStyle="PivotStyleLight16">
    <tableStyle name="TableStyleMedium10 - Custom" pivot="0"
count="7">
        <tableStyleElement type="wholeTable" dxId="6"/>
        <tableStyleElement type="headerRow" dxId="5"/>
        <tableStyleElement type="totalRow" dxId="4"/>
        <tableStyleElement type="firstColumn" dxId="3"/>
        <tableStyleElement type="lastColumn" dxId="2"/>
        <tableStyleElement type="firstRowStripe" dxId="1"/>
        <tableStyleElement type="firstColumnStripe" dxId="0"/>
    </tableStyle>
</tableStyles>
<colors/>
</styleSheet>

```

L.2.7.4.4 Cell D2 Formatting

	A	B	C	D
1				
2				Q1
3		Revenue		412.52
4		Expenses		697.37
5		Total		\$1,109.89

Cell D2 contains the text "Q1" and is defined in the cell table of sheet1 as:

```
<c r="D2" s="7" t="s">
  <v>0</v>
</c>
```

On this cell, the attribute value `s="7"` indicates that the 7th (zero-based) `<xf>` definition of `<cellXfs>` holds the formatting information for the cell. The 7th `<xf>` of `<cellXfs>` is defined as:

```
<xf numFmtId="0" fontId="4" fillId="2" borderId="2" xfId="1"
  applyBorder="1"/>
```

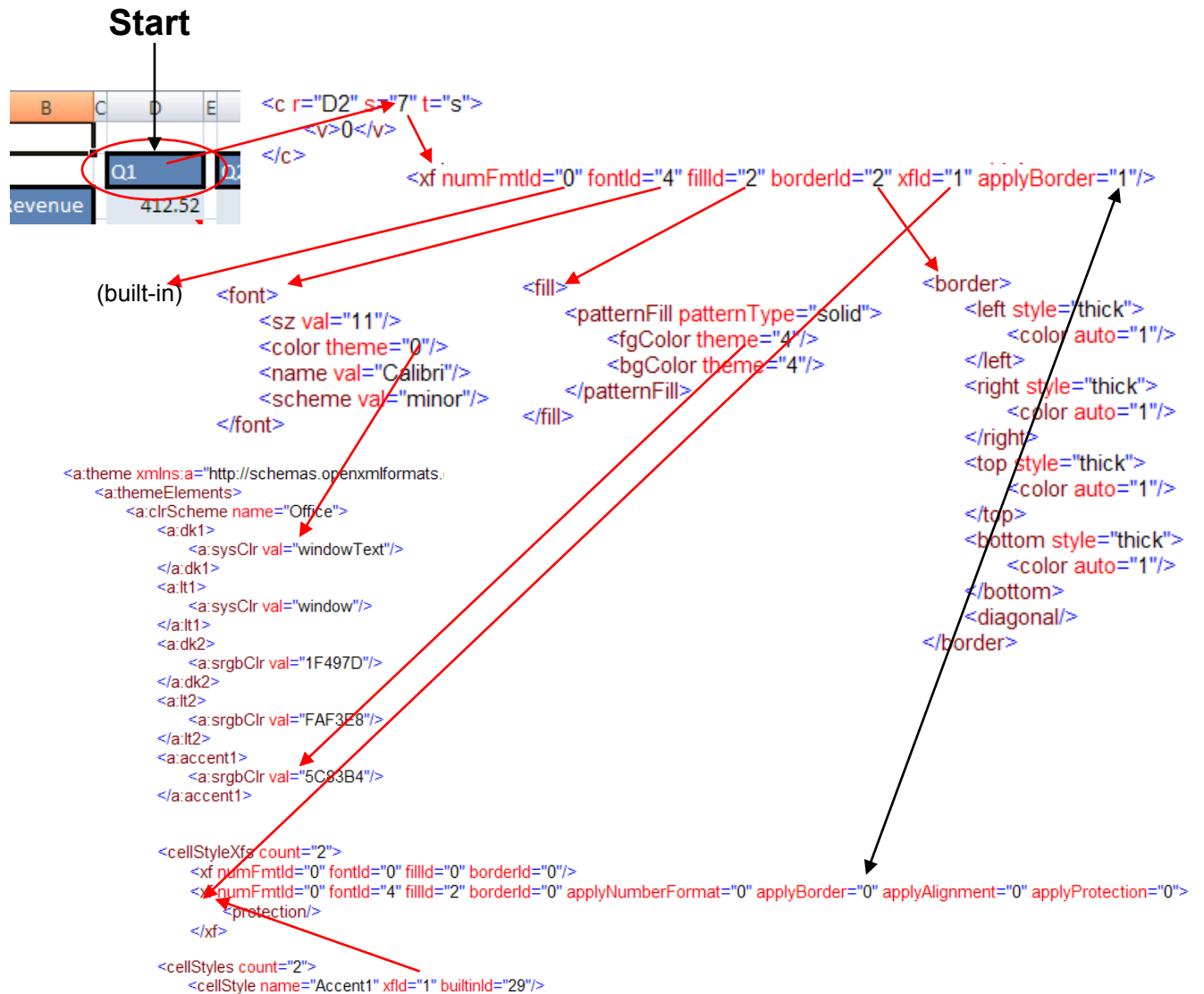
The number formatting information cannot be found in a `<numFmt>` definition because it is a built-in format; instead, it is implicitly understood to be the 0th built-in number format. Remembering that the indexes to other element collections are also zero-based, the font information can be found in the 4th `` definition; the fill information in the 2nd `<fill>` definition; and the border information in the 2nd `<border>` definition. The cell uses a cell style which is defined in the 1st `<cellStyleXf>` definition and, finally, borders specified in this master formatting record should be applied.

Remember that these collections are zero-based.

Additionally the `<fill>` definition for D2 references a themed color, whose index is 4th in the `<clrScheme>` definition of the theme part:

```
<fill>
  <patternFill patternType="solid">
    <fgColor theme="4"/>
    <bgColor theme="4"/>
  </patternFill>
</fill>
```

Graphically, the index references can be shown like this:



L.2.7.4.5 Custom Table Style

L	M	N	O
Column1	Column2	Column3	Column4
A	381.41	513.27	357.29
B	470.33	411.76	723.52
C	624.47	287.49	365.38
D	17.77	775.36	969.69

This range of cells is a Table object with a custom Table style applied. The table definition in table1 specifies which table style is applied, and which aspects of the table style definition are 'turned on' and should be applied:

```

<table id="2" name="Table11" displayName="Table11" ref="L20:024"
totalsRowShown="0">
  <tableStyleInfo name="TableStyleMedium10 - Custom" showFirstColumn="0"
showLastColumn="0" showRowStripes="1" showColumnStripes="0"/>
</table>

```

The `<tableStyleInfo>` element indicates that this Table uses the "TableStyleMedium10 - Custom" style and that "first column", "last column", and "column stripes" formatting are OFF. It also indicates that "row stripes" formatting is ON.

Here is the "TableStyleMedium10 - Custom" definition in the Styles part:

```

<stylesheet>
...
  <tableStyles count="1" defaultTableStyle="TableStyleMedium9"
defaultPivotStyle="PivotStyleLight16">
    <tableStyle name="TableStyleMedium10 - Custom" pivot="0"
count="7">
      <tableStyleElement type="wholeTable" dxfId="6"/>
      <tableStyleElement type="headerRow" dxfId="5"/>
      <tableStyleElement type="totalRow" dxfId="4"/>
      <tableStyleElement type="firstColumn" dxfId="3"/>
      <tableStyleElement type="lastColumn" dxfId="2"/>
      <tableStyleElement type="firstRowStripe" dxfId="1"/>
      <tableStyleElement type="firstColumnStripe" dxfId="0"/>
    </tableStyle>
  </tableStyles>
  <colors/>
</stylesheet>

```

Note that even though column stripes are defined for this table style, they are not used for this instance of the table.

The header row formatting for this table is defined by the 5th `<dxf>` definition:

```

<dxf>
  <font>
    <b/>
    <color theme="0"/>
  </font>
  <fill>
    <patternFill patternType="solid">
      <fgColor theme="5"/>
      <bgColor theme="5"/>
    </patternFill>
  </fill>
</dxf>

```

```

        </fill>
        <border>
            <bottom style="medium">
                <color theme="1"/>
            </bottom>
        </border>
    </dxf>

```

This formatting indicates that for the header row of this table, the font is bold face and uses a themed color; the fill is solid and uses a themed color; and there is a bottom border on the cells.

L.2.8 Worksheet Metadata

L.2.8.1 Overview

Value and cell metadata are additional properties that can be associated with a particular cell or value. Cell metadata properties can be carried along with the cell as it moves (e.g., via insert, shift, copy/paste, merge, or unmerge) and value metadata properties can be propagated along with the value as it is referenced in formulas.

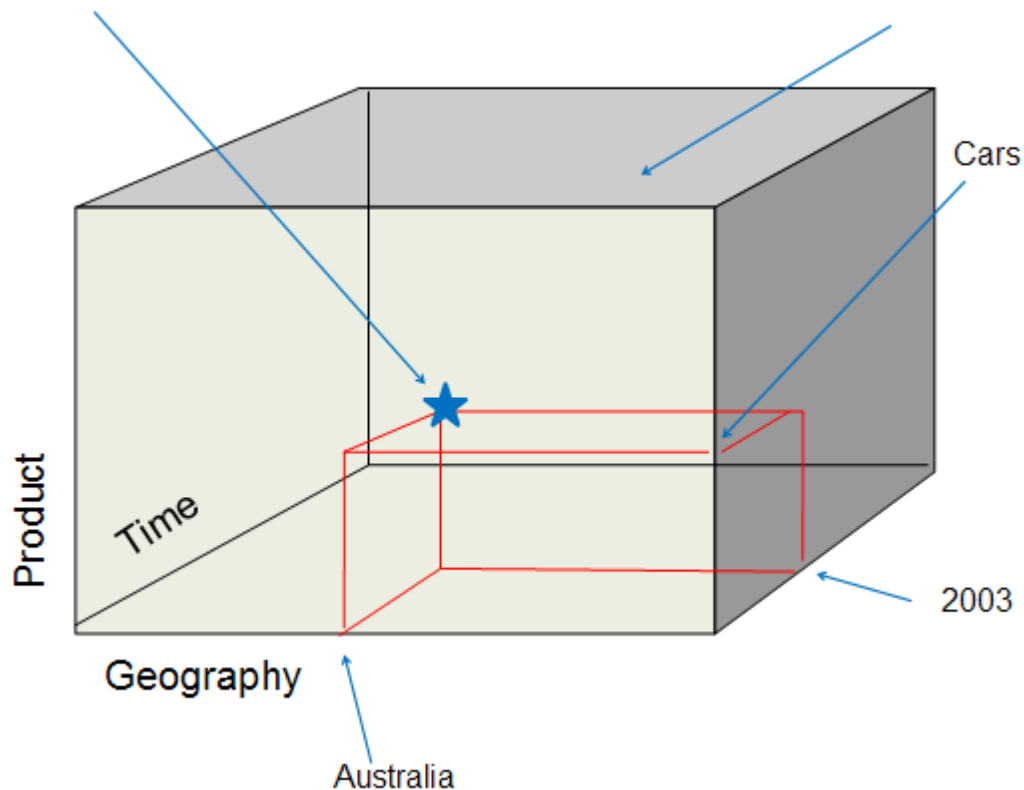
All of this metadata is stored separately in the metadata.xml part in the workbook.

While the architecture of this feature allows for future extensions, only MDX metadata—metadata that is associated with a particular cube function and its results—is currently defined. For example, if a CUBEMEMBER function call is used to identify a particular member in an OLAP cube, then the metadata would express the OLAP connection name, the MDX expression identifying that member, and various operational attributes of that metadata (e.g., whether it propagates through formula assignment, shifts with the cell when the cell moves locations in the grid, and so on).

L.2.8.1.1 OLAP Cube Review

Car sales in Australia for 2003

Sales in USD



Consider the 3-dimensional OLAP cube above. The three *dimensions* of the cube are "Product", "Geography", and "Time". "Sales Amount" is the *measure* being summarized, and is often considered an additional dimension of the cube. OLAP cubes can be N-dimensional, while this one has three dimensions.

Within each dimension are *hierarchies*, or ways of organizing the dimension into various levels of granularity. For example, within the Time dimension there can exist the Calendar Year / Quarter / Month / Day hierarchy. Likewise, the Time dimension can also have the Fiscal Year / Quarter / Month / Day hierarchy. Each of Year / Quarter / Month / Day represents *levels* in the hierarchy. '2003' is considered a *member* of the 'Year' level within the hierarchy. Likewise, the Product dimension can have multiple hierarchies. A hierarchy could be constructed based on the type of product while another hierarchy could be constructed based on the color of the product.

In the example above, picking a member from one dimension would be visualized as a slice through the cube. For example, picking 'Australia' from the Geography dimension could be a relatively thick slice of the cube, if there were many levels underneath 'Country', like 'State', 'City', and 'PostalCode'. Picking a member from Geography that is more granular than 'Australia' results in a thinner slice of the cube in the Geography dimension, because now some of Australia has been omitted from the data.

A *tuple* is the intersection of two or more members from distinct dimensions. In the example above, three members from three dimensions are expressed:

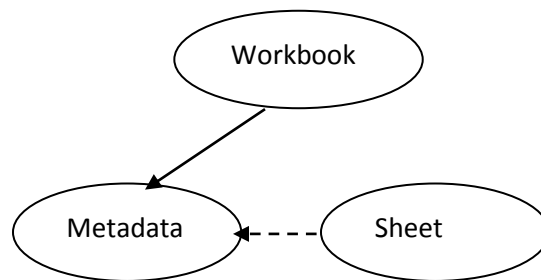
1. From Geography we have [Geography].[Country].&[Australia]
2. From Product we have [Product].[Cars].children
3. From Time we have [Time].[Calendar].[Calendar Year].&[2003]

L.2.8.1.2 OLAP Function Summary

There are seven recognized “CUBE” functions that can be used in cell formulas. These functions enable formulas in any cell to fetch data from Analysis Services. Specifically, the functions can fetch any member, set, aggregated value, property, or KPI from the OLAP cube. Because it is formula-driven, the layout of this data is as flexible as cells and formulas. The OLAP data can be placed anywhere on the spreadsheet, intermingled with other local calculations or within other formulas.

The function names are: CUBEKPIMEMBER, CUBEMEMBER, CUBEMEMBERPROPERTY, CUBERANKEDMEMBER, CUBESET, CUBESETCOUNT, and CUBEVALUE.

L.2.8.2 File Architecture – Relationships



The workbook holds the relationship to the metadata part, and cells within a sheet reference the items in the metadata part.

L.2.8.3 Example

In the following example, Cube functions are used to build up a report of internet sales by country, for all products, for the calendar years 2003 and 2004.

L.2.8.3.1 Illustration

=CUBEMEMBER("xlxdtdat9 Adventure Works", "[Measures].[Internet Sales Amount]")
 =CUBEMEMBER("xlxdtdat9 Adventure Works", "[Date].[Calendar].[All Periods].[CY 2003]")
 =CUBEMEMBER("xlxdtdat9 Adventure Works", "[Product].[Product Categories].[All Products]")
 =CUBESET("xlxdtdat9 Adventure Works", "[Customer].[Customer Geography].[All Customers].children", "Countries", 2, D5)

	A	B	C	D
1			Internet Sales Amount	
2			CY 2003	CY 2004
3			All Products	
4				
5	Countries	6	2003 Sales	2004 Sales
6	United States		\$2,838,512.36	\$3,324,031.16
7	Australia		\$3,033,784.21	\$2,563,884.29
8	United Kingdom		\$1,298,248.57	\$1,210,286.27
9	Germany		\$1,058,405.73	\$1,076,890.77
10	France		\$1,026,324.97	\$922,179.04
11	Canada		\$535,784.46	\$673,628.21

=CUBEMEMBER("xlxdtdat9 Adventure Works", "C1.C3, '2003 Sales')
 =CUBEMEMBER("xlxdtdat9 Adventure Works", "C1.D2.C3, '2004 Sales')
 =CUBERANKEDMEMBER("xlxdtdat9 Adventure Works", "A\$5, ROW(A1))
 =CUBEVALUE("xlxdtdat9 Adventure Works", "D\$5, A\$6")
 =CUBEVALUE("xlxdtdat9 Adventure Works", "C\$5, A\$6")

L.2.8.3.1.1 Function Summary

CUBEMEMBER(*connection*, *member-expression*, *caption*) returns a member in the cube (e.g., Bicycles, Cars, All Products, CY 2004) (member can be a tuple)

CUBESET(*connection*, *set-expression*, *caption*, *sort-order*, *sort-by*) returns a set of members (e.g., all Countries)

CUBERANKEDMEMBER(*connection*, *set-expression*, *rank*, *caption*) returns one member of the referenced set (e.g., Australia)

CUBEVALUE(*connection*, *member-expression-1*, *member-expression-2*, ...) returns the aggregate summarized value for the intersection of members specified.

L.2.8.3.1.2 Walk Through

C1 contains a CUBEMEMBER function call specifying the "Internet Sales Amount" member from the Measures dimension. C2 contains a CUBEMEMBER function call specifying "CY 2003" from the Date dimension. D2 contains a similar function specifying "CY2004" from the Date dimension. C3 contains a CUBEMEMBER function call specifying "All Products" from the Product dimension. Each of these cells contain simple string values (e.g., "All Products" in C3), and each of these cells is associated with MDX metadata which specifies the MDX expression identifying a particular member of a particular dimension (e.g., [Measures].[Internet Sales Amount]).

A5 contains a CUBESET function call specifying a set of members. Additionally, the CUBESET function call allows for specifying a caption for the cell ("Countries"), a sort order for sorting the set (in this case, "2" corresponds to descending), and a sort by field (in this case the set is sorted by the member as expressed in the MDX associated with cell D5, labeled "2004 Sales"). Finally, it should be noted that CUBESET returns a set of members, not just a single member.

Cells A6:A11 use the CUBERANKEDMEMBER function to return the individual members, by rank, returned from the CUBESET function call in A5. For example, A6 uses the "xlextdat9 Adventure Works" connection to connect to the OLAP cube, and addresses the first member (because "ROW(A1)" resolves to "1") in the set returned in A5.

Cell C6 uses the CUBEVALUE function to return measure data identified by intersecting the MDX expression found in A6 with the MDX expression found in C5 ("CY 2003 Internet Sales for All Products in the United States"). C7:C11 use similar CUBEVALUE function calls. D6:D11 involves similar functions as well, but using "CY 2004" instead.

The power of metadata in this example is that anytime a CUBE function argument referenced another cell, and that argument requires a set or member MDX expression, the MDX metadata for that referenced cell is returned to the calling function instead of the simple string value. For example, A6 contains a CUBERANKEDMEMBER function call, whose second argument is expecting a set of members. The reference for that argument is \$A\$5. Instead of using the A5's string value of "Countries" (which would result in a error), A5's MDX expression metadata is used instead, which returns a set. Similarly any of the CUBEVALUE function calls rely on cell references, where those cells contain MDX metadata used to pinpoint the measure data requested. Furthermore, each of the cells referenced by C6:D11, in turn reference other cells' MDX metadata. In this way, the MDX metadata is able to propagate through the formula calculation chain.

L.2.8.3.2 Worksheet Metadata XML

L.2.8.3.2.1 General Organization

```
<metadata>
  <metadataTypes/>
  <metadataStrings/>
  <mdxMetadata/>
  <valueMetadata/>
</metadata>
```

There are four general collections in the metadata part:

- metadataTypes - expresses various application runtime behaviors that apply to a set of metadata.
- metadataStrings - expresses supporting string resources for the metadata part. This includes the connection name to the OLAP cube as well as MDX expressions identifying members and sets.

- `mdxMetadata` - expresses the tuples in use in this workbook.
- `valueMetadata` - The block (bk) elements stored in `valueMetadata` are referenced from cells in the sheet definition (vm on the cell is an index (1-based) to a bk element). Each record in a block references additional element collections in the metadata part to define fully the metadata associated with this particular record, and therefore the full metadata definition for a particular cell's value. The records in `valueMetadata` serve as the bridge between the metadata definitions and the cells or values in the sheet.

L.2.8.3.2.2 Metadata Behaviors

The metadata type expresses operations on cells that allow the metadata to remain associated with the cell. Operations not listed or set to 0 would cause the metadata to no longer be associated with the cell.

```
<metadataTypes count="1">
  <metadataType name="XLMDX" minSupportedVersion="120000" copy="1"
    pasteAll="1" pasteValues="1" merge="1" splitFirst="1"
    rowColShift="1" clearFormats="1" clearComments="1" assign="1"
    coerce="1"/>
</metadataTypes>
```

Regarding `metadataTypes`:

- `count` is the number of `metadataType` elements.
- `type` is a particular set of cell operations.

Regarding `metadataType`:

- `name` is the name of this particular metadata type.
- `minSupportedVersion` indicates the earliest version of the application which supports this metadata type.
- `copy` value of 1 indicates that this metadata is copied to other cells when the cell is copied.
- `pasteAll` value of 1 indicates that this metadata is pasted to another cell when 'paste all' is chosen during a copy/paste operation.
- `pasteValues` value of 1 indicates that this metadata is pasted to another cell when only the values of the cell is pasted during a copy/paste operation.
- `merge` value of 1 indicates that when the cell is merged, the metadata associated with the cell remains.
- `splitFirst` value of 1 indicates that when a merged cell is split, the metadata associated with the merged cell is only applied to the first (from top left) cell resulting from the split.
- `rowColShift` value of 1 indicates that metadata associated with a cell remains after rows and columns are inserted, even when the cell is moved.
- `clearFormats` value of 1 indicates that the metadata remains after the cell has been cleared of all formatting.

- `clearComments` value of 1 indicates that the metadata remains after comments have been cleared from the cell.
- `assign` value of 1 indicates that the metadata propagates through formula assignment operations
- `coerce` value of 1 indicates that the metadata can be removed when the data type is coerced to another type.

L.2.8.3.2.3 Metadata Strings

This collection is a set of string resources for the metadata part. Most follow the format of an MDX expression. Connection names (to OLAP cubes) are also expressed here.

```
<metadataStrings count="12">
  <s v="xlextdat9 Adventure Works"/>
  <s v="[Measures].[Internet Sales Amount]"/>
  <s v="[Date].[Calendar].[Calendar Year]&[2003]"/>
  <s v="[Date].[Calendar].[Calendar Year]&[2004]"/>
  <s v="[Product].[Product Categories].[All Products]"/>
  <s v="[Customer].[Customer Geography].[All Customers].children"/>
  <s v="[Customer].[Customer Geography].[Country]&[Australia]"/>
  <s v="[Customer].[Customer Geography].[Country]&[United States]"/>
  <s v="[Customer].[Customer Geography].[Country]&[United Kingdom]"/>
  <s v="[Customer].[Customer Geography].[Country]&[Germany]"/>
  <s v="[Customer].[Customer Geography].[Country]&[France]"/>
  <s v="[Customer].[Customer Geography].[Country]&[Canada]"/>
</metadataStrings>
```

Regarding `metadataStrings`:

- `count` indicates the number of strings in the collection.
- `s` is the string container element
- `v` is the string value itself.

L.2.8.3.2.4 mdxMetadata

This collection expresses MDX metadata, and builds up the MDX members, sets, KPIs, and member properties.

`valueMetadata` records reference these records.

```

<mdxMetadata count="26">
  <mdx n="0" f="m">
    <t c="1">
      <n x="1"/>
    </t>
  </mdx>
  <mdx n="0" f="m">
    <t c="1">
      <n x="2"/>
    </t>
  </mdx>
  <mdx n="0" f="m">
    <t c="1">
      <n x="3"/>
    </t>
  </mdx>
  <mdx n="0" f="m">
    <t c="1">
      <n x="4"/>
    </t>
  </mdx>
  <mdx n="0" f="m">
    <t c="3">
      <n x="1"/>
      <n x="2"/>
      <n x="4"/>
    </t>
  </mdx>
  <mdx n="0" f="m">
    <t c="3">
      <n x="1"/>
      <n x="3"/>
      <n x="4"/>
    </t>
  </mdx>
  <mdx n="0" f="r">
    <t c="1">
      <n x="6"/>
    </t>
  </mdx>

```

```

<mdx n="0" f="r">
  <t c="1">
    <n x="7"/>
  </t>
</mdx>
<mdx n="0" f="r">
  <t c="1">
    <n x="8"/>
  </t>
</mdx>
<mdx n="0" f="r">
  <t c="1">
    <n x="9"/>
  </t>
</mdx>
<mdx n="0" f="r">
  <t c="1">
    <n x="10"/>
  </t>
</mdx>
<mdx n="0" f="r">
  <t c="1">
    <n x="11"/>
  </t>
</mdx>
<mdx n="0" f="v">
  <t c="4" ct="en-US">
    <n x="1"/>
    <n x="2"/>
    <n x="4"/>
    <n x="6"/>
  </t>
</mdx>
<mdx n="0" f="v">
  <t c="4" ct="en-US">
    <n x="1"/>
    <n x="3"/>
    <n x="4"/>
    <n x="7"/>
  </t>
</mdx>

```

```

<mdx n="0" f="v">
  <t c="4" ct="en-US">
    <n x="1"/>
    <n x="2"/>
    <n x="4"/>
    <n x="7"/>
  </t>
</mdx>
<mdx n="0" f="v">
  <t c="4" ct="en-US">
    <n x="1"/>
    <n x="3"/>
    <n x="4"/>
    <n x="8"/>
  </t>
</mdx>
<mdx n="0" f="v">
  <t c="4" ct="en-US">
    <n x="1"/>
    <n x="2"/>
    <n x="4"/>
    <n x="8"/>
  </t>
</mdx>
<mdx n="0" f="v">
  <t c="4" ct="en-US">
    <n x="1"/>
    <n x="3"/>
    <n x="4"/>
    <n x="9"/>
  </t>
</mdx>
<mdx n="0" f="v">
  <t c="4" ct="en-US">
    <n x="1"/>
    <n x="2"/>
    <n x="4"/>
    <n x="9"/>
  </t>
</mdx>

```

```

<mdx n="0" f="v">
  <t c="4" ct="en-US">
    <n x="1"/>
    <n x="3"/>
    <n x="4"/>
    <n x="10"/>
  </t>
</mdx>
<mdx n="0" f="v">
  <t c="4" ct="en-US">
    <n x="1"/>
    <n x="2"/>
    <n x="4"/>
    <n x="10"/>
  </t>
</mdx>
<mdx n="0" f="v">
  <t c="4" ct="en-US">
    <n x="1"/>
    <n x="3"/>
    <n x="4"/>
    <n x="11"/>
  </t>
</mdx>
<mdx n="0" f="v">
  <t c="4" ct="en-US">
    <n x="1"/>
    <n x="2"/>
    <n x="4"/>
    <n x="11"/>
  </t>
</mdx>
<mdx n="0" f="v">
  <t c="4" ct="en-US">
    <n x="1"/>
    <n x="3"/>
    <n x="4"/>
    <n x="6"/>
  </t>
</mdx>

```

```

<mdx n="0" f="s">
  <ms ns="5" c="3" o="d">
    <n x="1"/>
    <n x="3"/>
    <n x="4"/>
  </ms>
</mdx>
<mdx n="0" f="c">
  <ms ns="5" c="3" o="d">
    <n x="1"/>
    <n x="3"/>
    <n x="4"/>
  </ms>
</mdx>
</mdxMetadata>

```

Regarding mdxMetadata:

- count indicates the number of MDX statements in the collection.

Regarding mdx, which is a particular MDX statement:

- n indicates the index of the record in metadataStrings containing the connection name.
- f indicates the name of the calling cube function in the workbook.

Regarding t, which is an MDX tuple:

- c is the count of member expressions in the MDX tuple.

Regarding n:

- x is the index value into metadataStrings indicating the particular member expression for this dimension of the tuple expression.

For example, cell C5 has a CUBEMEMBER function call expressing the result of "Internet Sales Amount of All Products for CY 2003". In sheet1.xml, cell C5 has vm="5", which means it has an associated valueMetadata record whose index is "5". Looking ahead into the valueMetadata records, the 5th (1-based) record points to the 4th (zero-based) mdx collection in mdxMetadata.

The 5th mdx collection:

```

<mdx n="0" f="m">
  <t c="3">
    <n x="1"/>
    <n x="2"/>
    <n x="4"/>
  </t>
</mdx>

```

Where `<n x="1"/>` corresponds to the 1st position in the string store, namely

```
<s v="[Measures].[Internet Sales Amount]"/>
```

and where `<n x="2"/>` corresponds to the 2nd position in the string store, namely

```
<s v="[Date].[Calendar].[Calendar Year].&[2003]"/>
```

and where `<n x="4"/>` corresponds to the 4th position in the string store, namely

```
<s v="[Product].[Product Categories].[All Products]"/>.
```

Therefore this data point in the cube is addressed by intersecting these three hierarchies, one in each dimension of the OLAP cube:

- [Measures].[Internet Sales Amount]
- [Date].[Calendar].[Calendar Year].[2003]
- [Product].[Product Categories].[All Products]

Regarding `ms`:

- `ns` is the index of the MDX set definition in the string store.
- `c` is the number of sort-by member indicies, in this case 3 because the set is sorted by the contents of D5, which happens to be a member defined by 3 coordinates in the cube.
- `o` indicates the order of the sort; in this case, 'descending'.
- `n` is the index indicating the MDX expressions in the string store used to identify the members used to define the sort-by set.

L.2.8.3.2.5 valueMetadata

This collection defines cell or value metadata information (depending on the value of `metadataType's cellMeta`)

```

<valueMetadata count="26">
  <bk>
    <rc t="1" v="0"/>
  </bk>

```


<bk>
 <rc t="1" v="1"/>
</bk>
<bk>
 <rc t="1" v="2"/>
</bk>
<bk>
 <rc t="1" v="3"/>
</bk>
<bk>
 <rc t="1" v="4"/>
</bk>
<bk>
 <rc t="1" v="5"/>
</bk>
<bk>
 <rc t="1" v="6"/>
</bk>
<bk>
 <rc t="1" v="7"/>
</bk>
<bk>
 <rc t="1" v="8"/>
</bk>
<bk>
 <rc t="1" v="9"/>
</bk>
<bk>
 <rc t="1" v="10"/>
</bk>
<bk>
 <rc t="1" v="11"/>
</bk>
<bk>
 <rc t="1" v="12"/>
</bk>
<bk>
 <rc t="1" v="13"/>
</bk>
<bk>
 <rc t="1" v="14"/>
</bk>

```

    <bk>
      <rc t="1" v="15"/>
    </bk>
    <bk>
      <rc t="1" v="16"/>
    </bk>
    <bk>
      <rc t="1" v="17"/>
    </bk>
    <bk>
      <rc t="1" v="18"/>
    </bk>
    <bk>
      <rc t="1" v="19"/>
    </bk>
    <bk>
      <rc t="1" v="20"/>
    </bk>
    <bk>
      <rc t="1" v="21"/>
    </bk>
    <bk>
      <rc t="1" v="22"/>
    </bk>
    <bk>
      <rc t="1" v="23"/>
    </bk>
    <bk>
      <rc t="1" v="24"/>
    </bk>
    <bk>
      <rc t="1" v="25"/>
    </bk>
  </valueMetadata>

```

Regarding valueMetadata:

- `count` indicates the number of metadata block records.

Regarding `bk`, which is a metadata block, and `rc`, which is a metadata record:

- `t` indicates the index of the `metadataType` record in `metadataTypes` collection.
- `v` is the index of metadata record value in the storage corresponding to record type.

Looking at the first block using the bk element, the type of metadata with which this record is associated is the first (and only) metadataType record, which is of metadata type "XLMDX". This indicates that the v index is pointing to the 0th mdxMetadata record.

L.2.9 Pivot Table, Pivot Cache, and Common Types

L.2.9.1 Feature Overview

PivotTables display aggregated views of data easily and in an understandable layout. Hundreds or thousands of pieces of underlying information can be aggregated on row & column axes, revealing the meanings behind the data. PivotTable reports are used to organize and summarize your data in different ways. Creating a PivotTable report is about moving pieces of information around to see how they fit together. In a few gestures the pivot rows and columns can be moved into different arrangements and layouts.

A PivotTable object has a row axis area, a column axis area, a values area, and a report filter area. Additionally, PivotTables have a corresponding field list pane displaying all the fields of data which can be placed on one of the PivotTable areas.

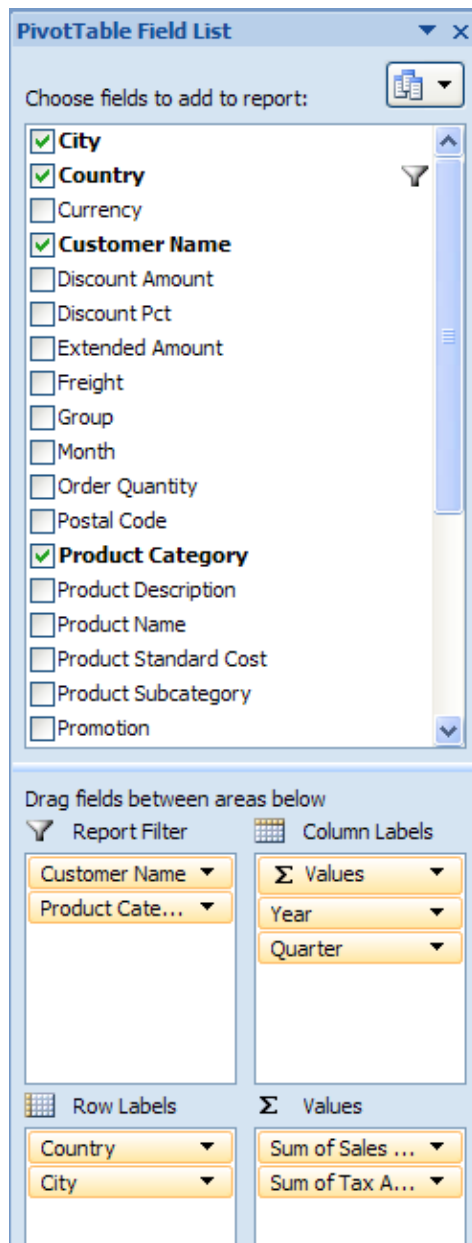
Consider this source data:

	A	C	F	H	I	O	P	Q	Z	AA	AB
1	Customer Name	Country	City	Product Category	Product Subcategory	Year	Quarter	Month	Sales Amount	Tax Amount	Freight
2	Michele Raman	Australia	Bendigo	Bikes	Road Bikes	2001	3	September	3578.27	286.2616	89.4568
3	Misty Raji	Australia	Bendigo	Bikes	Road Bikes	2001	3	July	3578.27	286.2616	89.4568
4	Tabitha E Arthur	Australia	Bendigo	Bikes	Road Bikes	2001	3	July	3578.27	286.2616	89.4568
5	Clarence D Rai	Australia	Bendigo	Bikes	Mountain Bikes	2001	3	July	3399.99	271.9992	84.9998
6	Jimmy L Moreno	Australia	Bendigo	Bikes	Mountain Bikes	2001	3	July	3399.99	271.9992	84.9998
7	Rob Verhoff	Australia	Bendigo	Bikes	Mountain Bikes	2001	3	July	3374.99	269.9992	84.3748
8	Levi Sai	Australia	Bendigo	Bikes	Road Bikes	2001	3	July	3578.27	286.2616	89.4568
9	Logan Gonzales	Australia	Brisbane	Bikes	Road Bikes	2001	3	July	3578.27	286.2616	89.4568
10	Dalton J Lee	Australia	Brisbane	Bikes	Road Bikes	2001	3	August	3578.27	286.2616	89.4568
11	Jessie J Ortega	Australia	Brisbane	Bikes	Road Bikes	2001	3	August	3578.27	286.2616	89.4568
12	Paul J. Shakespear	Australia	Caloundra	Bikes	Road Bikes	2001	3	September	3578.27	286.2616	89.4568
13	Joan R Martin	Australia	Caloundra	Bikes	Road Bikes	2001	3	September	699.0982	55.9279	17.4775
14	Casey Pal	Australia	Caloundra	Bikes	Road Bikes	2001	3	July	3578.27	286.2616	89.4568
15	Ethan G Coleman	Australia	Caloundra	Bikes	Road Bikes	2001	3	August	3578.27	286.2616	89.4568
16	Kendra Rubio	Australia	Caloundra	Bikes	Road Bikes	2001	3	August	3578.27	286.2616	89.4568
17	Bethany G Yuan	Australia	Cloverdale	Bikes	Mountain Bikes	2001	3	August	3399.99	271.9992	84.9998
18	Jasmine Wilson	Australia	Coffs Harb	Bikes	Road Bikes	2001	3	September	3578.27	286.2616	89.4568
19	Micah Wu	Australia	Coffs Harb	Bikes	Road Bikes	2001	3	September	3578.27	286.2616	89.4568
20	Warren L Zhang	Australia	Coffs Harb	Bikes	Road Bikes	2001	3	July	699.0982	55.9279	17.4775
21	Ariana Stewart	Australia	Coffs Harb	Bikes	Road Bikes	2001	3	August	3578.27	286.2616	89.4568
22	Suzanne K Lu	Australia	Coffs Harb	Bikes	Road Bikes	2001	3	August	3578.27	286.2616	89.4568
23	Randall M Rubio	Australia	Cranbourr	Bikes	Road Bikes	2001	3	September	3578.27	286.2616	89.4568
24	Deborah K Kumar	Australia	Cranbourr	Bikes	Road Bikes	2001	3	September	3578.27	286.2616	89.4568
25	Krystal Holt	Australia	Cranbourr	Bikes	Road Bikes	2001	3	July	3578.27	286.2616	89.4568
26	Patricia T Raman	Australia	Cranbourr	Bikes	Road Bikes	2001	3	August	3578.27	286.2616	89.4568
27	Wendy Dominguez	Australia	Cranbourr	Bikes	Mountain Bikes	2001	3	August	3374.99	269.9992	84.3748
28	Willie She	Australia	Darlinghu	Bikes	Road Bikes	2001	3	September	3578.27	286.2616	89.4568
29	Alan Zhu	Australia	Darlinghu	Bikes	Road Bikes	2001	3	September	3578.27	286.2616	89.4568
30	Dawn R Tang	Australia	Darlinehu	Bikes	Road Bikes	2001	3	Julv	3578.27	286.2616	89.4568

This data can be consolidated and summarized in a PivotTable. One way to organize the information would look like this:

	A	B	C	D	E	F	G	H	
1									
2		Customer Name	(All)						
3		Product Category	(All)						
4									
5		Column Labels							
6		Sum of Sales Amount				Sum of Tax Amount			
7		2001				2001			
8		Row Labels	3	4	2001 Total	3	4	2001 Total	
9		Australia	606184.7066	702862.4912	1309047.198	48494.7771	56229	104723.7771	
10		Goulburn	40580.8864	25047.89	65628.7764	3246.471	2003.8312	5250.3022	
11		Warrnambool	28091.32	27863.04	55954.36	2247.3056	2229.0432	4476.3488	
12		Port Macquarie	25746.9882	24463.05	50210.0382	2059.7591	1957.044	4016.8031	
13		Wollongong	24691.33	25390.4282	50081.7582	1975.3064	2031.2343	4006.5407	
14		Bendigo	24488.05	17484.79	41972.84	1959.044	1398.7832	3357.8272	
15		Geelong	21113.06	21088.06	42201.12	1689.0448	1687.0448	3376.0896	
16		Hobart	21088.06	6953.26	28041.32	1687.0448	556.2608	2243.3056	
17		Lavender Bay	21063.06	21965.4382	43028.4982	1685.0448	1757.2351	3442.2799	
18		Matrville	20909.78	6799.98	27709.76	1672.7824	543.9984	2216.7808	

Here is the corresponding PivotTable field list:



L.2.9.2 File Architecture

The workbook points to (and owns the longevity of) the `pivotCacheDefinition` part, which in turn points to and owns the `pivotCacheRecords` part. The workbook also points to and owns the `sheet` part, which in turn points to and owns a `pivotTable` part definition, when a PivotTable is on the sheet (there can be multiple PivotTables on a sheet). The `pivotTable` part points to the appropriate `pivotCacheDefinition` which it is using. Since multiple PivotTables can use the same cache, the `pivotTable` part does not own the longevity of the `pivotCacheDefinition`.

The `pivotTable` part describes the particulars of the layout of the PivotTable on the sheet. It indicates what fields are on the row axis, the column axis, report filter, and values areas of the PivotTable. It also

indicates formatting information about the PivotTable. If conditional formatting has been applied to the PivotTable, that is also expressed in the pivotTable part.

The pivotCacheRecords part contains the underlying data to be aggregated. It is a cache of the source data. The pivotCacheDefinition part defines each field in the pivotCacheRecords part, including field name and information about the data contained in the field. The pivotCacheDefinition part also defines pivot items that are shared among the pivotTable and pivotRecords parts.

L.2.9.3 Example - Native with Range Source

L.2.9.3.1 Illustration

Consider the source data pictured in the overview section. There are 28 fields of data in total (some aren't shown). A corresponding PivotTable summary of the data can look like this:

	A	B	C	D	E	F	G
1							
2		Country	(All)				
3		State	(All)				
4		City	(All)				
5							
6		Sum of Sales Amount	Column Labels				
7			2001				2001 Total
8			3				3 Total
9		Row Labels	July	August	September		
10		Bikes	209652.9046	222538.2892	173993.5128	606184.7066	606184.7066
11		Mountain Bikes	64424.81	60899.82	10174.97	135499.6	135499.6
12		Road Bikes	145228.0946	161638.4692	163818.5428	470685.1066	470685.1066
13		Grand Total	209652.9046	222538.2892	173993.5128	606184.7066	606184.7066

Regarding the layout of the PivotTable, notice that "Country", "State", and "City" are in the report filter area of the PivotTable. "Product Category" and "Product Subcategory" are on the row axis ("Bikes" belongs to the "Product Category" field and both "Mountain Bikes" and "Road Bikes" belong to the "Product Subcategory" field). On the column axis are "Year" ("2001"), "Quarter" ("3"), and "Month" ("July", "August", and "September") fields.

Row Grand Totals are turned on, and column Subtotals are turned on for Quarter and Year (if there was more than 1 quarter in the source data the Year Subtotal would be more interesting).

L.2.9.3.2 XML - pivotCacheDefinition part

The pivotCacheDefinition part defines each field in the source data, including the name, the string resources of the instance data (for shared items), and information about the type of data appearing in the field. Note: some of the "Customer Name" and "City" values have been removed to improve readability and reduce length.

```

<pivotCacheDefinition xmlns:r="..." r:id="rId1" refreshedBy="AnonUser"
  refreshedDateIso="2006-05-22T10:07:16" createdVersion="3"
  refreshedVersion="3" minRefreshableVersion="3" recordCount="182">
  <cacheSource type="worksheet">
    <worksheetSource name="Table1"/>
  </cacheSource>
  <cacheFields count="28">
    <cacheField name="Customer Name" numFmtId="0">
      <sharedItems count="7">
        <s v="Michele Raman"/>
        <s v="Misty Raji"/>
        <s v="Tabitha E Arthur"/>
        <s v="Clarence D Rai"/>
        <s v="Jimmy L Moreno"/>
        <s v="Rob Verhoff"/>
        <s v="Levi Sai"/>
      </sharedItems>
    </cacheField>
    <cacheField name="Group" numFmtId="0">
      <sharedItems/>
    </cacheField>
    <cacheField name="Country" numFmtId="0">
      <sharedItems count="1">
        <s v="Australia"/>
      </sharedItems>
    </cacheField>
    <cacheField name="Region" numFmtId="0">
      <sharedItems/>
    </cacheField>
    <cacheField name="State" numFmtId="0">
      <sharedItems count="5">
        <s v="Victoria"/>
        <s v="Queensland"/>
        <s v="South Australia"/>
        <s v="New South Wales"/>
        <s v="Tasmania"/>
      </sharedItems>
    </cacheField>
  </cacheFields>
</pivotCacheDefinition>

```

```

<cacheField name="City" numFmtId="0">
  <sharedItems count="7">
    <s v="Bendigo"/>
    <s v="Brisbane"/>
    <s v="Caloundra"/>
    <s v="Cloverdale"/>
    <s v="Coffs Harbour"/>
    <s v="Cranbourne"/>
    <s v="Darlinghurst"/>
  </sharedItems>
</cacheField>
<cacheField name="Postal Code" numFmtId="0">
  <sharedItems/>
</cacheField>
<cacheField name="Product Category" numFmtId="0">
  <sharedItems count="1">
    <s v="Bikes"/>
  </sharedItems>
</cacheField>
<cacheField name="Product Subcategory" numFmtId="0">
  <sharedItems count="2">
    <s v="Road Bikes"/>
    <s v="Mountain Bikes"/>
  </sharedItems>
</cacheField>
<cacheField name="Product Name" numFmtId="0">
  <sharedItems/>
</cacheField>
<cacheField name="Product Description" numFmtId="0">
  <sharedItems/>
</cacheField>
<cacheField name="Promotion Category" numFmtId="0">
  <sharedItems/>
</cacheField>
<cacheField name="Promotion" numFmtId="0">
  <sharedItems/>
</cacheField>
<cacheField name="Promotion Type" numFmtId="0">
  <sharedItems/>
</cacheField>

```



```

<cacheField name="Year" numFmtId="0">
  <sharedItems count="1">
    <s v="2001"/>
  </sharedItems>
</cacheField>
<cacheField name="Quarter" numFmtId="0">
  <sharedItems containsSemiMixedTypes="0" containsString="0"
    containsNumber="1" containsInteger="1" minValue="3" maxValue="3"
    count="1">
    <n v="3"/>
  </sharedItems>
</cacheField>
<cacheField name="Month" numFmtId="0">
  <sharedItems count="3">
    <s v="September"/>
    <s v="July"/>
    <s v="August"/>
  </sharedItems>
</cacheField>
<cacheField name="Currency" numFmtId="0">
  <sharedItems/>
</cacheField>
<cacheField name="Order Quantity" numFmtId="0">
  <sharedItems containsSemiMixedTypes="0" containsString="0"
    containsNumber="1" containsInteger="1" minValue="1"
    maxValue="1"/>
</cacheField>
<cacheField name="Unit Price" numFmtId="0">
  <sharedItems containsSemiMixedTypes="0" containsString="0"
    containsNumber="1" minValue="699.09820000000002"
    maxValue="3578.27"/>
</cacheField>
<cacheField name="Extended Amount" numFmtId="0">
  <sharedItems containsSemiMixedTypes="0" containsString="0"
    containsNumber="1" minValue="699.09820000000002"
    maxValue="3578.27"/>
</cacheField>
<cacheField name="Discount Pct" numFmtId="0">
  <sharedItems containsSemiMixedTypes="0" containsString="0"
    containsNumber="1" containsInteger="1" minValue="0"
    maxValue="0"/>
</cacheField>

```

```

<cacheField name="Discount Amount" numFmtId="0">
  <sharedItems containsSemiMixedTypes="0" containsString="0"
    containsNumber="1" containsInteger="1" minValue="0"
    maxValue="0"/>
</cacheField>
<cacheField name="Product Standard Cost" numFmtId="0">
  <sharedItems containsSemiMixedTypes="0" containsString="0"
    containsNumber="1" minValue="413.1463"
    maxValue="2171.2941999999998"/>
</cacheField>
<cacheField name="Total Product Cost" numFmtId="0">
  <sharedItems containsSemiMixedTypes="0" containsString="0"
    containsNumber="1" minValue="413.1463"
    maxValue="2171.2941999999998"/>
</cacheField>
<cacheField name="Sales Amount" numFmtId="0">
  <sharedItems containsSemiMixedTypes="0" containsString="0"
    containsNumber="1" minValue="699.09820000000002"
    maxValue="3578.27"/>
</cacheField>
<cacheField name="Tax Amount" numFmtId="0">
  <sharedItems containsSemiMixedTypes="0" containsString="0"
    containsNumber="1"
    minValue="55.927900000000001" maxValue="286.26159999999999"/>
</cacheField>
<cacheField name="Freight" numFmtId="0">
  <sharedItems containsSemiMixedTypes="0" containsString="0"
    containsNumber="1" minValue="17.477499999999999"
    maxValue="89.456800000000001"/>
</cacheField>
</cacheFields>
</pivotCacheDefinition>

```

In the context of pivotCacheDefinition:

- r:id indicates the relationship id pointing to the corresponding pivotCacheRecords part.
- refreshedBy indicates the username of whomever last refreshed the PivotCache.
- refreshedDateIso indicates when the PivotCache was last refreshed.
- createdVersion indicates the version of the producer which created the PivotCache.
- refreshedVersion indicates the version of the producer which last refreshed the PivotCache.
- minRefreshableVersion indicates the minimum version of the producer required to be able to refresh this PivotCache.

In the context of cacheSource:

- type indicates that data in a worksheet is the source for this PivotCache.
- worksheetSource identifies the particular location of the source data. In this case, it is a named range whose name is "Table1".

In the context of cacheFields, which is a collection of all the field definitions in the source data:

- cacheField indicates the name of the field and provides number format information.

In the context of cacheField:

- sharedItems indicates various flags about the data in this field. Child elements express the values of the shared items.

In the context of sharedItems:

- containsSemiMixedTypes "1" indicates that this field contains text values possibly mixed with other types of values, this can contain blanks. In this example the value is "0".
- containsString value of "1" indicates that this field contains a text value. In this example, the value is "0".
- containsNumber value of "1" indicates that this field contains numeric values.
- containsInteger indicates that this field contains integer values.
- minValue indicates that this field's minimum value is "3".
- maxValue indicates that this field's maximum value is "3".
- s indicates string content for this item value (expressed in v).
- n indicates the numeric content for this item value (expressed in v).

If there are no shared items expressed for a particular field, then the values are expressed directly in the pivotCacheRecords part.

Items in the PivotCacheDefinition can be shared, in order to reduce the redundancy of those values, since they're referenced in multiple places across all the PivotTable parts. For example, a value might be part of a filter, it might appear on a row or column axis, and appears in the pivotCacheRecords definition as well. However, because of the performance cost of creating the optimized shared items, items are only shared if they are actually in use in the PivotTable. Therefore, depending on user actions on the PivotTable layout, the pivotCacheDefinition and underlying PivotCacheRecords part can be updated.

L.2.9.3.3 XML - pivotCacheRecords part

This part expresses the underlying source data that the PivotTable is aggregating. (Note that the data has been trimmed down to two records to increase readability.)

```
<pivotCacheRecords ... xmlns:r="..." count="2">
  <r>
    <x v="0"/>
    <s v="Pacific"/>
```

```

    <x v="0"/>
    <s v="Australia"/>
    <x v="0"/>
    <x v="0"/>
    <s v="3550"/>
    <x v="0"/>
    <x v="0"/>
    <s v="Road-150 Red, 62"/>
    <s v="This bike is ridden by race winners. Developed with the Adventure
Works Cycles professional race team, it has a extremely light heat-treated
aluminum frame, and steering that allows precision control."/>
    <s v="No Discount"/>
    <s v="No Discount"/>
    <s v="No Discount"/>
    <x v="0"/>
    <x v="0"/>
    <x v="0"/>
    <s v="Australian Dollar"/>
    <n v="1"/>
    <n v="3578.27"/>
    <n v="3578.27"/>
    <n v="0"/>
    <n v="0"/>
    <n v="2171.29419999999998"/>
    <n v="2171.29419999999998"/>
    <n v="3578.27"/>
    <n v="286.2615999999999999"/>
    <n v="89.4568000000000001"/>
</r>
<r>
    <x v="1"/>
    <s v="Pacific"/>
    <x v="0"/>
    <s v="Australia"/>
    <x v="0"/>
    <x v="0"/>
    <s v="3550"/>
    <x v="0"/>
    <x v="0"/>
    <s v="Road-150 Red, 44"/>
    <s v="This bike is ridden by race winners. Developed with the Adventure
Works Cycles professional race team, it has a extremely light heat-treated
aluminum frame, and steering that allows precision control."/>

```

```

    <s v="No Discount"/>
    <s v="No Discount"/>
    <s v="No Discount"/>
    <x v="0"/>
    <x v="0"/>
    <x v="1"/>
    <s v="Australian Dollar"/>
    <n v="1"/>
    <n v="3578.27"/>
    <n v="3578.27"/>
    <n v="0"/>
    <n v="0"/>
    <n v="2171.2941999999998"/>
    <n v="2171.2941999999998"/>
    <n v="3578.27"/>
    <n v="286.26159999999999"/>
    <n v="89.456800000000001"/>
  </r>
</pivotCacheRecords>

```

In the context of pivotCacheRecords:

- r contains one record.

In the context of r:

- x is an index value referencing an item for this field, as defined in the pivotCacheDefinition part.
- s indicates that a value is being expressed inline in this record, and it is a string value.
- n indicates that a value is being expressed inline in this record, and it is a numeric value.

L.2.9.3.4 XML - pivotTable part

The pivotTable part is organized into 11 sections.

- Top-level attributes
- Location information
- Collection of Fields
- Fields on the row axis
- Items on the row axis (specific values)
- Fields on the column axis
- Items on the column axis (specific values)
- Fields in the report filter area
- Fields in the values area
- Style information
- This is what the shell of that structure looks like:

```

<pivotTableDefinition>
  <location/>
  <pivotFields/>
  <rowFields/>
  <rowItems/>
  <colFields/>
  <colItems/>
  <pageFields/>
  <dataFields/>
</dataFields>
  <conditionalFormats/>
  <pivotTableStyleInfo/>
</pivotTableDefinition>

```

Each collection is now addressed below section by section.

L.2.9.3.4.1 Attributes on pivotTableDefinition

```

<pivotTableDefinition xmlns:sh="..." name="PivotTable2" cacheId="5"
  applyNumberFormats="0" applyBorderFormats="0" applyFontFormats="0"
  applyPatternFormats="0" applyAlignmentFormats="0"
  applyWidthHeightFormats="1"
  dataCaption="Values" updatedVersion="3" minRefreshableVersion="3"
  showCalcMbrs="0" useAutoFormatting="1" colGrandTotals="0"
  itemPrintTitles="1"
  createdVersion="3" indent="0" outline="1" outlineData="1"
  multipleFieldFilters="0"/>

```

In the context of pivotTableDefinition:

- name indicates the name of the PivotTable.
- cacheId references by Id a particular pivotCache in the pivotCaches collection listed in workbook.xml.
- applyNumberFormats value of "1" means to apply legacy autoformat number format properties.
- applyBorderFormats value of "1" means to apply legacy autoformat border format properties.
- applyFontFormats value of "1" means to apply legacy autoformat Font format properties.
- applyPatternFormats value of "1" means to apply legacy autoformat pattern format properties.
- applyAlignmentFormats value of "1" means to apply legacy autoformat alignment format properties.
- applyWidthHeightFormats value of "1" means to apply legacy autoformat width and height format properties.
- dataCaption is the name of the values area header cell which can appear in the PivotTable when two or more fields are in the values area.

- `updatedVersion` is the Pivot version that last updated the PivotTable.
- `minRefreshableVersion` is the minimum Pivot version required to update this PivotTable's Pivot Cache.
- `showCalcMbrs` indicates whether calculated members should be shown in the PivotTable. Only applies to PivotTables based on OLAP sources.
- `useAutoFormatting` indicates whether autoformatting has been applied to the PivotTable.
- `colGrandTotals` indicates whether column grand totals are on for this PivotTable.
- `rowGrandTotals` defaults to "1" and therefore is not written.
- `itemPrintTitles` flag indicating whether PivotItem names should be repeated at the top of each printed page.
- `createdVersion` The Pivot version that created the cache.
- `indent` indentation increment for compact row axis, which means the Report Layout is set to Compact Form.
- `outline` flag indicating whether new fields should have their outline form flag set to "1".
- `outlineData` flag indicating whether the values field in the PivotTable should be displayed in outline form.
- `multipleFieldFilters` flag indicating whether each field of a pivot table can have multiple filters set on it.

L.2.9.3.4.2 Location Information

Location provides details on where the PivotTable is located in the sheet.

```
<location ref="B6:G13" firstHeaderRow="1" firstDataRow="4"
  firstDataCol="1" rowPageCount="3" colPageCount="1"/>
```

In the context of location:

- `ref` the location of the PivotTable area, not including the report filter area.
- `firstHeaderRow` the first row of the PivotTable header, relative to the top left cell in `ref` value.
- `firstDataRow` the first row of the PivotTable values area, relative to the top left cell in `ref` value.
- `firstDataCol` the first column of the PivotTable values area, relative to the top left cell in `ref` value.
- `rowPageCount` indicates how many rows the report filter area occupies, as fields are added to it, before taking up another column (there can be multiple rows and columns of fields in the report filter area). By default there is a single column of report filter fields and the fields occupy as many rows as there are fields..
- `colPageCount` indicates how many columns the report filter region occupies, as fields are added to it, before taking up another row (there can be multiple rows and columns of fields in the report filter region). By default, there is a single column of report filter fields and the fields occupy as many rows as there are fields.

L.2.9.3.4.3 PivotTable Fields

This collection expresses item order and field information for each field associated with the PivotTable, whether shown in the PivotTable report or not. (Note that items have been removed from the "Customer Name" and "City" fields (1st and 6th) to shorten the example.)

```
<pivotFields count="28">
  <pivotField showAll="0" includeNewItemsInFilter="1">
    <items count="8">
      <item x="66"/>
      <item x="133"/>
      <item x="74"/>
      <item x="27"/>
      <item x="118"/>
      <item x="63"/>
      <item x="141"/>
      <item t="default"/>
    </items>
  </pivotField>
  <pivotField showAll="0" includeNewItemsInFilter="1"/>
  <pivotField axis="axisPage" showAll="0" includeNewItemsInFilter="1">
    <items count="2">
      <item x="0"/>
      <item t="default"/>
    </items>
  </pivotField>
  <pivotField showAll="0" includeNewItemsInFilter="1"/>
  <pivotField axis="axisPage" showAll="0" includeNewItemsInFilter="1">
    <items count="6">
      <item x="3"/>
      <item x="1"/>
      <item x="2"/>
      <item x="4"/>
      <item x="0"/>
      <item t="default"/>
    </items>
  </pivotField>
```



```

<pivotField axis="axisPage" showAll="0" includeNewItemsInFilter="1">
  <items count="8">
    <item x="0"/>
    <item x="1"/>
    <item x="2"/>
    <item x="3"/>
    <item x="4"/>
    <item x="5"/>
    <item x="6"/>
    <item t="default"/>
  </items>
</pivotField>
<pivotField showAll="0" includeNewItemsInFilter="1"/>
<pivotField axis="axisRow" showAll="0" includeNewItemsInFilter="1">
  <items count="2">
    <item x="0"/>
    <item t="default"/>
  </items>
</pivotField>
<pivotField axis="axisRow" showAll="0" includeNewItemsInFilter="1">
  <items count="3">
    <item x="1"/>
    <item x="0"/>
    <item t="default"/>
  </items>
</pivotField>
<pivotField showAll="0" includeNewItemsInFilter="1"/>
<pivotField showAll="0" includeNewItemsInFilter="1"/>
<pivotField showAll="0" includeNewItemsInFilter="1"/>
<pivotField showAll="0" includeNewItemsInFilter="1"/>
<pivotField showAll="0" includeNewItemsInFilter="1"/>
<pivotField axis="axisCol" showAll="0" includeNewItemsInFilter="1">
  <items count="2">
    <item x="0"/>
    <item t="default"/>
  </items>
</pivotField>
<pivotField axis="axisCol" showAll="0" includeNewItemsInFilter="1">
  <items count="2">
    <item x="0"/>
    <item t="default"/>
  </items>
</pivotField>

```

```

<pivotField axis="axisCol" showAll="0" includeNewItemsInFilter="1">
  <items count="4">
    <item x="1"/>
    <item x="2"/>
    <item x="0"/>
    <item t="default"/>
  </items>
</pivotField>
<pivotField showAll="0" includeNewItemsInFilter="1"/>
<pivotField showAll="0" includeNewItemsInFilter="1"/>
<pivotField showAll="0" includeNewItemsInFilter="1"/>
<pivotField showAll="0" includeNewItemsInFilter="1"/>
<pivotField showAll="0" includeNewItemsInFilter="1"/>
<pivotField showAll="0" includeNewItemsInFilter="1"/>
<pivotField showAll="0" includeNewItemsInFilter="1"/>
<pivotField showAll="0" includeNewItemsInFilter="1"/>
<pivotField dataField="1" showAll="0" includeNewItemsInFilter="1"/>
<pivotField showAll="0" includeNewItemsInFilter="1"/>
<pivotField showAll="0" includeNewItemsInFilter="1"/>
</pivotFields>

```

In the context of pivotField:

- showAll flag indicating whether to show all items for this field.
- includeNewItemsInFilter Flag indicating if new items in the data source are included in the filter automatically after refresh when there was at least one hidden item for the field.
- axis indicates on which axis this field is shown on the PivotTable.
- dataField indicates that this field is in the values area of the PivotTable.

In the context of items, which is a listing of items (by index) in this field. The order in which the items are listed is the order they would appear on a particular axis (row or column, for example). In this example, the first field is "Customer Name" and the first item referenced here is <item x="66"/>, which references the value "Adam L Flores" in the pivotCacheDefinition. Therefore if one added "Customer Name" to the row axis, "Adam L Flores" would be the first row item listed.

In the context of item:

- t value of 'default' indicates the subtotal or total item.

L.2.9.3.4.4 Row Axis Fields

This collection indicates which fields are on the row axis of the PivotTable.

```
<rowFields count="2">
  <field x="7"/>
  <field x="8"/>
</rowFields>
```

In the context of field within rowFields:

- x is a zero based index into the pivotFields collection.

For this example, this collection indicates that "Product Category" and "Product Subcategory" are on the row axis of the PivotTable, in that order.

L.2.9.3.4.5 Row Items

This collection is a listing of all the values on the row axis of the PivotTable. In the spreadsheet example, the item values are found in cells B10:B13. For example, "Bikes" is in B10, and corresponds to the first I element below.

```
<rowItems count="4">
  <i>
    <x/>
  </i>
  <i r="1">
    <x/>
  </i>
  <i r="1">
    <x v="1"/>
  </i>
  <i t="grand">
    <x/>
  </i>
</rowItems>
```

In the context of rowItems:

- i expresses all the values (for all fields) in one row of the row axis. There is an I element for every row in the PivotTable.

In the context of i:

- r indicates how many fields/item values to "fill down" from the previous row item.

Note that the first item has no r explicitly written. Since a default of 0 is specified in the schema, for any item whose r is missing, a default value of 0 is implied.

In the context of x:

- `v` is a zero-based index referencing a `pivotField` item value. There is as many `x` elements as there are item values in any particular row. Note that these `x` elements cannot be explicitly written, but instead "inherited" from the previous row/`i` element, via the value of `r`. Note also that the `pivotField` items don't list values explicitly, but instead reference a shared item value in the `pivotCacheDefinition` part.

Note that the first instance of `x` has no attribute value `v` associated with it, so `v`'s default value of 0 is implied.

Looking at the layout of the PivotTable in the spreadsheet for this example, "Bikes" is the first (and only) item value in the first row, in cell B10. In the XML defining the PivotTable row item values, the first `I` element corresponds to the first row. There is a single index element `x`. The first (and only) `x` element corresponds to the first field on the row axis, namely "Product Category", and an index value of "0" indicates that the 0th item in the items collection for that `pivotField` definition is how to obtain the item value. Note that "Bikes" isn't explicitly listed as a value here, but instead the 0th item is an index to this field's shared items collection in the `pivotCacheDefinition` part.

For the second row, there are two item values, one item value (Bikes) from the first field in that row (Product Category) and one item value (Mountain Bikes) from the second field in that row (Product Subcategory). In the PivotTable, the first item value "Bikes" is hidden from view. In the XML for this example, the second `I` element expresses both item values for this row. The first item value "Bikes" is expressed implicitly, because the value of `r` on the second `i` element is 1, indicating that the first item value from the previous row is reused again as the first item value for the current row. The second item value is expressed explicitly via the `x` element under the second `i` element. The index of '0' indicates that the 0th item in the `pivotField` element for that field is how to obtain the item value. Note again that the 0th item is itself an index into this field's shared items collection in the `pivotCacheDefinition` part.

The item values for the third row can be discovered in a similar way, so is not discussed in detail here.

In the context of item:

- `t` value of 'default' indicates a grand total as the last row item value.

L.2.9.3.4.6 Column Axis Fields

This collection indicates which fields are on the column axis of the PivotTable.

```
<colFields count="3">
  <field x="14"/>
  <field x="15"/>
  <field x="16"/>
</colFields>
```

In the context of field:

- `x` is a zero based index into the `pivotFields` collection defined in this part.

For this example, the collection indicates that "Year", "Quarter" and "Month" are on the column axis of the PivotTable, in that order.

L.2.9.3.4.7 Column Items

This collection is a listing of all the values on the column axis of the PivotTable. In this example, the item values are found in cells C6:H8. For example, "2001" / "3" / "July" values are in C7:C9. Those are the first column item values and are referenced by the first <i> element below.

```
<colItems count="5">
  <i>
    <x/>
    <x/>
    <x/>
  </i>
  <i r="2">
    <x v="1"/>
  </i>
  <i r="2">
    <x v="2"/>
  </i>
  <i t="default" r="1">
    <x/>
  </i>
  <i t="default">
    <x/>
  </i>
</colItems>
```

In the context of colItems:

- i expresses all the values (for all fields) in one column of the column axis. There is an i element for every column in the PivotTable column area.

In the context of i:

- r indicates how many fields/item values to "fill right" from the previous column.

Note that the first item has no r explicitly written so the default value of 0 is implied.

In the context of x:

- v is a zero-based index referencing a pivotField item value. There is as many x elements as there are item values in any particular column. Note that these x elements sometimes are not explicitly written, but instead "inherited" from the previous column/i element, via the value of r.

Note also that the pivotField items don't list values explicitly, but instead reference a shared item value in the pivotCacheDefinition part.

Note that the first instance of x has no attribute value v associated with it, so v's default value of 0 is implied.

The first i collection represents all item values for the first column in the column axis area of the PivotTable. The first x in the first i corresponds to the first field in the columns area of the PivotTable, namely "Year". The implied index value of '0' on this x indicates that the item value for this first item in the column is the 0th item for this pivotField. The 0th item for this pivotField is itself an index to an item value into this field's shared items collection in the pivotCacheDefinition part, namely "2001".

The item values corresponding to the second and third x elements can be found in the same way, arriving at "3" for the second item value, and arriving at "July" for the third item value for this first column.

The second i collection expresses all three item values for the second column in the column axis area. The r value of '2' indicates that the first two item values from the previous column is repeated here, which means that the first item value for this second column is "2001" again and the second item value for this second column is "3". The third item value is expressed by the only x element under this second i element, and without further explanation is understood to reference the item value "August".

L.2.9.3.4.8 Report Filter Area Fields

This collection describes which fields are found in the report filter area of the PivotTable.

```
<pageFields count="3">
  <pageField fld="2" hier="0"/>
  <pageField fld="4" hier="0"/>
  <pageField fld="5" hier="0"/>
</pageFields>
```

In the context of pageField:

- fld is a zero-based index indicating the field to be on the report filter area.
- hier is an index of the OLAP hierarchy to which this belongs.

L.2.9.3.4.9 Values Area Fields

This collection describes which fields are found in the values area of the PivotTable.

```
<dataFields count="1">
  <dataField name="Sum of Sales Amount" fld="25" baseField="0"
    baseItem="0"/>
</dataFields>
```

In the context of dataField:

- `name` is the name of the values field.
- `fld` is the index of the field being summarized.
- `baseField` is the index of the base field when `showDataAs` calculation is in use.
- `baseItem` is the index of the base item when `showDataAs` calculation is in use.

L.2.9.3.4.10 PivotTable Style Information

Styles information is discussed in the informative subclause on spreadsheetML styles. Therefore the XML is provided for completeness, but is not discussed here.

```
<pivotTableStyleInfo name="PivotStyleDark8" showRowHeaders="1"
  showColHeaders="1" showRowStripes="0" showColStripes="0"
  showLastColumn="1"/>
</pivotTableDefinition>
```

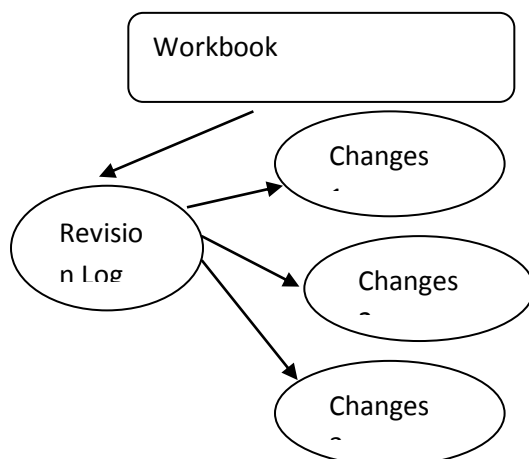
L.2.10 Shared Workbook Revisions

L.2.10.1 Overview

The Shared Workbooks architecture enables a spreadsheet application to record revisions made to a workbook (e.g., track changes), and is designed to enable multiple users to edit the same workbook at the same time. Therefore, the application needs to support the ability to read changes made by another user, and update its own state of the same workbook with those changes, even when those changes are made concurrently with other changes made by other users. Inevitably, there are conflicts, and therefore merge conflict resolution should be supported by the runtime application.

This architecture supports the ability to track changes made by a single user as well.

L.2.10.2 How It Works



Relationship diagram

A Shared Workbook must have shared mode turned on. For unsaved workbooks, this requires a save, because revisions are stored in the file.

Changes to the workbook are saved as Shared Workbook Revision Header parts within the document at each save or time interval specified.

A table summarizing the revision logs (revisionHeaders.xml) tracks when changes are made, who made them, and lists the relationship id to the specific Shared Workbook Revision Log part.

The application scans the summary table for new change logs and merges them into the workbook.

L.2.10.3 Example

Consider a series of edits made by different users.

L.2.10.3.1 First Edit

Starting with a blank workbook, the first user enters "A, B, C" into A1:C1, and "1, 2, 3; 4, 5, 6" into A2:C3, like this:

	A	B	C
1	A	B	C
2	1	2	3
3	4	5	6
4			

Once the file is saved to disk after these edits, the summary table is updated and the revision log for this change is written.

L.2.10.3.1.1 Summary Revision Table

Contents of the Shared Workbook Revision Header part (revisionHeaders.xml).

Inside the summary table there is a revision header definition corresponding to the time of the edit:

```
<header guid="{902054C2-C7B5-48BA-BFB2-4D439D9758D6}"
  dateTime="2006-04-14T10:33:16" maxSheetId="4" userName="User 1"
  r:id="rId2" minRId="1" maxRId="11">
  <sheetIdMap count="3">
    <sheetId val="1"/>
    <sheetId val="2"/>
    <sheetId val="3"/>
  </sheetIdMap>
</header>
```

Notice that the user name, userName, and date and time stamp, dateTime, for the edit is stored along with an outline of the sheet structure. Use the r:id value of rId2 and then follow the relationship expressed in revisionHeaders.xml.rels. In this way, the corresponding Shared Workbook Revision Log can be located.

L.2.10.3.1.2 First Edit Revision Log

Inside the corresponding Shared Workbook Revision Log part is the following content:

```
<revisions xmlns="..." xmlns:r="...">
  <rcc rId="1" sId="1">
    <nc r="A1" t="inlineStr">
      <is>
        <t>A</t>
      </is>
    </nc>
  </rcc>
  <rcc rId="2" sId="1">
    <nc r="B1" t="inlineStr">
      <is>
        <t>B</t>
      </is>
    </nc>
  </rcc>
  <rcc rId="3" sId="1">
    <nc r="C1" t="inlineStr">
      <is>
        <t>C</t>
      </is>
    </nc>
  </rcc>
  <rrc rId="4" sId="1" eol="1" ref="A2:XFD2" action="insertRow"/>
  <rcc rId="5" sId="1">
    <nc r="A2">
      <v>1</v>
    </nc>
  </rcc>
  <rcc rId="6" sId="1">
    <nc r="B2">
      <v>2</v>
    </nc>
  </rcc>
  <rcc rId="7" sId="1">
    <nc r="C2">
      <v>3</v>
    </nc>
  </rcc>
  <rrc rId="8" sId="1" eol="1" ref="A3:XFD3" action="insertRow"/>
```

```

<rcc rId="9" sId="1">
  <nc r="A3">
    <v>4</v>
  </nc>
</rcc>
<rcc rId="10" sId="1">
  <nc r="B3">
    <v>5</v>
  </nc>
</rcc>
<rcc rId="11" sId="1">
  <nc r="C3">
    <v>6</v>
  </nc>
</rcc>
</revisions>

```

rId is the revision Id, and indicates the order in which the particular revision should be applied.

sId indicates the sheet to which this revision applies.

rcc means "revision cell change"

nc means new cell, and is of complex type CT_Cell (see §L.2.2 for more information on the cell definition). Note that instead of using a shared string table, strings are expressed inline for these cells.

rrc means "revision row/column". Note that rrc can have an associated action, like insertRow (or deleteRow), which would cause a row to be inserted (or deleted) at that step in the series of revisions.

L.2.10.3.2 Second Edit

During the second edit, bold facing has been applied to A1:C1, and a formula has been applied to A4:C4 to sum the data in the table. For example, A4 contains =SUM(A2:A3).

	A	B	C
1	A	B	C
2	1	2	3
3	4	5	6
4	5	7	9

Once the file is saved to disk after these edits, the summary table is updated and the revision log for this change is written.

L.2.10.3.2.1 Summary Revision Table

Contents of the Shared Workbook Revision Header part (revisionHeaders.xml).

Inside the summary table there is a revision header definition corresponding to the time of the edit:

```
<header guid="{A3A5EE09-2092-433C-895D-77D5A15DC847}"
  dateTime="2006-04-14T10:34:10" maxSheetId="4" userName="User 2"
  r:id="rId3" minRId="12" maxRId="15">
  <sheetIdMap count="3">
    <sheetId val="1"/>
    <sheetId val="2"/>
    <sheetId val="3"/>
  </sheetIdMap>
</header>
```

This time the user name has been updated. Use the r:id value of rId3 and then follow the relationship expressed in revisionHeaders.xml.rels. In this way, the corresponding Shared Workbook Revision Log can be located.

L.2.10.3.2.2 Second Edit Revision Log

Inside the corresponding Shared Workbook Revision Log part is the following content:

```
<revisions xmlns="..." xmlns:r="...">
  <rfmt sheetId="1" sqref="A1:C1" start="0" length="2147483647">
    <dxfr>
      <font>
        <b/>
      </font>
    </dxfr>
  </rfmt>
  <rrc rId="12" sId="1" eol="1" ref="A4:XFD4" action="insertRow"/>
  <rcc rId="13" sId="1">
    <nc r="A4">
      <f>SUM(A2:A3)</f>
    </nc>
  </rcc>
  <rcc rId="14" sId="1">
    <nc r="B4">
      <f>SUM(B2:B3)</f>
    </nc>
  </rcc>
```

```

    <rcc rId="15" sId="1">
      <nc r="C4">
        <f>SUM(C2:C3)</f>
      </nc>
    </rcc>
    <rcv guid="{34804977-BBD3-40C9-87A7-1779BEE2183C}" action="add"/>
  </revisions>

```

rfmt indicates a formatting revision

start and length indicate where to apply the formatting on the string

eol indicates that an insert is happening at the end of a list of data (end row)

rcv means "revision custom view", and indicates that a custom view is to be added.

L.2.10.3.3 Third Edit

During this editing session, column A has been inserted, and columns have been inserted between the data. Additionally, a row has been inserted between the data and the summary formula row, and at the top of the worksheet.

	A	B	C	D	E	F
1						
2		A		B		C
3			1		2	3
4			4		5	6
5						
6			5		7	9
7						

Once the file is saved to disk after these edits, the summary table is updated and the revision log for this change is written.

L.2.10.3.3.1 Summary Revision Table

Contents of the Shared Workbook Revision Header part (revisionHeaders.xml).

```

<header guid="{894981D2-DACF-4C1B-951C-EB199EA01DBF}"
  dateTime="2006-04-14T10:36:10" maxSheetId="4" userName="User 2"
  r:id="rId4" minRId="16" maxRId="20">
  <sheetIdMap count="3">
    <sheetId val="1"/>
    <sheetId val="2"/>
    <sheetId val="3"/>
  </sheetIdMap>
</header>

```

Use the r:id value of rId4 and then follow the relationship expressed in revisionHeaders.xml.rels. In this way, the corresponding Shared Workbook Revision Log part can be located.

L.2.10.3.3.2 Third Edit Revision Log

Inside the corresponding Shared Workbook Revision Log part is the following content:

```
<revisions xmlns="" xmlns:r="">
  <rrc rId="16" sId="1" ref="A1:XFD1" action="insertRow"/>
  <rrc rId="17" sId="1" ref="A1:A1048576" action="insertCol"/>
  <rrc rId="18" sId="1" ref="C1:C1048576" action="insertCol"/>
  <rrc rId="19" sId="1" ref="E1:E1048576" action="insertCol"/>
  <rrc rId="20" sId="1" ref="A5:XFD5" action="insertRow"/>
  <rcv guid="{34804977-BBD3-40C9-87A7-1779BEE2183C}" action="delete"/>
  <rcv guid="{34804977-BBD3-40C9-87A7-1779BEE2183C}" action="add"/>
</revisions>
```

rrc indicates a "revision to row/column". There are several row inserts and column inserts expressed here.

L.2.10.3.4 Fourth Edit

During this edit, a double-underscore cell border was applied to B4 and D4. Also, column F (the data titled "C") was deleted.

	A	B	C	D	E	F
1						
2		A		B		
3			1		2	
4			4		5	
5						
6			5		7	
7						
8						

Once the file is saved to disk after these edits, the summary table is updated and the revision log for this change is written.

L.2.10.3.4.1 Summary Revision Table

Contents of the Shared Workbook Revision Header part (revisionHeaders.xml).

```
<header guid="{A478A962-DEB9-43AA-BB25-2C54AFA155F1}"
  dateTime="2006-04-14T10:37:14" maxSheetId="4" userName="User 2"
  r:id="rId5" minRId="21">
```

```

<sheetIdMap count="3">
  <sheetId val="1"/>
  <sheetId val="2"/>
  <sheetId val="3"/>
</sheetIdMap>
</header>

```

Use the r:id value of rId5 and then follow the relationship expressed in revisionHeaders.xml.rels. In this way, the corresponding Shared Workbook Revision Log part can be located.

L.2.10.3.4.2 Fourth Edit Revision Log

Inside the corresponding Shared Workbook Revision Log part is the following content:

```

<revisions xmlns="" xmlns:r="...">
  <rcc rId="21" sId="1" ref="F1:F1048576" action="deleteCol">
    <rfmt sheetId="1" xFDxf="1" sqref="F1:F1048576" start="0" length="0"/>
    <rcc rId="0" sId="1" dx="1">
      <nc r="F2" t="inlineStr">
        <is>
          <t>C</t>
        </is>
      </nc>
    </dx>
    <font>
      <b/>
      <sz val="11"/>
      <color theme="1"/>
      <name val="Calibri"/>
      <scheme val="minor"/>
    </font>
  </rcc>
  <rcc rId="0" sId="1">
    <nc r="F3">
      <v>3</v>
    </nc>
  </rcc>
  <rcc rId="0" sId="1">
    <nc r="F4">
      <v>6</v>
    </nc>
  </rcc>
  <rcc rId="0" sId="1">
    <nc r="F6">

```

```

        <f>SUM(F3:F4)</f>
    </nc>
</rcc>
</rrc>
<rfmt sheetId="1" sqref="B4" start="0" length="0">
    <dx>
        <border>
            <left/>
            <right/>
            <top/>
            <bottom style="double">
                <color auto="1"/>
            </bottom>
        </border>
    </dx>
</rfmt>
<rfmt sheetId="1" sqref="D4" start="0" length="0">
    <dx>
        <border>
            <left/>
            <right/>
            <top/>
            <bottom style="double">
                <color auto="1"/>
            </bottom>
        </border>
    </dx>
</rfmt>
</revisions>

```

The first rrc element, with action="deleteCol" expresses that column F was deleted. Additionally, child collections of rrc contain all the column, formatting, and cell information (values and formulas) that was deleted as part of deleting column F.

xfDxf true means a whole row/column of formatting was affected.

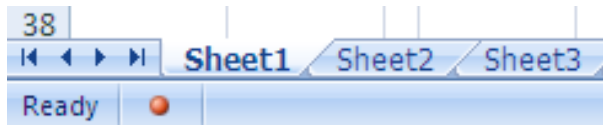
dx true means cell change includes format change

The rfmt collections at the bottom of this XML indicate that borders were applied to B4 and D4.

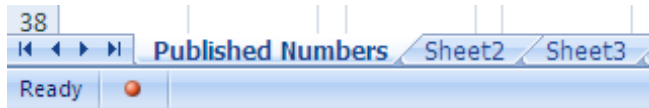
L.2.10.3.5 Fifth Edit

Rename "Sheet1" to "Published Numbers".

Before:



After:



Once the file is saved to disk after these edits, the summary table is updated and the revision log for this change is written.

L.2.10.3.5.1 Summary Revision Table

Contents of the Shared Workbook Revision Header part (revisionHeaders.xml).

```
<header guid="{B0CB8BC9-63A4-4830-8821-E03C053BD326}"
  dateTime="2006-04-14T10:40:24" maxSheetId="4" userName="User 2"
  r:id="rId6" minRid="22">
  <sheetIdMap count="3">
    <sheetId val="1"/>
    <sheetId val="2"/>
    <sheetId val="3"/>
  </sheetIdMap>
</header>
```

Use the r:id value of rId6 and then follow the relationship expressed in revisionHeaders.xml.rels. In this way the corresponding Shared Workbook Revision Log part can be located.

L.2.10.3.5.2 Fifth Edit Revision Log

Inside the corresponding Shared Workbook Revision Log part is the following content:

```
<revisions xmlns="..." xmlns:r="...">
  <rsnm rId="22" sheetId="1" oldName="[SharedWorkbook.xlsx]Sheet1"
    newName="[SharedWorkbook.xlsx]Published Numbers"/>
</revisions>
```

rsnm means "revision: sheet name".

oldName indicates the name of the sheet before renaming it.

newName indicates the name of the sheet after renaming it.

L.2.11 Query Tables

L.2.11.1 Overview

A *QueryTable* object is a range that is bound to an external data source. It is a cohesive range of cells in a sheet that share a common collection of properties and behaviors, separate from the connection itself.

A QueryTable object can be associated with a cell range or a table definition.

L.2.11.2 Web Query Example

This example illustrates a range, B2:D6, QueryTable rendering, which is data-bound to a table found on <http://www.msn.com>, specifically the financial information table usually found on that page.

	A	B	C	D	E	F
1						
2		This table charts the key U.S. financial indices by their last				
3		Index	Last	Change		
4		Dow	11,642.65	2.88		
5		NASDAQ	2,320.74	-17.51		
6		S&P	1,322.85	-2.29		

L.2.11.2.1 QueryTable XML

```
<queryTable xmlns="..." name="www.msn" preserveFormatting="0"
  connectionId="1"
  autoFormatId="16" applyNumberFormats="0" applyBorderFormats="0"
  applyFontFormats="1" applyPatternFormats="1" applyAlignmentFormats="0"
  applyWidthHeightFormats="0"/>
```

In the context of queryTable:

- name is the name of the QueryTable.
- preserveFormatting indicates whether to retain user-applied formatting after refresh or re-apply source data formatting.
- connectionId is the workbook connection's id.
- autoFormatId identifies (by implied index) the auto-format applied to the QueryTable.

All remaining attributes beginning with apply... indicate whether to apply this particular aspect of the auto-format definition.

L.2.11.3 Text Import Example

This example illustrates a range (B2:D3) QueryTable rendering which is data-bound to a text file. Notice that formulas are entered in E2:E3, the column directly to the right of the QueryTable range.

E2		fx		=SUM(B2:D2)			
	A	B	C	D	E	F	G
1							
2		1	2	3	6		
3		4	5	6	15		

L.2.11.3.1 QueryTable XML

```
<queryTable xmlns="..." name="Text" refreshOnLoad="1" fillFormulas="1"
  removeDataOnSave="1" connectionId="3" autoFormatId="16"
  applyNumberFormats="0" applyBorderFormats="0" applyFontFormats="1"
  applyPatternFormats="1" applyAlignmentFormats="0"
  applyWidthHeightFormats="0"/>
```

In the context of queryTable:

- refreshOnLoad value of 1 indicates that this QueryTable should be refreshed when the workbook is opened.
- fillFormulas indicates that this QueryTable has immediately adjacent columns (which are not part of the QueryTable range) containing formulas that need to be filled down as the QueryTable grows and shrinks in size after refresh.
- removeDataOnSave indicates that the data in the worksheet resulting from the QueryTable refresh should be removed from the worksheet when saved and closed.

L.2.11.4 Access Table Example

This example demonstrates a QueryTable that is applied to a Table object. This data came from connecting to an Access database table with four fields: "ID", "Field1", "Field2", and "Field3". "Field3" has been deleted from the QueryTable in the worksheet below. Notice that a calculated column has been added to the Table, in the column titled "CustomClientColumn", which concatenates the values from "Field1" and "Field2".

E4		fx		=[Field1]&[Field2]	
	A	B	C	D	E
1					
2		ID	Field1	Field2	CustomClientColumn
3		4	A	B	AB
4		5	D	E	DE
5		6	G	H	GH

L.2.11.4.1 QueryTable XML

```
<queryTable xmlns="..." name="Database1.accdb" connectionId="2"
  autoFormatId="16" applyNumberFormats="0" applyBorderFormats="0"
  applyFontFormats="0" applyPatternFormats="0" applyAlignmentFormats="0"
  applyWidthHeightFormats="0">
  <queryTableRefresh nextId="6" unboundColumnsRight="1">
    <queryTableFields count="4">
      <queryTableField id="1" name="ID" tableColumnId="1"/>
      <queryTableField id="2" name="Field1" tableColumnId="2"/>
      <queryTableField id="3" name="Field2" tableColumnId="3"/>
      <queryTableField id="5" dataBound="0" tableColumnId="4"/>
    </queryTableFields>
    <queryTableDeletedFields count="1">
      <deletedField name="Field3"/>
    </queryTableDeletedFields>
  </queryTableRefresh>
</queryTable>
```

In the context of queryTableRefresh:

- nextId is the next available Id that can be assigned to a field. This is an optimization done for load/save, to avoid recalculating the value.
- unboundColumnsRight are the number of columns on the right side of the QueryTable that aren't data bound (don't come from the external data)

In the context of queryTableFields:

- Each of the queryTableField elements expresses information about one of the columns in the Table that is part of the QueryTable. For example, the right-most column's dataBound is set to 0, indicating that this column is not bound to external data.

In the context of queryTable:

- queryTableDeletedFields collection expresses which fields returned by the connection have been deleted from the QueryTable. This is tracked so that the connection information does not have to be updated with which columns are no longer required.

L.2.12 External Connection

L.2.12.1 Overview

Many spreadsheet users want to be able to access data from external sources: databases, text files, web pages, XML web services, OLAP cubes. Typically, a spreadsheet application provides abilities for the user to locate, browse, connect to, and query external data sources. Once the data source has been located,

connected to, and queried, the resulting data must be rendered in the spreadsheet application, and made available for further analysis.

Data sources such as databases are made available for browsing and consumption via data-provider technologies. Typically, the data provider provides a standard interface for accessing the data, and removes the complexity introduced due to each database application's providing non-standard data access APIs. In this way, OLEDB providers, for example, can be written for myriad database implementations, and a consumer can always use a single interface (defined by OLEDB) to access these disparate data sources.

A live connection to a data source is established by the application at runtime, and can only exist as a live connection while the application is running. There are two kinds of information about a particular connection:

- The information used to establish the connection.
- The information and properties about how the connection should be used and how the connection should behave in conjunction with the application.

Information about a connection can be supplied by the user as the connection is being established—for example, providing a password, picking a table, applying a filter, or setting behavioral properties such as whether to refresh the data when the workbook is opened and whether to store refreshed data in the worksheet when the workbook is saved.

Information about a connection can also be persisted in a connection file separately from the workbook file. In this way a directory or file share containing a variety of these connection files can be considered a library of data connections, for example.

Any time a connection is established, whether by using information from a connection file or by gathering the connection information directly from the user, a copy of the connection information is stored in the workbook.

Data providers and connection types discussed below are:

- ODBC
- OLEDB
- ADO
- DAO
- Text Import
- Web

The corresponding features in SpreadsheetML that render and analyze the data are:

- Query Table
- Table
- XML Map

- Pivot Table
- The CUBE* Functions

L.2.12.2 OLAP Connection

Below is a PivotTable that is rendering data from an OLAP source:

	A	B	C
1			
2		Row Labels	Amount
3		Current Year's Actuals	398755.69
4		Adjustment for Budget input	565238.13
5		Current Year's Budget	565238.13
6		Forecast	565238.13
7		Grand Total	398755.69
8			

L.2.12.3 Pivot XML fragment

In this example, the PivotTable data cache records /cacheSource@connectionId="2", which associates this PivotTable to the connection whose id="2" in the workbook connections part.

```
<pivotCacheDefinition ... saveData="0" refreshedBy="Chad Rothschiller"
  refreshedDateIso="2006-04-13T16:02:14" backgroundQuery="1"
  createdVersion="3"
  refreshedVersion="3" minRefreshableVersion="3" recordCount="0">
  <cacheSource type="external" connectionId="2"/>
  <cacheFields count="2">
    <cacheField name="[Category].[Category Description]"
      caption="Category
      Description" numFmtId="0" hierarchy="1" level="1">
      <sharedItems count="4">
        <s v="[Category].[All Category].[Current Year's Actuals]"
          c="Current Year's Actuals"/>
        ...
      </sharedItems>
    </cacheField>
  </cacheFields>
</pivotCacheDefinition>
```

L.2.12.4 Connection XML

Looking at the XML in the workbook connections part that describes the connection whose id="2":

```
<connection id="2" odcFile="
  c:\...\externalData.odc" keepAlive="1" name="externalData"
  description="FoodMart 2000 - Budget Planing" type="5"
  refreshedVersion="3" background="1">
```

```

<dbPr connection="Provider=MSOLAP.2;Integrated Security=SSPI;Persist
  Security Info=True;Data Source=xlextdat8;Initial
  Catalog=AdamTest;Client
  Cache Size=25;Auto Synch Period=10000;MDX Compatibility=1"
  command="Budget" commandType="1"/>
<olapPr sendLocale="1" rowDrillCount="1000"/>
</connection>

```

Attributes on the connection element express properties about the connection.

- `odcFile` indicates the location of the data connection file which was used to create this connection. Data connection files can be created on the local machine, on any network share, or any web location whenever the connection is created so that the connection information can be reused if desired. The connection information is copied from the connection file into the spreadsheet. When a connection cannot be established, the spreadsheet application can check the external connection file to see if a newer definition of the connection is available.
- `name` indicates the friendly name of the connection. This name must be unique within a workbook.
- `keepAlive` indicates that the application should hold the connection open once established, instead of closing the connection after retrieving the data.
- `type` value of 5 indicates that this connection type is OLEDB.
- `refreshedVersion` indicates the version of the application which last refreshed this connection.
- `background` value of 1 indicates that background refresh (asynchronous refresh) is enabled. Note that this is not a guarantee that the connection is refreshed asynchronously. Certain objects can require a connection to be refreshed either synchronously or asynchronously regardless of this setting.

Attributes on the `dbPr` element express additional properties on the connection.

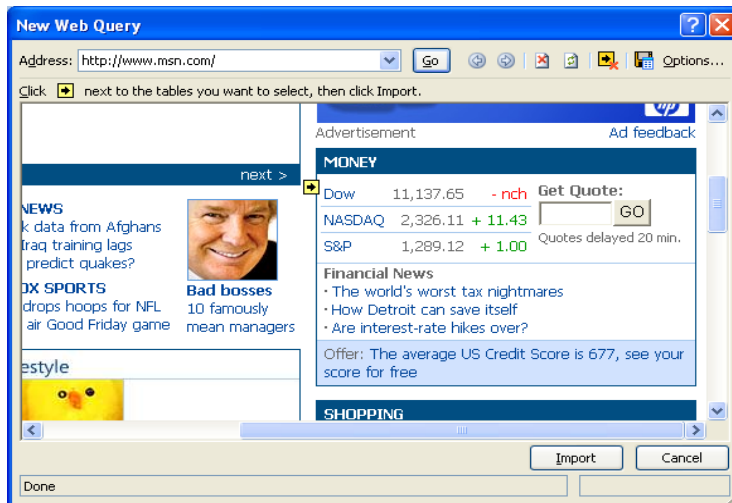
- `connection` expresses the connection string that is needed to establish a connection to the external data source.
- `command` can indicate a table name, a cube name, or an SQL expression requesting data.
- `commandType` indicates what kind of information is found in `command`: 1 means the value of `command` is the name of an OLAP cube.

Attributes on the `olapPr` element express properties that apply to connections to OLAP data sources.

- `sendLocale` value of 1 indicates that the client application should send its user interface language locale to the OLAP data provider in order to receive back from the server localized OLAP cube member string values.
- `rowDrillCount` is number of rows to return on a drill through request.

L.2.12.5 Web Query

A possible user interface for picking a web source is:



A possible rendering in the spreadsheet grid might be:

B	C	D
Web Query to MSN Money		
Dow	11,137.65	7.68
NASDAQ	2,326.11	11.43
S&P	1,289.12	1

L.2.12.6 QueryTable XML

The XML expressing the definition of the QueryTable indicates that it is using the connection whose Id value is 1 (connectionId):

```
<queryTable ... name="msn" connectionId="1" autoFormatId="16"
  applyNumberFormats="0" applyBorderFormats="0" applyFontFormats="1"
  applyPatternFormats="1" applyAlignmentFormats="0"
  applyWidthHeightFormats="0"/>
```

L.2.12.7 Connection XML

The workbook connection whose Id is 1 is expressed below.

```
<connection id="1" name="Connection" type="4" refreshedVersion="3"
  background="1" saveData="1">
  <webPr sourceData="1" parsePre="1" consecutive="1" xl2000="1"
    url="http://www.msn.com" htmlTables="1">
    <tables count="1">
      <x v="2"/>
    </tables>
  </webPr>
</connection>
```

Attributes and elements that have been previously discussed are not discussed here.

- type value of 4 indicates the connection is a web query connection.
- saveData value of 1 indicates that refreshed data is kept in the sheet when saving the workbook. 0 indicates to remove the data from the workbook when saving the workbook.
- sourceData value of 1 indicates to import and parse the XML data rather than consume the web page's HTML definition.
- parsePre value of 1 indicates that text in <PRE> tags is interpreted as tables.
- consecutive value of 1 means consecutive delimiters are treated as one delimiter
- url is the address indicating where to retrieve data for this query.
- htmlTables true means only import html tables

tables indicates which HTML table to import from the web page.

- v value of 2 indicates that the second table is the one to import.

L.2.12.8 Unused Connection

A connection can be expressed in a workbook, but not currently used. It remains until deleted by the user explicitly. This simply means that there is no object or feature in the workbook; that is referencing the connection.

L.2.12.9 ODBC

A database table imported to the grid, where the data provider is ODBC:

	A	B	C	D
1	ID	Field1	Field2	Field3
2	3	Foo	Bar	Goo
3	4	The	Quick	Brown
4	5	Fox	Jumped	Over
5	6	The	Lazy	Dog
6				

When a table object is used to render external data, it is associated with a QueryTable object to store the properties used when a range is associated with external data. Therefore, the Table object references the QueryTable name, which in turns references connectionId to identify the connection in the workbook connections part.

L.2.12.10 Connection XML

```
<connection id="4" name="Query from MS Access Database" type="1"
  refreshedVersion="3" background="1" saveData="1">
```



```

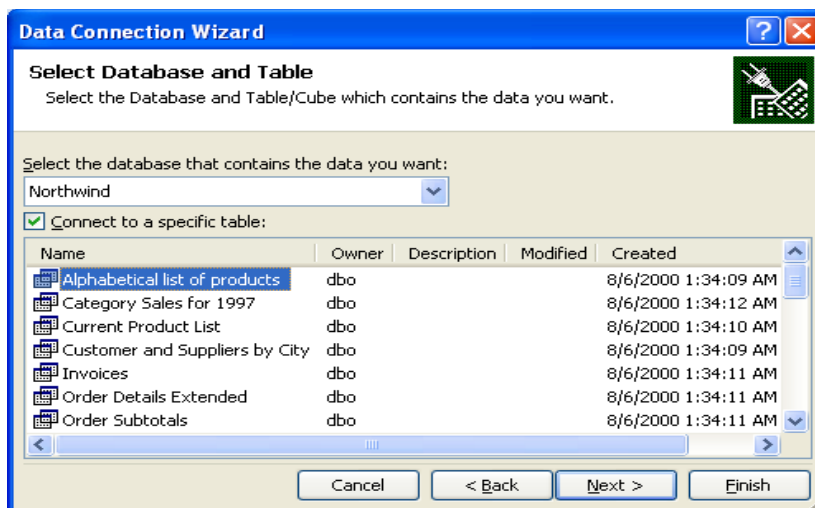
<dbPr connection="DSN=MS Access
Database;DBQ=E:\...\Database1.accdb;DefaultDir=E:\Documents and
Settings\chadroth\Desktop;DriverId=25;FIL=MS
Access;MaxBufferSize=2048;PageTimeout=5;"
command="SELECT Table1.ID,
Table1.Field1, Table1.Field2,
Table1.Field3_x000d__x000a_FROM
`E:\...\Database1.accdb`.Table1 Table1"/>
</connection>

```

- type value of 1 indicates ODBC connection type.
- command contents are an SQL select statement.

L.2.12.11 SQL

An implementation might use a data connection wizard to connect to a SQL table; for example:



The resulting data is rendered in the grid:

	A	B	C	D
1				
2		SQL Connection		
3		ShippedDate	OrderID	Subtotal
4		7/16/1996 0:00	10248	440
5		7/10/1996 0:00	10249	1863.4
6		7/12/1996 0:00	10250	1552.6
7		7/15/1996 0:00	10251	654.06
8		7/11/1996 0:00	10252	3597.9
9		7/16/1996 0:00	10253	1444.8
10		7/23/1996 0:00	10254	556.62
11		7/15/1996 0:00	10255	2490.5
12		7/17/1996 0:00	10256	517.8
13		7/22/1996 0:00	10257	1119.9
14		7/23/1996 0:00	10258	1614.88
15		7/25/1996 0:00	10259	100.8
16		7/29/1996 0:00	10260	1504.65
17		7/30/1996 0:00	10261	448
18		7/25/1996 0:00	10262	584

In this example, a table object is used to render external data, it is associated with a QueryTable object to store the properties used when a range is associated with external data. Therefore, the Table object references the QueryTable name, which in turns references connectionId to identify the connection in the workbook connections part.

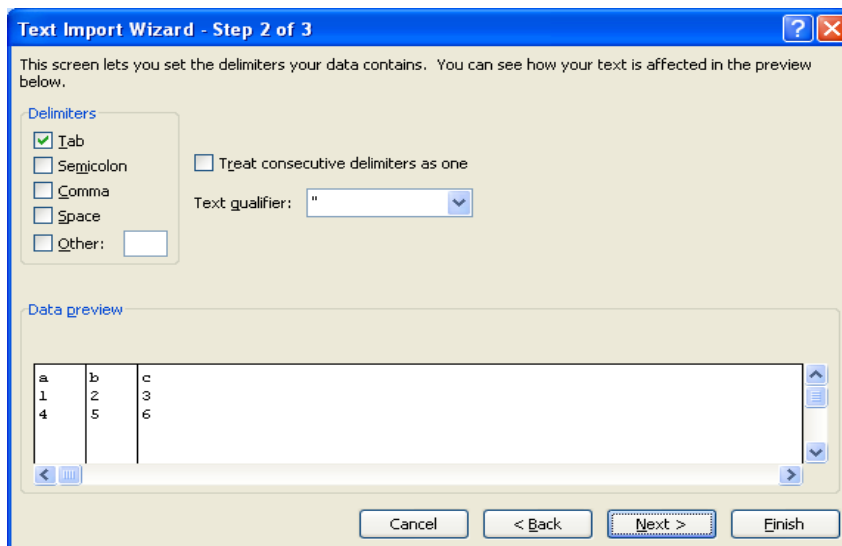
L.2.12.12 Connection XML

```
<connection id="6" odcFile="c:\...\xlext.dat8 Northwind Summary of Sales by
Year.odc" keepAlive="1"
name="xlext.dat8 Northwind Summary of Sales by Year"
type="5" refreshedVersion="3" background="1" saveData="1">
<dbPr connection="Provider=SQLOLEDB.1;Integrated Security=SSPI;
Persist Security Info=True;Initial Catalog=Northwind;Data
Source=xlext.dat8;Use Procedure for Prepare=1;Auto
Translate=True;Packet Size=4096;Workstation ID=CHADROTH012;Use
Encryption for Data=False;Tag with column collation when
possible=False" command=""Northwind"."dbo"
."Summary of Sales by Year";" commandType="3"/>
</connection>
```

- type value of 5 indicates that this connection is using an OLEDB data provider.
- commandType value of 3 specifies that a table name is in command
- command specifies a table name.

L.2.12.13 Text Import

Text Import settings:



Note that there are additional settings not pictured here.

The resulting data in the grid:

	A	B	C	D
1				
2		Text Import		
3		a	b	
4		1	2	
5		4	5	
6				

The range is associated with a QueryTable object. This query table definition references the connectionId used to retrieve the data.

L.2.12.14 Connection XML

```
<connection id="5" name="Text" type="6" refreshedVersion="3"
  background="1" saveData="1">...
  <textPr codePage="437" sourceFile="E:\ ...\Text.txt">
    <textFields count="3">
      <textField type="text"/>
      <textField position="5"/>
      <textField type="skip" position="10"/>
    </textFields>
  </textPr>
</connection>
```

connection defines the connection

- type value of 6 indicates that this is a text import type of connection.

textPr expresses properties which are specific to text import connections.

- codePage value of 437 indicates that the text file is using the IBM PC (OEM) code page 437 character set.
- sourceFile indicates where the file is located.

textFields expresses information about the particular fields in the text file.

- delimited value of 1 (default) indicates that the text is delimited (variable length). Since this example uses the default value, it is not saved as part of the connection information.
- type indicates the data type (user-specified) of the particular field.
- position indicates the starting position of the field for fixed-width fields.
- thousands specifies the thousands separator character (not in this example, but of enough interest to mention).
- tab, space, comma attributes with values of 1 would flag these characters as delimiters (not in this example, but of enough interest to mention).

L.2.13 External Links

L.2.13.1 Overview

An *external link* is used to link a workbook to other workbook or to external data. The most frequent occurrence for linking a workbook to other workbooks has to do with formulas. In this case, a formula references a range or name defined in another workbook. Hyperlinks on cells and other spreadsheet objects are also considered an external link. OLE links are yet another technology used to link the workbook to another object. Finally, Dynamic Data Exchange (DDE) servers can be used to access external data. DDE servers are accessed through formulas in the workbook.

The goal of the way in which external links are saved is to always write the target source in a relationship file, so that external resources are easily discoverable in lightweight relationship XML rather than deep in the application's XML.

L.2.13.2 Formula Example

Consider cells B2 and C2 in the following worksheet, Sheet1:

	A	B	C
1		Link to an external workbook range:	Link to an external workbook name:
2		=SUM('C:\[Source.xlsx]Sheet1'!\$A\$1:\$A\$3)	= 'C:\Source2.xlsx'!NameInExternalWorkbook
3			
4		W3C Hyperlink	
5			

Here, the formulas themselves are displayed in the cells.

	A	B	C	D
1		Link to an external workbook range:	Link to an external workbook name:	
2		6	2	
3				
4		W3C Hyperlink		

Here, the results of the formulas are displayed in the cells.

The formula is expressed in Sheet1's XML, as shown in the following subclause.

L.2.13.3 Sheet XML

The corresponding content from Sheet1.xml is:

```
<worksheet ...>
  <dimension ref="B1:C4"/>
  <sheetViews>
    <sheetView tabSelected="1" workbookViewId="0">
      <selection activeCell="B2" sqref="B2"/>
    </sheetView>
  </sheetViews>
  <sheetFormatPr defaultRowHeight="15"/>
  <cols>
    <col min="1" max="1" width="1.7109375" customWidth="1"/>
  </cols>
  <sheetData>
    <row r="1" spans="2:3" customFormat="1" ht="9" customHeight="1"/>
    <row r="2" spans="2:3" customFormat="1">
      <c r="B2">
        <f>SUM([1]Sheet1!$A$1:$A$3)</f>
        <v>6</v>
      </c>
      <c r="C2">
        <f>[2]!NameInExternalWorkbook</f>
        <v>2</v>
      </c>
    </row>
    <row r="4" spans="2:3" customFormat="1">
      <c r="B4" s="1" t="s">
        <v>0</v>
      </c>
    </row>
  </sheetData>
```

```

    <hyperlinks>
      <hyperlink ref="B4" r:id="rId1"/>
    </hyperlinks>
    <printOptions/>
    <pageMargins left="0.7" right="0.7" top="0.75" bottom="0.75"
      header="0.3" footer="0.3"/>
    <headerFooter/>
  </worksheet>

```

L.2.13.3.1 Cell B2

The formula expressed in cell B2 (cell B2 is the c element whose r="B2") is this:

```
SUM([1]Sheet1!$A$1:$A$3)
```

The external reference to another workbook in this case is tokenized to [1]. The value inside the brackets is a 1-based index to the externalReferences collection in the workbook part.

L.2.13.3.2 Cell C2

The formula expressed in cell C2 (cell C2 is the c element whose r is C2) is this:

```
[2]!NameInExternalWorkbook
```

The external reference to another workbook in this case is tokenized to [2]. The value inside the brackets is a 1-based index to the externalReferences collection in the workbook part.

L.2.13.3.3 Workbook XML

The corresponding content from workbook.xml is

```

<workbook ...>
  <fileVersion lastEdited="4" lowestEdited="4" rupBuild="4012"/>
  <workbookPr defaultThemeVersion="123820"/>
  <bookViews>
    <workbookView xWindow="360" yWindow="270" windowWidth="18735"
      windowHeight="11445"/>
  </bookViews>
  <sheets>
    <sheet name="Sheet1" sheetId="1" r:id="rId1"/>
    <sheet name="Sheet2" sheetId="2" r:id="rId2"/>
    <sheet name="Sheet3" sheetId="3" r:id="rId3"/>
  </sheets>
  <externalReferences>
    <externalReference r:id="rId4"/>
    <externalReference r:id="rId5"/>
  </externalReferences>

```

```

    <calcPr calcId="122211"/>
    <webPublishing codePage="1252"/>
</workbook>

```

The workbook part's externalReferences collection indicates that there are two external workbook references in this workbook. The first supporting external workbook data cache, also stored in this workbook, can be found by following the relationship from the workbook whose Id value is rId4. The second supporting external workbook data cache, also stored in this workbook, can be found by following the relationship from the workbook whose Id value is rId5.

L.2.13.4 Workbook Relationships

The corresponding content from workbook.xml.rels is:

```

<Relationships xmlns="http://.../package/2006/relationships">
  <Relationship Id="rId8" Type="http://.../sharedStrings"
Target="sharedStrings.xml"/>
  <Relationship Id="rId3" Type="http://.../worksheet"
Target="worksheets/sheet3.xml"/>
  <Relationship Id="rId7" Type="http://.../styles" Target="styles.xml"/>
  <Relationship Id="rId2" Type="http://.../worksheet"
Target="worksheets/sheet2.xml"/>
  <Relationship Id="rId1" Type="http://.../worksheet"
Target="worksheets/sheet1.xml"/>
  <Relationship Id="rId6" Type="http://.../theme" Target="theme/theme1.xml"/>
  <Relationship Id="rId5" Type="http://.../externalLink"
  Target="externalLinks/externalLink2.xml"/>
  <Relationship Id="rId4" Type="http://.../externalLink"
  Target="externalLinks/externalLink1.xml"/>
  <Relationship Id="rId9" Type="http://.../calcChain"
Target="calcChain.xml"/>
</Relationships>

```

These relationship expressions indicate that cell B2 is supported by the external workbook data cache located at externalLinks/externalLink1.xml in the package. These relationship expressions also indicate that cell C2 is supported by the external workbook data cache located at externalLinks/externalLink2.xml in the package.

L.2.13.5 Supporting Workbook Cache (Cell C2)

The corresponding content from externalLink2.xml is:

```

<externalLink ...>
  <externalBook
xmlns:r="http://purl.oclc.org/ooxml/officeDocument/relationships"
r:id="rId1">
    <sheetNames>
      <sheetName val="Sheet1"/>
      <sheetName val="Sheet2"/>
      <sheetName val="Sheet3"/>
    </sheetNames>
    <definedNames>
      <definedName name="NameInExternalWorkbook"
        refersTo="'Sheet1'!$B$1"/>
    </definedNames>
    <sheetDataSet>
      <sheetData sheetId="0">
        <row r="1">
          <cell r="B1">
            <v>2</v>
          </cell>
        </row>
      </sheetData>
      <sheetData sheetId="1"/>
      <sheetData sheetId="2"/>
    </sheetDataSet>
  </externalBook>
</externalLink>

```

Supporting workbook data caches store the top-level structure of the workbook (sheet names, defined names, cell table). Only the cells referenced are cached. This supporting workbook data cache indicates that the workbook being referenced by C2 has three sheets, whose names are "Sheet1", "Sheet2", and "Sheet3", and has a defined name of "NameInExternalWorkbook". Additionally, the cell table shows that cell B1 in this workbook is the cell being referenced. A copy of the cell table is stored locally, inside the workbook containing the external link.

The r:id="rId1" on the top level externalLink element indicates the Id of the relationship from the externalLink2.xml part, which indicates the location of the actual external workbook.

L.2.13.6 External Link (Cell C2)

The corresponding content from externalLink2.xml.rels is

```

<Relationships ...>
  <Relationship Id="rId1" Type="http://.../externalLinkPath"
    Target="file:///C:/Source2.xlsx" TargetMode="External"/>
</Relationships>

```


This relationship indicates that the supporting workbook that C2 references resides on the local drive, at `c:\source2.xlsx`.

L.2.13.7 Supporting Workbook Cache (Cell B2)

The corresponding content from `externalLink1.xml` is:

```
<externalLink ...>
  <externalBook xmlns:r="http://.../relationships" r:id="rId1">
    <sheetNames>
      <sheetName val="Sheet1"/>
      <sheetName val="Sheet2"/>
      <sheetName val="Sheet3"/>
    </sheetNames>
    <sheetDataSet>
      <sheetData sheetId="0">
        <row r="1">
          <cell r="A1">
            <v>1</v>
          </cell>
        </row>
        <row r="2">
          <cell r="A2">
            <v>2</v>
          </cell>
        </row>
        <row r="3">
          <cell r="A3">
            <v>3</v>
          </cell>
        </row>
      </sheetData>
      <sheetData sheetId="1"/>
      <sheetData sheetId="2"/>
    </sheetDataSet>
  </externalBook>
</externalLink>
```

This supporting workbook data cache indicates that the workbook being referenced by B2 has three sheets, whose names are "Sheet1", "Sheet2", and "Sheet3". Additionally, the cell table shows that cells A1, A2, and A3, whose values are 1, 2, and 3, respectively, in this workbook are being referenced. A copy of the cell table is stored locally, inside the workbook containing the external link.

The `r:id="rId1"` on the top level `externalLink` element indicates the Id of the relationship from the `externalLink1.xml` part, which indicates the location of the actual external workbook.

L.2.13.8 External Link (Cell B2)

The corresponding content from externalLink1.xml.rels is

```
<Relationships ...>
  <Relationship Id="rId1" Type="http://.../externalLinkPath"
    Target="file:///C:\Source.xlsx" TargetMode="External"/>
</Relationships>
```

This relationship indicates that the supporting workbook that C2 references resides on the local drive, at c:\source.xlsx.

L.2.13.9 Hyperlink Example

Consider the following worksheet:

	A	B	C
1		Link to an external workbook range:	Link to an external workbook name:
2		=SUM('C:\[Source.xlsx]Sheet1'!\$A\$1:\$A\$3)	=C:\Source2.xlsx!NameInExternalWorkbook
3			
4		W3C Hyperlink	
5			

Cell B4 contains a hyperlink, whose friendly name is "W3C Hyperlink", and whose target is "http://www.w3.org/".

L.2.13.10 Worksheet XML

See §L.2.13.3 for the full XML. Here is the snippet expressing the hyperlink information, whose collection appears immediately after the sheetData collection in this example.

```
<hyperlinks>
  <hyperlink ref="B4" r:id="rId1"/>
</hyperlinks>
```

The hyperlink XML indicates that cell B4 of this sheet has a hyperlink, whose target can be found by following the relationship whose Id="rId1" from the current sheet. The 'friendly' name of the hyperlink is stored in the cell definition.

L.2.13.11 Relationship

The corresponding content from sheet1.xml.rels is:

```
<Relationships ...>
  <Relationship Id="rId1" Type="http://.../hyperlink"
    Target="http://www.w3.org/" TargetMode="External"/>
</Relationships>
```

This hyperlink points external to the workbook (TargetMode="External"), and the URL is found in the value of Target to be "http://www.w3.org/".

L.2.14 Volatile Dependencies

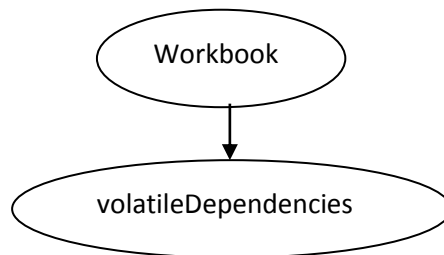
L.2.14.1 Overview

The volatile dependencies part provides a supporting cache of data for Real Time Data (RTD) and CUBE functions in the workbook. Both of these types of functions require connectivity to external servers to retrieve their data. For RTD functions, an RTD interface has been defined for how to provide (on the server side) and retrieve (on the client side) external data. Similarly, CUBE functions are able to access data in OLAP cubes. Each type of function has its own function syntax resulting in a specific piece of information being returned.

In the event that the server providing the data is unavailable, a spreadsheet application might want to cache the most recently retrieved values so that when recalculating the spreadsheet, calculated results can be acquired instead of errors.

The volatile dependencies part provides that cache of data and supporting information about these functions and their data servers and connections.

L.2.14.2 File Architecture - Relationships



The workbook holds the relationship to the volatile dependencies part.

L.2.14.3 Example

In this example, both a Real Time Data (RTD) function and CUBE functions are in use.

L.2.14.3.1 Illustration

	A	B
1	aaa: 672	
2		
3	Corporate	
4	\$80,450,596.98	
5	Set	
6	#N/A	
7	#N/A	
8	Not Applicable	
9	Growth in Customer Base Goal	
10		

(values shown)

	A
1	=RTD("jrtdx.rtd",,"aaa")
2	
3	=CUBEMEMBER("xlextat9 Adventure Works DW Adventure Works","[Department].[Departments].[Corporate]")
4	=CUBEVALUE("xlextat9 Adventure Works DW Adventure Works",A3)
5	=CUBESET("xlextat9 Adventure Works DW Adventure Works","[Customer].[Customer Geography].[All Customers].[United Kingdom].children","Set")
6	=CUBERANKEDMEMBER("xlextat9 Adventure Works DW Adventure Works",A\$3,ROW(A1))
7	=CUBESETCOUNT(A3)
8	=CUBEMEMBERPROPERTY("xlextat9 Adventure Works DW Adventure Works","[Product].[Product].[All Products].[Blade]","Class")
9	=CUBEKPIMEMBER("xlextat9 Adventure Works DW Adventure Works","Growth in Customer Base",2)
10	

(functions shown)

L.2.14.3.2 volatileDependencies.xml

```

<volTypes xmlns="...">
  <volType type="realTimeData">
    <main first="jrtdx.rtd">
      <tp t="s">
        <v>aaa: 4447</v>
        <stp/>
        <stp>aaa</stp>
        <tr r="A1" s="1"/>
      </tp>
    </main>
  </volType>
  <volType type="olapFunctions">
    <main first="xlextat9 Adventure Works DW Adventure Works">
      <tp t="e">
        <v>#N/A</v>
        <stp>1</stp>
        <tr r="A6" s="1"/>
      </tp>
    </main>
  </volType>

```

```

        <tr r="A9" s="1"/>
        <tr r="A8" s="1"/>
        <tr r="A5" s="1"/>
        <tr r="A4" s="1"/>
        <tr r="A3" s="1"/>
    </tp>
</main>
</volType>
</volTypes>

```

L.2.14.3.2.1 RTD Supporting Data

/volTypes/volType@type indicates that the supporting information pertains to an RTD function call. Valid values, as defined by the SpreadsheetML schema, are `realTimeData` and `olapFunctions`

/volTypes/volType/main@first indicates the ProgId of the RTD server. This value corresponds to the first argument of an RTD function in a worksheet.

/volTypes/volType/main/tp contains a listing of topics within the main topic. For the RTD function, this collection expresses the remaining parameters of the function, and indicate the last known value and data type of that value.

/volTypes/volType/main/tp@t indicates the data type of the value associated with this topics. For this RTD example, the value is "aaa: 4447" whose data type is string.

/volTypes/volType/main/tp/v expresses the last known value of this RTD function, "aaa: 4447".

/volTypes/volType/main/tp/stp expresses the remaining topics, or function parameters, for this RTD function. Notice that in the example, the second parameter is left empty, and the third parameter is "aaa".

/volTypes/volType/main/tp/tr expresses the cells which are dependent on this particular set of topics, and which are associated with this supporting information.

L.2.14.3.2.2 Cube Function Supporting Data

Cube functions use the same persistence structure as the RTD supporting data, but the information is interpreted slightly differently. At a high level, `main@first` indicates the connection name, and the `tr` elements spell out the cells with cube function calls dependent on this connection. In most cases (when the `<stp>` value is equal to "1") the remaining information can be ignored.

/volTypes/volType/main@first indicates the connection name for the related cube functions.

/volTypes/volType/main/tp@t can be ignored when `stp` value is 1.

/volTypes/volType/main/tp/v contains an error value of "#N/A", which can be ignored when `stp` value is 1.

/volTypes/volType/main/tp/stp value of 1 indicates that all of the related cells with calling cube functions have been refreshed.

/volTypes/volType/main/tp/tr expresses the cells contain cube functions which are dependent on this connection, and which are associated with this supporting information.

L.2.15 Custom XML Mappings

L.2.15.1 Overview

With the pervasiveness of XML data structures and XML web services, it is appropriate for a spreadsheet application to consume XML data structures and render the data in the sheet grid. Furthermore it is appropriate and desirable for the spreadsheet application to be able to generate XML data structures. Finally, since XML is extensible, the kinds of XML structures that can be consumed or produced by a spreadsheet application should be as varied as the number of XML schemas that exist.

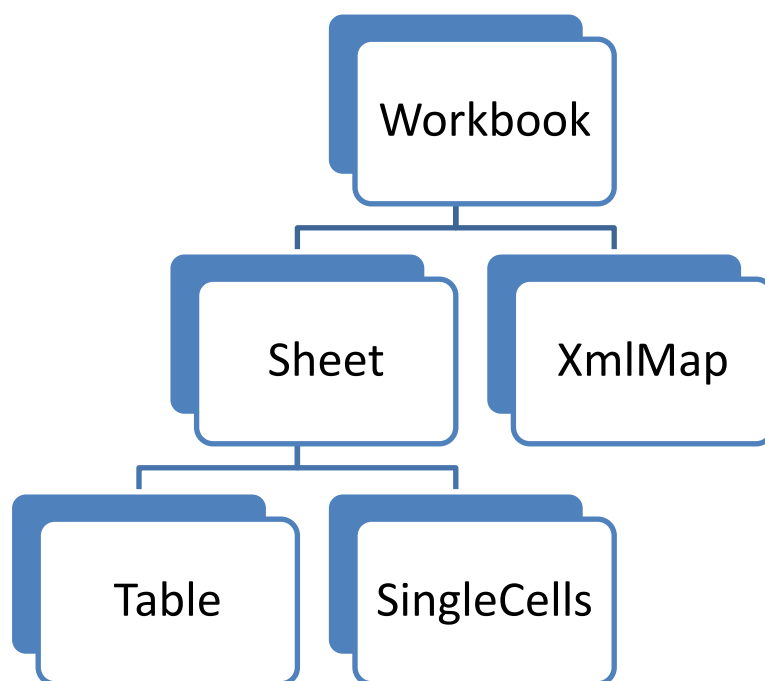
The XML Mapping feature enables adding arbitrary XML data structures and arbitrary XML schema definitions to the workbook, then mapping the various XML nodes to cells and ranges in the workbook. Once an XML Mapping is set up, the application is able to import and export XML instance structures according to the schema definition.

While the original schema or XML definition can reside on disk or at some file location outside the workbook, a copy of the schema is stored in the workbook.

Every time an XML instance or schema is added to the workbook, a new map object is created which ties together the schemas and where the various elements are mapped in the workbook.

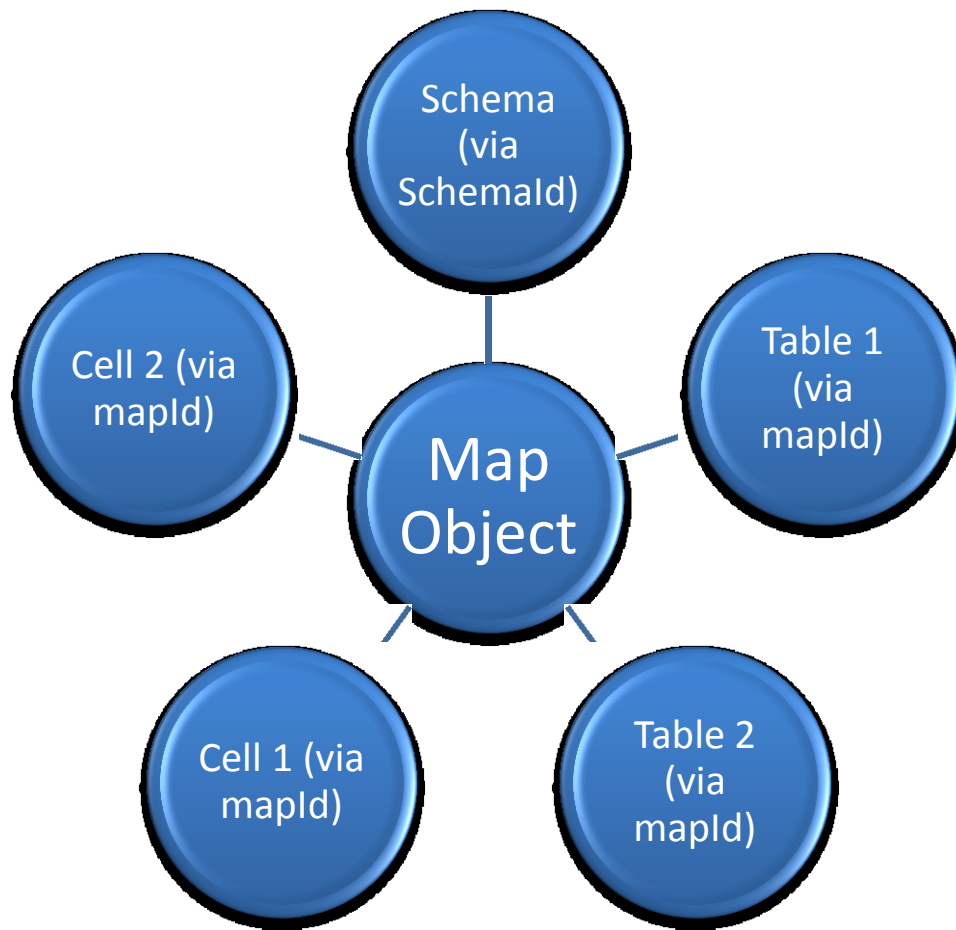
Additional properties are stored on each cell and each column of a Table that has an XML map association.

L.2.15.2 File Architecture - Relationships



The workbook owns sheets and the xmlMap definitions. Each sheet references Tables and single cells which are mapped to XML structures.

L.2.15.3 Conceptual Model



Conceptually all the objects reference a common Map Object, by `@id`. It is in this way that they come together into a single working feature that can import and export custom XML data.

L.2.15.4 Example

In this example both single cells and a Table are shown to have a data binding to an XML structure.

L.2.15.4.1 Illustration

	A	B	C	D	E	F
1						
2		currency	detailed	total-sum		
3		USD	FALSE	556.9		
4						
5		First	Last	Email		
6		Fred	Landis	f.landis@nanonull.com		
7						
8		type	expto	Date	expense	description
9		Lodging	Sales	1/1/2003	122.11	
10		Lodging	Development	1/2/2003	122.12	Played penny arcade
11		Lodging	Marketing	1/2/2003	299.45	Treated Clients
12		Entertainment	Development	1/2/2003	13.22	Bought signed "XMLSPY Handbo
13						
14						
15						

The table in B8:G12 is also data bound to an XML mapping object. The first column, titled "type", is associated with the XML Map named "expense-report_Map", specifically the attribute identified by the XPath expression `/expense-report/expense-item/@type` pointing into the corresponding XML structure. In similar fashion, each of the columns in the Table correspond with elements or attributes in the related XML Map structure.

Additionally, cells B3:D3 and B6:D6 are each bound to a single, non-repeating element or attribute from the same XML Map structure. For example, cell B3 corresponds to `/expense-report/@currency`.

In this way XML instance structures can be refreshed into the cells and Table region, and XML instance structures can be generated from the data in those ranges of the spreadsheet. In other words, XML structures can be imported and exported to and from the worksheet via the XML Mapping feature.

L.2.15.4.2 The xmlMap XML

The xmlMaps part stores the custom schema that has been added to the workbook, and also stores the xmlMap definitions. There can be multiple schemas and xmlMaps in a single workbook.

```
<MapInfo SelectionNamespaces="">
  <Schema ID="Schema1">
    <xsd:schema xmlns:xsd="http://www.w3.org/2001/XMLSchema">
      <xsd:element nillable="true" name="expense-report">
        <xsd:complexType>
          <xsd:sequence minOccurs="0">
            <xsd:element minOccurs="0" nillable="true"
name="Person" form="unqualified">
              <xsd:complexType>
                <xsd:sequence minOccurs="0">
```

```

                                <xsd:element minOccurs="0"
nillable="true" type="xsd:string" name="First"
form="unqualified"></xsd:element>
                                <xsd:element minOccurs="0"
nillable="true" type="xsd:string" name="Last"
form="unqualified"></xsd:element>
                                <xsd:element minOccurs="0"
nillable="true" type="xsd:string" name="Title"
form="unqualified"></xsd:element>
                                <xsd:element minOccurs="0"
nillable="true" type="xsd:string" name="Phone"
form="unqualified"></xsd:element>
                                <xsd:element minOccurs="0"
nillable="true" type="xsd:string" name="Email"
form="unqualified"></xsd:element>
                                </xsd:sequence>
                                </xsd:complexType></xsd:element>
                                <xsd:element minOccurs="0" maxOccurs="unbounded"
nillable="true" name="expense-item" form="unqualified">
                                <xsd:complexType>
                                <xsd:all>
                                <xsd:element minOccurs="0"
nillable="true" type="xsd:date" name="Date"
form="unqualified"></xsd:element>
                                <xsd:element minOccurs="0"
nillable="true" type="xsd:double" name="expense"
form="unqualified"></xsd:element>
                                <xsd:element minOccurs="0"
nillable="true" type="xsd:string" name="description"
form="unqualified"></xsd:element>
                                <xsd:element minOccurs="0"
nillable="true" name="Misc" form="unqualified">
                                <xsd:complexType>
                                <xsd:attribute name="misctype"
form="unqualified" type="xsd:string"></xsd:attribute>
                                </xsd:complexType>
                                </xsd:element>
                                </xsd:all>
                                <xsd:attribute name="type"
form="unqualified" type="xsd:string"></xsd:attribute>
                                <xsd:attribute name="expto"
form="unqualified" type="xsd:string"></xsd:attribute>
                                </xsd:complexType>

```

```

        </xsd:element>
    </xsd:sequence>
    <xsd:attribute name="currency" form="unqualified"
type="xsd:string"></xsd:attribute>
    <xsd:attribute name="detailed" form="unqualified"
type="xsd:boolean"></xsd:attribute>
    <xsd:attribute name="total-sum" form="unqualified"
type="xsd:double"></xsd:attribute>
    </xsd:complexType>
</xsd:element>
</xsd:schema>
</Schema>
<Map ID="1" Name="expense-report_Map" RootElement="expense-report"
SchemaID="Schema1" ShowImportExportValidationErrors="false" AutoFit="true"
Append="false" PreserveSortAFLayout="true" PreserveFormat="true">
    <DataBinding FileBinding="true" DataBindingLoadMode="1"/>
</Map>
</MapInfo>

```

- `/MapInfo@SelectionNamespaces` ties the prefix to the actual namespace. This is used when writing xpath expressions at runtime against the XML instance structures, because the xpath expressions use namespace prefixes instead of the fully spelled out namespace.
- `/MapInfo/Schema` stores the schemas for a particular XML map object. There can be multiple `<Schema>` elements in a workbook, one for each XML map.
- `/MapInfo/Schema@ID` identifies the schema collection used to define a particular XML map object.
- `/MapInfo/Map/@ID` identifies the map object.
- `/MapInfo/Map@Name` is the friendly name of the map object.
- `/MapInfo/Map@RootElement` is the name of the root element of the XML instance (schemas can define more than one root node).
- `/MapInfo/Map@SchemaID` identifies which schema collection the map uses.
- `/MapInfo/Map@ShowImportExportValidationErrors` indicates that when an XML instance is imported or exported, the schema should be used to validate the instance, and schema errors should be shown to the user.
- `/MapInfo/Map@AutoFit` indicates that after refresh, all the cells should be 'best fitted'.
- `/MapInfo/Map@Append` means that when refreshed, don't discard existing data, but append new data to it.
- `/MapInfo/Map@PreserveSortAFLayout` indicates whether to keep filters on (Tables).
- `/MapInfo/Map@PreserveFormat` indicates whether to keep the cell formatting applied or re-apply based on schema data type.

L.2.15.4.3 The Table XML

The only difference with table definitions that are bound to XML is that `@tableType="xml"` and each column has an additional set of xml-specific properties, contained in the `<xmlColumnPr>` collection, which appears once for every column in the Table which has an XML data binding.

```
<table xmlns="http://purl.oclc.org/ooxml/spreadsheetml/main" id="7"
name="Table7" displayName="Table7" ref="B8:G12" tableType="xml"
totalsRowShown="0" connectionId="1">
  <autoFilter ref="B8:G12"/>
  <tableColumns count="6">
    <tableColumn id="1" uniqueName="type" name="type">
      <xmlColumnPr mapId="1" xpath="/expense-report/expense-
item/@type" xmlDataType="string"/>
    </tableColumn>
    <tableColumn id="2" uniqueName="expto" name="expto">
      <xmlColumnPr mapId="1" xpath="/expense-report/expense-
item/@expto" xmlDataType="string"/>
    </tableColumn>
    <tableColumn id="3" uniqueName="Date" name="Date">
      <xmlColumnPr mapId="1" xpath="/expense-report/expense-
item/Date" xmlDataType="date"/>
    </tableColumn>
    <tableColumn id="4" uniqueName="expense" name="expense">
      <xmlColumnPr mapId="1" xpath="/expense-report/expense-
item/expense" xmlDataType="double"/>
    </tableColumn>
    <tableColumn id="5" uniqueName="description" name="description">
      <xmlColumnPr mapId="1" xpath="/expense-report/expense-
item/description" xmlDataType="string"/>
    </tableColumn>
    <tableColumn id="6" uniqueName="misctype" name="misctype">
      <xmlColumnPr mapId="1" xpath="/expense-report/expense-
item/Misc/@misctype" xmlDataType="string"/>
    </tableColumn>
  </tableColumns>
  <tableStyleInfo name="TableStyleMedium7" showFirstColumn="0"
showLastColumn="0" showRowStripes="1" showColumnStripes="0"/>
</table>
```

The column in the Table titled "type" is bound to an XML mapping, whose map object Id `@mapId` is "1". The `@xpath` value indicates an xpath expression to which this Table column is associated. In this example the Table column "type" corresponds to `@type`, which is an attribute of the `<expense-item>` collection. The corresponding custom schema definition for `@type` indicates a data type of string. This is

stored as an xml column property as well, in @xmlDataType. This is used for interpreting the data on import and export, and is also used to format the cells for proper rendering in the range.

The remaining columns have similar properties set and can be understood from the discussion above.

L.2.15.4.4 Single Cell XML

Contents of tableSingleCells.xml

```
<singleXmlCells xmlns="http://purl.oclc.org/ooxml/spreadsheetml/main">
  <singleXmlCell id="1" name="Table1" displayName="Table1" r="B3"
connectionId="1">
    <xmlCellPr id="1" uniqueName="currency">
      <xmlPr mapId="1" xpath="/expense-report/@currency"
xmlDataType="string"/>
    </xmlCellPr>
  </singleXmlCell>
  <singleXmlCell id="2" name="Table2" displayName="Table2" r="C3"
connectionId="1">
    <xmlCellPr id="1" uniqueName="detailed">
      <xmlPr mapId="1" xpath="/expense-report/@detailed"
xmlDataType="boolean"/>
    </xmlCellPr>
  </singleXmlCell>
  <singleXmlCell id="3" name="Table3" displayName="Table3" r="D3"
connectionId="1">
    <xmlCellPr id="1" uniqueName="total-sum">
      <xmlPr mapId="1" xpath="/expense-report/@total-sum"
xmlDataType="double"/>
    </xmlCellPr>
  </singleXmlCell>
  <singleXmlCell id="4" name="Table4" displayName="Table4" r="B6"
connectionId="1">
    <xmlCellPr id="1" uniqueName="First">
      <xmlPr mapId="1" xpath="/expense-report/Person/First"
xmlDataType="string"/>
    </xmlCellPr>
  </singleXmlCell>
  <singleXmlCell id="5" name="Table5" displayName="Table5" r="C6"
connectionId="1">
    <xmlCellPr id="1" uniqueName="Last">
      <xmlPr mapId="1" xpath="/expense-report/Person/Last"
xmlDataType="string"/>
    </xmlCellPr>
  </singleXmlCell>
```

```

    <singleXmlCell id="6" name="Table6" displayName="Table6" r="D6"
connectionId="1">
    <xmlCellPr id="1" uniqueName="Email">
    <xmlPr mapId="1" xpath="/expense-report/Person/Email"
xmlDataType="string"/>
    </xmlCellPr>
    </singleXmlCell>
</singleXmlCells>

```

A single cell which has been mapped to an XML node is expressed in much the same way that an entire table is expressed.

The `<singleXmlCell>` collection is the top level object, like the Table, which identifies the cell in question.

The `<xmlCellPr>` collection identifies the name for the only 'column' in this structure, the single cell. In this way it is much like a table column definition and the table column-level properties.

The `<xmlPr>` collection expresses the xml properties for this cell.

L.2.16 Formulas

L.2.16.1 Introduction

A SpreadsheetML *formula* is an equation that performs a calculation that typically involves the values of one or more cells in one or more worksheets.

A formula is an expression that can contain the following: constants (§L.2.16.2), operators (§L.2.16.3), cell references (§L.2.16.4), calls to functions (§L.2.16.5), and names (§L.2.16.6).

Consider the formula `PI()*(A2^2)`. In this case,

- `PI()` results in a call to the function `PI`, which returns the value of π .
- The cell reference `A2` returns the value in that cell.
- `2` is a numeric constant.
- The caret (^) operator raises its left operand to the power of its right operand.
- The parentheses, (and), are used for grouping.
- The asterisk (*) operator performs multiplication of its two operands.

L.2.16.2 Constants

A *constant* is a predefined value that is not calculated, and, therefore, does not change. A constant can be any of the following:

- A real number
- The logical values `TRUE` and `FALSE`
- A string literal

- An array constant
- An error constant

L.2.16.3 Operators

An *operator* is a symbol that specifies the type of operation to perform on one or more operands. There are arithmetic, comparison, text, and reference operators.

Operators			
Family	Operator	Description	Precedence
Reference operators	:	Binary range operator, which takes two cell reference (§L.2.16.3) operands, and results in one reference to the cells inclusive of, and between, those references. For example, SUM(B5:C15), which references 11 cells.	highest
	,	Binary union operator, which takes two cell reference (§L.2.16.3) operands, and results in one reference to all those, possibly non-contiguous, cells. For example, SUM((B5:B15,D5:D15)), which references 22 cells, 11 from column B, and 11 from column D. The grouping parentheses are necessary to indicate that the comma is an operator rather than a punctuation separating two arguments.	
	space	Binary intersection operator, which takes two cell reference (§L.2.16.3) operands, and results in one reference to those, possibly non-contiguous, cells that are common. If the intersection is empty, the result is #NULL!. For example, COUNT((B1:C1) (C1:D1)), which results in a reference to C1, while COUNT((B1:D1) (B1,D1)) results in a single reference to B1 and D1.	
Arithmetic operators	-	Unary minus	
	%	Percentage (unary postfix), which divides its operand by 100. For example, 10.5%, which results in 0.105.	
	^	Exponentiation	
	*	Multiplication	
	/	Division	
	+	Addition	
	-	Subtraction	

Operators			
Text operator	&	Text concatenation (Each of the two operands is converted to text, if necessary, before concatenation.)	
Comparison operators	=	Equal-to	lowest
	<>	Not-equal-to	
	<	Less-than	
	<=	Less-than or equal-to	
	>	Greater-than	
	>=	Greater-than-or-equal-to	

Given that cell E38 contains the value 4, and cell F38 contains the value 2, the formula

$$((-1+E38^2)*3-F38)/2$$

produces the result 21.5.

L.2.16.4 Cell References

Each set of horizontal cells in a worksheet is a *row*, and each set of vertical cells is a *column*. A cell's row and column combination designates the location of that cell.

A *cell reference* designates one or more cells on the same worksheet. Using references, one can:

- Use data contained in different parts of the same worksheet in a single formula.
- Use the value from a single cell in several formulas.
- Refer to cells on other sheets in the same workbook, and even to other workbooks. (References to cells in other workbooks are called *links*.)

There are two cell reference styles: A1 and R1C1.

- In the A1 reference style, each row has a numeric heading numbered sequentially from the top down, starting at 1. Each column has an alphabetic heading named sequentially from left-to-right, A–Z, then AA–AZ, BA–BZ, ..., ZA–ZZ, AAA–AAZ, ABA–ABZ, and so on. Column letters are not case-sensitive.

A relative reference to a single cell is written as its column letter immediately followed by its row number. A relative reference to a whole row is written as its row number. A relative reference to a whole column is written as its column letter. A reference to a range of two or more cells is written as two single-cell references separated by the binary range operator (:). An absolute A1 reference is made up of a cell's column letter followed by its row number, with each being preceded by a dollar character (\$). For example, A2, B34, and B5:D8 are relative

A1 references. `A2`, `B34`, and `B5:D8` are absolute A1 references. `$A2`, `B$34`, and `$B5:D$8` are mixed A1 references.

- In the R1C1 reference style, each row has a numeric heading numbered sequentially from the top down, starting at 1. Each column has a numeric heading numbered sequentially from left-to-right, starting at 1.

A whole row is referenced by omitting the column, and a whole column is referenced by omitting the row. An absolute row or column reference uses absolute row or column numbers, respectively. A relative row or column reference uses, respectively, row or column offsets from the cell containing the formula, with a negative offset indicating a row to the left or a column above, and a positive offset indicating a row to the right or a column below. Specifying an offset of zero is equivalent to omitting that offset and its delimiting brackets. For example, `R[-2]C` refers to the cell two rows up and in the same column, `R[2]C[2]` refers to the cell two rows down and two columns to the right, `R2C2` refers to the cell in the second row and in the second column, `R[-1]` refers to the entire row above the active cell, and `R` refers to the current row.

The R1C1 alternate reference style can only be used at runtime.

L.2.16.5 Functions

A *function* is a named formula that takes zero or more arguments, performs an operation, and, optionally, returns a result. Some examples of function calls are: `PI()`, `POWER(A1,B3)`, and `SUM(C6:C10)`.

There are more than 300 predefined functions defined by this Office Open XML specification. User-defined functions are also permitted.

L.2.16.6 Names

A *name* is an alias for a constant, a cell reference, or a formula. A name in a formula can make it easier to understand the purpose of that formula. For example, the formula `SUM(FirstQuarterSales)` is easier to identify than `SUM(C20:C30)`.

L.2.16.7 Types and Values

Each *expression* has a type. SpreadsheetML formulas support the following types: array, error, logical, number, and text.

An array value or constant represents a collection of one or more elements, whose values can have any type (i.e., the elements of an array need not all have the same type).

L.2.16.8 Error values

The evaluation of an expression can result in an error having one of a number of *error values*. These error values are:

Error Value	Reason for Occurrence
#DIV/0!	Intended to indicate when any number, including zero, is divided by zero.
#N/A	Intended to indicate when a designated value is not available. For example, Some functions, such as SUMX2MY2, perform a series of operations on corresponding elements in two arrays. If those arrays do not have the same number of elements, then for some elements in the longer array, there are no corresponding elements in the shorter one; that is, one or more values in the shorter array are not available. This error value can be produced by calling the function NA.
#NAME?	Intended to indicate when what looks like a name is used, but no such name has been defined. For example, XYZ/3, where XYZ is not a defined name. Total is & A10, where neither Total nor is is a defined name. Presumably, "Total is " & A10 was intended. SUM(A1C10), where the range A1:C10 was intended.
#NULL!	Intended to indicate when two areas are required to intersect, but do not. For example, In the case of SUM(B1 C1), the space between B1 and C1 is treated as the binary intersection operator, when a comma was intended.
#NUM!	Intended to indicate when an argument to a function has a compatible type, but has a value that is outside the domain over which that function is defined. (This is known as a <i>domain error</i> .) For example, Certain calls to ASIN, ATANH, FACT, and SQRT might result in domain errors. Intended to indicate that the result of a function cannot be represented in a value of the specified type, typically due to extreme magnitude. (This is known as a <i>range error</i> .) For example, FACT(1000) might result in a range error.
#REF!	Intended to indicate when a cell reference is invalid. For example, If a formula contains a reference to a cell, and then the row or column containing that cell is deleted, a #REF! error results. If a worksheet does not support 20,001 columns, OFFSET(A1,0,20000) results in a #REF! error.
#VALUE!	Intended to indicate when an incompatible type argument is passed to a function, or an incompatible type operand is used with an operator. For example, In the case of a function argument, a number was expected, but text was provided. In the case of 1+"ABC", the binary addition operator is not defined for text.

L.2.16.9 Dates and Times

Each unique instant in SpreadsheetML time is stored as an ISO 8601-formatted string, which is made up of a date component, a time component, and a timezone component.

Numerous functions take dates and/or times as arguments. Functions that care only about the date must ignore any time information that is provided. Functions that care only about the time must ignore any date information that is provided.

L.2.16.9.1 Date Conversion for Serial Values

All date values stored in cells within a SpreadsheetML file are stored in the ISO 8601 format.

For compatibility, a SpreadsheetML application can interpret serial-number values in cells or in formulas as dates. This subclause describes how serial number values can be converted to date values depending on the compatibility mode.

A date that can be interpreted as a numeric value is a *serial value*. This is made up of a signed integer date component and an unsigned fractional time component. Going forward in time, the date component of a serial value increases by 1 each day. A serial value represents a UTC date and time, and, as such, has no timezone information.

Three different bases can be used for converting dates into serial values:

- In the *1900 date base system*, the lower limit is January 1, -9999 00:00:00, which has serial value -4346018. The upper-limit is December 31, 9999, 23:59:59, which has serial value 2,958,465.9999884. The base date for this date base system is December 30, 1899, which has a serial value of 0.
- In the *1900 backward compatibility date-base system*, the lower limit is January 1, 1900, 00:00:00, which has serial value 1. The upper limit is December 31, 9999, 23:59:59, which has serial value 2,958,465.9999884. The base date for this date base system is December 31, 1899, which has a serial value of 0.
- In the *1904 backward compatibility date-base system*, the lower limit is January 1, 1904, 00:00:00, which has serial value 0. The upper limit is December 31, 9999, 23:59:59, which has serial value 2,957,003.9999884. The base date for this date base system is January 1, 1904, which has a serial value of 0.

For the 1900 date base system:

The serial value -2338.0000000... represents 1893-08-05
 The serial value 2.0000000... represents 1900-01-01
 The serial value 3687.0000000... represents 1910-02-03
 The serial value 38749.0000000... represents 2006-02-01
 The serial value 2958465.0000000... represents 9999-12-31

For the 1904 backward compatibility date base system:

The serial value -3800.0000000... represents 1893-08-05
 The serial value 0.0000000... represents 1904-01-01
 The serial value 2225.0000000... represents 1910-02-03
 The serial value 37287.0000000... represents 2006-02-01
 The serial value 2957003.0000000... represents 9999-12-31

L.2.16.9.2 Time Conversion for Serial Values

The time component of a serial value ranges in value from 0–0.99999999, and represents times from the instant starting 0:00:00 (12:00:00 AM) to the last instant of 23:59:59 (11:59:59 P.M.), respectively.

Going forward in time, the time component of a serial value increases by 1/86,400 each second. (As such, the time 12:00 has a serial value time component of 0.5.)

The serial value 0.0000000... represents 00:00:00

The serial value 0.0000115... represents 00:00:01

The serial value 0.4207639... represents 10:05:54

The serial value 0.5000000... represents 12:00:00

The serial value 0.9999884... represents 23:59:59

L.2.16.9.3 Combined Date and Time Conversion for Serial Values

Any date component can be added to any time component to produce a serial value for that date/time combination. The resulting serial value encodes that date whose (positive or negative) time span from base date in the respective date-base equals the serial value.

For the 1900 date base system:

The serial value -2337.999989... represents 1893-08-05T00:00:01Z

The serial value 3687.4207639... represents 1910-02-03T10:05:54Z

The serial value 1.5000000... represents 1900-01-01T12:00:00Z

The serial value 2958465.9999884... represents 9999-12-31T23:59:59Z

For the 1904 backward compatibility date base system:

The serial value -3799.999989... represents 1893-08-05T00:00:01Z

The serial value 2225.4207639... represents 1910-02-03T10:05:54Z

The serial value 0.5000000... represents 1904-01-01T12:00:00Z

The serial value 2957003.9999884... represents 9999-12-31T23:59:59Z

L.2.16.10 XML Representation

A formula is represented in a worksheet's XML by an `f` element that contains the text of the formula, and a `v` element that contains the text version of the last computed value for that formula. This pair of elements is inside a `c` element, which is, in turn, is inside a row element. Consider the scalar formula $\text{SQRT}(C2^2 + D2^2)$, where C2 refers to a cell containing the number 12.5, and D2 refers to a cell containing the number 9.6. The corresponding XML might be as follows:

```

<row r="2" spans="2:4">
  <c r="B2" s="40">
    <f>SQRT(C2^2+D2^2)</f>
    <v>15.761027885261798</v>
  </c>
  <c r="C2" s="0">
    <v>12.5</v>
  </c>
  <c r="D2" s="0">
    <v>9.6</v>
  </c>
</row>

```

In the scalar formula `CONCATENATE("The total is ",C7," units")`, C7 refers to a cell containing the number 23. The corresponding XML might be as follows:

```

<row r="7" spans="2:4" ht="285">
  <c r="B7" s="4" t="str">
    <f>CONCATENATE("The total is ",C7," units")</f>
    <v>The total is 23 units</v>
  </c>
  <c r="C7" s="0">
    <v>23</v>
  </c>
</row>

```

As the function `CONCATENATE` returns a string, the value for the cell's `t` attribute is `str`.

L.3 Introduction to PresentationML

This clause contains a detailed introduction to the structure of a PresentationML document.

The PresentationML file format can be broken down into the following subjects:

- Presentation
- Slides
- Slide Content
- Animation

There are other schemas—most notably `DrawingML`—that make up a sizeable chunk of the PresentationML file format. These schemas are addressed separately in §L.4.

L.3.1 Basics

L.3.1.1 Introduction

This subclause provides a high-level overview of PresentationML.

The PresentationML file format can be broken down into the following subjects:

- Presentation
- Slides
- Slide Content
- Animation

The best way to understand the content in each of these subjects is to cover them in that particular order.

There are other schemas—most notably DrawingML—that make up a sizeable chunk of the PresentationML file format. These schemas are addressed separately.

This subclause introduces the first subject, “Presentation”. Other subclauses build on this foundation.

L.3.1.2 Basic Utilities

PresentationML contains a set of complex types and simple types that are used by other schemas. The types, or utilities, are used in a variety of cases. Their single implementation provides for rapid and less error-prone changes throughout an implementation.

To provide some insight into the type of information that is being repurposed, here is a sample of these utilities:

- Empty Element
- Name
- Direction
- Index and Index Range
- Slide Show ID
- Slide List Choice
- Slide Relationship
- Customer Data
- Future Extensibility

Each of these is discussed in the following subclauses.

L.3.1.2.1 Empty Element

Sometimes, the simple presence of an element is sufficient to convey meaning. That is, in some cases, you do not necessarily need information to be a Boolean, an integer, or complex type.

A simple example is the Show Type element group. In this case, a slide show can be one of three types: present, browse, or kiosk. The schema for this element group is as follows:

```

<xsd:group name="EG_ShowType">
  <xsd:choice>
    <xsd:element name="present" type="CT_Empty">
    </xsd:element>
    <xsd:element name="browse" type="CT_ShowInfoBrowse">
    </xsd:element>
    <xsd:element name="kiosk" type="CT_Empty">
    </xsd:element>
  </xsd:choice>
</xsd:group>

```

L.3.1.2.2 Name

Many constructs within a presentation have names associated with them. In some cases, the names are machine-generated, such as shape names (e.g., rectangle1), while others are user-defined, such as slide shows (e.g., customer-ready).

In one implementation the name simple type is simply an xsd:string. The intent is to restrict this to the appropriate pattern allowed for named constructs. The tentative restriction pattern is:

```
[ \t]*[^\t].*
```

L.3.1.2.3 Direction

This multi-purpose simple type is used to convey horizontal versus vertical direction of a variety of types. Such usage can be found in the definition of slide transitions and various shape effects.

L.3.1.2.4 Index and Index Range

These two utilities are generally used to denote a contiguous set of items within a list. The classic example of usage would be the selection of a set of slides to print.

From a schema-perspective, there is no way to enforce that the start index be equal to or less than the end index.

L.3.1.2.5 Slide Show ID

This defines the ID for a slide show (also called a custom show). Because slide shows can be named, and that name can change, an implementation needs a method of referring to a slide show that can withstand name changes made by the user. In many cases, for example, with a slide, we can leverage the fact that each slide has a part within the package, in which case we can use the relationship ID. However, since there is no part for each slide show, we are forced to generate an unsigned integer for each slide show and use that.

There is nothing in the schema that prevents two or more slide shows from having the same ID.

L.3.1.2.6 Slide List Choice

There are many cases in which a user needs to specify a set of slides for an operation. The canonical example is what slides to include in your slide show. Because this operation is frequently required in the file format, one implementation has provided a utility to facilitate this:

```
<xsd:group name="EG_SlideListChoice">
  <xsd:choice>
    <xsd:element name="sldAll" type="CT_Empty" />
    <xsd:element name="sldRg" type="CT_IndexRange" />
    <xsd:element name="custShow" type="CT_CustomShowId" />
  </xsd:choice>
</xsd:group>
```

As the schema above declares, when selecting a set of slides, the user can select all of the slides, a slide range (by declaring a pair of start and end indices) or a particular custom show.

L.3.1.2.7 Slide Relationship

As described in the Slide Show ID paragraphs above, there are many situations where the format needs to store an ordered list of slides, and does so by storing their slide IDs. This is implemented using two types: a list entry complex type and a list complex type:

```
<xsd:complexType name="CT_SlideRelationshipListEntry">
  <xsd:attribute ref="r:id" use="required"/>
</xsd:complexType>
<xsd:complexType name="CT_SlideRelationshipList">
  <xsd:sequence>
    <xsd:element name="sld" type="CT_SlideRelationshipListEntry"
      minOccurs="0" maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```

L.3.1.2.8 Customer Data

There is a set of utilities that facilitate the storage of customer XML data within the file format. Although a topic for a separate paper, essentially, this functionality comes down to the ability to store extra-standard XML in the file format in a way that it can be easily queried, modified and/or surfaced in the presentation. Suffice it to say, the data is stored in a separate part within the package, and hence the utility pairs the object using it with the part within the package.

L.3.1.2.9 Future Extensibility

There is functionality that provides the ability to extend a subset of objects within the file format for inclusion of additional data over the lifetime of the file format. The utilities provide both the ability to add an alternative representation (e.g., provide a raster image in addition to the XML data for a diagram) as well as additional properties to the objects.

L.3.1.3 The Presentation Object

PresentationML also defines the content of the principal or start part for a PresentationML document. This content includes both structural and presentation-level data for the presentation.

Astute readers should quickly identify an apparent duplication of presentation-level data, as there is also a separate part which contains presentation-level data. That being said, there is actually no duplication. Rather, the differentiation of what presentation-level data goes into which part is based on two user scenarios: document signatures and document sanitization.

In a document signature scenario, assume a user digitally signs a presentation. There exist two kinds of data within the presentation package: data which changes the “content” of the presentation and data which is intended to configure an editor or the behavior of an editor. In the first case, any modification to data which changes the “content” of the presentation must invalidate the signature; in the second case, any modification to that data should not invalidate the signature.

A classic example of this scenario deals with Kinsoku information and the publish path in the HTML settings. If the user changes the Kinsoku information in a file, the file looks like (and potentially means) something different. This is in contrast to a user setting a new HTML publish path for their particular computer.

In a document sanitization scenario, users want to remove all non-necessary information from the file. A typical usage case would be posting a presentation to a company’s Internet site. In this case, you don’t want certain configuration information publicly available. The ideal manner of removal would be to remove an entire part from the presentation package as opposed to editing a part from a package.

Going back to our Kinsoku and HTML publish path example above, the Kinsoku information needs to remain with the file. The HTML publish path could give away internal information about web servers that could be used to facilitate an attack or, more likely, simply provide information about the author to the public (e.g., the path `c:\documents and settings\shawnv\webpages` strongly implies that “shawnv” published this document).

Going back to the original question—what presentation-level data goes in which part—we see that data that does not invalidate a digital signature or data that should be removed during a sanitization pass should be stored in the Presentation Properties part and other presentation-level data should be stored in the Presentation part.

In addition to structural and presentation-level data defined by this schema, there are also definitions for handling customer data and future extensibility. Again, both of these are addressed in additional papers.

L.3.1.3.1 Structural Information

From a structural information perspective, there are two sets of data defined in this schema: core lists and sizes.

The schema first defines a number of lists that serve as the foundation for most objects in the presentation. These lists are as follows:

- Slide IDs
- Slide Masters
- Notes Masters
- Handout Masters
- Custom Shows

It is essential that the reader fully understand the implementation of usage of these lists as they are the foundation for almost all solutions that operate—open, interrogate, modify, write—against the PresentationML file format.

As mentioned above, the lists are defined as a part of list entry and list complex types. The slide master list is defined as follows:

```
<xsd:complexType name="CT_SlideMasterIdListEntry">
  <xsd:attribute ref="r:id" use="required" />
</xsd:complexType>
<xsd:complexType name="CT_SlideMasterIdList">
  <xsd:sequence>
    <xsd:element name="sldMasterId" type="CT_SlideMasterIdListEntry"
      minOccurs="0" maxOccurs="unbounded" />
  </xsd:sequence>
</xsd:complexType>
```

Although not complex or difficult to understand, the lists are called out because they are vital to any solution.

The next pieces of structural information are the sizes for the slides and the notes slides. By storing this information at the presentation level, the implication is that all slides (or all notes slides) in a presentation have the same size. This further implies that all slides in a presentation share the same orientation (i.e., they are all landscape-oriented or all portrait-oriented).

L.3.1.3.2 Presentation-Level Properties

The presentation-level properties defined in this schema can be grouped into the following groupings:

- Text-Related
- Save-Related
- Editor-Related
- Content-Related

A description for each property within each group follows.

L.3.1.3.2.1 Text-Related Properties

The first property stores information related to the Kinsoku settings. Kinsoku settings define the list of characters that are not allowed to start or end a line of text for a given East Asian language.

The schema definition of the Kinsoku settings is relatively straightforward: identify the language, the set of start characters, and the set of end characters that do not afford breaking opportunities:

```
<xsd:complexType name="CT_Kinsoku">
  <xsd:attribute name="lang" type="xsd:string" use="optional">
</xsd:attribute>
  <xsd:attribute name="invalStChars" type="xsd:string" use="required">
</xsd:attribute>
  <xsd:attribute name="invalEndChars" type="xsd:string" use="required">
</xsd:attribute>
</xsd:complexType>
```

The second property stores a flag to use strict characters for starting and ending a line of Japanese text. Naturally, this is a simple Boolean attribute:

```
<xsd:attribute name="strictFirstAndLastChars"
  type="xsd:boolean" use="optional" default="true"/>
```

The final text-related property stores information related to any fonts that are embedded in the presentation. To do this, we need to store a list of embedded fonts that reference each part that stores font data (generally, there is a one-font-to-one-part mapping, although this is not a strict rule). This information is defined using three complex types:

```
<xsd:complexType name="CT_EmbeddedFontList">
  <xsd:sequence>
    <xsd:element name="embeddedFont" type="CT_EmbeddedFontListEntry"
      minOccurs="0" maxOccurs="unbounded" />
  </xsd:sequence>
</xsd:complexType>
```

```

<xsd:complexType name="CT_EmbeddedFontListEntry">
  <xsd:sequence>
    <xsd:element name="font" type="a:CT_TextFont" minOccurs="1"
      maxOccurs="1" />
    <xsd:element name="regular" type="CT_EmbeddedFontDataId"
      minOccurs="0" maxOccurs="1"/>
    <xsd:element name="bold" type="CT_EmbeddedFontDataId"
      minOccurs="0" maxOccurs="1"/>
    <xsd:element name="italic" type="CT_EmbeddedFontDataId"
      minOccurs="0" maxOccurs="1"/>
    <xsd:element name="boldItalic" type="CT_EmbeddedFontDataId"
      minOccurs="0" maxOccurs="1" />
  </xsd:sequence>
</xsd:complexType>
<xsd:complexType name="CT_EmbeddedFontDataId" >
  <xsd:attribute ref="r:id" use="required"/>
</xsd:complexType>

```

L.3.1.3.2.2 Save-Related Properties

There is a set of properties that indicate to the editor what should be saved as part of the presentation.

The first such property controls the inclusion of Personally Identifiable Information (“PII”). PII is any information that can be used to identify the author or contributor to a presentation. And while there are cases where this information is exposed visually to the user (e.g., author name in a comment shape), there are other cases where the information is not immediately evident to the user (e.g., the document author name in the list of document properties).

An implementation can provide a mechanism by which the author of a presentation can configure a file to always remove any PII that might otherwise be normally included during a regular save operation. While not a guarantee that no PII is stored in the file (e.g., consider a shape with my name in it—in some cases it describes content in the file [my position in my group’s organization chart] whereas in others it is an editorial directive [“check with ShawnV on this point”]). Given this ambiguity, we cannot solve all cases of this. As a result, this is more a convenience feature than a privacy management feature.

The second set of save-related properties has two groupings of properties. The first controls whether or not fonts are embedded into the package representing the presentation. The second, enabled by setting the first, allows an implementation to optimize such font embedding to keep the size minimal, at the cost of future editing on other machines.

```

<xsd:attribute name="embedTrueTypeFonts" type="xsd:boolean"
  use="optional" default="false"/>
<xsd:attribute name="saveSubsetFonts" type="xsd:boolean"
  use="optional" default="false"/>

```

The user scenario behind these properties is as follows. Assume you are putting together a presentation to distribute to external customers. You happen to use an East Asian font with an on-disk file size of around 5 megabytes.

Assuming that this font is not a standard font that is widely distributed, not including this font causes font substitution when the presentation is opened on machines that don't have a copy of the font. In any case, this can radically change the visual appearance of the presentation; in some cases, it can render the presentation unreadable.

Because you cannot afford the presentation to be unreadable or to look unprofessional, you decide to embed the font. By default, the implementation sets `embedTrueTypeFonts` to true and embeds the entire 5 megabyte font file in the presentation package. This clearly bloats the file, but ensures that anyone viewing or editing this file has the same font experience as you originally had (subject to licensing restrictions, of course).

Since you are distributing the presentation, and your primary purpose is for people to view the presentation, you can reduce the amount of font data embedded in the presentation package. By setting the second property (`saveSubsetFonts`) to true, only those characters in the font that were actually used to create the presentation are saved. This yields less font data stored in the file at the cost of not being able to use unused characters in future edits of the presentation on different machines.

The third property related to saving, controls whether or not an implementation can automatically compress pictures contained in the presentation. This is particularly important given the proliferation of digital cameras and scanners and the increasing importance of small files (e.g., to save network bandwidth, reduce storage required for mail and file servers, etc.).

The final property in this set specifies a password that is required to enable editing of the file using the implementation. Because this is a convenience feature intended to prevent accidental changes to information, it is stored in clear text as an `xsd:string`.

By storing this information in the file, the implementation prompts the user for this password in order to open the file read/write; if the user does not provide the correct modify password, the implementation opens the file read-only.

L.3.1.3.2.3 Editor-Related Properties

The presentation file itself contains data that provide configuration information for the implementation's editor.

For example, the presentation can define a set of smart tags for use while editing the particular presentation. Because Smart Tags are stored in a separate part, the presentation object contains the relationship ID of the Smart Tag part.

In a fully functioning OLE server, PresentationML objects can be embedded into OLE containers, during which time a customer can set a zoom scale. This is stored in the file as a percentage called `serverZoom`.

An internationalized application might support configuring the editor to respect different screen orientations. For example, in regions of the world where Complex Scripts are in use, it is customary to orient the screen right-to-left. As such, a presentation can request the editor reconfigure itself for such usage scenarios.

Finally, due to changes in the file format and functionality (e.g., graphics and text engines), PresentationML introduces some end-user complexity when working collaboratively with other customers using older versions. To help remedy this, an implementation might support a Compatibility Mode, which restricts the functionality exposed by the editor to optimize the output for the best cross-version collaboration story possible. As a result, each presentation needs to opt-into this mode.

L.3.1.3.2.4 Content-Related Properties

This set of properties is related to the actual content in the presentation.

End-users can define the starting slide number for numbered slides in each presentation. While it typically starts at one, the user can select any positive number to begin slide numbering. The primary user scenario is when compiling a mega-presentation that is a collection of multiple presentations. A secondary user scenario is when including a presentation in the middle of or at the end of a printed document where you want the slide/page numbers to continue.

Another content-related property controls whether or not header/footer placeholders are to be shown on title slides. In many cases users use special shapes called header and footer placeholder that contain built-in field codes that control the display of various sorts of information like the date/time and slide number.

In most cases, users like to keep their title slides as simple as possible (much like in the printed world where you want your first page to be clean and streamlined) and hence do not want data like date/times and slide numbers to show up on such slides. This attribute defines this presentation-wide.

The final property relates to creating photo albums. The implementation has a feature that allows the user to generate automatically a presentation based on a set of pictures. During this process, the user can select from a variety of settings, including, but not limited to, what pictures to include, the layout of the pictures on the slides (e.g., one picture per slide, two pictures per slide, etc.), what type of frame shape to use, etc. All of this information is stored in the presentation for future photo album creation.

L.3.1.4 Presentation Properties

Those properties that apply to the presentation as a whole, and that are likely to be removed during document sanitization, or are not going to invalidate a digital signature, are defined in the Presentation Properties part. These properties can be grouped into three primary groupings.

- HTML Publish Properties
- Print Properties
- Slide Show Properties
- View Properties

In addition to this grouping, there are properties that define a Most Recently Used (“MRU”) list of colors as well as providing for future extensibility. (The MRU is discussed in a DrawingML paper and the extensibility is discussed in a similar paper.)

L.3.1.4.1 HTML Publish Properties

An implementation must have the ability to save (and publish) a presentation to a web-friendly format like HTML or MHTML. Various parameters are used to configure the application for saving such formats as well as to control what content gets generated. The parameters that configure the application are the HTML Publish properties whereas the content properties are the Web Properties.

The HTML Publish properties provide the author with the ability to control what content gets displayed in the browser when the resulting file—either HTML or MHTML—is viewed using that kind of an application. For example, the speaker notes can either be displayed in the frameset or can be hidden from view. This is particularly useful when a speaker’s notes are not necessarily in a customer-ready format. It’s useful but not necessarily secure.

The author can also specify the title to be displayed in the browser. Although this defaults to the actual file name, or if that is missing, to the content of the first slide’s title placeholder, it can be overridden by the author.

Finally the author can specify a publish path to use when saving this file in this format. This is particularly useful for two reasons.

First, because there is a transformation happening, it sometimes takes a few iterations of publishing to get the browser-based experience to be exactly what you want. A classic example of this is the differing animation capabilities between the implementation and certain browsers: it is important to verify that the change in animation behavior continues to work after publishing; if you are not satisfied with the experience, sometimes you need to change the animation in the implementation and republish.

The second reason storing the path is useful is that web server paths can be cumbersome and are often not on the tip of each user’s tongue. This allows the user to specify the path once and then publish using the same location without having to re-specify it. Naturally, being stored in the file format, this allows this data to persist across session.

Indirectly, the HTML Publish properties can prime the Web Properties by defining a target web browser generation (i.e., third, fourth or third and fourth). This is done by setting the appropriate `ST_HtmlPublishWebBrowserSupport` attribute:

```
<xsd:complexType name="CT_HtmlPublishProperties">
  <xsd:sequence>
    <xsd:group ref="EG_SlideListChoice" minOccurs="1" maxOccurs="1">
      </xsd:group>
    </xsd:sequence>
```

```

<xsd:attribute name="showSpeakerNotes" type="xsd:boolean"
  use="optional" default="true" />
<xsd:attribute name="pubBrowser"
  type="ST_HtmlPublishWebBrowserSupport"
  use="optional" default="v3v4" />
<xsd:attribute name="title" type="xsd:string" use="optional"
  default="">
</xsd:attribute>
  <xsd:attribute ref="r:id" use="required">
</xsd:attribute>
</xsd:complexType>

```

By providing a target generation, the Web Properties are set to a predefined package defined for the specified browser generation. Naturally, the user can override the individual Web Property settings.

L.3.1.4.1.1 Web Properties

As mentioned in the previous subclause, these properties configure the output of the presentation when saved using the HTML or MHTML formats. In this case, a number of parameters can be controlled.

In all multi-slide cases where the presentation is saved using one of these formats, the implementation creates a frameset to bring the various parts of a presentation—the slide content, the speaker notes and the outline—together as well as provide for simple navigation. The color of the HTML frames, the background used and the user interface controls can be controlled to leverage browser settings, use high contrast, etc.

The author can also control how much interactivity is exposed in the resulting output. For example, the user might elect to disable slide animations and transitions and opt for a more static presentation. Similarly, the author might elect to disable certain scripting features like the ability to resize dynamically the output to match the size of the browser window.

Somewhat related to this is the ability to specify the target screen size which is especially important when targeting the earlier browser generations or user environments where features like JavaScript are disabled.

For an internationalized implementation, there is the ability to control the encoding of text used in the generation of the HTML or MHTML output.

Finally there are a set of parameters that configure the on-disk storage of the resulting output. For example, if the customer knows something about the machine configurations of her audience, she can opt to use better raster graphic formats like PNG that support alpha transparency or elect to include Vector Markup Language (“VML”) representations only for vector images.

The customer can also provide some indication as to how the output is used. If the customer knows that the output is used like regular files (perhaps passed around on CDs or moved between file shares) the user can elect to store the files in a folder to ensure that a straggling file is not lost; if, however, the

target scenario is to put the files on a web server, the user can skip the folder and save the individual files in a flat directory. Similarly, if the customer knows that they are using a web server that only handles “8.3” file names, they can configure the implementation to generate files using names that are “8.3” compliant, as opposed to using long file names that might otherwise cause such web servers problems.

L.3.1.4.2 Print Options Properties

There is also a set of properties that control the default print behavior for a presentation. The inclusion of this information in the file format simply primes the Print dialog when this presentation is used. It does not force options nor does it represent the last-used set of print options for a presentation.

Using these properties, the author can control the output printed. For example, in some cases, authors need to print their slides (one slide per printed page) while in other cases, they want to provide printed handouts for the audience on which to take their own notes (handout pages that can contain anywhere from three to nine slides per printed page, as well as option lines for note taking). In other cases, the author would like to print out notes where each printed page has one slide (anchored at the top) and a text box (anchored at the bottom) with the speaker notes included or simply print the textual outline of the presentation.

The author can also control whether or not hidden slides are included in the printed output, as well as whether or not the output is sent to the printer in color, in grayscale, or in pure black and white.

There is also a set of properties that the author can set that determine if slides are framed on the printed page, if the slides are scaled up to the printed page (e.g., consider non 4x3 aspect ratio slides), etc.

L.3.1.4.3 Slide Show Properties

This set of presentation-level properties controls the default slide show.

Among the parameters that can be controlled is one that defines the type of slide show. Generally, the classic slide show is characterized by a presenter presenting the presentation to an audience. The presenter controls the flow of the presentation, etc. This is referred to as a “present” slide show. In some cases, however, the presentation is distributed and individuals walk themselves through the slide show. This is referred to as a “browse” slide show. Finally, there are cases where a slide show is prepackaged and used as a kiosk; naturally, it is referred to as a “kiosk” slide show.

Furthermore, the customer can control which slides are to be included in the slide show, what color the pen should be, etc.

Finally, the customer can control various interactivity settings that are to be used for the slide show. This provides the customer the ability to configure their slide show outside the typical settings for a particular slide show type. For example, the user can create a slide show that has a pre-configured animation built with timings (i.e., the time between particular builds or the time between slide transitions), even though she is going to be presenting the content to an audience.

L.3.1.4.4 View Properties

The View Properties part defines the properties on all of the views found in the implementation.

PresentationML currently supports the following views:

- Slide View
- Slide Master View
- Notes View
- Handout View
- Notes Master View
- Outline View
- Slide Sorter View

Additionally, the default view, Normal View, is a composite view that pulls from three multiple view property sets.

In general, there is a significant amount of commonality among views. For example, each view contains four common components:

Scale	The zoom scale for the view
Origin	The origin of the view
Variable Scaling	A special zoom scale that configures the application to fit the content of the view into whatever view size is provided
Draft Mode	Controls whether or not a view is in draft mode which is a mode designed to provide the fastest editing/redraw possible by dropping properties like font face, certain colors, pictures, etc.

For those views based on a slide (e.g., slide master view) there are additional common components:

Guide List	Represents the list of drawing guides for this view
Guide Properties	Represents guide properties like direction and position of each guide in the view
Guide Settings	Determines if guides should be shown for this view
Snap Settings	Determines if shapes should be snapped to the grid and/or snapped to other shapes for this view

L.3.2 Slides, Masters, Layouts, and Placeholders

L.3.2.1 Introduction

This subclause provides a high-level overview of the content in the Slide Part.

The important aspects of the PresentationML Slides file format are introduced in the following order.

- Masters
- Presentation Slide
- Slide Notes
- Slide Layouts

This subclause provides a structured introduction to the slides portion of the PresentationML file format. Other subclauses build on this foundation and explain more about topics such as animation, comments, and the presentation object.

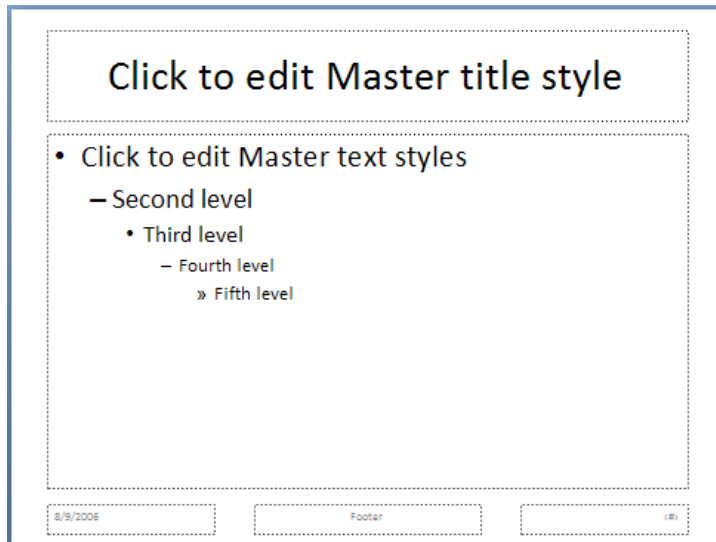
L.3.2.2 Masters

For slides the notion of hierarchy and inheritance applies. A master represents a common layout for the page type in question. For instance, if a slide master had a background set to a gradient fill then all slides referencing to that slide master would have the same background. In addition to setting common attributes of the slides such as background and styling information, the slide master also provides numerous layouts within itself in order to make a presentation that both follows a layout theme and incorporates a high level of variety. The variety is supported through slide layouts which are discussed in a later subclause.

L.3.2.2.1 Slide Master

A *slide master* is a master that is tied specifically to presentation slides. The presentation slides are those that are shown during a presentation. These are discussed in more detail in a later section on the Presentation Slide. Within a slide master are some common structural elements that should be understood, namely:

- *Common Data* - Common properties that are inherited by the other slides as well as layout information for presentation slides based on the master slide.
- *Header and Footer* - Header and footer properties for the presentation slides to inherit.
- *Color Map* - Color Mapping for the presentation slides to inherit.
- *Text Styles* - Text Styling information to be used within each placeholder on a presentation slide.
- *Slide Layout List* - A list of slide layouts that provide the variety needed within any presentation. These are applied to a presentation slide which inherits both the layout of the slide layout in addition to the slide design of the slide master.
- *Timing Information* - Common timing properties used for animation, controls, etc.
- *Transition Information* - Slide transitioning information to be inherited by each presentation slide.

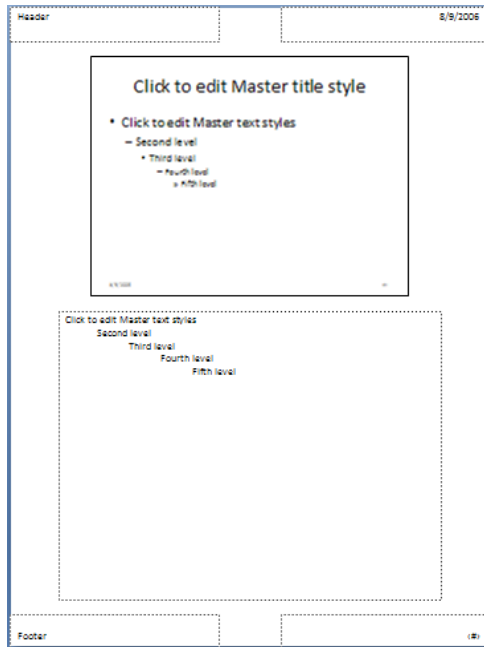


Slides inheriting information from a slide master do have the ability to specify properties that override those specified in the slide master.

L.3.2.2.2 Notes Master

A *notes master* is a master that specifies properties for slide notes pages. The notes page associated with a presentation slide stores a thumbnail of the presentation slide as well as the presenter's notes about the slide. These are discussed in more detail in a later section. Within a notes master the important common structural elements are:

- *Common Data* - Common properties that are inherited by other notes pages as well as the layout information for notes pages based on this master slide. The notes master serves as the pattern for all notes pages.
- *Color Map* - Color Mapping for the notes pages to inherit.

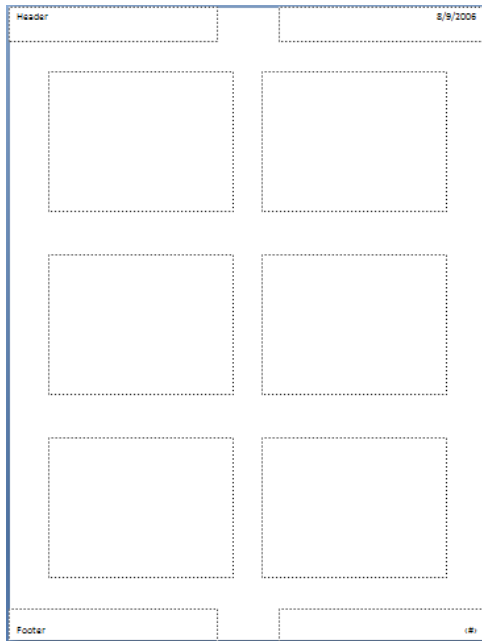


Notes pages inheriting information from a notes master do have the ability to specify properties that override those specified in the notes master.

L.3.2.2.3 Handout Master

A handout master determines the layout for all handout pages. The handout pages consist of a place to store a thumbnail of each slide with additional elements such as header, footer or graphical information. These are discussed in more detail in a later section. Within a handout master are some common structural elements that should be understood, namely the following.

- *Common Slide Data* - Common properties and layout information that are used by all handout pages. The handout master represents how each handout page looks.
- *Header and Footer* - Header and footer properties for all handout pages.
- *Color Map* - Color Mapping for all handout pages.

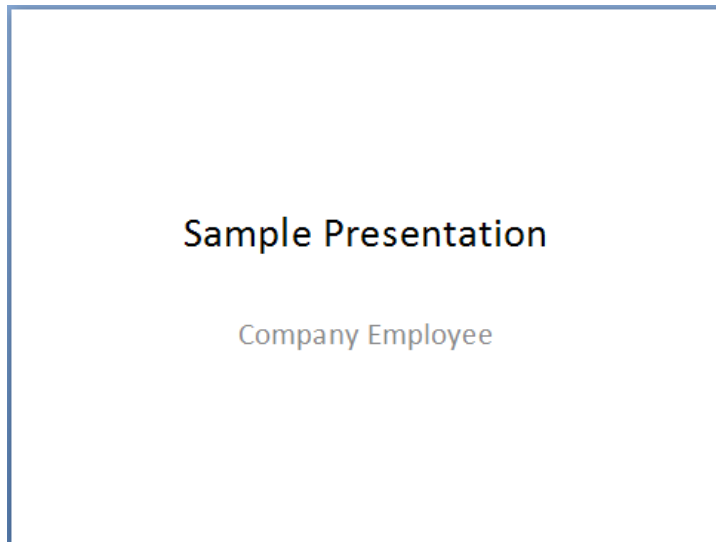


L.3.2.3 Presentation Slide

A presentation slide is a slide that inherits slide properties from the corresponding slide master and layout information from the corresponding slide layout. Each presentation slide has the ability to override any of this information that it chooses by specifying local attribute values within the presentation slide. Much like the master slide, the presentation slide contains some common structural elements, namely the following.

- *Common Slide Data* - Common properties and layout information for this presentation slide. Properties listed here that conflict with existing elements specified in the slide master override those specified in the slide master.
- *Color Map Override* - Color Mapping that overrides the inherited color mapping for this presentation slide.
- *Timing Information* - Common timing properties used for animation, controls, etc.
- *Transition Information* - Slide transitioning information for this presentation slide.

The above list defines the areas that can be used to override inherited components from the master slide and the layout slide. That is, these can be specifically defined on a per-slide basis via the above elements.

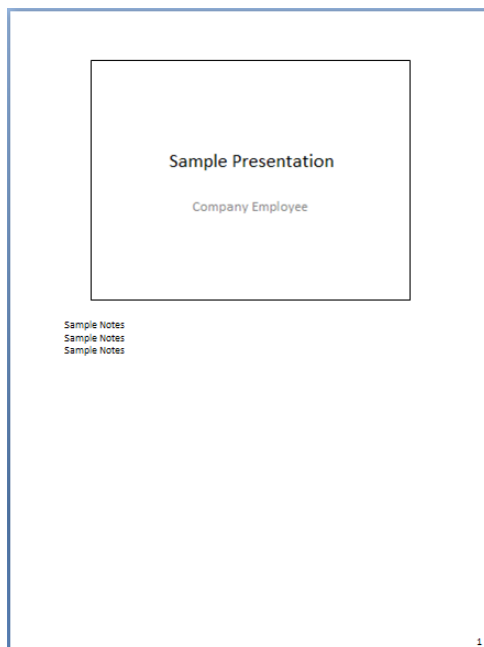


L.3.2.4 Notes Page

A notes page inherits slide properties from the corresponding notes master. The initial layout for a notes page is defined by the single notes master slide. Each notes page has the ability to override any of this information that it chooses by specifying local attribute values within the notes slide. Much like the notes master, the notes page contains some common structural elements, namely the following.

- *Common Slide Data* - Common properties and layout information for this notes page.
- *Color Map Override* - Color Mapping to override the inherited color mapping for this notes page.

The above list defines the areas that can be used to override inherited components from the notes master. That is, these can be specifically defined on a per-slide basis via the above elements.



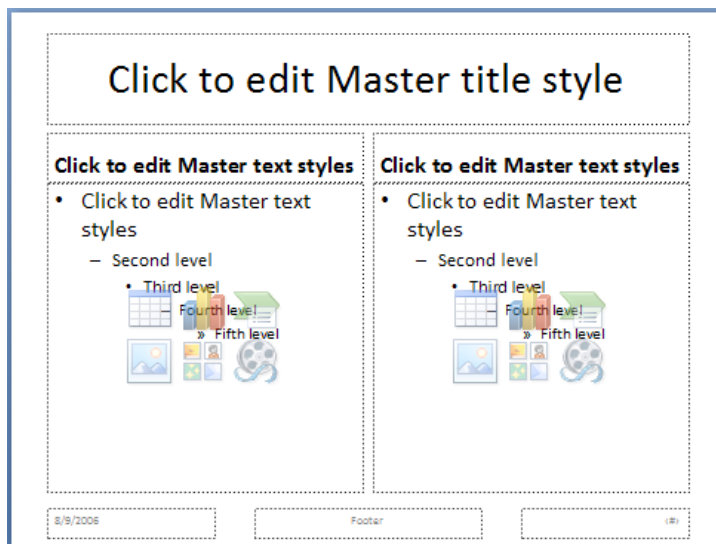
L.3.2.5 Slide Layouts

A *slide layout* inherits slide properties from the corresponding slide master and sets layout information for all presentation slides that utilize this layout. Each presentation slide has the ability to override any of this information that it chooses by specifying local attribute values within the presentation slide.

Much like the slide master, the slide layout contains some common structural elements:

- *Common Slide Data* - Common properties and layout information that override properties set within the slide master but are inherited by all presentation slides that utilize this layout.
- *Color Map Override* - Color Mapping that overrides the inherited color mapping from the slide master but is inherited by all presentation slides that utilize this layout.
- *Header and Footer* - Header and footer properties that override properties set within the slide master but are inherited by all presentation slides that utilize this layout.
- *Timing Information* - Common timing properties used for animation, controls, etc. These override properties set within the slide master but are inherited by all presentation slides that utilize this layout.
- *Transition Information* - Slide transitioning information to be inherited by each presentation slide. These override properties set within the master slide but are inherited by all presentation slides that utilize this layout

The above list defines the areas that can be used to override inherited components from the master slide. That is, these can be specifically defined on a per-layout basis via the above elements.



L.3.3 Comments

L.3.3.1 Introduction

This document describes the commenting feature for presentations as expressed in PresentationML..

Note that it is important to keep in mind that comments are not shapes. The representation of them within the document is left entirely up to the generating application and are thus implementation specific.

L.3.3.2 Functional Overview

Readers of a presentation can provide feedback to the presentation author in the form of *comments*. Comments can only be applied to slides; they cannot be applied to masters of any master type or to notes slides.

At first glance, comments appear to be shapes on the slide surface; however, they are not. Comments differ from regular shapes in two ways:

- Comments cannot be formatted or resized
- The text contained within a comment cannot be formatted

L.3.3.3 Comment Author List

Presentations contain a list of all authors who have comments in the presentation. This list is commonly referred to as the *Comment Author List* (CAL). The CAL contains one entry for each author. Each entry is made up of five pieces of data: ID, Author Name, Author Initials, Last Index, and Color Index.

Each author that comments on a presentation is assigned an ID, which is a simple integer. This ID is unique within the presentation, and is assigned by the application itself.

The Author Name and Author Initials are taken from the application itself. If no initials are known to the application, the comment author is prompted upon the insertion of the initial comment. Both the Author Name and Author Initials are simple strings; that is, there is no association of the values with an identity (from a security or authentication perspective).

The Last Index (*lastIdx*) is an integer that documents how many comments the associated author has made in this presentation. When the author makes another comment, that comment is numbered using the next integer, and then this value is updated once again.

The Color Index (*clrIdx*) is an integer into a color table that is used to provide the solid background fill for the comment shape. The utility that this provides is that all of the comments by a particular author share the same color.

Here is an example of such a CAL:

```
<p:cmAuthorLst>
  <p:cmAuthor id="0" name="Shawn" initials="SV" lastIdx="3" clrIdx="0" />
  <p:cmAuthor id="1" name="Brian" initials="BJ" lastIdx="7" clrIdx="1" />
</p:cmAuthorLst>
```

To determine if an author is already in the CAL, one must consider only the Author Name and Author Initials data. If they both match an entry in the CAL, the author is already considered to be in the CAL; otherwise, the author is considered unique, and a separate entry is added for that author in the CAL.

When the presentation is saved using PresentationML, a separate Comment Authors part is created that contains the CAL.

L.3.3.4 Comment List

Each slide within a presentation can contain zero or more comments. Each slide with at least one comment starts a list of comments for that slide. Each entry in that list is made up of the following pieces of data:

- Author ID: This represents the ID of the author who created the comment. It matches an entry in the CAL.
- Date/Time: This represents the date and time of the last modification of this particular comment. Although expressed in UTC, its accuracy is dependent on the state of the machine making the edits.
- Index: This is the number assigned to this particular comment, and is one of the comments associated with the specified author. This number should be equal to, or less than, the Last Index value for the author in the CAL. There cannot be duplicate Indexes for the same author.
- Position: This defines the 2D coordinate for the location at which the comment shows up on the slide surface. This is the position of the upper left point of the comment shape.
- The Text data includes all of the text that makes up the body of the comment. Note that this text is expressed differently than other text as expressed in DrawingML. As this text contains no formatting, and is strictly limited to text input, there is no additional data that needs to be stored.

Here is an example of a comment list for a slide:

```
<p:cmLst>
  <p:cm authorId="0" dt="2006-01-30T22:45:13.597" idx="3">
    <p:pos x="10" y="10" />
    <p:text>Need to check with Mary on exact data values</p:text>
  </p:cm>
  <p:cm authorId="1" dt="2006-01-30T22:46:22.082" idx="1">
    <p:pos x="106" y="106" />
    <p:text>This chart is hard to read from afar</p:text>
  </p:cm>
</p:cmLst>
```

When the presentation is saved using PresentationML, a separate Comments part is created for each comment list.

L.3.4 Animation

L.3.4.1 Introduction

This subclause provides a high-level overview of the animation settings in PresentationML. This schema is loosely based on the syntax and concepts from the Synchronized Multimedia Integration Language (SMIL), a W3C Recommendation for describing multimedia presentations using XML.

The schema describes all the animations effects on that reside on a slide; it also describes the animation that occurs when going from slide to slide (slide transition).

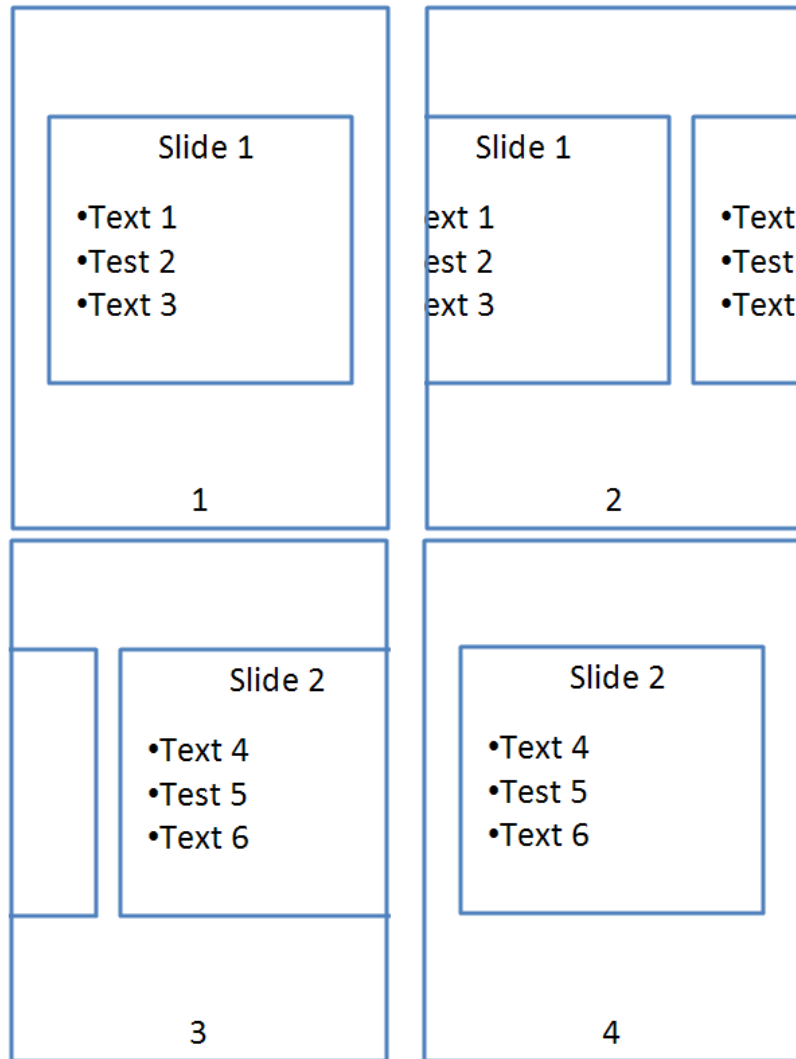
Animations on a slide are inherently time-based and consist of an animation effects on an object or text. However, slide transitions do not follow this concept and always appear before any animation on a slide.

All elements described in this schema are contained within the slide XML file. More specifically, they are in the transition and the timing element as shown below:

```
<p:sld>
  <p:cSld> ...
  <p:clrMapOvr> ...
  <p:transition> ...
  <p:timing> ...
</p:sld>
```

L.3.4.2 Slide Transitions

Slide transitions are the animation effects that displayed in between slides. They are specified in the transition element in the slide XML file. For example, consider a slide with a "push" slide transition as shown below:



The push element should be used as follows:

```
<p:transition>
  <p:push dir="r"/>
</p:transition>
```

L.3.4.3 Timeline Overview

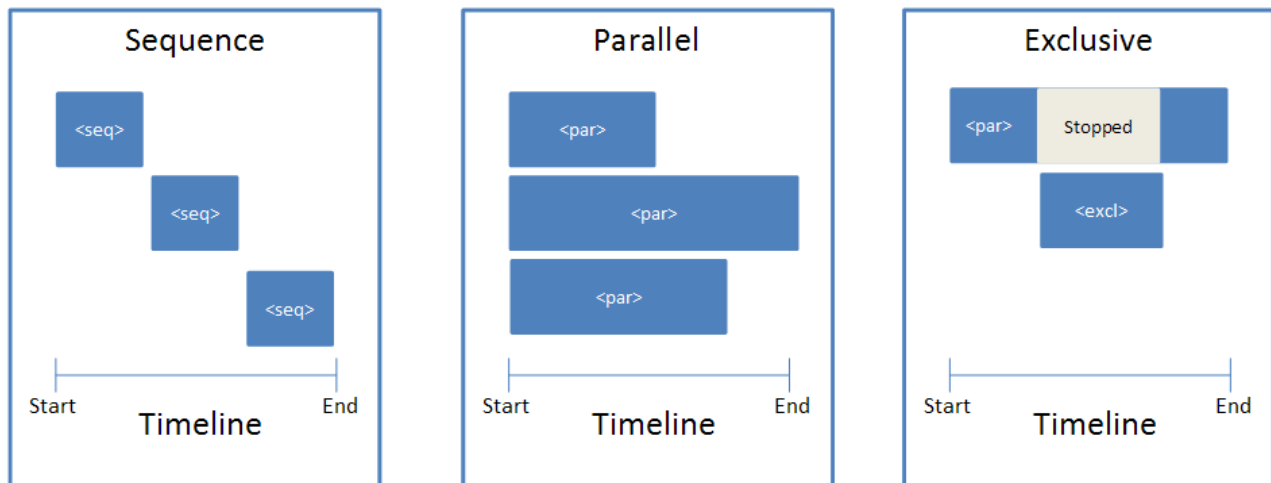
The timeline is an important aspect for animations on a slide. It moderates the amount of time that the animations are run from beginning to end. For example, it allows animation to be started when the slide is loaded or based on an event.

A timeline is composed of timing nodes that dictate at which point a certain animation is shown. A timeline can contain unlimited number of timing nodes; it can also have time nodes nested within them.

There are three types of time nodes:

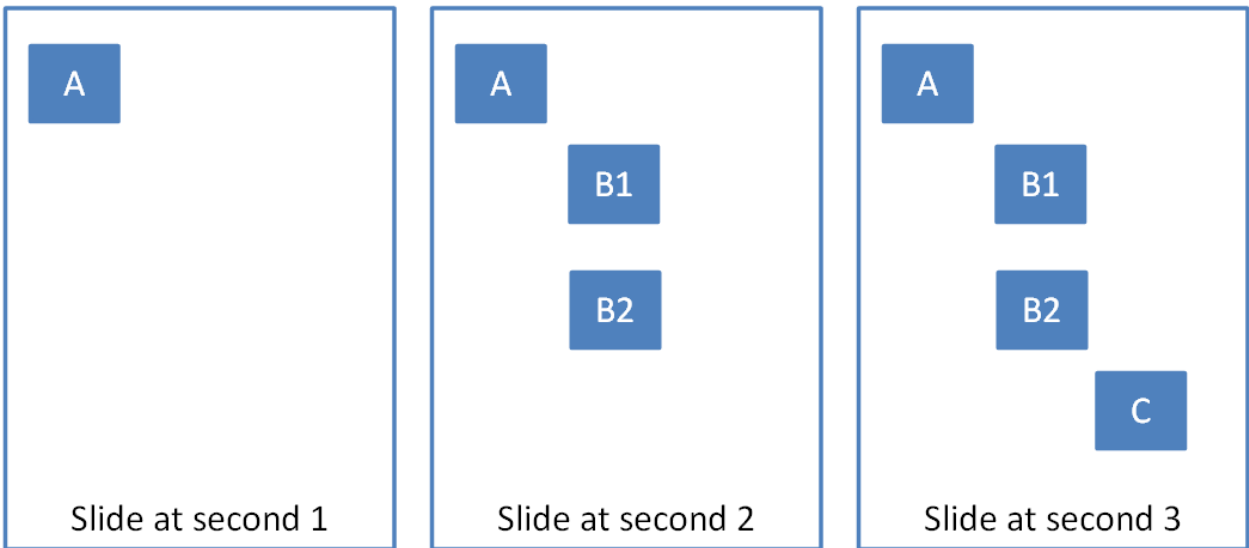
Element	Name	Description
par	Parallel	This is a parallel time node and can be activated along with other parallel time node containers.
seq	Sequence	This is a sequence time node and it can only be activated when the one before it finishes.
excl	Exclusive	This time node is used to pause all other timelines when it is activated.

A conceptual diagram of this is shown below:

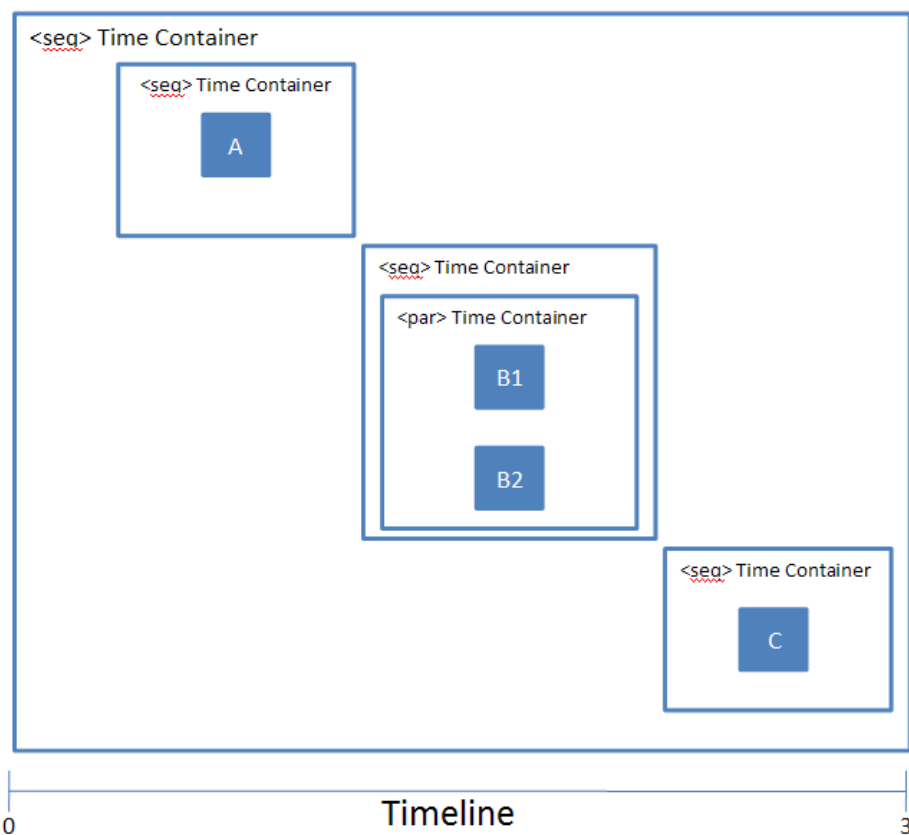


L.3.4.4 Timeline Construction

To illustrate what the timeline looks like in the slide XML file, suppose we have four rectangles named A, B1, B2, and C that appear on a timeline three seconds long. Rectangle A appears at second 1, B1 and B2 appear together at second 2, and C appears at second 3, as shown below:



The timeline and time containers could look something like:



A typical timeline consists of the following structure:

```

<p:timing>
  <p:tnLst>
    <p:seq concurrent="1" nextAc="seek">
      <p:stCondLst> ...
      <p:cTn id="2" dur="indefinite" nodeType="mainSeq">
        <p:childTnLst>
          <p:seq> ... // Square A
          <p:seq>
            <par>... // Square B1
            <par>... // Square B2
          </p:seq>
          <p:seq> ... // Square C
        </p:childTnLst>
      </p:cTn>
      <p:prevCondLst> ...
      <p:nextCondLst> ...
    </seq>
  </p:tnLst>
  <p:bldLst> ... </p:bldLst>
</p:timing>

```

As show, this timeline starts with a timing element that represents the timeline. Within this timeline, there is a child element tnList, which contains a list of time nodes.

In this case, there is one main timing container, which is the seq element. Within this element there are a three of conditional elements, namely stCondList, nextCondList, and prevCondList. These elements contain condition properties that allow for the starting/stopping of the particular time node. This is explained in more detail in §L.3.4.6.

Following the stCondList element is the cTn element, which describes the properties for this node. Within this element is the childTnList, which contains the nested time nodes that describe the animation sequence mentioned above.

Finally, we have the bldList element, which is used to specify how objects with sub-shapes should be animated. More information can be found in §L.3.4.7.

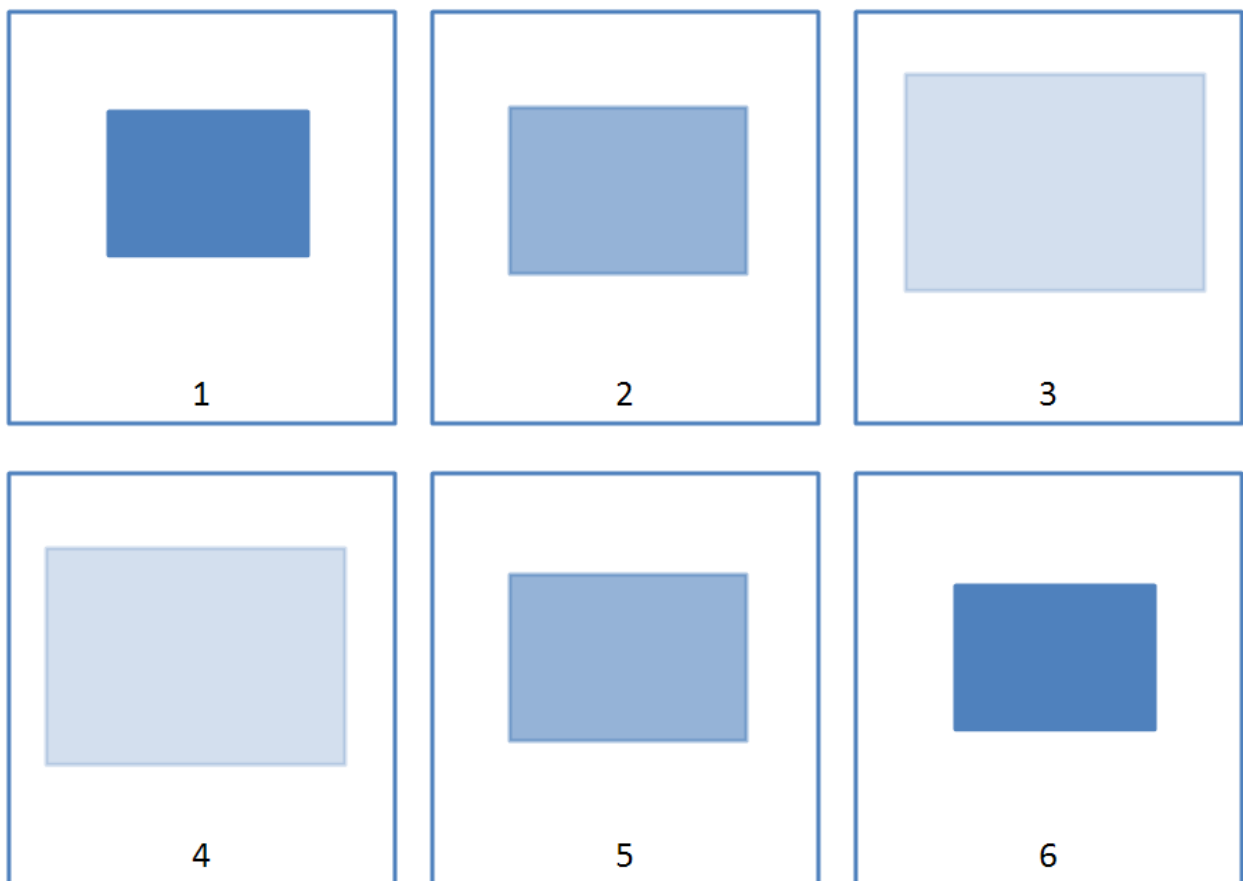
L.3.4.5 Animation Behaviors

All animation consists of the following basic animation behaviors:

Element	Name	Description
anim	Animate	The animate behavior introduces a generic attribute animation that requires no semantic understanding of the attribute being animated. It can animate numbers.
animColor	Animate Color	This behavior animates the color of a particular element.

Element	Name	Description
animEffect	Animate Effect	This behavior provides the ability to do image transform/filter effects on elements.
animMotion	Animate Motion	Animate motion provides an abstracted way to move positioned elements. It provides the ability to specify from/to/by type motion as well as to use more detailed path descriptions for motion over polylines or bezier curves.
animRotation	Animate Rotation	This behavior allows rotation of an element.
animScale	Animate Scale	Allows animation of the width and/or height of an element over time.

A time node can combine multiple animations for a range of effects. For example, the "flash bulb" animation which scales a shape larger while at the same time having it fade uses two animation behavior elements. An example is shown below:



The representation for this animation effect in the time node element appears like:


```

<p:par>
  <p:cTn id="5">
    <p:stCondLst>...
    <p:childTnLst>
      <p:animEffect transition="out" filter="fade"> ...
      <p:animScale>
        <p:cBhvr>
          <p:cTn id="7" dur="500" autoRev="1" fill="hold"/>
          <p:tgtEl>
            <p:spTgt spid="9"/>
          </p:tgtEl>
        </p:cBhvr>
        <p:by x="105000" y="105000"/>
      </p:animScale>
    </p:childTnLst>
  </p:cTn>
</p:par>

```

In this time node, we have two animation effects. One is creating a "fade" effect on the shape using the `animEffect` element and the other is creating a "scale" effect using the `animScale` element. All animation behaviors have a `cBhvr` and `cTn` element, which stores properties for the animation. For example, we can give the animation behaviors an ID and attributes that set the duration of the animation. The `spTgt` specifies the target shape to which this animation effect is applied.

L.3.4.6 Conditional Properties

Another important aspect of time nodes is conditional properties. There are four such conditions:

Element	Name	Description
<code>stCondLst</code>	Start Condition	Conditions that must be met for a time node to start.
<code>prevCondLst</code>	Previous Condition	Conditions that must be met for a time node to go back to the previous time node.
<code>nextCondLst</code>	Next Conditions	Conditions that must be met for a time node to advance to the next time node.
<code>endCondLst</code>	End Conditions	Conditions that must be met for a time node to end.

Conditional properties are useful for providing finer granularity as to exactly when a time node should be activated. For example, suppose we have a shape with an entrance appearance after five seconds. The `stCondLst` element should be used as follows:

```

<p:par>
  <p:cTn id="5">
    <p:stCondLst>
      <p:cond delay="5000"/>
    </p:stCondLst>
  </p:cTn>
</p:par>

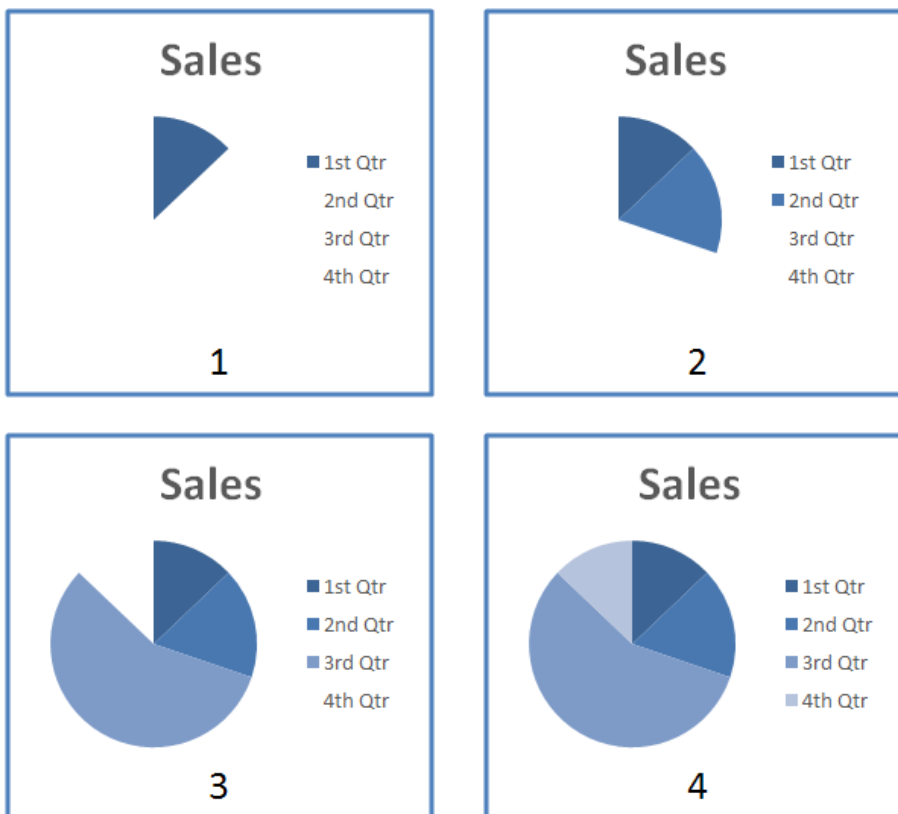
```

L.3.4.7 Build Animations

Another important aspect of animations is how they are built. This refers to how the different sub-shapes or sub-components of an object are displayed. The different objects that can have build properties are text, diagrams, and charts.

This is specified in the `bldLst` element.

For example, suppose we want to animate a pie chart, but based on category as shown below:



The representation of this in the slide XML looks like:

```

<p:bldLst>
  <p:bldGraphic spid="4" grpId="0">
    <p:bldSub>
      <a:bldChart bld="category"/>
    </p:bldSub>
  </p:bldGraphic>
</p:bldLst>

```

The bldLst element contains children elements that describe how the different objects should be built. In this case, there is only one graphic to be built, that with id 4. The bldGraphic element contains the bldSub element, which describes how the object should be built. This element then contains the bldChart element with the attribute bld set to category.

L.3.5 Slide Synchronization

This subclause provides an overview of the Slide Synchronization Data part and its contents..

L.3.5.1 Introduction

It is often the case that slides are repurposed from existing presentations to be used in other presentations. In such cases, it is often beneficial for there to be an association, or a pairing, between the original slide and all copied instances of it. In the presence of such a pairing, applications can enable a variety of time-saving features, including the automatic updates of copied slides when the original slide changes. The Slide Synchronization Data part is designed to enable such functionality.

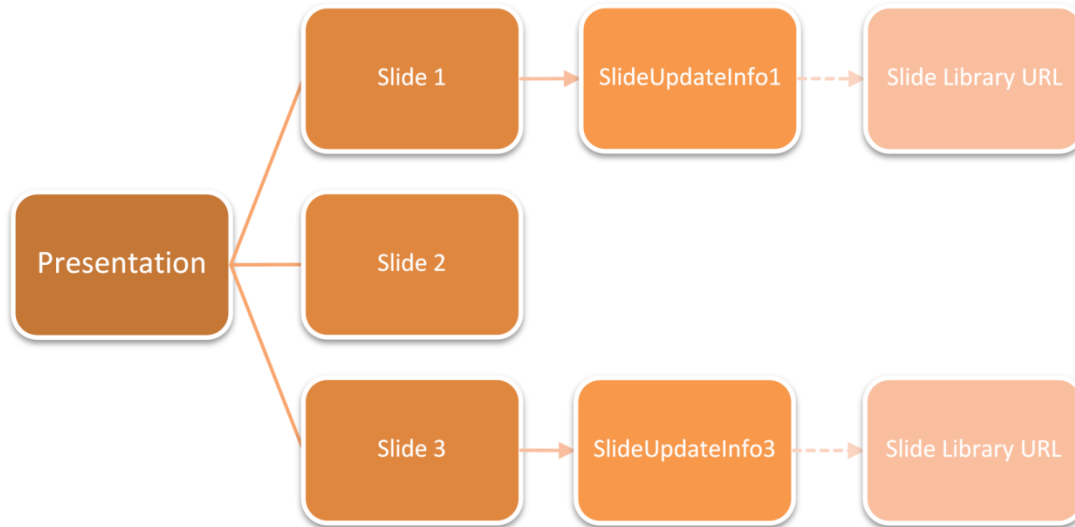
Conceptually, there are four components of this pairing:

- an external relationship that refers to where the original slide is stored;
- a unique identifier for the original slide;
- a date/time field that indicates when the slide in the current presentation was last updated; and,
- a date/time field that indicates when the original slide was last updated.

The intent behind these components is to provide a method of finding the original slide (i.e., the combination of the external relationship and the unique identifier) and to provide a trigger that an application can use to detect that the original slide has changed (i.e., differences between the two date/time fields).

L.3.5.2 Slide Update Info

For each slide in a presentation that is paired with an original slide, there is a corresponding Slide Synchronization Data part. The diagram below provides an overview of this relationship.



Each Slide Synchronization Data part is identified by an implicit relationship from the appropriate Slide part with the following characteristics:

Type: `http://.../slideUpdateInfo`
 TargetMode: Internal
 Target= "<Uri of the slideupdateinfo part for the slide>"

The content type of the update info part is `application/vnd.openxmlformats-officedocument.presentationml.slideUpdateInfo+xml`.

The Slide Synchronization Data part contains the aforementioned unique identifier and both date/time fields.

These Slide Synchronization Data :

parts themselves have an external relationship to the Slide Library Url from which the Slide was inserted.

Type: `http://.../slideLibraryUrl`
 TargetMode: External
 Target = "<Uri of the Slide Library>"

Every Slide Update Info part should have exactly one occurrence of this relationship.

Samples:

`slideupdateinfo1.xml`

```

<p:sldUpdatePr ... serverSldId="7991" serverSldModifiedTime="2006-03-
08T18:48:33"
  clientInsertedTime="2006-03-10T06:02:33.975" />
    
```

slideupdateinfo1.xml.rels

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
  <Relationships xmlns="http://.../relationships">
    <Relationship Id="rId1" Type="http://.../slideUpdateUrl
      Target="http://content/slides" TargetMode="External" />
  </Relationships>
```

L.4 Introduction to DrawingML

This clause contains a detailed introduction to the components of DrawingML.

L.4.1 Basics

L.4.1.1 EMU Unit of Measurement

Throughout ECMA-376, the EMU is used as a unit of measurement for length. An *EMU* is defined as follows:

$$1 \text{ emu} = \frac{1}{914400} \text{ US inch} = \frac{1}{360000} \text{ cm}$$

The EMU was created in order to be able to evenly divide in both English and Metric units, in order to avoid rounding errors during the calculation. The usage of EMUs also facilitates a more seamless system switch and interoperability between different locales utilizing different units of measurement. EMUs define an integer based, high precision coordinate system.

L.4.1.2 Introduction

This subclause provides a high-level overview of the content described in DrawingML. The aggregation of the elements within these schemas encompass what has been labeled the DrawingML – Basics sub-clause. That is, the elements contained here are considered to be commonly shared elements among the DrawingML framework.

L.4.1.3 Overview

This sub-clause is made up of four distinct pieces: Basic Elements, Colors, Compatibility, and Locked Canvas. Together these make up the common elements that are shared across the DrawingML framework. These elements are described below.

L.4.1.4 Basic Elements

When the common elements of the DrawingML framework are aggregated it can be seen that the most widely used elements are property elements. These reside within every object and allow for the setting of both visual and non-visual object-specific properties. The visual properties are those that affect the appearance of the object when it is rendered on the screen. The non-visual properties on the other hand, do not affect the object's appearance. Instead, these properties are used to store information normally hidden such as identification numbers, human readable names for the objects and specific behaviour that should be obeyed within the UI when manipulating the corresponding object.

L.4.1.5 Colors

The notion of color plays a vital role in the presentation of DrawingML objects within a document. Virtually all objects are specified to have a corresponding color or set of colors. The notion of color is a common one among graphically-inclined applications. Because of this and the fact that there are many different kinds of graphic objects available today, we introduce the notion of several different types of color models. The following color models can be used to specify color within a DrawingML based document.

1. RGB – Red, Green, Blue Color Model
2. HSL – Hue, Saturation, Luminance Color Model
3. Scheme – Scheme Based Color Model
4. Preset – Color Presets Color Model
5. System – Operating System Color Model

These different models allow document authors the choice as to which color model would be appropriate for their particular application. Each of these is detailed within the DrawingML Basics reference material.

L.4.1.6 Compatibility

Compatibility deals with the notion of legacy drawings. Legacy drawings are objects that were supported by previous versions of a generating application, but are no longer provided as an option. In order to store these drawing objects correctly, we introduce the notion of legacy drawing compatibility. This allows for the specification of information used to identify this legacy object and thus allow for full rendering support within current versions of the generating application.

L.4.1.7 Locked Canvas

Locked Canvas is a minor topic that is similar to compatibility in that it is used to render drawing objects that would otherwise not be recognized due to a lack of information. Locked Canvas, however, goes in the opposite direction from compatibility, and deals with objects that have been created and saved in the current version of a generating application and are being opened in a previous version of the generating application. The locked canvas element acts as a container for more advanced drawing objects. The notion of a locked canvas comes from the fact that the generating application opening the file cannot create this object and thus cannot perform edits either. Thus, the drawing object is locked from all UI adjustments that would normally take place.

L.4.2 Audio and Video

L.4.2.1 Introduction

DrawingML contains support for basic audio and video capabilities.

L.4.2.2 Functional Overview

Presentation authors can specify that both audio and video can play while a slide is shown in slide show. When such media is inserted into a presentation, a presentation author can specify that the media is to

play automatically (that is, in accordance with the slide's animation timeline) or in response to a mouse-click. In either case, media only plays for the duration of time specified, or until the slide changes, whichever is shorter.

Sources for audio content include CD-based files as well as the more traditional disc- or server-based files.

When inserting audio content stored on a CD, the author can specify a start and end track, as well as an index into each track. This information identifies the content from the CD to be played for the specified slide during a slide show.

In cases where the audio or video content is stored on a hard drive or server, the author can only specify the file itself; it is played in its entirety, or until the slide changes.

L.4.2.3 DrawingML Syntax

In all three cases, the media objects themselves are stored on the slides using a picture shape. The picture shape uses a blipFill to show the media object on the slide's surface. In both audio cases, the picture used is the icon image, whereas in the video case, the picture used is the poster frame for the video file.

To express this information, the standard blipFill element is used to refer to the image file; and because this refers to a file within the package, a relationship ID is used:

```
<p:pic>
  <p:nvPicPr> ...</p:nvPicPr>
  <p:blipFill>
    <a:blip r:embed="rId4" r:link="" />
    <a:stretch>
      <a:fillRect />
    </a:stretch>
  </p:blipFill>
  <p:spPr> ... </p:spPr>
</p:pic>
```

As the media objects are related to the slide's timeline—in both the automatic and mouse-click cases—they must have interactivity information stored in the form of a hyperlink.

To express this information, a hyperlink is added to the non-visual shape properties; and because it is a hyperlink, it, too, uses a relationship ID:

```

<p:pic>
  <p:nvPicPr>
    <p:cNvPr id="15" name="Rectangle 15" descr="">
      <a:hlinkClick r:id="rId3" tgtFrame="" tooltip="" />
    </p:cNvPr>
  <p:cNvPicPr />
  <p:nvPr> ... </p:nvPr>
</p:nvPicPr>
<p:blipFill> ... </p:blipFill>
<p:spPr> ... </p:spPr>
</p:pic>

```

The final piece of information required for each media type is the source bits. In both file-based media cases, DrawingML needs to provide a mechanism to specify the location and file name for the media; this is in contrast to the CD-based audio where only track information is required. Regardless of the type of source information required, all of this is stored in application-defined non-visual properties. This is illustrated in the following three XML islands representing each of the three media cases:

CD-Audio	<pre> <p:pic> <p:nvPicPr> ... <p:cNvPicPr /> <p:nvPr> <a:audioCd> <a:st track="2" time="50" /> <a:end track="3" time="22" /> </a:audioCd> </p:nvPr> ... </p:pic> </pre>
File-Audio	<pre> <p:pic> <p:nvPicPr> ... <p:cNvPicPr /> <p:nvPr> <a:audioFile r:embed="" r:link="rId1" /> </p:nvPr> </p:nvPicPr> ... </p:pic> </pre>
File-Video	<pre> <p:pic> <p:nvPicPr> ... <p:cNvPicPr /> <p:nvPr> <a:videoFile r:embed="" r:link="rId1" /> </p:nvPr> </p:nvPicPr> ... </p:pic> </pre>

In the CD-Audio case, there is no capability to choose the particular CD drive that contains the source. This is a functional limitation.

While the default case is that media is linked, file-based media can also have the source bits included in the package as a separate part. In this case, the relationships point not to an external file but, rather, to a part inside the package.

L.4.3 Styles

L.4.3.1 Introduction

This piece of DrawingML deals with the definition of the shared aspects contained within a document theme. The shared-style sheet defines an application-independent set of styling that can be applied to objects within a document and which affects the look of the document and the information and objects it contains. For example, in a presentation, shapes can have a certain look, whereas in an e-mail, all of the text can have certain properties, and headings are styled.

A second topic is the definition of a table style as used within DrawingML. A table style defines the look of a table regardless of the data present in that table.

L.4.3.2 Shared Style Sheet

The shared-style sheet within DrawingML is responsible for containing different formatting options and style options that can be used within a given document.

L.4.3.2.1 Theme

The theme is the root-level complex type associated with a shared-style sheet. This complex type holds all of the different formatting options available to a theme, and defines the overall look and feel of a document when themed objects are used within the document. In figure 1 below, we can see an example of two different themes applied to the same slide in a presentation.

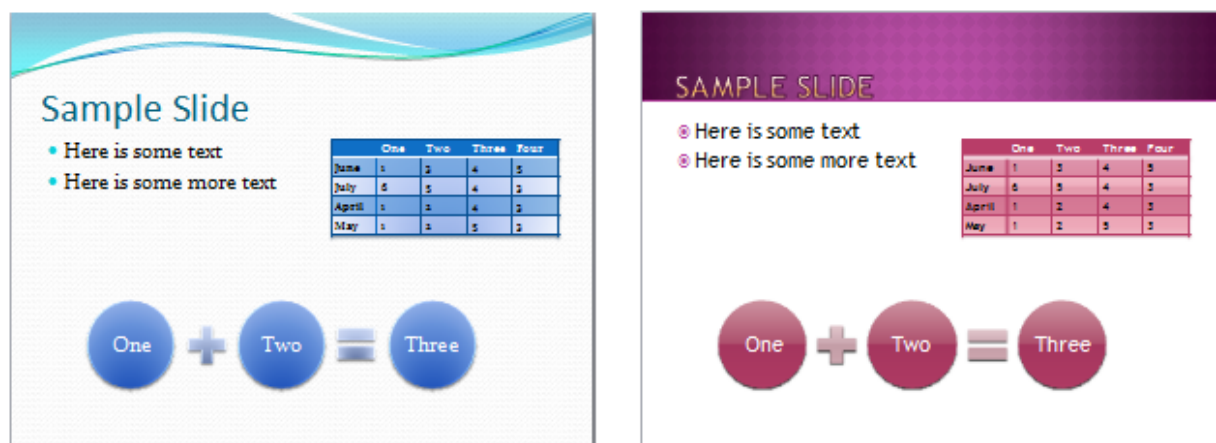


Figure 1: A theme applied to the same slide in a presentation. Not only does the font and colors change, but also the effects applied to the shapes and table.

A theme consists of four main parts, although the themeElements element is the piece that holds the main formatting defined within the theme. The other parts provide overrides, defaults, and additions to the information contained in themeElements. The complex type defining a theme, CT_OfficeStyleSheet, is defined in the following manner:

```
<complexType name="CT_OfficeStyleSheet">
  <sequence>
    <element name="themeElements" type="CT_BaseStyles" minOccurs="1"
      maxOccurs="1"/>
    <element name="objectDefaults" type="CT_ObjectStyleDefaults"
      minOccurs="0" maxOccurs="1"/>
    <element name="extraClrSchemeLst" type="CT_ColorSchemeList"
      minOccurs="0" maxOccurs="1"/>
    <element name="custClrLst" type="CT_CustomColorList" minOccurs="0"
      maxOccurs="1"/>
    <element name="extLst" type="CT_OfficeArtExtensionList"
      minOccurs="0" maxOccurs="1"/>
  </sequence>
  <attribute name="name" type="xsd:string" use="optional" default=""/>
</complexType>
```

This complex type also holds a CT_OfficeArtExtensionList, which is used for future extensibility of this complex type.

L.4.3.2.2 Theme Elements

The complex type CT_BaseStyles defines the theme elements for a theme, and is the workhorse of the theme. The bulk of the shared theme information that is used by a given document is defined here. Within this complex type is defined a color scheme, a font scheme, and a style matrix (format scheme) that defines different formatting options for different pieces of a document. The complex type CT_BaseStyles is defined in the following manner:

```
<complexType name="CT_BaseStyles">
  <sequence>
    <element name="clrScheme" type="CT_ColorScheme" minOccurs="1"
      maxOccurs="1"/>
    <element name="fontScheme" type="CT_FontScheme" minOccurs="1"
      maxOccurs="1"/>
    <element name="fmtScheme" type="CT_StyleMatrix" minOccurs="1"
      maxOccurs="1"/>
    <element name="extLst" type="CT_OfficeArtExtensionList"
      minOccurs="0" maxOccurs="1"/>
  </sequence>
</complexType>
```

L.4.3.2.3 Color Scheme

The complex type CT_ColorScheme defines a set of colors for the theme. The set of colors consists of twelve color slots that can each hold a color of choice. The colors are organized in the following way:

- Dark 1 (dk1) – This represents a dark color, usually defined as a system text color
- Light 1 (lt1) – This represents a light color, usually defined as the system window color
- Dark 2 (dk2) – This represents a second dark color for use
- Light 2 (lt2) – This represents a second light color for use
- Accents 1 through 6 (accent1 through accent6) – These are six colors which can be used as accent colors in the theme
- Hyperlink (hlink) – The color of hyperlinks
- Followed Hyperlink (folHlink) – The color of a followed hyperlink

These colors define the theme colors that objects can utilize within a document. When an object uses a theme color, the color of the object can change when the theme is changed, but always maps to accent 1 if that were the theme color used by the object. An example of theme colors defined and used can be seen in figure 2.

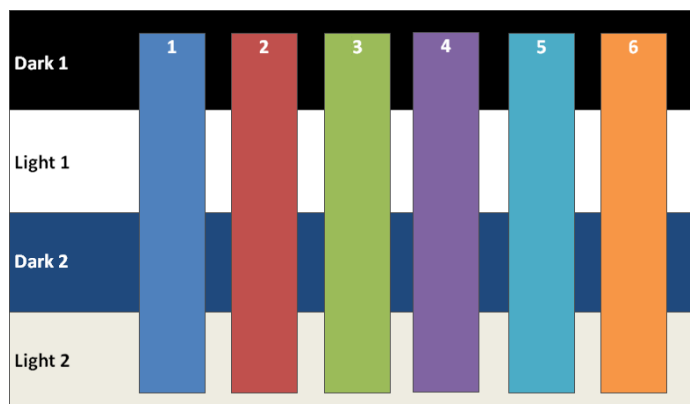


Figure 2: Sample colors defined and used for dark1/2, light1/2, and the six accent colors.

The complex type CT_ColorScheme is defined in the following manner:

```
<complexType name="CT_ColorScheme">
  <sequence>
    <element name="dk1" type="CT_Color" minOccurs="1" maxOccurs="1"/>
    <element name="lt1" type="CT_Color" minOccurs="1" maxOccurs="1"/>
    <element name="dk2" type="CT_Color" minOccurs="1" maxOccurs="1"/>
    <element name="lt2" type="CT_Color" minOccurs="1" maxOccurs="1"/>
    <element name="accent1" type="CT_Color" minOccurs="1"
      maxOccurs="1"/>
```

```

    <element name="accent2" type="CT_Color" minOccurs="1"
      maxOccurs="1"/>
    <element name="accent3" type="CT_Color" minOccurs="1"
      maxOccurs="1"/>
    <element name="accent4" type="CT_Color" minOccurs="1"
      maxOccurs="1"/>
    <element name="accent5" type="CT_Color" minOccurs="1"
      maxOccurs="1"/>
    <element name="accent6" type="CT_Color" minOccurs="1"
      maxOccurs="1"/>
    <element name="hlink" type="CT_Color" minOccurs="1" maxOccurs="1"/>
    <element name="folHlink" type="CT_Color" minOccurs="1"
      maxOccurs="1"/>
    <element name="extLst" type="CT_OfficeArtExtensionList"
      minOccurs="0" maxOccurs="1"/>
  </sequence>
  <attribute name="name" type="xsd:string" use="required"/>
</complexType>

```

L.4.3.2.4 Font Scheme

The complex type CT_FontScheme defines a font pair. The pair consists of a major font and a minor font. An example of use would be the major font used in headings for a document and the minor font used for the paragraph parts of a document. The major and minor fonts are defined through a collection of font faces defined on a per-language basis. For example, one can define only a Latin-based font, or one can define many different fonts for different locals for a major or minor font. The font used in the document depends on the user's language.

The complex type CT_FontScheme is defined in the following manner:

```

<complexType name="CT_FontScheme">
  <sequence>
    <element name="majorFont" type="CT_FontCollection" minOccurs="1"
      maxOccurs="1"/>
    <element name="minorFont" type="CT_FontCollection" minOccurs="1"
      maxOccurs="1"/>
    <element name="extLst" type="CT_OfficeArtExtensionList"
      minOccurs="0" maxOccurs="1"/>
  </sequence>
  <attribute name="name" type="xsd:string" use="required"/>
</complexType>

```

L.4.3.2.5 Major and Minor Font (Font Collection)

The complex type CT_FontCollection defines a major and minor font which is used in the font scheme. A font collection consists of a font definition for Latin, East Asian, and complex script. On top of these three definitions, one can also define a font for use in a specific language or languages.

The complex type CT_FontCollection is defined in the following manner:

```
<complexType name="CT_FontCollection">
  <sequence>
    <element name="latin" type="CT_TextFont" minOccurs="1"
      maxOccurs="1"/>
    <element name="ea" type="CT_TextFont" minOccurs="1" maxOccurs="1"/>
    <element name="cs" type="CT_TextFont" minOccurs="1" maxOccurs="1"/>
    <element name="font" type="CT_SupplementalFont" minOccurs="0"
      maxOccurs="unbounded"/>
    <element name="extLst" type="CT_OfficeArtExtensionList"
      minOccurs="0" maxOccurs="1"/>
  </sequence>
</complexType>
```

L.4.3.2.6 Supplemental Font

The complex type CT_SupplementalFont defines an additional font that is used for language specific fonts in themes. For example, one can specify a font that gets used only within the Japanese language context.

The complex type CT_SupplementalFont is defined in the following manner:

```
<complexType name="CT_SupplementalFont">
  <attribute name="script" type="xsd:string" use="required"/>
  <attribute name="typeface" type="ST_TextTypeface" use="required"/>
</complexType>
```

L.4.3.2.7 Format Scheme (Style Matrix)

The complex type CT_StyleMatrix defines a set of formatting options, which can be referenced by documents that apply a certain style to a given part of an object. For example, in a given shape, say a rectangle, one can reference a themed line style, themed effect, and themed fill that would be theme specific and change when the theme is changed. All of these formatting options are defined within this style matrix. Background fills can also be contained within the style matrix. This is most useful to presentations (but not unique to presentations) which reference different background fills as slide backgrounds. Three sets of each type of formatting are defined, corresponding to subtle, moderate, and intense versions of each style. Combinations of styles are used to create, for example a shape style. An example of this would be a shape style utilizing a subtle fill, moderate line, and intense effect to define the overall look of a shape.

The complex type CT_StyleMatrix is defined in the following manner:

```
<complexType name="CT_StyleMatrix">
  <sequence>
    <element name="fillStyleLst" type="CT_FillStyleList" minOccurs="1"
      maxOccurs="1"/>
    <element name="lnStyleLst" type="CT_LineStyleList" minOccurs="1"
      maxOccurs="1"/>
    <element name="effectStyleLst" type="CT_EffectStyleList"
      minOccurs="1" maxOccurs="1"/>
    <element name="bgFillStyleLst" type="CT_BackgroundFillStyleList"
      minOccurs="1" maxOccurs="1"/>
  </sequence>
  <attribute name="name" type="xsd:string" use="optional" default=""/>
</complexType>
```

L.4.3.2.8 Fill Style List

The complex type CT_FillStyleList defines a set of three fill types. Currently, only three fill types are used, corresponding to subtle, moderate, and intense fills, but the number of fills that can be defined is unbounded. An example of three fills that could be present can be seen in figure 3. In this figure, we have a solid blue fill in the subtle slot, a gradient fill in the moderate slot, and an image fill in the intense slot.



Figure 3: Three different fills increasing in relative intensity.

The complex type CT_FillStyleList is defined in the following manner:

```
<complexType name="CT_FillStyleList">
  <sequence>
    <group ref="EG_FillProperties" minOccurs="3" maxOccurs="unbounded"/>
  </sequence>
</complexType>
```

L.4.3.2.9 Line Style List

The complex type CT_LineStyleList defines a set of three line styles. As with the fill style list, currently only three styles are utilized corresponding to a subtle line, moderate line, and intense line.

The complex type CT_LineStyleList is defined in the following manner:

```
<complexType name="CT_LineStyleList">
  <sequence>
    <element name="ln" type="CT_LineProperties" minOccurs="3"
      maxOccurs="unbounded"/>
  </sequence>
</complexType>
```

L.4.3.2.10 Effect Style List

The complex type CT_EffectStyleList defines a set of three effect styles. As with the previously mentioned style lists, three styles are currently utilized corresponding to subtle, moderate, and intense effect styles, but the list remains unbounded. In figure 4 we see subtle, moderate, and intense effects applied to a given shape with a blue fill. The subtle effect is, basically, no effect, whereas the moderate effect is a glow surrounding the shape, and the intense effect is a 3-D bevel along with a shadow applied to the shape.

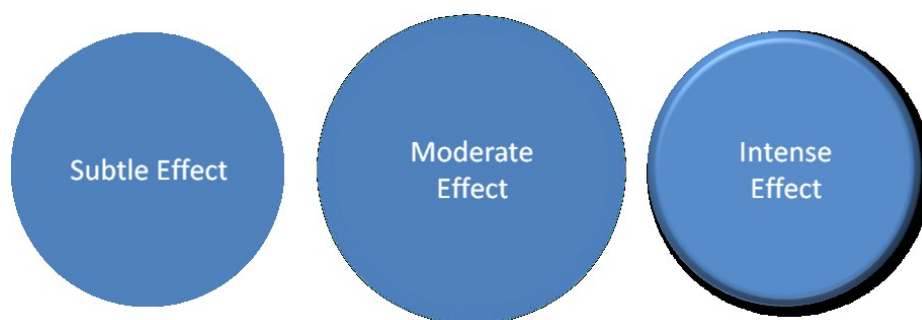


Figure 4: Subtle, moderate, and intense effects applied to a shape that has a blue fill.

The complex type CT_EffectStyleList is defined in the following manner:

```
<complexType name="CT_EffectStyleList">
  <sequence>
    <element name="effectStyle" type="CT_EffectStyleItem" minOccurs="3"
      maxOccurs="unbounded"/>
  </sequence>
</complexType>
```

L.4.3.2.11 Effect Style Item

The complex type CT_EffectStyleItem holds the properties for a given effect style. Within this complex type, one can define a list of effects (blur, shadow, reflection, etc.) along with any 3-D properties that are to be applied to an object. A basic example of how effects can be applied to a shape can be seen in figure 4.

The complex type CT_EffectStyleItem is defined in the following manner:

```

<complexType name="CT_EffectStyleItem">
  <sequence>
    <group ref="EG_EffectProperties" minOccurs="1" maxOccurs="1"/>
    <element name="scene3d" type="CT_Scene3D" minOccurs="0"
      maxOccurs="1"/>
    <element name="sp3d" type="CT_Shape3D" minOccurs="0" maxOccurs="1"/>
  </sequence>
</complexType>

```

L.4.3.2.12 Background Fill Style List

The complex type CT_BackgroundFillStyleList defines a set of three fill types similar to the fill style list. Again, they define three fill types corresponding to subtle, moderate, and intense background fills but the list itself is unbounded. The background-fills are meant, for example, to be applied to a slide background, or as the background fill in a shape or table.

The complex type CT_BackgroundFillStyleList is defined in the following manner:

```

<complexType name="CT_BackgroundFillStyleList">
  <sequence>
    <group ref="EG_FillProperties" minOccurs="3" maxOccurs="unbounded"/>
  </sequence>
</complexType>

```

L.4.3.2.13 Table Styles

Table styles are responsible for the rapid formatting that can be applied to a table. This rapid formatting takes different things into account, such as if the first row or last row should be emphasized, or if there is banding present on the table. All of these different types of formatting can be defined within a table style. An example of different table styles in use on the same table can be seen in figure 1.

	Red	Blue	Yellow
1 st Qtr	21.5	18.3	4.5
2 nd Qtr	17.4	3.6	2.2
3 rd Qtr	9.1	19.8	7.9
4 th Qtr	12.2	13.4	12.1

	Red	Blue	Yellow
1 st Qtr	21.5	18.3	4.5
2 nd Qtr	17.4	3.6	2.2
3 rd Qtr	9.1	19.8	7.9
4 th Qtr	12.2	13.4	12.1

	Red	Blue	Yellow
1 st Qtr	21.5	18.3	4.5
2 nd Qtr	17.4	3.6	2.2
3 rd Qtr	9.1	19.8	7.9
4 th Qtr	12.2	13.4	12.1

	Red	Blue	Yellow
1 st Qtr	21.5	18.3	4.5
2 nd Qtr	17.4	3.6	2.2
3 rd Qtr	9.1	19.8	7.9
4 th Qtr	12.2	13.4	12.1

Figure 5: Different table styles in use.

The application of a table style to a table formats the table in its entirety. There are numerous complex types that make up a table style. The pieces of a table style are discussed first, before defining the table style itself.

L.4.3.2.14 Cell 3D

The complex type CT_Cell3D defines all of the 3-D properties that an individual cell can hold. In the case of a table, these 3-D properties can be a bevel along with a material and a light rig for the cell. More explanation of these three pieces of a CT_Cell3D can be found in the document on 3-D. These properties are applied on a per-cell basis, rather than to the table as a whole. A CT_Cell3D is defined in the following manner:

```
<xsd:complexType name="CT_Cell3D">
  <xsd:sequence>
    <xsd:element name="bevel" type="CT_Bevel" minOccurs="1"
      maxOccurs="1" />
    <xsd:element name="lightRig" type="CT_LightRig" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="ext" type="CT_OfficeArtExtension" minOccurs="0"
      maxOccurs="1" />
  </xsd:sequence>
  <xsd:attribute name="prstMaterial" type="ST_PresetMaterialType"
    use="optional" default="plastic" />
</xsd:complexType>
```

This complex type also holds a CT_OfficeArtExtension. This complex type is used for future extensibility and is seen elsewhere throughout the tables area.

L.4.3.2.15 Themeable Styles

There are three groups and a complex type that account for style pieces that can be themed. These themed-aspects either pull from the style matrix, or they define an actual fill or effect for example. If they pull their style from the matrix, then an update to the document theme also updates the particular style dynamically. The three groups consist of the following groups:

```
<xsd:group name="EG_ThemeableFillStyle">
  <xsd:choice>
    <xsd:element name="fill" type="CT_FillProperties" minOccurs="1"
      maxOccurs="1" />
    <xsd:element name="fillRef" type="CT_StyleMatrixReference"
      minOccurs="1" maxOccurs="1" />
  </xsd:choice>
</xsd:group>
```

```

<xsd:group name="EG_ThemeableEffectStyle">
  <xsd:choice>
    <xsd:element name="effect" type="CT_EffectProperties" minOccurs="1"
      maxOccurs="1" />
    <xsd:element name="effectRef" type="CT_StyleMatrixReference"
      minOccurs="1" maxOccurs="1" />
  </xsd:choice>
</xsd:group>
<xsd:group name="EG_ThemeableFontStyles">
  <xsd:choice>
    <xsd:element name="font" type="CT_FontCollection" minOccurs="1"
      maxOccurs="1" />
    <xsd:element name="fontRef" type="CT_FontReference" minOccurs="1"
      maxOccurs="1" />
  </xsd:choice>
</xsd:group>

```

The three groups above all give a choice between using a themed style, or defining the style themselves. The last complex type in this group is a complex type used to perform the same task as the above three, only it deals with the lines in the table. The complex type CT_ThemeableLineStyle is defined as:

```

<xsd:complexType name="CT_ThemeableLineStyle">
  <xsd:choice>
    <xsd:element name="ln" type="CT_LineProperties" minOccurs="1"
      maxOccurs="1" />
    <xsd:element name="lnRef" type="CT_StyleMatrixReference"
      minOccurs="1" maxOccurs="1" />
  </xsd:choice>
</xsd:complexType>

```

L.4.3.2.16 On/Off Property Definition

The simple type ST_OnOffStyleType defines a type with values of on, off, or default. The default value means to follow the parent settings. This comes into play for a themed property, which means follow what the theme says. For an unthemed property, this means to follow the parent setting in the property inheritance chain.

L.4.3.2.17 Text Properties

The complex type CT_TableStyleTextStyle defines the table text properties that can be styled. The text properties contain a reference to a themeable font style along with bold and italic being enabled or disabled. The CT_TableStyleTextStyle is defined in the following manner:

```

<xsd:complexType name="CT_TableStyleTextStyle">
  <xsd:sequence>
    <xsd:group ref="EG_ThemeableFontStyles" minOccurs="0"
      maxOccurs="1" />
    <xsd:group ref="EG_ColorChoice" minOccurs="0" maxOccurs="1" />
    <xsd:element name="ext" type="CT_OfficeArtExtension" minOccurs="0"
      maxOccurs="1" />
  </xsd:sequence>
  <xsd:attribute name="b" type="ST_OnOffStyleType" use="optional"
    default="def" />
  <xsd:attribute name="i" type="ST_OnOffStyleType" use="optional"
    default="def" />
</xsd:complexType>

```

L.4.3.2.18 Cell Border Properties

The complex type CT_TableCellBorderStyle defines the properties of the borders that can be styled in a table. The border styles can be applied to the following different types of borders in a table:

- left – left border
- right – right border
- top – top border
- bottom – bottom border
- insideH – inner horizontal borders
- insideV – inner vertical borders
- tl2br – diagonal border from top left corner to bottom right corner
- tr2bl – diagonal border from top right corner to bottom left corner

The complex type is defined in the following manner:

```

<xsd:complexType name="CT_TableCellBorderStyle">
  <xsd:sequence>
    <xsd:element name="left" type="CT_ThemeableLineStyle" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="right" type="CT_ThemeableLineStyle" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="top" type="CT_ThemeableLineStyle" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="bottom" type="CT_ThemeableLineStyle"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="insideH" type="CT_ThemeableLineStyle"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="insideV" type="CT_ThemeableLineStyle"
      minOccurs="0" maxOccurs="1" />
  </xsd:sequence>
</xsd:complexType>

```

```

    <xsd:element name="tl2br" type="CT_ThemeableLineStyle" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="tr2bl" type="CT_ThemeableLineStyle" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="ext" type="CT_OfficeArtExtension" minOccurs="0"
      maxOccurs="1" />
  </xsd:sequence>
</xsd:complexType>

```

L.4.3.2.19 Cell Style Properties

The complex type CT_TableStyleCellStyle contains the definition for cell properties which can be styled. Within this complex type are held the border style, cell fill style, and the cell 3-D. The complex type is defined in the following manner:

```

<xsd:complexType name="CT_TableStyleCellStyle">
  <xsd:sequence>
    <xsd:element name="tcBdr" type="CT_TableCellBorderStyle"
      minOccurs="0" maxOccurs="1" />
    <xsd:group ref="EG_ThemeableFillStyle" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="cell3D" type="CT_Cell3D" minOccurs="0"
      maxOccurs="1" />
  </xsd:sequence>
</xsd:complexType>

```

L.4.3.2.20 Table Background Style

The complex type CT_TableBackgroundStyle defines the style elements associated with the background of the table. The table background style can contain a fill and effect. The complex type is defined in the following manner:

```

<xsd:complexType name="CT_TableBackgroundStyle">
  <xsd:sequence>
    <xsd:group ref="EG_ThemeableFillStyle" minOccurs="0"
      maxOccurs="1" />
    <xsd:group ref="EG_ThemeableEffectStyle" minOccurs="0"
      maxOccurs="1" />
  </xsd:sequence>
</xsd:complexType>

```

L.4.3.2.21 Table Part Style

The complex type CT_TablePartStyle defines a structure for holding the style information for a single part of the table. The table is broken up in 13 different parts, which are explained in the next subclause

of this document. A table part contains a text style and a cell style and is defined in the following manner:

```
<xsd:complexType name="CT_TablePartStyle">
  <xsd:sequence>
    <xsd:element name="tcTxStyle" type="CT_TableStyleTextStyle"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="tcStyle" type="CT_TableStyleCellStyle"
      minOccurs="0" maxOccurs="1" />
  </xsd:sequence>
</xsd:complexType>
```

L.4.3.2.22 Table Style

The complex type CT_TableStyle defines the actual table style. Apart from the table background, 13 different parts that can be defined in a table style. These parts work together to define the styling for a table, given the 6 combinations of on/off states for the first row, first column, last row, last column, row banding, and column banding options. The different parts of a table that make up a table style are:

- tableBg – table background (this is not a CT_TablePartStyle)
- wholeTable – formatting for the entire table
- band1Horizontal – applied when row banding is enabled, this is the first row style, which alternates with band2Horizontal
- band2Horizontal – applied when row banding is enabled, this is the second row style, which alternates with band1Horizontal
- band1Vertical – applied when column banding is enabled, this is the first column style, which alternates with band2Vertical
- band2Vertical – applied when column banding is enabled, this is the second column style, which alternates with band1Vertical
- lastCol – formatting applied to the last column when last column formatting is enabled
- firstCol – formatting applied to the first column when first column formatting is enabled
- lastRow – formatting applied to the last row when last row formatting is enabled
- firstRow – formatting applied to the first row when first row formatting is enabled
- seCell – formatting applied to the cell in the southeast corner of the table when last column and last row are enabled
- swCell – formatting applied to the cell in the southwest corner of the table when first column and last row are enabled
- neCell – formatting applied to the cell in the northeast corner of the table when the last column and first row are enabled
- nwCell – formatting applied to the cell in the northwest corner of the table when the first column and first row are enabled

The table style is defined in the following manner:

```

<xsd:complexType name="CT_TableStyle">
  <xsd:sequence>
    <xsd:element name="tblBg" type="CT_TableBackgroundStyle"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="wholeTbl" type="CT_TablePartStyle" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="band1H" type="CT_TablePartStyle" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="band2H" type="CT_TablePartStyle" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="band1V" type="CT_TablePartStyle" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="band2V" type="CT_TablePartStyle" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="lastCol" type="CT_TablePartStyle" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="firstCol" type="CT_TablePartStyle" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="lastRow" type="CT_TablePartStyle" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="seCell" type="CT_TablePartStyle" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="swCell" type="CT_TablePartStyle" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="firstRow" type="CT_TablePartStyle" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="neCell" type="CT_TablePartStyle" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="nwCell" type="CT_TablePartStyle" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="ext" type="CT_OfficeArtExtension" minOccurs="0"
      maxOccurs="1" />
  </xsd:sequence>
  <xsd:attribute name="styleId" type="ST_Guid" use="required" />
  <xsd:attribute name="styleName" type="xsd:string" use="required" />
</xsd:complexType>

```

Also contained within the table style are an ID and a name. The name shows up as the name for the table style, and the ID is the unique id (GUID) that is associated with the table style.

L.4.3.2.23 Table Style List

The final complex type dealing with table styles is simply a list of table styles. Also contained in this list is the default style which gets applied to the table when the a default is to be used. The complex type CT_TableStyleList is defined in the following manner:

```
<xsd:complexType name="CT_TableStyleList">
  <xsd:sequence>
    <xsd:element name="tblStyle" type="CT_TableStyle" minOccurs="0"
      maxOccurs="unbounded" />
  </xsd:sequence>
  <xsd:attribute name="def" type="ST_Guid" use="required" />
</xsd:complexType>
```

L.4.4 Text

L.4.4.1 Introduction

This subclause provides a high-level overview of DrawingML text.

The best way to understand these schemas as they relate to one another is to learn about the DrawingML Text file format in the following order.

- Text Overview
- Body Level Properties
- Paragraph Level Properties
- Run and Character Level Properties

Companion schemas build on the ones discussed in this document. As these are encountered below, pointers to them are provided.

This subclause provides a structured breakdown of the text portion of the DrawingML file format. Other subclauses build on this foundation and explain more about topics such as text frame, text styles, text fields, and embedded fonts.

Note that DrawingML Text described within this document is distinct from WordprocessingML Text in that the file framework surrounding it has been optimized for use in a graphics-centric, presentation-like manner. As a contrast, WordprocessingML Text allows for text to be stored in a format that is optimized for layout of printed documents but not for art-based text as is found within the <a:> namespace.

Note that the use of the "p" namespace within this document references to the PresentationML-specific schemas while the use of the "a" namespace within this document references to the DrawingML-specific schemas.

L.4.4.2 Overview

Consider an XML tree that has the following basic structure:

```

<sld>
  <cSld>
    <spTree>
      <nvGrpSpPr> ... </nvGrpSpPr>
      <grpSpPr> ... </grpSpPr>
      <sp>
        <nvSpPr> ... </nvSpPr>
        <spPr> ... </spPr>
        <style> ... </style>
        <txBody>
          <bodyPr rtlCol="0" anchor="ctr"/>
          <lstStyle/>
          <p>
            <pPr algn="ctr"/>
            <r>
              <t>Your text here!</t>
            </r>
          </p>
        </txBody>
      </sp>
    </spTree>
  </cSld>
</sld>

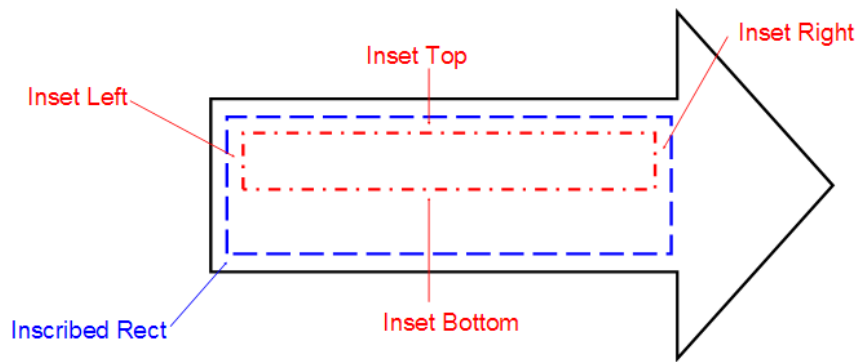
```

In the structure above, we are interested in the content contained within the matching `p:txBody` tags. The understanding of this tag in relation to the basic slide structure above encompasses the schema background needed to digest effectively the remainder of this description.

Note that shapes are the standard container within which all text resides. Usually, the shape does not have any visual properties attached to it and thus no visible shape is rendered; nonetheless, a shape is still present and does house any content text.

Each shape contains an inset rectangle that houses any text attached to that shape. The shape has margins or *insets* that buffer this rectangle on all four sides (top, bottom, left, and right) just like margins on a page. When thinking about text within a shape, it is useful to keep these inset properties in mind.

An illustration of this is provided below.



Let's look at the different element tags contained within p:txBody. Listed below are only those tags discussed here. (Note that this sample framework is a skeleton and does not fully show all elements and attributes needed.)

```
<p:txBody>
  <a:bodyPr />           required, only listed once.
  <a:lstStyle />          optional, if present only listed once.
  <a:p>                   required, no limit on the number of instances.
    <a:pPr />             optional, if present only listed once.
    <a:r>                 required, no limit on the number of instances.
      <a:rPr />           optional, if present only listed once.
      <a:t>Your text here!</a:t>
                          Actual text for this run is contained here.
    </a:r>
    <a:endParaRPr />     optional, if present only listed once.
  </a:p>
</p:txBody>
```

Element	Purpose	Description
a:bodyPr	Body Properties	Describes text anchor points, shape autofit, number of columns, text warping, and 3D scenes and lighting effects. See §L.4.4.3.
a:lstStyle	List Style	Used to define style properties for the paragraph and its nine list levels.
a:p	Single Paragraph	Houses a single paragraph and its corresponding paragraph-level properties. Contained within here are also all the text runs that comprise this paragraph. See §L.4.4.3.4.
a:pPr	Paragraph Properties	Describes the format and style with which the corresponding paragraph is presented. Some possible settings that can be utilized within this space include, but are not limited to, the

		following: spacing, margins, and alignment. See §L.4.4.3.4.
a:r	Single Run	Specifies the existence of a run of text within a paragraph. A run represents the most granular form of text that can be represented in the file format. See §L.4.4.3.8.
a:rPr	Run Properties	Allows the attachment of properties to the run of text specified by its parent a:r element. These properties include, but are not limited to, the following: underline, strikethrough, and text caps. See §L.4.4.3.8.
a:t	Actual text	Allows for the storage of the specific text that all these body, paragraph and run level properties are describing. This tag is the most important as it gives context to all the other elements and attributes that have come before it.
a:endParaRPr	Persistent Run Properties	Specifies the properties that are to persist should the user begin to enter additional text after this paragraph. This property should only be set when the style that should follow this paragraph is different from the paragraph itself.

L.4.4.3 Body Level Properties

In this subclause, we'll explore the sorts of properties that can be attached to the body as a whole. As shown in the sample XML above, there are three essential property levels available. The body-level properties are to the broadest of these. Note that some of these body-level properties are applied as attributes to the body property tag while others are expressed as child elements. The specific method by which each property is applied can be found in the schemas listed above.

```

<p:txBody>
  <a:bodyPr /> ← Main element covered in this subclause
  <a:lstStyle />
  <a:p>
    <a:pPr />
    <a:r>
      <a:rPr />
      <a:t>Your text here!</a:t>
    </a:r>
  </a:p>
</p:txBody>

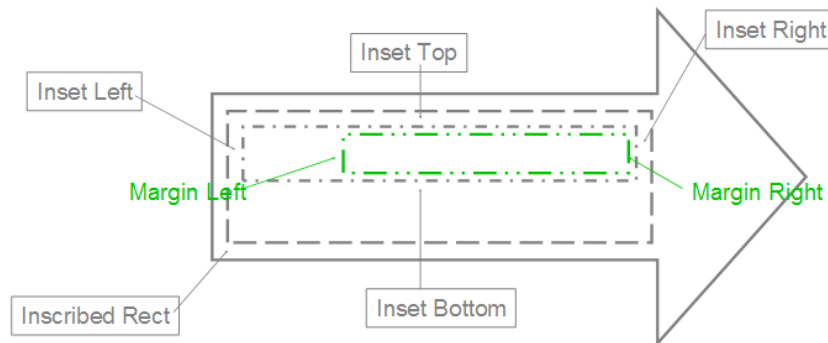
```

L.4.4.3.1 Setting Up the Text Area

Let's start with how a text area might be initially described. This area is the container within which all the child text for this body resides. First, it is useful to understand the inset properties; specifically, the

top, bottom, left and right inset properties that are also known as internal margins for the text body. The anchor attribute allows us to specify where the text area should be anchored within its bounding rectangle.

An illustration of this bounding rectangle is highlighted below by the inner green box. Notice here that the bounding rectangle is anchored to the right.



Here is how the text appears inside. Attribute `AutoFit` allows for three basic scenarios:

- No `AutoFit`: The text is allowed to flow outside the container.
- Normal `AutoFit`: The text is resized using defined constraints to fit inside the container area. (This is used when the text is too large or long to fit in the text container.)
- Shape `AutoFit`: The actual text container is resized to contain all the text. (This is the only option that can cause the container to have its dimensions changed.)

The term *flow* is used to describe the way in which text moves around inside this text area, and to describe how each of the body properties affects the text within the text area.

One way that text can flow is from one line to the next. This can be done automatically by using the text-wrapping attribute. Another way is to use columns. The XML framework allows for the specification of a number of columns into which the text is to be automatically broken. This feature also allows for the specifying of the spacing of columns and a right-to-left layout instead of the default left-to-right. Another way that text can flow is vertical instead of horizontal. For this, there are many different forms of vertical text that can be described: from text that appears rotated to text where the characters are truly stacked. The text can even be made to flow differently when an East Asian font is specified.

When looking at the flow it is useful to discuss the potential for *overflow*. That is, the text must flow outside the text area because it is too large to fit inside. For this, there are two common overflow types: vertical and horizontal. The vertical overflow can be handled in three ways:

- overflow: This allows the text to flow outside the text area.

One
Two
Three
Four
Five
Six
Seven
Eight
Nine
Ten

-
- ellipsis: This crops the text that overflows and adds "...", to denote that there is hidden text.

One
Two
Three
Four
...

-
- clip: This crops the text just as ellipsis but does not insert "...", so the user has no indication that there is hidden text.

One
Two
Three
Four
Five

-
- Horizontal overflow works exactly like vertical, but with only two options: overflow and clip, which both operate as described above.

L.4.4.3.2 Manipulating the Text

Let's look at the ways in which the text can be further enhanced at the text body level. Note that the properties that follow apply only to the text body as a whole and thus cannot be applied to a specific paragraph or run within the text body. These properties are as follows:

- Text Warping: Text within the text area is made to distort itself according to a predefined shape. This shape resides within the bounding box described earlier. This effect is known as *text warping* and has its preset shapes defined further within DrawingML.

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- 3D Text: Text can be described with respect to a 3D scene. Using this tag provides three basic options:
 - The text resides within a 3D scene, but as planar text.
 - The text is allowed to reside within the 3D scene and has 3D effects (such as bevel or extrusion) applied to it.
 - The text resides on top of a 3D scene.

- Rotated and Upright Text: A particular rotation can be specified that is applied to the text within the text area. Note that this is different from the rotation that is applied to the shape within which the text area resides. If this attribute is not specifically set then the rotation of the container shape is used.

L.4.4.3.3 Backwards and Forwards Compatibility

The following areas are of interest when considering support for both past design and future innovation.

- From WordArt: This is specific to dealing with previous WordArt text. Now that text is described as simply a shape, there is no need for a WordArt-specific description. There is, however, the need to identify which pieces of text were from the old WordArt styles in case there is the need to write them back out in their old format.
- Future Extensions: The ability for future extensions has been provided to the body property tag via the ext tag. This can be used the widest way possible as it is a complex type and can thus describe the most complex future properties. Note that each of the schema subclauses below have their own ext tag.

L.4.4.3.4 Paragraph-Level Properties

In this subclause, we explore what sorts of properties can be attached to a paragraph as a whole. Paragraph-level properties allow for a more granular description of the text than the properties of the body tag described earlier. Keep in mind that the properties that can be applied at this level are not duplicates of the body or run levels, but unique only to the paragraph element. Once again, it should be noted that some of these paragraph-level properties are applied as attributes to the paragraph property tag while others are expressed as child elements. The specific method by which each property is applied can be found in the schemas listed above.

```
<p:txBody>
  <a:bodyPr />
  <a:lstStyle />
  <a:p>
    <a:pPr /> ← Main element covered in this subclause
    <a:r>
      <a:rPr />
      <a:t>Your text here!</a:t>
    </a:r>
  </a:p>
</p:txBody>
```

L.4.4.3.5 Spacing, Alignment, and Direction

The XML file format allows for the specifying of spacing both between lines in the form of line spacing, and also outside the paragraph via margins and special before/after spacing. In addition to this, there is also the ability to specify indent spacing for the beginning of the paragraph.

The standard alignment options include left-aligned, right-aligned, centered, justified, and distributed. Justified alignment causes each line of text to be stretched out to a certain point. To ensure that short lines remain readable, they are not stretched. Distributed alignment is quite similar, but stretches every line, regardless of that line's length.

Text direction is specified as either left-to-right (the default) or right-to-left using the specific rtl tag.

L.4.4.3.6 Tabs and Line Breaks

When the default tabs are not sufficient for the paragraph in question there is the option of including custom tab stops in the XML file format. The information required for this is both a default tab size attribute and a full tab stop list showing all tab stop positions that apply to this paragraph. Keep in mind that if tab stops are not explicitly stated in the file format that the business logic of the application must use its own default positions if tabs are needed.




Line break is a tag that informs the application as to whether it should break up a string of text onto multiple lines based on Latin grammar rules or East Asian grammar rules. The East Asian option uses the Kinsoku settings to determine whether a word is allowed to begin or end a line of text.

L.4.4.3.7 Adding Bullets

Bullets are specified per paragraph, so bullets can be mixed and matched within a single text body to appear as a coherent text group. The types of bullets available are:

- Character Bullets: Uses a font character to denote a bullet and can be set to appear in any size (percentage of text), color (all available including theme colors), and font. *The properties are Bullet Color, Bullet Size, Bullet Font Typeface, Bullet Character (represents the actual bullet)*
 - g Bullet 1
 - g Bullet 2
 - g Bullet 3
- Auto-Numbered Bullets: Uses the application logic to assign a series of numbers/characters to a specific bulleted item using just a bullet scheme and a starting number. (When a starting number is used, all bulleted paragraphs listed after the start number are automatically numbered based on this last known start number. The scope of this auto-numbering is only within its current text body, no start at number would ever carry over to a different text body.) The properties are Start At number, Bullet Scheme (letters, roman numerals, etc.), Bullet Color, Bullet Size, and Bullet Font Typeface.
 - 1. Bullet 1
 - 1. Bullet 2
 - 2. Bullet 3
- Blip Bullets: Uses a picture to denote a bulleted item. The only additional property available with this type of applied bullet is the size (percentage of text). If the graphic is not in the applications

standard set of graphics then the attached graphic is converted to a PNG format, placed in the document container and is given a relationship id that is used later to reference the image. The properties are Embed id (corresponds to a bullet graphic) and Bullet Size.

-  Bullet 1
-  Bullet 2
-  Bullet 3

L.4.4.3.8 Run- and Character-Level Properties

In this subclause, we'll explore the most granular text properties available in this XML framework, namely those described at the text run and character level. This level is usually the level in which text is broken up into differently formatted parts, because the most commonly used text properties almost all reside at this level. This allows for some very detailed formatting to be represented. Again, it should be noted that for consistency that some of these run and character level properties are applied as attributes to the run property tag while others are expressed as child elements. The specific method by which each property is applied can be found in the schemas listed above.

```
<p:txBody>
  <a:bodyPr />
  <a:lstStyle />
  <a:p>
    <a:pPr />
    <a:r>
      <a:rPr />    ← Main element covered in this subclause
      <a:t>Your text here!</a:t>
    </a:r>
  </a:p>
</p:txBody>
```

L.4.4.3.9 Visual Properties

When looking to format a run of text the first property that one might need to specify would be the font typeface. The XML file format allows for the specification of not only Latin Fonts but also East Asian, Complex Script, and Symbol fonts as well. These four font buckets give the application additional information that is used to layout text in a manner fitting for the specific font. Along with the actual font being used, comes the size of the font. To specify this simply use the sz attribute and along with a value that is 1/100th of the size in points.

Other common formatting properties allowed in the XML framework are bold, italic, underline and strikethrough. The use of both the bold and italic properties is simply via a Boolean value of 0 or 1. The usage of the underline and strikethrough, however, allow a more specific selection to be made. There are 17 values for underline, which range from a single line to wavy double lines. In addition to specifying the style of underline that is to be used, the framework can also specify fill properties for the underline.

These are solid color, multi-color gradient, and texture fill. For strikethrough, there are two options: single and double strike through.

When standard formatting isn't adequate, more complex effects can be defined for a specific run of text. The basic breakdown for these is line properties, fill properties and effect properties. Encapsulated within each of these areas is a wide range of customizable effects. A quick look at line properties, for example, reveals the ability to specify a color, gradient, or pattern fill, along with a width and style applied. Along these lines fill properties allows for transparent fill, solid fill, gradient fill, texture fill and even picture fill. While these features alone give the XML file format plenty of robustness in describing text, other features are also available. Because text is treated the same as a shape, a run of text can have virtually all shape effects applied to it just as if it were a shape. These effects include shadow, glow, and reflection, and are placed in an effect list under the run properties tag. An example of what these lines, fills and effects might look like is provided below.

```
<a:rPr>
  <a:ln>
    <a:solidFill ... />    ← Line properties here
  </a:ln>
  <a:gradFill>
    <a:gsLst ... />        ← Fill properties here
  </a:gradFill>
  <a:effectLst>
    <a:reflection ... />    ← Effect properties here
  </a:effectLst>
</a:rPr>
```

A few additional properties are worth noting:

- **Minimum kerning size:** This specifies the smallest font size at which kerning still occurs. When no tag is present for this the default value is 0, allowing kerning at any text size.
- **Spacing between characters:** The units here are the same as are used for font size. Along the lines of specifying horizontal spacing, vertical spacing can be specified via the baseline tag. This is typically used for subscript and superscript text and is specified in the same units as font size.
- **Capitalization and Normalize:** Capitalization sets the case of the character to either all small caps or all large caps. For this property there are only these two settings aside from the "none" setting at which point this property is ignored. Normalize height takes all shorter characters and adjusts their height up so that they are the same as taller characters. This property is set via a Boolean value.

L.4.4.3.10 Properties for Interactivity

Hyperlinks: The XML file format allows for the inputting of hyperlinks that are activated by either click or mouse over. These two tags are `HyperlinkClick` and `HyperlinkMouseOver`, respectfully. They both allow for the specifying of a link to another resource very much like those found on a common website.

Spelling and Smart Tags: Although spelling is very much an application-defined part of text editing and is most likely to be done within the application itself there are a few ways that spelling settings and preferences can be persisted within the file format. One way is through the spelling error bit, which simply saves whether there is a known spelling mistake. The next is the spelling dirty bit. This gets set whenever the user has entered new text and the application has not had a chance to check for spelling errors on this piece of text. Lastly, in this realm we actually have a user preference of no proofing that is persisted for the next time a document is opened. This allows the user to specify a word that they do not want to have checked for spelling. Along with spell-checking comes the notion of smart tags which must be checked for just like spelling mistakes. For this there are two related tags. The first is the smart tag clean, which allows for a boolean value to be set determining if this portion of text has been checked for the presence of new smart tags. The next is the actual smart tag id. Once a piece of text has been determined to be a smart tag then a smart tag id is assigned which points to the actual smart tag information.

L.4.4.3.11 International Language Support

There exists the notion of the language id, which is simply a value that assists the application in laying out the text. The tags that help with this are the language id tag and the alternate language id tag. Together, these allow the file format to be robust and handle multiple languages for a single run of text. In addition, there is also the kumimoji tag, which aids with the layout of East Asian text by specifying whether numbers appear vertically with text (default) or horizontally. An illustration of a run of text with kumimoji applied is provided below.



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L.4.5 Tables

L.4.5.1 Introduction

L.4.5.2 This aspect of DrawingML deals with the definition of a table and the associated styling information. The first part describes the table styles aspect, while the second part describes the definition of a table within DrawingML. Table Styles

Table styles are responsible for the rapid formatting that can be applied to a table. This rapid formatting takes different things into account, such as if the first row or last row should be emphasized, or if there is banding present on the table. All of these different types of formatting can be defined within a table style. An example of different table styles in use on the same table can be seen in figure 1.

	Red	Blue	Yellow
1 st Qtr	21.5	18.3	4.5
2 nd Qtr	17.4	3.6	2.2
3 rd Qtr	9.1	19.8	7.9
4 th Qtr	12.2	13.4	12.1

Figure 6: Different table styles in use.

The application of a table style to a table formats the table in its entirety. A number of complex types make up a table style. The pieces of a table style are discussed first, before the table style itself is defined.

L.4.5.2.1 Cell 3-D

The complex type, CT_Cell3D, defines all of the 3-D properties that an individual cell can hold. In the case of a table, these 3-D properties can be a bevel along with a material and a light rig for the cell. (More explanation of these three pieces of a CT_Cell3D can be found in §L.4.6.) These properties are applied on a per-cell basis, rather than to the table as a whole. A CT_Cell3D is defined in the following manner:

```

<xsd:complexType name="CT_Cell3D">
  <xsd:sequence>
    <xsd:element name="bevel" type="CT_Bevel" minOccurs="1"
      maxOccurs="1" />
    <xsd:element name="lightRig" type="CT_LightRig" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="extLst" type="CT_OfficeArtExtensionList"
      minOccurs="0" maxOccurs="1" />
  </xsd:sequence>
  <xsd:attribute name="prstMaterial" type="ST_PresetMaterialType"
    use="optional" default="plastic" />
</xsd:complexType>

```

This complex type also holds a CT_OfficeArtExtensionList. This complex type is used for future extensibility and is seen elsewhere throughout the tables area.

L.4.5.2.2 Themeable Styles

Three groups and a complex type account for style pieces that can be themed. These themed aspects either pull from the style matrix, or they define an actual fill or effect for example. If they pull their style from the matrix, then an update to the document theme also updates the particular style dynamically. The three groups consist of the following groups:

```

<xsd:group name="EG_ThemeableFillStyle">
  <xsd:choice>
    <xsd:element name="fill" type="CT_FillProperties" minOccurs="1"
      maxOccurs="1" />
    <xsd:element name="fillRef" type="CT_StyleMatrixReference"
      minOccurs="1" maxOccurs="1" />
  </xsd:choice>
</xsd:group>
<xsd:group name="EG_ThemeableEffectStyle">
  <xsd:choice>
    <xsd:element name="effect" type="CT_EffectProperties"
      minOccurs="1" maxOccurs="1" />
    <xsd:element name="effectRef" type="CT_StyleMatrixReference"
      minOccurs="1" maxOccurs="1" />
  </xsd:choice>
</xsd:group>

```

```

<xsd:group name="EG_ThemeableFontStyles">
  <xsd:choice>
    <xsd:element name="font" type="CT_FontCollection" minOccurs="1"
      maxOccurs="1" />
    <xsd:element name="fontRef" type="CT_FontReference" minOccurs="1"
      maxOccurs="1" />
  </xsd:choice>
</xsd:group>

```

The three groups above all give a choice between using a themed style or defining the style themselves. The last type in this group is a complex type used to perform the same task as the above three, only it deals with the lines in the table. The complex type, CT_ThemeableLineStyle, is defined as:

```

<xsd:complexType name="CT_ThemeableLineStyle">
  <xsd:choice>
    <xsd:element name="ln" type="CT_LineProperties" minOccurs="1"
      maxOccurs="1" />
    <xsd:element name="lnRef" type="CT_StyleMatrixReference"
      minOccurs="1" maxOccurs="1" />
  </xsd:choice>
</xsd:complexType>

```

L.4.5.2.3 On/Off Property Definition

The simple type, ST_OnOffStyleType, defines a type with values of on, off, or default. A value of default indicates that parent settings should be used. Thus, for a themed property, default indicates that the theme properties should be followed. For an unthemed property, default means that the parent setting in the property inheritance chain should be followed.

L.4.5.2.4 Text Properties

The complex type, CT_TableStyleTextStyle, defines the table text properties that can be styled. The text properties contains a reference to a themeable font style along with bold and italic being enabled or disabled. The CT_TableStyleTextStyle is defined in the following manner:

```

<xsd:complexType name="CT_TableStyleTextStyle">
  <xsd:sequence>
    <xsd:group ref="EG_ThemeableFontStyles" minOccurs="0"
      maxOccurs="1" />
    <xsd:group ref="EG_ColorChoice" minOccurs="0" maxOccurs="1" />
    <xsd:element name="extLst" type="CT_OfficeArtExtensionList"
      minOccurs="0" maxOccurs="1" />
  </xsd:sequence>
  <xsd:attribute name="b" type="ST_OnOffStyleType" use="optional"
    default="def" />

```

```

    <xsd:attribute name="i" type="ST_OnOffStyleType" use="optional"
      default="def" />
  </xsd:complexType>

```

L.4.5.2.5 Cell Border Properties

The complex type, CT_TableCellBorderStyle, defines the properties of the borders that can be styled in a table. The border styles can be applied to the following different types of borders in a table:

- left – left border
- right – right border
- top – top border
- bottom – bottom border
- insideH – inner horizontal borders
- insideV – inner vertical borders
- tl2br – diagonal border from top left corner to bottom right corner
- tr2bl – diagonal border from top right corner to bottom left corner

The complex type is defined in the following manner:

```

<xsd:complexType name="CT_TableCellBorderStyle">
  <xsd:sequence>
    <xsd:element name="left" type="CT_ThemeableLineStyle"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="right" type="CT_ThemeableLineStyle"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="top" type="CT_ThemeableLineStyle"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="bottom" type="CT_ThemeableLineStyle"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="insideH" type="CT_ThemeableLineStyle"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="insideV" type="CT_ThemeableLineStyle"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="tl2br" type="CT_ThemeableLineStyle"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="tr2bl" type="CT_ThemeableLineStyle"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="extLst" type="CT_OfficeArtExtensionList"
      minOccurs="0" maxOccurs="1" />
  </xsd:sequence>
</xsd:complexType>

```

L.4.5.2.6 Cell Style Properties

The complex type, CT_TableCellStyle, contains the definition for cell properties that can be styled. Within this complex type are held the border style, cell fill style, and the cell 3-D. The complex type is defined in the following manner:

```
<xsd:complexType name="CT_TableCellStyle">
  <xsd:sequence>
    <xsd:element name="tcBdr" type="CT_TableCellBorderStyle"
      minOccurs="0" maxOccurs="1" />
    <xsd:group ref="EG_ThemeableFillStyle" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="cell3D" type="CT_Cell3D" minOccurs="0"
      maxOccurs="1" />
  </xsd:sequence>
</xsd:complexType>
```

L.4.5.2.7 Table Background Style

The complex type, CT_TableBackgroundStyle, defines the style elements associated with the background of the table. The table background style can contain a fill and effect. The complex type is defined in the following manner:

```
<xsd:complexType name="CT_TableBackgroundStyle">
  <xsd:sequence>
    <xsd:group ref="EG_ThemeableFillStyle" minOccurs="0"
      maxOccurs="1" />
    <xsd:group ref="EG_ThemeableEffectStyle" minOccurs="0"
      maxOccurs="1" />
  </xsd:sequence>
</xsd:complexType>
```

L.4.5.2.8 Table Part Style

The complex type, CT_TablePartStyle, defines a structure for holding the style information for a single part of the table. The table is broken up into 13 different parts which are explained in the next subclause of this document. A table part contains a text style and a cell style and is defined in the following manner:

```
<xsd:complexType name="CT_TablePartStyle">
  <xsd:sequence>
    <xsd:element name="tcTxStyle" type="CT_TableStyleTextStyle"
      minOccurs="0" maxOccurs="1" />
  </xsd:sequence>
</xsd:complexType>
```

```

    <xsd:element name="tcStyle" type="CT_TableStyleCellStyle"
      minOccurs="0" maxOccurs="1" />
  </xsd:sequence>
</xsd:complexType>

```

L.4.5.2.9 Table Style

The complex type, CT_TableStyle, defines the actual table style. There are thirteen different parts (outside of the table background) that can be defined in a table style. These parts work together to define the styling for a table, given the six combinations of on/off states for the first row, first column, last row, last column, row banding, and column banding options. The different parts of a table that make up a table style are:

- tableBg – table background (this is not a CT_TablePartStyle)
- wholeTable – formatting for the entire table
- band1Horizontal – applied when row banding is enabled, this is the first row style, which alternates with band2Horizontal
- band2Horizontal – applied when row banding is enabled, this is the second row style, which alternates with band1Horizontal
- band1Vertical – applied when column banding is enabled, this is the first column style, which alternates with band2Vertical
- band2Vertical – applied when column banding is enabled, this is the second column style, which alternates with band1Vertical
- lastCol – formatting applied to the last column when last column formatting is enabled
- firstCol – formatting applied to the first column when first column formatting is enabled
- lastRow – formatting applied to the last row when last row formatting is enabled
- firstRow – formatting applied to the first row when first row formatting is enabled
- seCell – formatting applied to the cell in the southeast corner of the table when last column and last row are enabled
- swCell – formatting applied to the cell in the southwest corner of the table when first column and last row are enabled
- neCell – formatting applied to the cell in the northeast corner of the table when the last column and first row are enabled
- nwCell – formatting applied to the cell in the northwest corner of the table when the first column and first row are enabled

The table style is defined in the following manner:

```

<xsd:complexType name="CT_TableStyle">
  <xsd:sequence>
    <xsd:element name="tblBg" type="CT_TableBackgroundStyle"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="wholeTbl" type="CT_TablePartStyle"
      minOccurs="0" maxOccurs="1" />
  </xsd:sequence>
</complexType>

```

```

<xsd:element name="band1H" type="CT_TablePartStyle" minOccurs="0"
  maxOccurs="1" />
<xsd:element name="band2H" type="CT_TablePartStyle" minOccurs="0"
  maxOccurs="1" />
<xsd:element name="band1V" type="CT_TablePartStyle" minOccurs="0"
  maxOccurs="1" />
<xsd:element name="band2V" type="CT_TablePartStyle" minOccurs="0"
  maxOccurs="1" />
<xsd:element name="lastCol" type="CT_TablePartStyle"
  minOccurs="0" maxOccurs="1" />
<xsd:element name="firstCol" type="CT_TablePartStyle"
  minOccurs="0" maxOccurs="1" />
<xsd:element name="lastRow" type="CT_TablePartStyle"
  minOccurs="0" maxOccurs="1" />
<xsd:element name="seCell" type="CT_TablePartStyle" minOccurs="0"
  maxOccurs="1" />
<xsd:element name="swCell" type="CT_TablePartStyle" minOccurs="0"
  maxOccurs="1" />
<xsd:element name="firstRow" type="CT_TablePartStyle"
  minOccurs="0" maxOccurs="1" />
<xsd:element name="neCell" type="CT_TablePartStyle" minOccurs="0"
  maxOccurs="1" />
<xsd:element name="nwCell" type="CT_TablePartStyle" minOccurs="0"
  maxOccurs="1" />
<xsd:element name="extLst" type="CT_OfficeArtExtensionList"
  minOccurs="0" maxOccurs="1" />
</xsd:sequence>
<xsd:attribute name="styleId" type="ST_Guid" use="required" />
<xsd:attribute name="styleName" type="xsd:string" use="required" />
</xsd:complexType>

```

Also contained within the table style is an ID and a name. The name shows up as the name for the table style and the ID is the unique id (GUID) that is associated with the table style.

L.4.5.2.10 Table Style List

The final complex type dealing with table styles is simply a list of table styles. Also contained in this list is the default style which is applied to the table when the a default is to be used. The complex type, CT_TableStyleList, is defined in the following manner:


```

<xsd:complexType name="CT_TableStyleList">
  <xsd:sequence>
    <xsd:element name="tblStyle" type="CT_TableStyle" minOccurs="0"
      maxOccurs="unbounded" />
  </xsd:sequence>
  <xsd:attribute name="def" type="ST_Guid" use="required" />
</xsd:complexType>

```

L.4.5.3 Table Definition

In this subclause, the focus is on the actual definition of a table and the data contained within the table. There are not as many complex types in this subclause as with the table style subclause, but they are organized in the same way as the table style section.

L.4.5.3.1 Cell Properties

The complex type, CT_TableCellProperties, holds all the information that deals with the properties of a given cell. The cell properties contain a section for the different line properties (ln*), the cell fill properties, the 3-D properties, cell margin information (mar*), anchoring information (anchor and anchorCtr), a vertical text type, and finally an attribute which defines the behavior of horizontal text overflow (horzOverflow). As with many other types defined in this document, CT_TableCellProperties contains an element reserved for future extensibility. The complex type is defined in the following manner:

```

<xsd:complexType name="CT_TableCellProperties">
  <xsd:sequence>
    <xsd:element name="lnL" type="CT_LineProperties" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="lnR" type="CT_LineProperties" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="lnT" type="CT_LineProperties" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="lnB" type="CT_LineProperties" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="lnTlToBr" type="CT_LineProperties"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="lnBlToTr" type="CT_LineProperties"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="cell3D" type="CT_Cell3D" minOccurs="0"
      maxOccurs="1" />
    <xsd:group ref="EG_FillProperties" minOccurs="0" maxOccurs="1" />
    <xsd:element name="extLst" type="CT_OfficeArtExtensionList"
      minOccurs="0" maxOccurs="1" />
  </xsd:sequence>

```

```

<xsd:attribute name="marL" type="ST_Coordinate32" use="optional"
  default="91440" />
<xsd:attribute name="marR" type="ST_Coordinate32" use="optional"
  default="91440" />
<xsd:attribute name="marT" type="ST_Coordinate32" use="optional"
  default="45720" />
<xsd:attribute name="marB" type="ST_Coordinate32" use="optional"
  default="45720" />
<xsd:attribute name="vert" type="ST_TextVerticalType" use="optional"
  default="horz" />
<xsd:attribute name="anchor" type="ST_TextAnchoringType"
  use="optional" default="t" />
<xsd:attribute name="anchorCtr" type="xsd:boolean" use="optional"
  default="false" />
<xsd:attribute name="horzOverflow" type="ST_TextHorzOverflowType"
  use="optional" default="clip" />
</xsd:complexType>

```

L.4.5.3.2 Column

The complex type, CT_TableCol, defines a table column element. The table column element simply holds the width for a given column in a table along with an element reserved for future extensibility. The complex type is defined as:

```

<xsd:complexType name="CT_TableCol">
  <xsd:sequence>
    <xsd:element name="extLst" type="CT_OfficeArtExtensionList"
      minOccurs="0" maxOccurs="1" />
  </xsd:sequence>
  <xsd:attribute name="w" type="ST_Coordinate" use="required" />
</xsd:complexType>

```

L.4.5.3.3 Table Grid

The complex type, CT_TableGrid, defines a list of table column elements, or rather CT_TableCol complex types. The CT_TableGrid should contain a CT_TableCol for each column in the table and it is defined in the following manner:

```

<xsd:complexType name="CT_TableGrid">
  <xsd:sequence>
    <xsd:element name="gridCol" type="CT_TableCol" minOccurs="0"
      maxOccurs="unbounded" />
  </xsd:sequence>
</xsd:complexType>

```

L.4.5.3.4 Cell

The complex type, CT_TableCell, defines a cell in a table. Within this complex type lies a text body which holds the data of the cell along with any formatting applied to the text. This complex type also holds a table cell property complex type which has already been defined. The rowSpan and gridSpan attributes are available along with hMerge and vMerge attributes. The hMerge and vMerge attributes define if the current cell is supposed to be merged with the previous cell horizontally or vertically. This is how the table is parsed and created. The complex type, CT_TableCell, is defined as:

```
<xsd:complexType name="CT_TableCell">
  <xsd:sequence>
    <xsd:element name="txBody" type="CT_TextBody" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="tcPr" type="CT_TableCellProperties"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="extLst" type="CT_OfficeArtExtensionList"
      minOccurs="0" maxOccurs="1" />
  </xsd:sequence>
  <xsd:attribute name="rowSpan" type="xsd:int" use="optional"
    default="1" />
  <xsd:attribute name="gridSpan" type="xsd:int" use="optional"
    default="1" />
  <xsd:attribute name="hMerge" type="xsd:boolean" use="optional"
    default="false" />
  <xsd:attribute name="vMerge" type="xsd:boolean" use="optional"
    default="false" />
</xsd:complexType>
```

L.4.5.3.5 Row

The complex type, CT_TableRow, defines a table row. This complex type is somewhat more complex than the similar table column complex type in that it holds a sequence of CT_TableCell structures along with a height for the row. The complex type is defined in the following way:

```
<xsd:complexType name="CT_TableRow">
  <xsd:sequence>
    <xsd:element name="tc" type="CT_TableCell" minOccurs="0"
      maxOccurs="unbounded" />
    <xsd:element name="extLst" type="CT_OfficeArtExtensionList"
      minOccurs="0" maxOccurs="1" />
  </xsd:sequence>
  <xsd:attribute name="h" type="ST_Coordinate" use="required" />
</xsd:complexType>
```

L.4.5.3.6 Table Properties

The complex type, CT_TableProperties, defines the properties for a table as a whole. Within this complex type is a definition for a table style that is currently applied to the table, or the GUID for the built in table style that is applied to the table. Also in this complex type are right-to-left settings, the effects applied to the table (shadow, reflection, etc), background fill information, and the states for the different on/off table style options. The complex type is defined as:

```
<xsd:complexType name="CT_TableProperties" >
  <xsd:sequence>
    <xsd:group ref="EG_FillProperties" minOccurs="0" maxOccurs="1" />
    <xsd:group ref="EG_EffectProperties" minOccurs="0"
      maxOccurs="1" />
    <xsd:choice oxsd:cname="TableStyleOrLink" minOccurs="0"
      maxOccurs="1" >
      <xsd:element name="tableStyle" type="CT_TableStyle" />
      <xsd:element name="tableStyleId" type="ST_Guid" />
    </xsd:choice>
    <xsd:element name="extLst" type="CT_OfficeArtExtensionList"
      minOccurs="0" maxOccurs="1" />
  </xsd:sequence>
  <xsd:attribute name="rtl" type="xsd:boolean" use="optional"
    default="false" />
  <xsd:attribute name="firstRow" type="xsd:boolean" use="optional"
    default="false" />
  <xsd:attribute name="firstCol" type="xsd:boolean" use="optional"
    default="false" />
  <xsd:attribute name="lastRow" type="xsd:boolean" use="optional"
    default="false" />
  <xsd:attribute name="lastCol" type="xsd:boolean" use="optional"
    default="false" />
  <xsd:attribute name="bandRow" type="xsd:boolean" use="optional"
    default="false" />
  <xsd:attribute name="bandCol" oxsdtype="xsd:boolean" use="optional"
    default="false" />
</xsd:complexType>
```

L.4.5.3.7 Table

The final complex type, CT_Table, is the root element for a table. This complex type holds all the information that is needed to create a table within DrawingML. Within CT_Table are the table properties, a table grid, and a table row. A CT_Table is defined in the following manner:

```

<xsd:complexType name="CT_Table">
  <xsd:sequence>
    <xsd:element name="tblPr" type="CT_TableProperties" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="tblGrid" type="CT_TableGrid" minOccurs="1"
      maxOccurs="1" />
    <xsd:element name="tr" type="CT_TableRow" minOccurs="0"
      maxOccurs="unbounded" />
  </xsd:sequence>
</xsd:complexType>

```

L.4.6 3D Aspects

L.4.6.1 Introduction

L.4.6.2 This aspect of DrawingML deals mainly with the 3-D aspects, and can be broken down into two topics: 3-D properties associated with an object, and the styling information associated with an object.3-D

Here we'll explain the 3-D definitions contained in DrawingML. The goal here is to define a 3-D scene so that lighting calculations can be made on the geometry within the scene.

L.4.6.2.1 3-D Scene

Every 3-D scene consists of a camera, a light, and a backdrop, that define the associated properties of the scene. The complex type, CT_Scene3D, defines the scene as follows:

```

<xsd:complexType name="CT_Scene3D" xmlns:oxsd="Scene3D">
  <xsd:sequence>
    <xsd:element name="camera" type="CT_Camera" minOccurs="1"
      maxOccurs="1" />
    <xsd:element name="lightRig" type="CT_LightRig" minOccurs="1"
      maxOccurs="1"/>
    <xsd:element name="backdrop" type="CT_Backdrop" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="ext" type="CT_OfficeArtExtension" minOccurs="0"
      maxOccurs="1" />
  </xsd:sequence>
</xsd:complexType>

```

As was stated above, the complex type, CT_Scene3D, contains a camera, a set of lights (the light rig), and a backdrop. Those familiar with 3-D rendering techniques understand the usage of a camera and set of lights, or light rig. The backdrop, however, is a special structure (which is defined below) that allows for a special plane to render certain effects that need to be rendered together in a single plane. The final element of a CT_Scene3D is the ext element. This is a DrawingML structure used for future extensibility. This element is seen in other complex types dealing with the 3-D scene as well.

L.4.6.2.2 Camera

The complex type, CT_Camera, defines a camera within the 3-D scene. A camera is based on a preset, with an optional rotation, field-of-view, and zoom, which all act as overrides for the preset values. A camera is defined in the following way:

```
<xsd:complexType name="CT_Camera">
  <xsd:sequence>
    <xsd:element name="rot" type="CT_SphereCoords" minOccurs="0"
      maxOccurs="1" oxsd:dataStructure="optional" />
  </xsd:sequence>
  <xsd:attribute name="prst" type="ST_PresetCameraType" use="required"
    />
  <xsd:attribute name="fov" type="ST_FOVAngle" use="optional" />
  <xsd:attribute name="zoom" type="ST_PositivePercentage"
    use="optional" default="100%" />
</xsd:complexType>
```

The only complex type contained in the camera, CT_SphereCoords, is a complex type defined elsewhere within the DrawingML. There are three simple types associated with a camera:

- ST_FOVAngle (field of view angle), which is a positive angle between 0 and 180 in 60,000th of a degree.
- ST_PositivePercentage (zoom), which is defined as a percentage.
- ST_PresetCameraType (preset camera)

Figure 1 below shows some different presets applied to a shape.

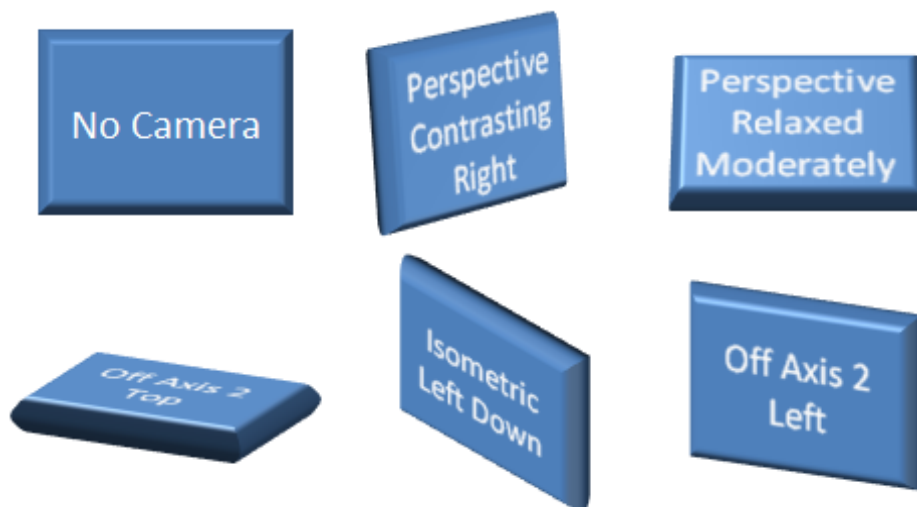


Figure 7: Different default cameras applied to a shape

The available options for ST_PresetCameraType are as follows:

legacyObliqueTopLeft

legacyObliqueTop

legacyObliqueLeft

legacyObliqueFront

legacyObliqueRight

legacyObliqueBottomLeft

legacyObliqueBottom

legacyObliqueBottomRight

legacyPerspectiveTopLeft

legacyPerspectiveTop

legacyPerspectiveTopRight

legacyPerspectiveLeft

legacyPerspectiveFront

legacyPerspectiveRight

legacyPerspectiveBottomLeft

legacyPerspectiveBottom

legacyPerspectiveBottomRight

orthographicFront

isometricTopUp

isometricTopDown

isometricBottomDown

isometricLeftUp

isometricLeftDown

isometricRightUp

isometricRightDown

isometricOffAxis1Left

isometricOffAxis1Right

isometricOffAxis1Top

isometricOffAxis2Left

isometricOffAxis2Right

isometricOffAxis2Top

isometricOffAxis3Left

isometricOffAxis3Right

isometricOffAxis3Bottom

isometricOffAxis4Left

isometricOffAxis4Right

isometricOffAxis4Bottom

obliqueTopLeft

obliqueTopRight
obliqueLeft

obliqueRight
obliqueBottomLeft
obliqueBottom
obliqueBottomRight
perspectiveFront

perspectiveLeft
perspectiveRight
perspectiveAbove
perspectiveBelow
perspectiveAboveLeftFacing

perspectiveAboveRightFacing
perspectiveContrastingRightFacing
perspectiveContrastingLeftFacing
perspectiveHeroicLeftFacing
perspectiveHeroicRightFacing

perspectiveHeroicExtremeLeftFacing
perspectiveHeroicExtremeRightFacing
perspectiveRelaxed
perspectiveRelaxedModerately

L.4.6.2.3 Light

The complex type, CT_LightRig, defines the lighting of the scene. A light rig consists of a preset direction, preset rig type, and a rotation that serves as an override for the direction. The complex type is defined as:

```
<xsd:complexType name="CT_LightRig">
  <xsd:sequence>
    <xsd:element name="rot" type="CT_SphereCoords" minOccurs="0"
      maxOccurs="1" />
  </xsd:sequence>
  <xsd:attribute name="rig" type="ST_LightRigType" use="required" />
  <xsd:attribute name="dir" type="ST_LightRigDirection" use="required"/>
</xsd:complexType>
```

Just as with the camera, the complex type, CT_SphereCoords, is defined elsewhere in the DrawingML. This element, however, serves as an override for the default light right direction. Figure 2 below shows some of the different preset lights applied to a shape.



Figure 8: Some preset lights applied to a shape.

The types of available light rigs are:

legacyFlat1
 legacyFlat2
 legacyFlat3
 legacyFlat4
 legacyNormal1

legacyNormal2
 legacyNormal3
 legacyNormal4
 legacyHarsh1
 legacyHarsh2

legacyHarsh3
 legacyHarsh4
 threePoint
 balanced
 soft

harsh
 flood
 contrasting
 morning
 sunrise

sunset
 chilly

freezing
 flat
 twoPoint
 glow
 brightRoom

The types of available present directions are:

tl – top left
 t – top
 tr – top right
 l – left

 r – right
 bl – bottom left
 b – bottom
 br – bottom right

L.4.6.2.4 Backdrop

The complex type, CT_Backdrop, defines a unique place in the 3-D scene. The backdrop is a flat 2-D plane that can hold effects, such as shadows, oriented in 3-D space. The points and vectors contained within the backdrop are relative to world space. The complex type is defined as:

```
<xsd:complexType name="CT_Backdrop">
  <xsd:sequence>
    <xsd:element name="anchor" type="CT_Point3D" minOccurs="1"
      maxOccurs="1" />
    <xsd:element name="norm" type="CT_Vector3D" minOccurs="1"
      maxOccurs="1" />
    <xsd:element name="up" type="CT_Vector3D" minOccurs="1"
      maxOccurs="1"/>
    <xsd:element name="ext" type="CT_OfficeArtExtension" minOccurs="0"
      maxOccurs="1" />
  </xsd:sequence>
</xsd:complexType>
```

All of the complex types defined within this backdrop are defined elsewhere in DrawingML. As with other complex types, the backdrop also contains an element reserved for future extensibility.

L.4.6.3 Styles

The 3-D styles section encompasses the properties for 3-D shapes. These properties are those that get applied to the 3-D shape, such as a bevel or a contour, and they define the look of the shape in 3-D. A number of simple types used within the complex types of this group are defined below.

L.4.6.3.1 Simple Types

The simple types defined here outline the different presets available to the user. These presets are applied to the shapes through the complex type definitions that are outlined later.

L.4.6.3.1.1 Bevel Type

The simple type, `ST_BevelPresetType`, defines a preset bevel for a shape and some examples can be seen in figure 3.

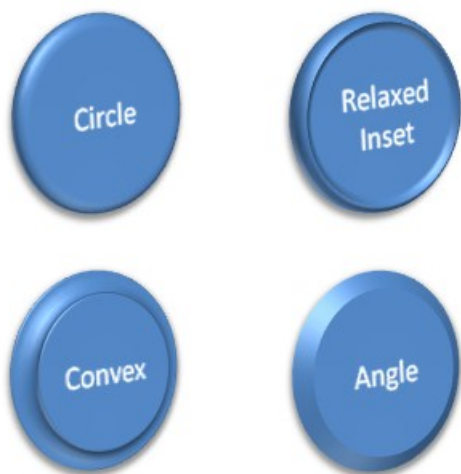


Figure 9: Different bevel types applied to a shape

The different types of bevels available are:

relaxedInset
circle
slope
cross
angle
softRound

convex
coolSlant
divot
ribblet
hardedge
artDeco

L.4.6.3.1.2 Preset Material Type

The simple type, `ST_PresetMaterialType`, defines a material for the shape. The material properties describe the surface appearance of the shape, and are used in lighting calculations to define exactly how the light interacts with the shape. Some example material types can be seen in figure 4.



Figure 10: Different material types on a shape.

The different preset material types are:

legacyMatte
 legacyPlastic
 legacyMetal
 legacyWireframe
 matte

 plastic
 metal
 warmMatte
 translucentPowder
 powder

 dkEdge
 softEdge
 clear
 flat
 softMetal

L.4.6.3.2 Complex Types

The complex types in this area define the actual 3-D properties that get applied to a shape. These properties work together in order to define the geometry of a shape along with the scene related properties that define the look of the geometry of the shape.

L.4.6.3.2.1 Bevel

The complex type, CT_Bevel, defines a bevel for a shape. The bevel consists of a width and a height value, along with a preset bevel. The complex type is defined in the following manner:

```
<xsd:complexType name="CT_Bevel">
  <xsd:attribute name="w" type="ST_PositiveCoordinate" use="optional"
    default="76200" />
  <xsd:attribute name="h" type="ST_PositiveCoordinate" use="optional"
    default="76200" />
  <xsd:attribute name="prst" type="ST_BevelPresetType" use="optional"
    default="circle" />
</xsd:complexType>
```

L.4.6.3.2.2 Shape 3-D

The complex type, CT_Shape3D, defines all of the 3-D properties associated with an individual shape. A shape can have two bevels, one on the top and one on the bottom. An extrusion color also defined, which, when applied, applies a color to the surface of the extrusion. There is also an extrusion width, which defines the width of the extrusion. A contour color and width can be defined for the shape. A z-axis anchor is defined within the complex type and is the anchor relative to the shape's top face. The shape 3-D complex type also holds a present material. Finally the shape 3-D contains another element just as in previous complex types, which is used for future extensibility. The CT_Shape3D complex type is defined in the following manner:

```
<xsd:complexType name="CT_Shape3D">
  <xsd:sequence>
    <xsd:element name="bevelT" type="CT_Bevel" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="bevelB" type="CT_Bevel" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="extrusionClr" type="CT_Color" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="contourClr" type="CT_Color" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="ext" type="CT_OfficeArtExtension" minOccurs="0"
      maxOccurs="1" />
  </xsd:sequence>
  <xsd:attribute name="z" type="ST_Coordinate" use="optional"
    default="0" />
</xsd:complexType>
```

```

<xsd:attribute name="extrusionH" type="ST_PositiveCoordinate"
  use="optional" default="0" />
<xsd:attribute name="contourW" type="ST_PositiveCoordinate"
  use="optional" default="0" />
<xsd:attribute name="prstMaterial" type="ST_PresetMaterialType"
  use="optional" default="warmMatte" />
</xsd:complexType>

```

L.4.6.3.2.3 Flat Text

The complex type, CT_FlatText, defines a text object in a 3-D scene that should be rendered as a normal, flat, text overlay outside of the 3-D scene. The complex type is defined in the following manner:

```

<xsd:complexType name="CT_FlatText">
  <xsd:attribute name="z" type="ST_Coordinate" use="optional"
    default="0" />
</xsd:complexType>

```

L.4.6.3.2.4 Group, Text 3-D

The final structure to be defined is a group, EG_Text3D, which describes how text should be applied in the 3-D scene. If the text object is a member of the 3-D scene, then there are three different ways it can be displayed:

- If no EG_Text3D choice is provided, the text is rendered in a scene coherent manner and is rendered in perspective inside of the 3D scene as a planar shape inside the 3-D.
- If CT_Shape3D is provided then the text is scene coherent and fully 3-D.
- If CT_FlatText is provided then the text is drawn as normal 2-D text rendered on top of the 3-D scene.

An EG_Text3D is defined in the following manner:

```

<xsd:group name="EG_Text3D">
  <xsd:choice oxsd:cname="Text3DChoice"
    oxsd:cnameMember="text3DChoice">
    <xsd:element name="sp3dtype="CT_Shape3D" minOccurs="1"
      maxOccurs="1"/>
    <xsd:element name="flatTx" type="CT_FlatText" minOccurs="1"
      maxOccurs="1" />
  </xsd:choice>
</xsd:group>

```

L.4.7 Coordinate Systems and Transformations

L.4.7.1 Introduction

This document provides an overview of the transformation elements for shapes and groups, represented by <a:xfrm> in DrawingML. These schemas are for the representation of scaling and rotation on individual shapes and groups.

§L.4.7.2, §L.4.7.3, and §L.4.7.4 provide a qualitative overview of the transformation pipeline. §L.4.7.6 provides mathematical details.

L.4.7.2 Coordinate System

All DrawingML shapes are located on a 2-D Cartesian coordinate space with the origin (0,0) in the upper left-hand corner of the canvas. The x-axis coordinates grow positively as one moves from left to right, and the y-axis coordinates grow positively as one moves from top to bottom.

Coordinates are measured in EMUs, and can be positive or negative.

L.4.7.3 Shape Transformations

In this subclause, we describe the transformation pipeline for a shape. To summarize, the *shape transformation* for a shape is defined as the following sequence of operations:

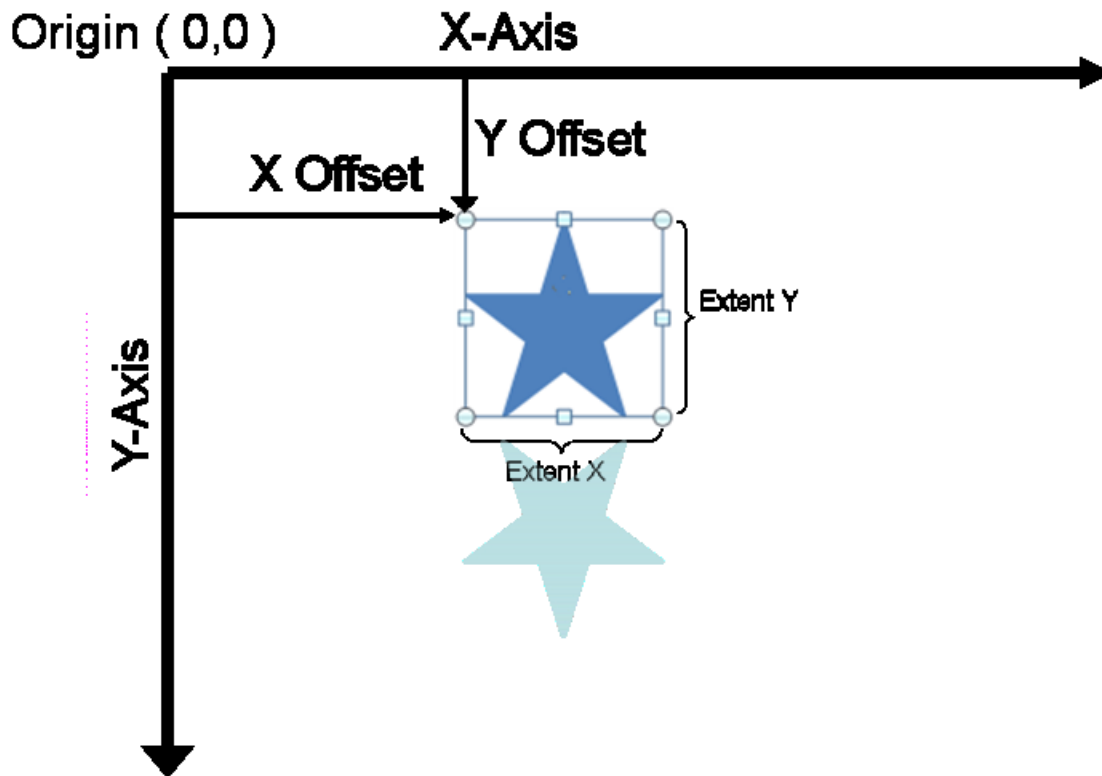
1. The translation and scaling required to transform its original bounding box to a rectangle specified by the offset and extents.
2. A flip across the center of the bounding box according to flipH and flipV.
3. A rotation about the center of the bounding box according to the rot attribute.

To render a shape that is not inside a group (§L.4.7.4), the renderer simply applies the shape transformation to the original shape.

L.4.7.3.1 Scaling and Translating a Shape

The shape is scaled horizontally, scaled vertically, and translated in both dimensions, to fill a given bounding box. The bounding box is represented by specifying an offset in x and y (attributes x and y of a:off) and extents in x and y (attributes cx and cy of a:ext, both of which must be greater than or equal to zero). The upper left corner of the bounding box is located at the offset, and the lower right corner of the bounding box is located at the offset plus extent.

If the starting shape has zero width (e.g., it is a vertical line), then the cx attribute of a:ext is ignored and the horizontal scaling is skipped. Similarly, if the starting shape has zero height, then the cy attribute of a:ext is ignored and the vertical scaling is skipped.



The following XML fragment represents the offset and extents for the star shape above:

```
<a:xfrm>
  <a:off x="1866680" y="990600"/>
  <a:ext cx="1371600" cy="1371600"/>
</a:xfrm>
```

Notice that as demonstrated with the example above, any effects attached to the shape are disregarded when scaling and translating the shape to fill the given bounding box.

This example illustrates that no additional parameters are needed to represent the scaling of a shape. The bounding-box parameters are sufficient to represent scaling. The following XML Fragments represent the offset and extents for a star shape, before and after scaling. In this particular example, the bounding boxes have been chosen to have the same upper-left corner, i.e., the same offset.



Before scaling (small star):

```
<a:xfrm>
  <a:off x="1066800" y="990600"/>
  <a:ext cx="1371600" cy="1371600"/>
</a:xfrm>
```

After scaling (large star):

```
<a:xfrm>
  <a:off x="1066800" y="990600"/>
  <a:ext cx="2438400" cy="2133600"/>
</a:xfrm>
```

L.4.7.3.2 Rotating a Shape

Rotation is represented with the `rot` attribute. The shape is rotated clockwise about the bounding-box center, by the amount specified in the `rot` attribute. Each unit of rotation is 1/1,000 of an arc minute (1/60,000 of a degree).

This example represents the small star from above, with a subsequent 45-degree rotation clockwise. Since the y axis points down, a clockwise rotation is positive.



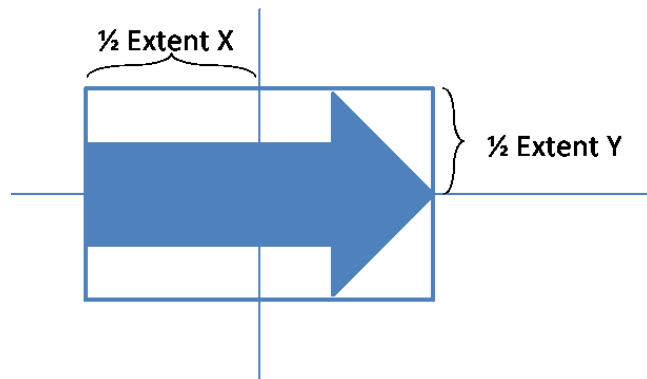
```

<a:xfrm rot="2700000">
  <a:off x="1066800" y="990600"/>
  <a:ext cx="1371600" cy="1371600"/>
</a:xfrm>

```

L.4.7.3.3 Flipping a Shape

A flip is a reflection across a vertical or horizontal line that intersects the center of the bounding box. The optional flipH and flipV attributes control horizontal and vertical flipping, respectively. Each is absent or equal to 0 if no flipping is to be performed, and equal to 1 if flipping is to be performed.



The following XML fragment illustrates a shape that has been flipped both horizontally and vertically.

```

<a:xfrm flipH="1" flipV="1">
  <a:off x="3964937" y="2652643"/>
  <a:ext cx="168838" cy="1219199"/>
</a:xfrm>

```

L.4.7.4 Group Transformations

A group is composed of zero to many shapes. Because a group is a shape, this composition relationship can nest recursively. (A group with zero shapes is degenerate; it produces no user-visible output. A group with one shape is also degenerate; it has no representational power beyond that of the one shape.)

The definition of a group transformation is identical to that of a shape transformation, except that in place of the pre-transform bounding box of a shape, we use the union of all of its children prior to their individual rotations. To summarize, a *group transformation* is the following sequence of operations:

1. The translation and scaling required to transform the union of the children's bounding boxes to a rectangle defined by the group's offset and extent attributes.
2. A flip about that bounding box according to the flipH and flipV attributes.
3. A rotation about the center of that bounding box according to the rot attribute.

To render a simple shape that is inside a group hierarchy, the renderer does not simply apply the shape transformation and all parent group transformations to the original shape. Instead (see §L.4.7.5), it applies the transformation equal to the following sequence of operations:

1. Horizontal scaling and flipping by a factor equal to the product of the horizontal scalings and flips in its own transformation and those of its parents.
2. Vertical scaling and flipping by a factor equal to the product of the vertical scalings and flips in its own transformation and those of its parents.
3. Rotation by an amount equal to the sum of the rotations in its own transformation and those of its parents.
4. Translation such that its center coincides with the point obtained by applying the shape transformation and all parent group transformations to the shape's original center.

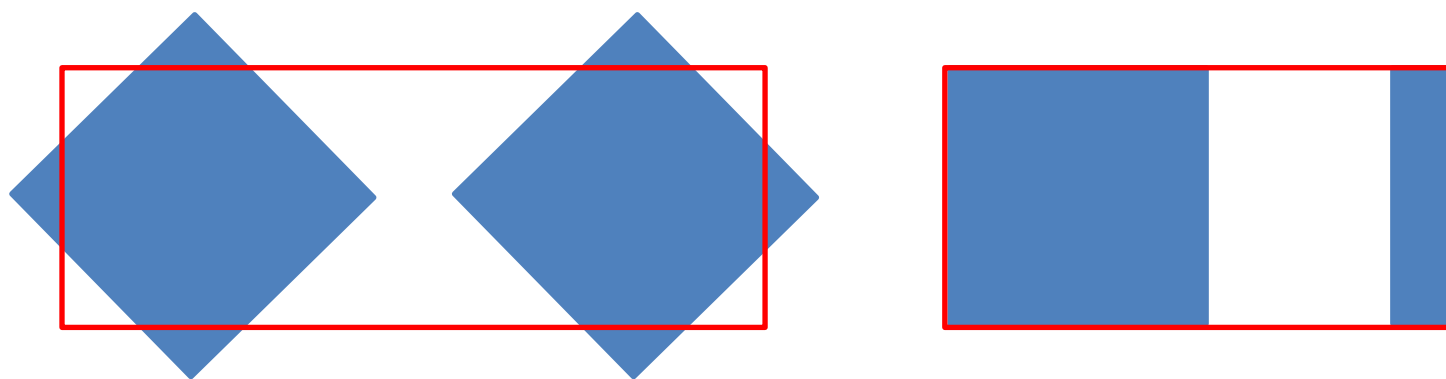
Because of the similarity with the transformation pipeline for a shape, the forthcoming subsections primarily cover illustrative examples.

L.4.7.4.1 Scaling and Translating a Group

The group is scaled horizontally, scaled vertically, and translated in both dimensions. The parameters are chosen to transform the child bounding box (specified by `a:chOff` and `a:chExt`) to the group bounding box (specified by `a:off` and `a:ext`). The *child bounding box* is defined as the bounding box around the group's children as they would have been had their `rot` attributes been absent.

It is possible for the child bounding box to have a zero value for `cx` or `cy` in `a:chExt`, e.g., because the starting shape is a horizontal or vertical line, or because the starting shape was scaled to have zero width or height. Such a case is handled in the same way as previously described for simple shapes.

This example demonstrates the definition of the child bounding box. The two shapes on the left, rotated squares, are grouped. The two shapes on the right, non-rotated squares, are also grouped.



The red bands are not part of the drawing; each represents the child bounding box of a group. In the XML fragments, the child bounding boxes have identical `y` values, illustrating that they are computed based on the bounding boxes of the squares prior to their rotation.

For the left-hand group:

```

<a:xfrm>
  <a:off x="762000" y="1828800" />
  <a:ext cx="3327400" cy="1219200" />
  <a:chOff x="762000" y="1828800" />
  <a:chExt cx="3327400" cy="1219200" />
</a:xfrm>

```

For the right-hand group:

```

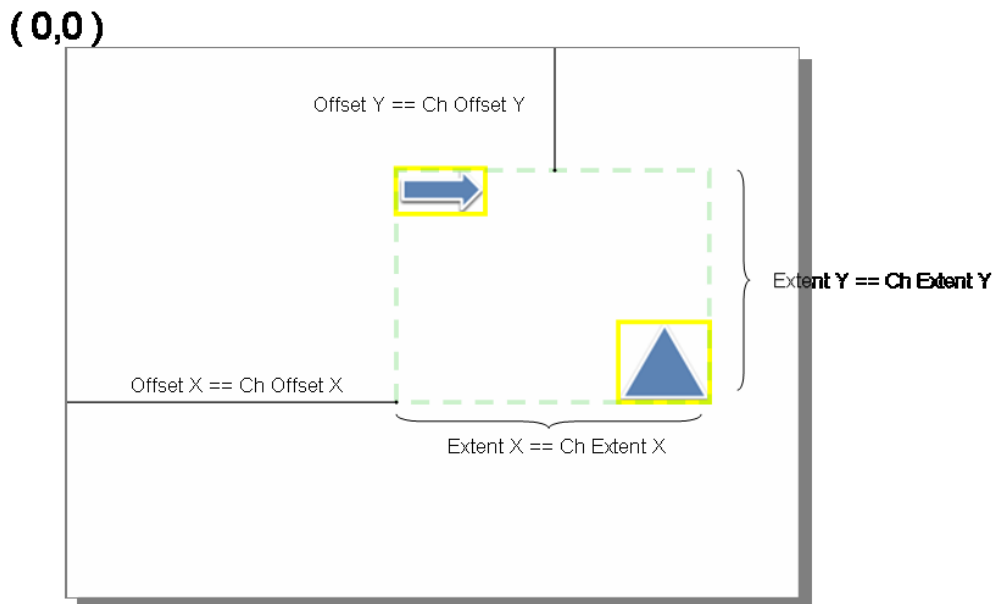
<a:xfrm>
  <a:off x="4978400" y="1828800" />
  <a:ext cx="3327400" cy="1219200" />
  <a:chOff x="4978400" y="1828800" />
  <a:chExt cx="3327400" cy="1219200" />
</a:xfrm>

```

The remainder of the examples in this subsection illustrate translation and scaling of a group.

In this situation, two shapes are grouped: an arrow and a triangle. No further translation, scaling, rotation, or flipping is applied.

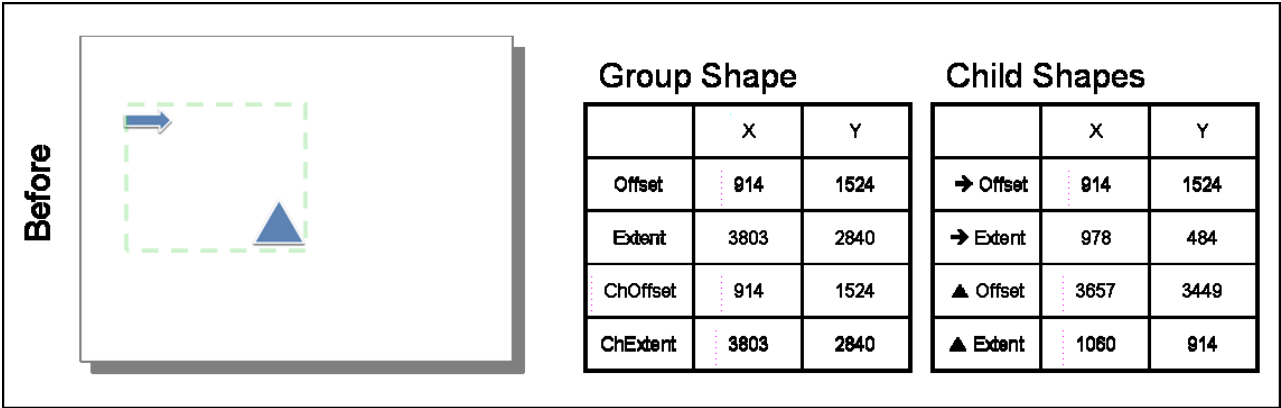
To represent this situation, the child bounding box is the bounding box around both of these shapes; and because no further transformation is applied, the group bounding box is equal to the child bounding box.



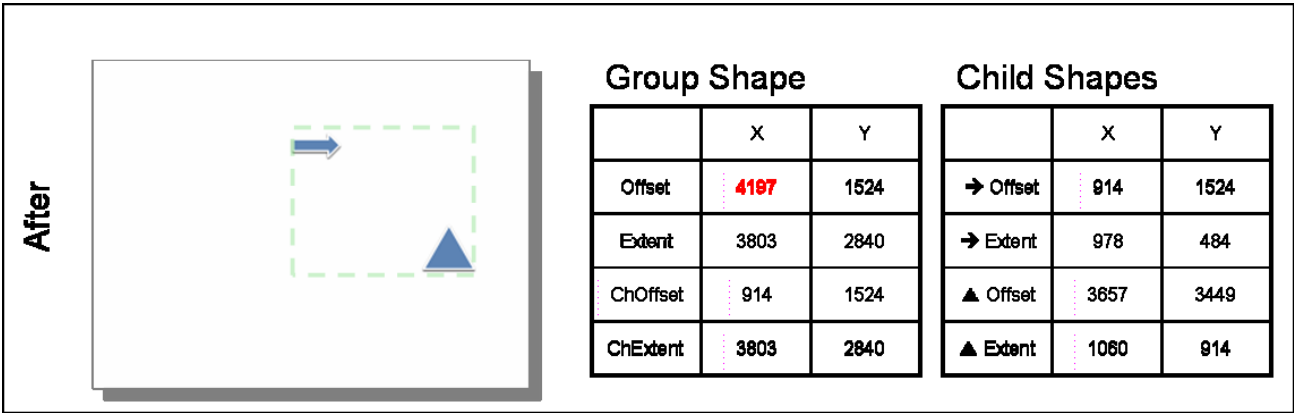
The following is an XML snippet representing the transform variables of the group.

```
<p:grpSpPr>
  <a:xfrm>
    <a:off x="2209800" y="2514600"/>
    <a:ext cx="4038600" cy="2286000"/>
    <a:chOff x="2209800" y="2514600"/>
    <a:chExt cx="4038600" cy="2286000"/>
  </a:xfrm>
</p:grpSpPr>
```

This example illustrates that no additional parameters are needed to represent the translation of a group. A group is moved to the right. The following diagram shows the starting state, prior to the translation. Note that offset==ChOffset and extent==ChExtent.



Increasing the x component of the offset moves the group to the right.

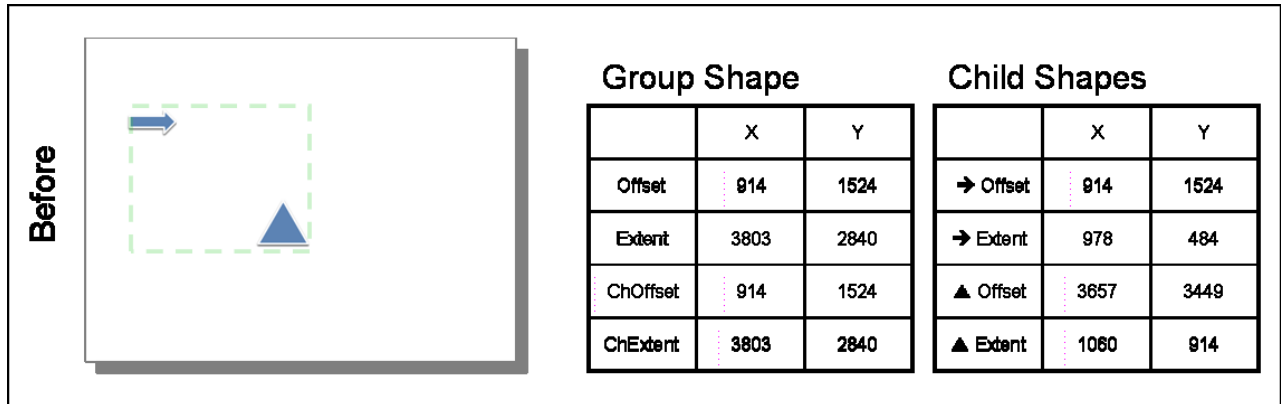


Similarly, scaling can be performed by adjusting the group bounding box.

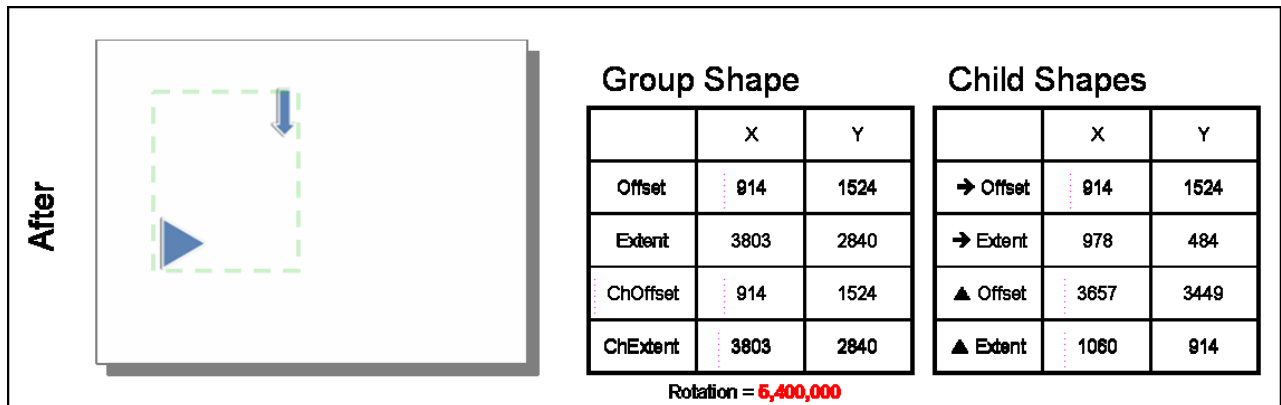
L.4.7.4.2 Rotating a Group

Group rotation is identical to shape rotation. The group is rotated clockwise about the bounding-box center, by the amount specified in the rot attribute.

In this example, group is rotated 90 degrees clockwise. The following diagram shows the starting state, prior to the rotation.



Setting the rotation attribute to 5,400,000 rotates the group clockwise 90 degrees.



L.4.7.5 Nesting Transformations

The following example illustrates the rendering procedure described at the end of the introduction to §L.4.7.4, which differs from a conventional transformation pipeline in any case where a scaled group contains a rotated child.

[Example: In this example, the diagram on the left side is a group that comprises a rotated red square centered inside a non-rotated blue square. The diagram on the right side is the same group, scaled horizontally. The red square scales along an axis parallel to its own edges instead of an axis parallel to the edges of the blue square.



L.4.7.6 Transformation Matrices

The preceding sections fully define the transformation pipeline and its parameters. This section assists developers in implementing the pipeline by describing it mathematically. It is generalized to describe either the shape transformation pipeline or the group transformation pipeline.

L.4.7.6.1 Symbol Definitions

Let the following symbols represent parameters described in the preceding sections.

- (B_x, B_y) For a shape: upper left corner of untransformed shape.
For a group: upper left corner of child bounding box (a:chOff).
- (D_x, D_y) For a shape: (width,height) of untransformed shape.
For a group: (width,height) of child bounding box (a:chExt).
- (B'_x, B'_y) Upper left corner of bounding box (a:off), prior to rotation and flip.
- (D'_x, D'_y) (width,height) of bounding box (a:ext), prior to rotation and flip.
- θ Clockwise rotation (from the attribute rot, which uses thousandths of an arc minute).
- F_x -1 if flipH is true; +1 otherwise.
- F_y -1 if flipV is true; +1 otherwise.

We use homogeneous coordinates, in which a point p is represented in the form

$$p = \begin{bmatrix} x \\ y \\ 1 \end{bmatrix}.$$

We use the convention in which transformations are applied by left-hand multiplication. Thus, to obtain the point p' by applying transformation T to point p we write:

$$p' = T p$$

L.4.7.6.2 Transformation Pipeline

The entire transformation pipeline that defines either a shape transformation or a group transformation is represented by the matrix T , defined at the end of this subsection.

Scaling and translation are produced by the following matrix:

$$T_{st} = \begin{bmatrix} \frac{D'_x}{D_x} & 0 & B'_x - \left(\frac{D'_x}{D_x}\right) B_x \\ 0 & \frac{D'_y}{D_y} & B'_y - \left(\frac{D'_y}{D_y}\right) B_y \\ 0 & 0 & 1 \end{bmatrix} .$$

The following matrix translates the bounding box to the origin in preparation for rotation and flipping:

$$U = \begin{bmatrix} 1 & 0 & -\left(B'_x + \frac{D'_x}{2}\right) \\ 0 & 1 & -\left(B'_y + \frac{D'_y}{2}\right) \\ 0 & 0 & 1 \end{bmatrix} .$$

Rotation and flipping are produced by the following matrix:

$$T_{rf} = U^{-1} \begin{bmatrix} \cos \theta & -\sin \theta & 0 \\ \sin \theta & \cos \theta & 0 \\ 0 & 0 & 1 \end{bmatrix} \begin{bmatrix} F_x & 0 & 0 \\ 0 & F_y & 0 \\ 0 & 0 & 1 \end{bmatrix} U .$$

The entire transformation pipeline for one step in the group hierarchy is represented by the matrix

$$T = T_{rf} T_{st}$$

L.4.8 Shape Properties and Effects

L.4.8.1 Introduction

Color Models are also covered, as Fills, Lines, and Effects all reference color model schemas to represent color.

L.4.8.2 Color Models

There are several methods of expressing color: `scrgbClr`, `srgbClr`, `hslClr`, `sysClr`, `schemeClr`, and `prstClr`. Although `srgbClr` is the most commonly used model, the rationale for having various equivalent color models stems from a desire to have different ways of naturally expressing a color choice.

L.4.8.2.1 `scrgbClr`

`scrgbClr` is a legacy form of expressing Red, Green, Blue color. Values are expressed in Percentages. `r`, `g`, and `b` are all required and correspond to red, green, and blue, respectively.

```
<a:scrgbClr r="10000" g="20000" b="30000"/>
```


L.4.8.2.2 `srgbClr`

`srgbClr` is similar to `scrgbClr` with the exception that instead of expressing the values as percentages, they are specified using two hex digits per color, in the order RGB.

```
<a:srgbClr val="FFFF00"/>
```

L.4.8.2.3 `hslClr`

`hslClr` represents a color using the Hue, Saturation, and Luminescence color model. Values are expressed in Percentages. `h`, `s`, and `l` are all required, and correspond to hue, saturation, and luminescence respectively. A perceptual gamma of 2.2 is assumed.

```
<a:hslClr h="10000" s="20000" l="30000"/>
```

L.4.8.2.4 `sysClr`

`sysClr` represents a system color, and introduces a level of indirection. For example, specifying:

```
<a:sysClr val="windowText"/>
```

binds the color to be the color chosen in the system for "Window Text". The possible values are:

```
scrollBar
background
activeCaption
inactiveCaption
menu
window
windowFrame
menuText
windowText
captionText
activeBorder
inactiveBorder
appWorkspace
highlight
highlightText
btnFace
btnShadow
grayText
btnText
inactiveCaptionText
```

btnHighlight
 3dDkShadow
 3dLight
 infoText
 infoBk
 hotLight
 gradientActiveCaption
 gradientInactiveCaption
 menuHighlight
 menuBar

L.4.8.2.5 `schemeClr`

`schemeClr` represents a color from a theme. The color changes if theme bindings change. For example, specifying:

```
<a:schemeClr val="lt1"/>
```

binds the color to be Light 1 color of the current theme. The possible values are:

accent1	extra scheme color 1
accent2	extra scheme color 2
accent3	extra scheme color 3
accent4	extra scheme color 4
accent5	extra scheme color 5
accent6	extra scheme color 6
bg1	semantic background color
bg2	semantic additional background color
dk1	main dark color 1
dk2	main dark color 2
folHlink	followed hyperlink color
hlink	hyperlink color
lt1	Main light color 1
lt2	main light color 2
phClr	a color used in theme definitions which means "use the color of the style"
tx1	semantic text color
tx2	semantic additional text color

L.4.8.2.6 prstClr

prstClr represents a preset color. This is a legacy definition of colors which is no longer currently used. A preset color is a choice from among several presets provided in older versions of Office.

```
<a:prstClr val="black"/>
```

The selected color is "black". Valid values for this setting, as defined by the DrawingML schema, are:

```
aliceBlue
antiqueWhite
aqua
aquamarine
azure
beige
bisque
black
blanchedAlmond
blue
blueViolet
brown
burlyWood
cadetBlue
chartreuse
chocolate
coral
cornflowerBlue
cornsilk
crimson
cyan
darkBlue
darkCyan
darkGray
darkGrey
darkGreen
darkKhaki
darkMagenta
darkOliveGreen
darkOrange
darkOrchid
darkRed
darkSalmon
darkSeaGreen
darkSlateBlue
darkSlateGray
```

darkSlateGrey
darkTurquoise
darkViolet
dkBlue
dkCyan
dkGoldenrod
dkGray
dkGrey
dkGreen
dkKhaki
dkMagenta
dkOliveGreen
dkOrange
dkOrchid
dkRed
dkSalmon
dkSeaGreen
dkSlateBlue
dkSlateGray
dkSlateGrey
dkTurquoise
dkViolet
deepPink
deepSkyBlue
dimGray
dimGrey
dodgerBlue
firebrick
floralWhite
forestGreen
fuchsia
gainsboro
ghostWhite
gold
goldenrod
gray
grey
green
greenYellow
honeydew
hotPink

indianRed
indigo
ivory
khaki
lavender
lavenderBlush
lawnGreen
lemonChiffon
lightBlue
lightCoral
lightCyan
lightGoldenrodYellow
lightGray
lightGreen
lightPink
lightSalmon
lightSeaGreen
lightSkyBlue
lightSlateGray
lightSteelBlue
lightYellow
ltBlue
ltCoral
ltCyan
ltGoldenrodYellow
ltGray
ltGrey
ltGreen
ltPink
ltSalmon
ltSeaGreen
ltSkyBlue
ltSlateGray
ltSlateGrey
ltSteelBlue
ltYellow
lime
limeGreen
linen
magenta

maroon
medAquamarine
medBlue
medOrchid
medPurple
medSeaGreen
medSlateBlue
medSpringGreen
medTurquoise
medVioletRed
mediumAquamarine
mediumBlue
mediumOrchid
mediumPurple
mediumSeaGreen
mediumSlateBlue
mediumSpringGreen
mediumTurquoise
mediumVioletRed
midnightBlue
mintCream
mistyRose
moccasin
navajoWhite
navy
oldLace
olive
oliveDrab
orange
orangeRed
orchid
paleGoldenrod
paleGreen
paleTurquoise
paleVioletRed
papayaWhip
peachPuff
peru
pink

```

plum
powderBlue
purple
red
rosyBrown
royalBlue
saddleBrown
salmon
sandyBrown
seaGreen
seaShell
sienna
silver
skyBlue
slateBlue
slateGray
slateGrey
snow
springGreen
steelBlue
tan
teal
thistle
tomato
transparent
turquoise
violet
wheat
white
whiteSmoke
yellow
yellowGreen

```

L.4.8.3 Color Transforms

A color transform is a modification to related properties of an underlying color. For example, transparency is a property that is related to color. Color transforms are specified as child tags off any color model's tag.

```

<a:solidFill>
  <a:srgbClr val="00B050">
    <a:alpha val="51000"/>
  </a:srgbClr>
</a:solidFill>

```

The following are the allowed color transforms and descriptions of the transformations they apply:

- tint: Yields a lighter version of its input color. A 10% tint is 10% of the input color combined with 90% white.
- shade: Yields a darker version of its input color. A 10% shade is 10% of the input color combined with 90% black.
- comp: Yields the complement of its input color. For example, the complement of red is green.
- inv: Yields the inverse of its input color. For example, the inverse of red (1,0,0) is cyan (0,1,1).
- gray: Yields a grayscale of its input color, taking into relative intensities of the red, green, and blue primaries.
- alpha: Yields its input color with the specified opacity, but with its color unchanged.
- alphaOff: Yields a more or less opaque version of its input color. An alpha offset never increases the alpha beyond 100% or decreases below 0%; i.e., the result of the transform pins the alpha to the range of [0%,100%]. A 10% alpha offset increases a 50% opacity to 60%. A -10% alpha offset decreases a 50% opacity to 40%.
- alphaMod: Yields a more or less opaque version of its input color. An alpha modulate never increases the alpha beyond 100%. A 200% alpha modulate makes a input color twice as opaque as before. A 50% alpha modulate makes a input color half as opaque as before.
- hue: Yields the input color with the specified hue, but with its saturation and luminance unchanged.
- hueOff: Yields the input color with its hue shifted, but with its saturation and luminance unchanged.
- hueMod: Yields the input color with its hue modulated by the given percentage.
- sat: Yields the input color with the specified saturation, but with its hue and luminance unchanged. Typically saturation values fall in the range [0%, 100%].
- satOff: Yields the input color with its saturation shifted, but with its hue and luminance unchanged.
- satMod: Yields the input color with its saturation modulated by the given percentage. A 50% saturation modulate reduces the saturation by half. A 200% saturation modulate doubles the saturation.
- lum: Yields the input color with the specified luminance, but with its hue and saturation unchanged. Typically, luminance values fall in the range [0%,100%].
- lumOff: Yields the input color with its luminance shifted, but with its hue and saturation unchanged.
- lumMod: Yields the input color with its luminance modulated by the given percentage. A 50% luminance modulate reduces the luminance by half. A 200% luminance modulate doubles the luminance.
- red: Yields the input color with the specified red component, but with its green and blue components unchanged.
- redOff: Yields the input color with its red component shifted, but with its green and blue components unchanged.

- **redMod**: Yields the input color with its red component modulated by the given percentage. A 50% red modulate reduces the red component by half. A 200% red modulate doubles the red component.
- **green**: Yields the input color with the specified green component, but with its red and blue components unchanged.
- **greenOff**: Yields the input color with its green component shifted, but with its red and blue components unchanged.
- **greenMod**: Yields the input color with its green component modulated by the given percentage. A 50% green modulate reduces the green component by half. A 200% green modulate doubles the green component.
- **blue**: Yields the input color with the specified blue component, but with its red and green components unchanged.
- **blueOff**: Yields the input color with its blue component shifted, but with its red and green components unchanged.
- **blueMod**: Yields the input color with its blue component modulated by the given percentage. A 50% blue modulate reduces the blue component by half. A 200% blue modulate doubles the blue component.
- **gamma**: Yields the sRGB gamma shift of its input color.
- **invGamma**: Yields the inverse sRGB gamma shift of its input color.

L.4.8.4 Fills

There are six types of fills:

- No Fill
- Solid Fill
- Gradient Fill
- Blip Fill
- Pattern Fill
- Group Fill

The se types describe the general structure of all fills; however, not all fills are permitted in all locations. For example, Blip Fills and Group Fills are not permitted on lines.

L.4.8.4.1 Solid Fills

```
<p:sp>
  <p:nvSpPr> ... </p:nvSpPr>
  <p:spPr>
    <a:xfrm>
      <a:off x="5410200" y="2438400"/>
      <a:ext cx="2895600" cy="304800"/>
```

```

    </a:xfrm>
    <a:prstGeom prst="rect">
      <a:avLst/>
    </a:prstGeom>
    <a:solidFill>
      <a:srgbClr val="FFFF00"/>
    </a:solidFill>
  </p:spPr>
</p:style> ... </p:style>
<p:txBody> ... </p:txBody>
</p:sp>

```

Solid Fill

A solid fill specifies a single color, using any color model

L.4.8.4.2 Gradient Fills

```

<a:gradFill>
  <a:gsLst>
    <a:gs pos="69000">
      <a:schemeClr val="accent1"/>
    </a:gs>
    <a:gs pos="0">
      <a:scrgbClr r="0" g="0" b="0"/>
    </a:gs>
  </a:gsLst>
  <a:lin ang="2700000" scaled="1"/>
</a:gradFill>

```

Gradient Fill

(The shaded text is the Gradient Stop List.)

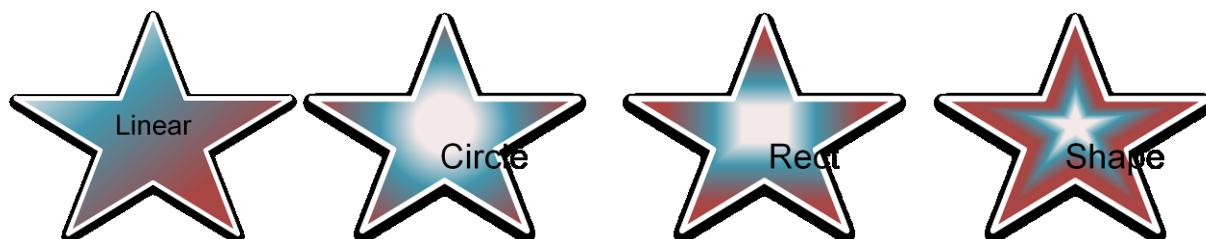
Gradient Fills consist of three elements: a list of gradient stops, a shading specification, as well as some attributes.

Two attributes are available on gradient fills.

- flip specifies how to flip a tile region when using it to fill a larger fill region.
- rotWithShape specifies whether the fill rotates along with a shape when the shape is rotated.

A gradient stop list is a list of locations and colors that make up the gradient fill. Positions are specified as percentages.

The shading specification specifies the two possible kinds of gradient fills: linear, or path based. A linear fill follows a straight-line direction as specified by the angle of the line. A path-based fill follows the contours of a well-defined path (such as a shape, circle, or rectangle).



L.4.8.4.3 Blip Fills

```
<p:blipFill>
  <a:blip r:embed="rId4" r:link=""/>
  <a:srcRect l="11000" t="14000"
    r="20000" b="28667"/>
  <a:stretch>
    <a:fillRect/>
  </a:stretch>
</p:blipFill>
```



BLIPs refer to Binary Large Image or Pictures. Blip Fills are made up of several components: a Blip Reference, a Source Rectangle, and a Fill Mode.

The Blip reference, `a:blip`, is the main reference to the blip content itself. A reference ID serves as the main link with an attribute allowed to specify compression level of the blip (one of: email, screen, print, hqprint, none). A Blip Effect can optionally be specified to indicate a modification of the raw blip content. Blip Effects are:

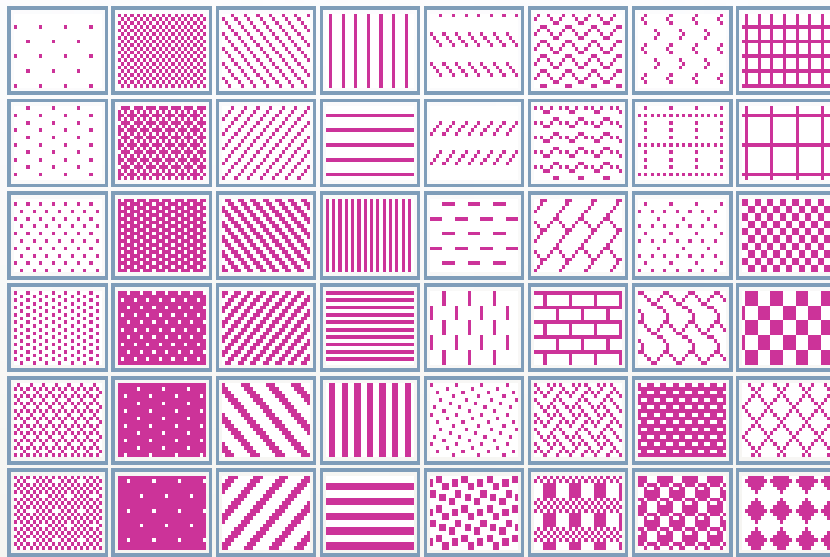
alphaBiLevel
alphaCeiling
alphaFloor
alphaInv
alphaMod
alphaModFix
alphaRepl
biLevel
blur
clrChange
clrRepl
duotone
fillOverlay
grayscale
hsl
lum
tint

The blip effects mirror the color transformations (see the descriptions in the color transformations subclause for descriptions of Blip Effects).

A Source Rectangle, `a:srcRect`, is used to implement image cropping, and indicates the rectangular window of content which is of interest.

Finally, two fill modes are possible, tiling, and stretching. This indicates the behavior to be performed when the user resizes an image to an area larger than the source rectangle. Tiling 'tiles' an image so that image content is simply duplicated while stretching scales the source rectangle content to fill the bounds of the `fillRect` (bounding box of blip filled shape).

L.4.8.4.4 Pattern Fills



Pattern Fills are legacy Office 11 fills which consist of a Foreground Color, a Background Color and a preset pattern value. Possible pattern values are:

pct5
 pct10
 pct20
 pct25
 pct30
 pct40
 pct50
 pct60
 pct70
 pct75
 pct80
 pct90
 horz
 vert
 ltHorz
 ltVert
 dkHorz
 dkVert
 narHorz
 narVert

dashHorz
dashVert
cross
dnDiag
upDiag
ltDnDiag
ltUpDiag
dkDnDiag
dkUpDiag
wdDnDiag
wdUpDiag
dashDnDiag
dashUpDiag
diagCross
smCheck
lgCheck
smGrid
lgGrid
dotGrid
smConfetti
lgConfetti
horzBrick
diagBrick
solidDmnd
openDmnd
dotDmnd
plaid
sphere
weave
divot
shingle
wave
trellis
zigZag

L.4.8.4.5 Group Fills

When objects are grouped together, a group fill is a convenient structure for indicating that the fill properties of any individual element inherits from the fill properties of parent group.

```

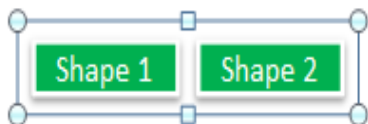
<p:grpSp>
  <p:nvGrpSpPr> ... </p:nvGrpSpPr>
  <p:grpSpPr>

```

```

    <a:xfrm> ... </a:xfrm>
    <a:solidFill>
      <a:srgbClr val="00B050"/>
    </a:solidFill>
  </p:grpSpPr>
  <p:sp>
    <p:nvSpPr> ... </p:nvSpPr>
    <p:spPr>
      <a:xfrm> ... </a:xfrm>
      <a:prstGeom prst="rect"> ... </a:prstGeom>
      <a:grpFill/>
    </p:spPr>
    <p:style> ... </p:style>
    <p:txBody> ... </p:txBody>
  </p:sp>
  <p:sp>
    <p:nvSpPr> ... </p:nvSpPr>
    <p:spPr>
      <a:xfrm> ... </a:xfrm>
      <a:prstGeom prst="rect"> ... <a:/prstGeom>
      <a:grpFill/>
    </p:spPr>
    <p:style> ... </p:style>
    <p:txBody> ... </p:txBody>
  </p:sp>
</p:grpSp>

```



L.4.8.5 Line Properties

While it is obvious that line properties, `a:ln` are used to represent properties for lines, what might be less obvious is where this structure can appear. Lines aren't just for lines-- just about any object can have a line property-- usually referring to the outlines that are possible on shapes, pictures, or text. Lines used in this context also yield additional characteristics we wish to persist-- like what happens when line segments meet (i.e., line joins). So when understanding this section on line properties, it's important to visualize two possible cases-- a single line segment and the properties of that segment, and the case of multiple line segments (e.g., an outline of an autoshape). By considering both cases, the meaning of most properties becomes intuitively clear.

Line properties consist of several sections: line fill properties, line dash properties, line join properties, head/tail properties, as well as a few attributes.

L.4.8.5.1 Line Fill Properties

Line fill properties are a proper subset of general fill properties. One of the following can be used: noFill, solidFill, gradFill, or pattFill. Blip fills and group fills are not permitted for line fill properties.

L.4.8.5.2 Line Dash Properties

Line Dash properties can be either one of the presets, a:prstDash, or a custom dashing scheme, a:custDash. For the presets, the following options are available:

- solid: Solid (continuous) pen.
- dot: Dot style. [-]
- dash: Short dash style. [---- ---- ---- ----]
- lgDash: Long dash style. [-----]
- dashDot: Short dash followed by dot. [---- - ---- - ---- -]
- lgDashDot: Long dash followed by dot. [----- - ---- - ---- -]
- lgDashDotDot: Long dash followed by two dots. [----- - - ---- - -]
- sysDash: System short dash style (PS_DASH). [--- ----]
- sysDot: System dot style (PS_DOT). [-]
- sysDashDot: System short dash and one dot (PS_DASHDOT) [--- ---- -]
- sysDashDotDot: System short dash and two dots (PS_DASHDOTDOT) [--- ---- - - -]

L.4.8.5.2.1 Custom Dashes

Custom dashes allow full flexibility in expressing any dashing scheme. Custom dashes are also known as dash stop lists, a:ds, due to the way the custom dashes are expressed. An element of the list specifies two attributes: d for the length of the dash relative to line width, and sp for length of the space relative to line width. Any number of elements can be combined into a dash stop list for full generality in expressing dashing schemes.

L.4.8.5.3 Line Join Properties

```
<a:ln w="38100" cap="sq" cmpd="thickThin" algn="ctr">
  <a:solidFill>
    <a:schemeClr val="lt1"/>
  </a:solidFill>
  <a:prstDash val="sysDot"/>
  <a:bevel/>
</a:ln>
```


Line join properties are for expressing the visual appearance of what happens when line segments meet. They can be round, beveled, or mitered. Notice the corners of the following rectangles, which illustrate the effect line join properties have.



The only attribute of line join properties is `lim`. This attribute limits the amount by which lines can be extended to form a join. Normally, this is a relatively infrequent occurrence, but in the case of nearly parallel lines, this attribute comes into play.

L.4.8.5.4 Head/Tail End Properties

Head/Tail End properties specify whether there are any special attachments to the head or the tail of a line. All parameters are specified in attributes: a `type`, a `w` (width of line end to width of line), and a `len` (length of the end relative to the line width). By default, no head/tail end properties are applied. The `type` can be one of: `none`, `triangle`, `stealth`, `diamond`, `oval`, `arrow`. `w` and `len` can be one of `sm`, `med` and `lg` corresponding to small, medium, and large respectively.

```
<a:ln w="25400" cap="rnd" cmpd="sng" algn="ctr">
  <a:solidFill>
    <a:srgbClr val="4F81BD"/>
  </a:solidFill>
  <a:prstDash val="solid"/>
  <a:tailEnd type="arrow" w="lg" len="lg"/>
</a:ln>
```

Head End



Tail End

L.4.8.5.5 Line Attributes

Line Properties, `a:ln`, takes several attributes: `w` specifies the line width. `cap` specifies whether the line ends are round (value `rnd`), square (`sq`), or flat (`flat`).



cmpd specifies a compound line type. Its permitted values are shown below:

“cmpd” compound line type

- sng (simple)
- dbl (double)
- thickThin
- ThinThick
- tri



L.4.8.6 Effects

Effects are most naturally applied to shapes, but like fill properties and line properties, they can apply to shapes, pictures, and text. Effects are represented two ways: via an Effect List, a:effectLst, or an effects container, a:effectDag.

L.4.8.6.1 Effects Lists

```

<p:sp>
  <p:nvSpPr>...
  <p:spPr>
    <a:xfrm>...
    <a:prstGeom prst="star5">...
    <a:effectLst>
      <a:glow rad="190500">
        <a:schemeClr val="accent5">
          <a:alpha val="80000"/>
        </a:schemeClr>
      </a:glow>
      <a:outerShdw blurRad="50800" dist="50800"
        dir="2700000" algn="t1"
        rotWithShape="0">
        <a:srgbClr val="000000">
          <a:alpha val="43137"/>
        </a:srgbClr>
      </a:outerShdw>
      <a:reflection stA="75000" endA="10000"
        dist="101600" dir="5400000"
        sy="-100000" algn="b1"
        rotWithShape="0"/>
      <a:softEdge rad="31750"/>
    </a:effectLst>
    <a:scene3d>...
    <a:sp3d>...
  </p:spPr>
  <p:style>...
  <p:txBody>...
</p:sp>

```

An effect list is made up of one or more primitive effects that can be applied one after another. The primitives are:

- Blur
- fillOverlay
- glow
- innerShdw
- outerShdw
- prstShdw
- reflection
- softEdge

L.4.8.6.2 Blur

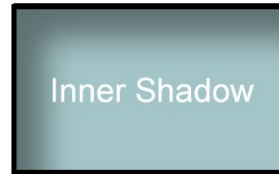
Blur blurs all color channels, including alpha. Two attributes, rad (radius of blur) and grow (boolean), apply here. grow specifies if the bounds should grow as a result of the blurring.

L.4.8.6.3 Inner Shadow

```

<a:effectLst>
  <a:innerShdw blurRad="317500"
               dist="293171"
               dir="1350000">
    <a:srgbClr val="000000">
      <a:alpha val="43000"/>
    </a:srgbClr>
  </a:innerShdw>
</a:effectLst>

```



Inner Shadows contain a color choice, as well as three attributes:

- blurRad: blur radius
- dist: how far to offset the shadow
- dir: direction to offset the shadow

L.4.8.6.4 Outer Shadow

```

<a:effectLst>
  <a:outerShdw blurRad="50800" dist="50800"
               dir="2700000"
               sx="106000" sy="106000"
               algn="tl" rotWithShape="0">
    <a:srgbClr val="000000">
      <a:alpha val="43137"/>
    </a:srgbClr>
  </a:outerShdw>
</a:effectLst>

```



Outer shadows contain a color choice as well as several attributes:

- blurRad: blur radius
- dist: how far to offset the shadow
- dir: direction to offset the shadow
- sx, sy: horizontal/vertical scale factors
- kx, ky: horizontal/vertical skew angles

- `align`: shadow alignment. Alignment happens first and effectively sets the origin for scale, skew, and offset
- `rotWithShape`: (boolean) Rotate shadow with shape

L.4.8.6.5 Preset Shadows

Preset shadows consist of a color choice, and a preset shadow:

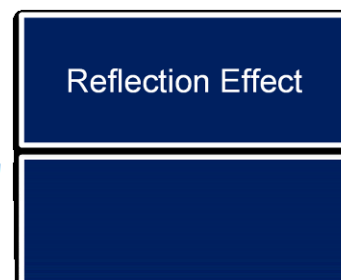
```
shdw1
shdw2
shdw3
shdw4
shdw5
shdw6
shdw7
shdw8
shdw9
shdw10
shdw11
shdw12
shdw13
shdw14
shdw15
shdw16
shdw17
shdw18
shdw19
shdw20
```

The attributes for Preset Shadows are:

- `dist`: how far to offset the shadow
- `dir`: direction to offset the shadow

L.4.8.6.6 Reflection Effects

```
<a:effectLst>
  <a:reflection blurRad="12700" stA="50000" endPos="75000"
    dist="12700" dir="5400000" sy="-100000"
    align="bl" rotWithShape="0"/>
</a:effectLst>
```



Reflections are represented entirely through attributes:

- blurRad: Blur Radius
- stA: (Start Alpha) starting reflection opacity
- stPos: start position along gradient ramp of start alpha value
- endA: (End Alpha) ending reflection opacity
- endPos: end position along gradient, ramp of end alpha value
- dist: how far to offset reflection
- dir: Direction to offset reflection
- fadeDir: direction of alpha gradient, ramp relative to shape itself
- sx, sy: horizontal/vertical scale factors
- kx, ky: horizontal/vertical skew angles
- algn: reflection alignment
- rotWithShape: (boolean)
- rotate: reflection with shape

L.4.8.6.7 Soft Edge Effects

```
<a:effectLst>
  <a:softEdge rad="127000"/>
</a:effectLst>
```



Soft Edge Effect

Soft Edge blurs the edges of the applied object subject to the specified blur radius rad.

L.4.8.6.8 Glow Effects

```
<a:effectLst>
  <a:glow rad="101600">
    <a:schemeClr val="accent2">
      <a:alpha val="60000"/>
    </a:schemeClr>
  </a:glow>
</a:effectLst>
```

A glow effect is very similar to a soft edge effect, but differs in that it permits a color specification in addition to rad. Basically, a glow is a soft edge effect, except with the color specified used instead of the object's color.

L.4.9 Shape Definitions and Attributes

L.4.9.1 Introduction

This aspect of DrawingML deals mainly with the shapes and their attributes, and is broken down into two topics:

- Working with preset shapes
- Defining custom shapes and their properties

L.4.9.2 The Coordinate Systems

To specify a shape there are a few high level systems that must first be understood, namely the coordinate systems that are used. These are the document, shape and path coordinate systems, described in the following sub clauses.

L.4.9.2.1 The Document Coordinate System

To first specify a shape within a document the document coordinate system must be understood. This system has both an x and y component and starts with a value of (0,0) in the upper left corner of the document. As the x-coordinate increases, the point moves to the right. As the y-coordinate increases, the point moves downwards. The units of measurement within the document coordinate system are EMUs. In addition to specifying a position for the shape, you must also specify the width and height of the shape, which is called the extent of the shape. This value is again measured in EMUs. To specify these two values, the following transform would be used.

```
<p:sp>
  <p:spPr>
    <a:xfrm>
      <a:off x="3200400" y="1600200"/>
      <a:ext cx="1200000" cy="1000000"/>
    </a:xfrm>
  </p:spPr>
</p:sp>
```

Here we can see that this new shape is placed at $x = 3200400$ and $y = 1600200$ within the document coordinate system. In addition, we see that this shape has a width of 1200000 EMUs and a height of 1000000 EMUs.

The width and height set the bounding box within which the entire shape is contained.

L.4.9.2.2 The Shape Coordinate System

Now that we have a width and height specified, we can now move into the explanation of the shape coordinate system. The shape coordinate system has both an x and y component and starts with a value of (0,0) in the upper left corner of the shape. The width and height of this coordinate system are specified by the extent of the shape, which was recently specified above, and the units are once again EMUs. This coordinate system is used to define the locations of many of the shape attributes.

L.4.9.2.3 The Path Coordinate System

The final coordinate system is the path coordinate system which also has both an x and y component and starts with a value of (0,0) in the upper left corner of the shape. Now it must be known that this coordinate system is a unique one in that its units are relative to the specified width and height of the coordinate space. The path coordinate system has exactly the same EMU dimensions as the shape coordinate system but different units. While the shape coordinate system uses EMUs, the path coordinate system uses $(1/\text{width})$ as the x units and $(1/\text{height})$ as the y units. That is if the path was

specified to have a width of 2 and a height of 1, then the path coordinate (1,1) would be equivalent to (600000,1000000) in the shape coordinate system. The path coordinate system is better understood later, once the path element is described.

Note that all dimensions and coordinates must be specified using whole numbers.

L.4.9.3 Specifying a Preset Shape

Within the Shape Definitions and Attributes section of DrawingML there are many pre-defined shapes that can be used, 187 to be exact. Of course, if the user does not wish to use a preset shape there is always the option of specifying a custom shape that is described further in §L.4.9.4.

L.4.9.3.1 Defining a Preset Shape

It is quite easy to specify a preset shape as that is the whole notion around presets. They are meant to solve the most common cases of shape definition.

To specify a heart shape for instance the following DrawingML code can be used.

```
<p:sp>
  <p:spPr>
    <a:xfrm>
      <a:off x="1981200" y="533400"/>
      <a:ext cx="1143000" cy="1066800"/>
    </a:xfrm>
    <a:prstGeom prst="heart">
      </a:prstGeom>
    </p:spPr>
  </p:sp>
```



This heart is rendered by the generating application using the custom shape code for this shape, which is fully documented within ST_ShapeTypes located in the reference documentation. Thus, we see that the user need not specify the preset name to place a shape within their document.

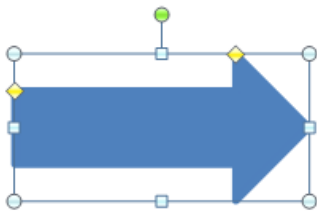
L.4.9.3.2 Adjusting a Preset Shape

While specifying a preset shape is convenient and looks good most of the time. There might also be the need for the user to adjust this preset to more closely suit the needs of their document. For this we introduce the notion of adjust values. The preset shape is built using lines, curves and calculations, just as a custom shape would be defined. To allow for the adjusting of these preset shapes we have based

certain properties of shapes on adjust values rather than concrete dimensions. This means that they can be modified which in turn modifies the geometry of the shape.

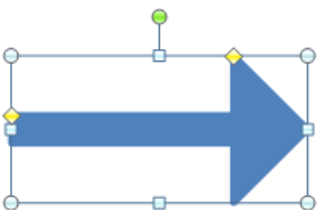
A simple arrow would be specified using the following DrawingML code.

```
<p:sp>
  <p:spPr>
    <a:xfrm>
      <a:off x="3276600" y="990600"/>
      <a:ext cx="978408" cy="484632"/>
    </a:xfrm>
    <a:prstGeom prst="rightArrow">
      <a:avLst>
        <a:gd name="adj1" fmla="val 50000"/>
        <a:gd name="adj2" fmla="val 50000"/>
      </a:avLst>
    </a:prstGeom>
  </p:spPr>
</p:sp>
```



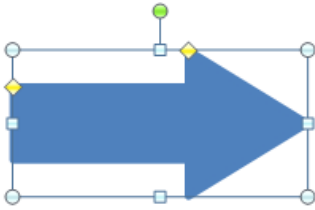
This specifies the basic arrow shown above which might be sufficient for the document needs of the user but it also might not. If this standard arrow is not sufficient then the two adjust values for this shape can be adjusted. For instance, if the body of the arrow is too large then the value for adj1 can be decreased. The following DrawingML code would specify such a case.

```
<a:gd name="adj1" fmla="val 18553"/>
```



Similarly, if the arrow head itself was too short then the value of adj2 can be increased. The following DrawingML code would specify such a case.

```
<a:gd name="adj2" fmla="val 81447"/>
```



Thus, it can be seen that while each preset is indeed a preset with a pre-defined geometry, it can be modified. Through the use of adjust values, the user is able to custom fit a preset shape to their document needs without having to specify an entirely custom shape.

Note that the values used here for adjust values have no real units as they are simply input parameters into the equations that make up the shape geometry. More on these equations and their parameters are discussed in §L.4.9.4.2.

L.4.9.4 Specifying a Custom Shape

In addition to the specifying of a preset shape there is also the possibility of a specifying a custom shape. This is accomplished by defining a geometry from a set of construction methods and applying various shape properties to this geometry. This compliments preset shapes, giving the user the opportunity to specify a complete shape with any custom properties that are deemed necessary.

L.4.9.4.1 Defining the Geometry

Just like a preset shape, a custom shape has a position and a shape bounding box that is specified by the offset and extent transform values. The shape coordinate system is defined by these values as was described in section 1.2 above. The path coordinate system is also partially defined by these in that it has it's width and height set by these values. The units of the path system however are determined by the specified width and height of the path.

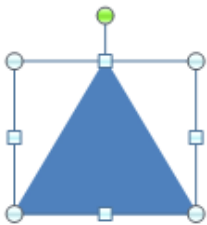
A custom shape with a single path can be specified using the following DrawingML code.

```
<p:sp>
  <p:spPr>
    <a:xfrm>
      <a:off x="3200400" y="1600200"/>
      <a:ext cx="1200000" cy="1000000"/>
    </a:xfrm>
    <a:custGeom>
      <a:pathLst>
        <a:path w="2" h="2">
          <a:moveTo>
            <a:pt x="0" y="2"/>
          </a:moveTo>
```

```

    <a:lnTo>
      <a:pt x="2" y="2"/>
    </a:lnTo>
    <a:lnTo>
      <a:pt x="1" y="0"/>
    </a:lnTo>
    <a:close/>
  </a:path>
</a:pathLst>
</a:custGeom>
</p:spPr>
</p:sp>

```



As can be seen in the above code, the path has a width and height of 2. This means that the path coordinate space has units of $(1/2 * \text{shape width})$ for x-coordinate and $(1/2 * \text{shape height})$ for the y-coordinate. Thus we see that a coordinate of (2,2) in the path coordinate system is the same as (1200000,1000000) within the shape coordinate system.

To define the shape path above we can see that there are a few different parts to defining this custom shape. The first is to define the first path in what is called the path list. It should be noted that the path list can have multiple paths in it, some filled, some not, some outlined, some not. To define the path we must specify the width, height and thus units for this path via the following DrawingML.

```
<a:path w="2" h="2"/>
```

This sets up the path coordinate system for this path as was previously described. Next we need to move the drawing cursor to the point in this path coordinate system that we wish to start drawing our shape from. The following DrawingML does just that.

```

<a:moveTo>
  <a:pt x="0" y="2"/>
</a:moveTo>

```

This moves the drawing cursor to the bottom left position (0,2) which is equivalent to (0,1000000) in the shape coordinate system. Following this we can now start by drawing the first line in the shape via the following line.

```
<a:lnTo>
  <a:pt x="2" y="2"/>
</a:lnTo>
```

This draws a line from the current drawing cursor position of (0,2) to (2,2) which is the bottom right corner of the path coordinate system. This is equivalent to drawing a line from (0,1000000) to (1200000,1000000) in the shape coordinate system. Now that we have the bottom edge of the triangle drawn we can continue to the final edge in the shape via the following.

```
<a:lnTo>
  <a:pt x="1" y="0"/>
</a:lnTo>
```

This draws the final line that is drawn from the current drawing cursor position of (2,2) to (1,0) which is in the top middle of the path coordinate system. This is equivalent to drawing a line from (1200000,1000000) to (600000,1000000) in the shape coordinate system. With most of the triangle drawn the <close/> element specified at the end of the path draws a line from the last point in the path back to the first point in the path.

```
<a:close/>
```

This finalizes the edges of the shape path being specified. Since the fill of this path is set to normal, this path has a fill no matter if this close tag is specified or not. However, the fact that it is specified determines that there is a final edge drawn between the final drawing cursor point and the path starting point. Now that the path has been fully specified, this shape can be filled and thus be considered finished.

L.4.9.4.2 Adjusting the Geometry

Now that we have shown how a custom shape can be specified we can look at how it might be adjusted. This adjusting is different from the typical resizing that can happen by using the shape transform elements. Using these shape adjusting methods, a shape can be made to have many different resize/adjustment characteristics.

L.4.9.4.3 Geometry Guides

A guide within a shape is essentially an equation with a set number of inputs and a single output. A guide is used to calculate construction values for a shape and thus can be manipulated to govern the shape's overall geometry.

An example of this can be seen in the following DrawingML.

```
<gdLst>
  <gd name="y1" fmla="*/ h adj1 100"/>
</gdLst>
```

This guide calculates its output based on 3 input parameters and assign this output to a guide named y1. The formula that is used in the calculation here is the multiply divide formula. The result for this guide is calculated in the following manner: $y1 = ((h * adj1) / 100)$. After the result here is calculated, the guide y1 can be used later within the <gdlst> or <path> to calculate further values. That is it can be used as an input for calculating another guide value. These guides then allow for a path to be based off of series of equations rather than static path coordinate values. To use a guide in the defining of a path we would simply specify the following within the path list.

```
<a:lnTo>
  <a:pt x="2" y="y1"/>
</a:lnTo>
```

This would draw a line to the point (2,y1) where y1 is the calculated result of the guide equation shown above. The drawing of this line then changes based on the input parameters of h and adj1 which are previously calculated guides as well.

Note that while h is a previously calculated guide. It is not calculated for each shape, rather it is a built-in guide that the generating application makes available to the shape.

L.4.9.4.3.1 Adjust Handles

To allow for the adjusting UI of a shape we introduce the notion of an adjust handle. This adjust handle is linked to adjust values that are then used as input to the guide equations defined previously. The numerical chain described here thus directly changes the geometry of the related shape. There are two types of adjust handles that can be specified. An XY adjust handle acts in the horizontal/vertical direction and has two related guides, both a horizontal and a vertical respectively. A polar adjust handle acts in a polar manner and has two related guides as well. One guide for the radial width and the other for the radial angle. An adjust handle is specified to have an x and y coordinate as well as these adjust handles. This adjust handle can then be moved around in a generating application's UI to adjust a pair of guides which in turn adjusts the shape being rendered.

An adjust handle can be specified by the following DrawingML.

```
<ahXY gdRefX="adj1" minX="-2147483647" maxX="2147483647" gdRefY="adj2"
  minY="-2147483647" maxY="2147483647">
  <pos x="x1" y="y1"/>
</ahXY>
```

Above is an XY adjust handle that has two guide references, a min and max allowed position for both the x and y coordinates as well as a position within the shape coordinate system where this adjust handle should be placed.

L.4.9.4.4 Additional Properties

In addition to specifying the geometry for a shape and all the associated adjustments for it there are also a few other properties that are of special significance. These properties do not act on the geometry of the shape but instead enhance a shape so that it can be used for a more specialized task.

L.4.9.4.4.1 Connection Sites

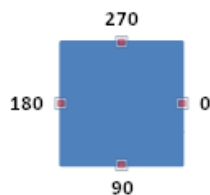
As one might have experienced when trying to draw a diagram with shapes and connections between those shapes, it is quite difficult to move a part of your diagram without entirely redrawing the connections between shapes. For this, there is the notion of connection sites that allow for the specification of specific points within a shape to attach connection shapes to. This allows a user to build a diagram from a set of shapes and connect them together using connection shapes. A connection site is specified within the connection list and consists of an x-coordinate, y-coordinate and an attachment angle.

The following DrawingML code defines two connection sites, one at each edge of this triangle.

```
<a:cxnLst>
  <a:cxn ang="10800000">
    <a:pos x="0" y="679622"/>
  </a:cxn>
  <a:cxn ang="0">
    <a:pos x="1705233" y="679622"/>
  </a:cxn>
</a:cxnLst>
```



The attachment angle works by specifying an angle in 60,000ths of a degree that a connector should attach to. The diagram below shows an actual connection point and the attachment angles that correspond to the sides of this point. This information along with the geometry of the shape is used by the generating applications connector routing algorithm to correctly route connectors around connected shapes.



L.4.9.4.4.2 Text Rectangle

Within each shape is a text box that allows for the attaching of text to any given shape. The text rectangle defines where text resides within the shape. Depending on Auto-fit options that are selected for the body of text attached to this shape the text might intentionally flow outside this text rectangle. It must also be pointed out that this text rectangle is also the bounding box that is used to compute the geometry of a <prstTxWarp>. The EMU dimensions of this text rectangle is used to compute this geometry just like the transform extent element is used to compute the actual shape.

The following DrawingML specifies a text rectangle within a shape.

```
<a:rect l="0" t="0" r="1200000" b="1000000"/>
```

The text rectangle shown above has a left edge of 0 x-coordinate, top edge of 0 y-coordinate, right edge of 1200000 x-coordinate and a bottom edge of 1000000 y-coordinate. This effectively specifies a space that is 1200000 EMUs in width and 1000000 EMUs in height.

Note that the edges of this text rectangle can be set so as to allow text to be placed outside the actual geometry of the shape.

L.4.10 Pictures

L.4.10.1 Introduction

The DrawingML Picture file format is broken down into the following subjects:

- Specifying a basic picture
- Attaching properties to this picture
- Transforming this picture

The best way to understand the above subjects is to cover them in the ordering above.

L.4.10.2 Specifying a Basic Picture

A picture can be inserted into a presentation slide by use of the picture element, `pic`, which is similar to the shape element but contains some key differences that enable more complete storage of picture information. This basic picture element should contain a `blipfill` and some basic non-visual picture properties.



```

<p:pic>
  <p:nvPicPr>
    <p:cNvPr id="4" name="St_Patrick's_Day.jpg"/>
    <p:cNvPicPr>
      <a:picLocks noChangeAspect="1"/>
    </p:cNvPicPr>
    <p:nvPr/>
  </p:nvPicPr>
  <p:blipFill>
    <a:blip r:embed="rId2"/>
    <a:stretch>
      <a:fillRect/>
    </a:stretch>
  </p:blipFill>
  <p:spPr>
    <a:xfrm>
      <a:off x="1346200" y="914400"/>
      <a:ext cx="3657600" cy="2743200"/>
    </a:xfrm>
    <a:prstGeom prst="rect">
      <a:avLst/>
    </a:prstGeom>
    <a:noFill/>
    <a:ln>
      <a:noFill/>
    </a:ln>
  </p:spPr>
</p:pic>

```


L.4.10.3 Attaching Properties to this Picture

Now that the base picture has been specified, we can move on to more complicated properties, such as recolor options and picture descriptions. In the picture below, notice that the picture that was once green has been re-colored in a purple hue. This can be done by utilizing the duotone element, which allows for the setting of two base colors to use for re-coloring the entire picture. The first is used to act upon the darker regions of the picture and the second is used to act upon the lighter regions. This we can see below that black (#000000) is indeed used below for the darker regions while accent4 (purple in this case) is used for the lighter areas.



```
<p:pic>
  <p:nvPicPr>
    <p:cNvPr id="4" name="St_Patrick's_Day.jpg"
      descr="This is a Saint Patrick's day picture"/>
    <p:cNvPicPr>
      <a:picLocks noChangeAspect="1"/>
    </p:cNvPicPr>
    <p:nvPr/>
  </p:nvPicPr>
  <p:blipFill>
    <a:blip r:embed="rId2">
      <a:duotone>
        <a:srgbClr val="000000"/>
        <a:schemeClr val="accent4"/>
      </a:duotone>
    </a:blip>
    <a:stretch>
      <a:fillRect/>
    </a:stretch>
  </p:blipFill>
```

```

<p:spPr>
  <a:xfrm>
    <a:off x="1346200" y="914400"/>
    <a:ext cx="3657600" cy="2743200"/>
  </a:xfrm>
  <a:prstGeom prst="rect">
    <a:avLst/>
  </a:prstGeom>
  <a:noFill/>
  <a:ln>
    <a:noFill/>
  </a:ln>
</p:spPr>
</p:pic>

```

L.4.10.4 Transforming this Picture

Now that both basic properties and additional picture properties have been specified, we can begin incorporating shape properties. Below is the same picture as described above, with 3D camera perspective applied along with a simple shadow and a white outline. These shape properties are the same that can be applied to a shape element. One picture-specific difference can be seen here with the border around the picture. Instead of the border growing both inward and outward, it only grows outward.



```

<p:pic>
  <p:nvPicPr>
    <p:cNvPr id="4" name="St_Patrick's_Day.jpg"
      descr="This is a Saint Patrick's day picture"/>
    <p:cNvPicPr>
      <a:picLocks noChangeAspect="1"/>
    </p:cNvPicPr>
    <p:nvPr/>
  </p:nvPicPr>
  <p:blipFill>
    <a:blip r:embed="rId2">
      <a:duotone>
        <a:srgbClr val="000000"/>
        <a:schemeClr val="accent4"/>
      </a:duotone>
    </a:blip>
    <a:stretch>
      <a:fillRect/>
    </a:stretch>
  </p:blipFill>
  <p:spPr>
    <a:xfrm>
      <a:off x="1346200" y="914400"/>
      <a:ext cx="3657600" cy="2743200"/>
    </a:xfrm>
    <a:prstGeom prst="rect">
      <a:avLst/>
    </a:prstGeom>
    <a:noFill/>
    <a:ln w="57150">
      <a:solidFill>
        <a:schemeClr val="bg1"/>
      </a:solidFill>
    </a:ln>
    <a:effectLst>
      <a:outerShdw blurRad="50800" dist="50800" dir="2700000" algn="t1"
        rotWithShape="0">
        <a:srgbClr val="7D7D7D">
          <a:alpha val="65000"/>
        </a:srgbClr>
      </a:outerShdw>
    </a:effectLst>
  </p:spPr>

```

```

    <a:scene3d>
      <a:camera prst="perspectiveRelaxedModerately"/>
      <a:lightRig rig="threePt" dir="t">
        <a:rot lat="0" lon="0" rev="18900000"/>
      </a:lightRig>
    </a:scene3d>
  </p:spPr>
</p:pic>

```

L.4.11 WordprocessingML Drawing

Within a WordprocessingML document, it is possible to include graphical DrawingML objects:

- Charts
- Diagrams
- Locked Canvases
- Pictures

When these objects are present in a word processing document, it is necessary to include information that specifies how the objects are to be positioned relative to the paginated document.

The WordprocessingML Drawing namespace acts in this capacity, specifying all information necessary to anchor and display DrawingML objects within a word processing document.

Consider a DrawingML picture that is to be displayed in the center of the printed page on which it appears, modifying the flow of text as necessary. This object would be specified as follows:

```

<w:r>
  <w:drawing>
    <wp:anchor relativeHeight="10" allowOverlap="true">
      <wp:positionH relativeFrom="margin">
        <wp:align>center</wp:align>
      </wp:positionH>
      <wp:positionV relativeFrom="margin">
        <wp:align>center</wp:align>
      </wp:positionV>
      <wp:extent cx="2441542" cy="1828800"/>
      <wp:wrapSquare wrapText="bothSides"/>
      <a:graphic>
        ...
      </a:graphic>
    </wp:anchor>
  </w:drawing>
</w:r>

```

The anchor element specifies that this object is not positioned in-line with text, and its child elements specify that the object is centered on the page horizontally and vertically, and that text can wrap around it in a square.

L.4.11.1 Object Anchoring

When the WordprocessingML Drawing namespace is used to anchor a DrawingML object within a document, that object can be anchored in one of two ways:

- In line with text - The object is displayed within the regular text stream (modifying line height and so on to accommodate it).
- Floating – The object is positioned absolutely or relatively within the document and text flow is modified as needed around it.

L.4.11.2 Text Wrapping

Aside from positioning data, WordprocessingML Drawing also needs to specify how text flows around the object. There are five different types of text wrapping which can be applied to floating objects present in WordprocessingML documents:

- In Front/Behind Text - In this type of text wrapping, the drawing object is positioned on the document and text is not displaced around it.

On the Insert tab, the galleries include items that are designed to coordinate with the overall look of your document. You can use these galleries to insert tables, headers, footers, lists, cover pages, and other document building blocks. When you insert charts, or diagrams, they also coordinate with your current document look.

You can easily change the format of text by choosing a look for the selected text from the Quick Styles gallery. You can also format text directly by using the other controls on the Home tab. You can also change the look from the current theme or using a format that you have saved.

To change the overall look of your document, use the Themes gallery on the Page Layout tab. To change the looks available in the Quick Styles gallery, use the Change Current Quick Style Set command. Both the Themes gallery and the Quick Styles gallery provide reset commands so that you can always restore the look of your document to the original contained in your current template.

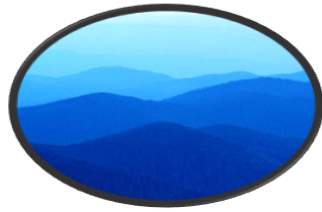


- Square Wrapping - In this type of text wrapping, the drawing object is positioned on the document and a rectangle is stored within the file format to determine the wrapping extents.

On the Insert tab, the galleries include items that are designed to coordinate with the overall look of your document. You can use these galleries to insert tables, headers, footers, document building blocks, charts, or diagrams, they also coordinate with your current document look.

You can easily change the look of the document text by choosing a look for the Quick Styles gallery on the Home tab. You can also format text directly by using the other controls on the Home tab. Most controls offer a choice of using the look from the current theme or using a format that you specify directly.

To change the overall look of your document, choose new Theme elements on the Page Layout tab. To in the Quick Style gallery, use



use these galleries to insert lists, cover pages, and other document building blocks. When you create pictures, charts, or diagrams, they also coordinate with your current document look.

formatting of selected text in choosing a look for the Quick Styles gallery on the Home tab. Most controls offer a choice of using the look from the current theme or using a format that you specify directly.

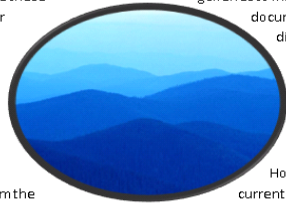
of your document, choose the Page Layout tab. To in the Quick Style gallery, use

- **Tight Wrapping** - In this type of text wrapping, a wrapping polygon is created and stored in the WordprocessingML document, and this polygon determines how text wraps around the left and right sides of the drawing object.

On the Insert tab, the galleries include items that are designed to coordinate with the overall look of your document. You can use these galleries to insert tables, headers, footers, document building blocks. When you create pictures, charts, or diagrams, they also coordinate with your current document look.

You can easily change the look of the document text by choosing a look for the Quick Styles gallery on the Home tab. You can also format text directly by using the other controls on the Home tab. Most controls offer a choice of using the look from the current theme or using a format that you specify directly.

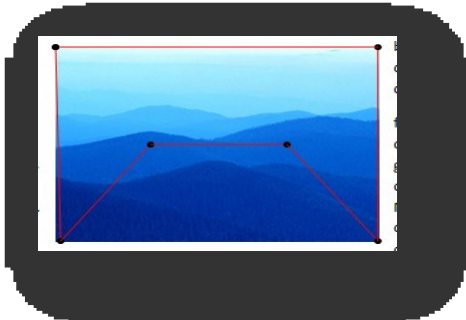
To change the overall look of your document, choose new Theme elements on the Page Layout



formatting of selected text in choosing a look for the Quick Styles gallery on the Home tab. Most controls offer a choice of using the look from the current theme or using a format that you specify directly.

- **Through Wrapping** - In this type of text wrapping, a wrapping polygon is created just like with tight wrapping, but any indents in the wrap polygon can be filled with text in this case.

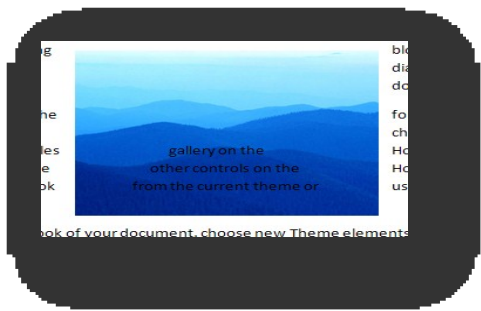
If the wrapping polygon looks like the following:



Tight wrapping would look like this:



While through wrapping would look like this:



In the latter case, notice that text fills in the 'indentation' within the wrapping polygon.

- Top and Bottom Wrapping - In this type of text wrapping, text cannot wrap around either side of the object, and must only restart below the bottom edge of the document.

On the Insert tab, the galleries include items that are designed to coordinate with the overall look of



your document. You can use these galleries to insert tables, headers, footers, lists, cover pages, and other document building blocks. When you create pictures, charts, or diagrams, they also coordinate with your current document look.

L.4.12 SpreadsheetML Drawing

L.4.12.1 Introduction

The elements in this subclause specify how drawing elements are to be described within a spreadsheet. For example, suppose we want to specify a rectangle drawing shape within a worksheet to look like the following:

	A	B	C	D	E	F
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						

L.4.12.2 Overview

The elements that specify the drawing objects within a worksheet are all located within its respective drawing XML file. This file is located under the "drawings" folder inside the spreadsheet file. For example, if the drawing element is located on Worksheet 1, then the specifications for the said element would be located in the file `\xl\drawings\drawing1.xml`.

L.4.12.3 Worksheet Drawings

Within the `drawing*.xml` file is contained a single worksheet drawing `wsDr` element, which is the parent element for all the drawing elements. Its child specifies the anchoring properties of the drawing elements. It is within this element that the main specifications for the drawing elements are located. For example in the above screenshot with a simple shape located on the worksheet, the XML for this would look like:

```
<xdr:wsDr>
  <xdr:absoluteAnchor>
    <xdr:pos x="2162175" y="1743075"/>
    <xdr:ext cx="1238250" cy="1314450"/>
    ...
    <xdr:sp>
      <xdr:spPr>
        <a:prstGeom prst="rect">
          <a:avLst/>
        </a:prstGeom>
      </xdr:spPr>
      ...
    </xdr:sp>
  </xdr:absoluteAnchor>
</xdr:wsDr>
```

In this `SpreadsheetDrawingML` code there is a single drawing specified almost exactly as it would within the regular `DrawingML` framework. However the `SpreadsheetDrawingML` wrapper that is used allows for the specifying of spreadsheet specific properties in addition to the normal drawing properties.

L.4.12.3.1 Anchoring Types

To define a drawing within a spreadsheet an anchoring type must be chosen. There are three different anchoring types allowed for use within a spreadsheet: Absolute Anchoring, One Cell Anchoring, and Two Cell Anchoring. Each of these types is described in the following subclauses.

L.4.12.3.1.1 Absolute Anchoring

Absolute Anchoring describes the placement of the drawing within the spreadsheet based upon absolute coordinates. This positioning information includes both position coordinates and extent coordinates. The `absoluteAnchor` element is what specifies this anchoring behavior and a sample usage is shown below.


```

<xdr:absoluteAnchor>
  <xdr:pos x="552450" y="390525"/>
  <xdr:ext cx="2733675" cy="2105025"/>
  <xdr:sp>
    <xdr:nvSpPr> ... </xdr:nvSpPr>
    <xdr:spPr> ... </xdr:spPr>
    <xdr:style> ... </xdr:style>
    <xdr:txBody> ... </xdr:txBody>
  </xdr:sp>
  <xdr:clientData/>
</xdr:absoluteAnchor>

```

In this example, there is a single shape specified using absolute anchoring as its anchoring method.

L.4.12.3.1.2 One Cell Anchoring

One Cell Anchoring describes the placement of the drawing within the spreadsheet based upon offsets as well as a specified column and row. The offset is always in reference to the specified anchor cell and acts to offset the shape object from being exactly on top of the anchor cell. The offset information determines the actual placement of the drawing within the spreadsheet while the row and column are used to specify to which cell the drawing should be anchored. Thus, if the anchor cell changes positions then the drawing can be moved as well. The oneCellAnchor element is what specifies this anchoring behavior and a sample usage is shown below.

```

<xdr:oneCellAnchor>
  <xdr:from>
    <xdr:col>0</xdr:col>
    <xdr:colOff>552450</xdr:colOff>
    <xdr:row>2</xdr:row>
    <xdr:rowOff>9525</xdr:rowOff>
  </xdr:from>
  <xdr:ext cx="2733675" cy="2105025"/>
  <xdr:sp>
    <xdr:nvSpPr> ... </xdr:nvSpPr>
    <xdr:spPr> ... </xdr:spPr>
    <xdr:style> ... </xdr:style>
    <xdr:txBody> ... </xdr:txBody>
  </xdr:sp>
  <xdr:clientData/>
</xdr:oneCellAnchor>

```

In this example, there is a single shape specified using one cell anchoring as its anchoring method.

L.4.12.3.1.3 Two Cell Anchoring

Two Cell Anchoring describes the placement of the drawing within the spreadsheet based upon offsets as well as a specified columns and rows. The offset is always in reference to the specified anchor cell and acts to offset the shape object from being exactly on top of the anchor cell. The offset information determines the actual placement of the drawing within the spreadsheet while the rows and columns are used to specify the cells to which the drawing should be anchored and upon which the resized is based. For instance, if the anchor cell changes positions then the drawing can be moved. Likewise, if the anchor cells behind the shape grow, then the shape can grow as well. The `twoCellAnchor` element is what specifies this anchoring behavior and a sample usage is shown below.

```
<xdr:twoCellAnchor>
  <xdr:from>
    <xdr:col>0</xdr:col>
    <xdr:colOff>495300</xdr:colOff>
    <xdr:row>1</xdr:row>
    <xdr:rowOff>152400</xdr:rowOff>
  </xdr:from>
  <xdr:to>
    <xdr:col>4</xdr:col>
    <xdr:colOff>447675</xdr:colOff>
    <xdr:row>12</xdr:row>
    <xdr:rowOff>47625</xdr:rowOff>
  </xdr:to>
  <xdr:sp>
    <xdr:nvSpPr> ... </xdr:nvSpPr>
    <xdr:spPr> ... </xdr:spPr>
    <xdr:style> ... </xdr:style>
    <xdr:txBody> ... </xdr:txBody>
  </xdr:sp>
  <xdr:clientData/>
</xdr:twoCellAnchor>
```

In this example, there is a single shape specified using two cell anchoring as its anchoring method.

L.4.13 Charts

L.4.13.1 Overview

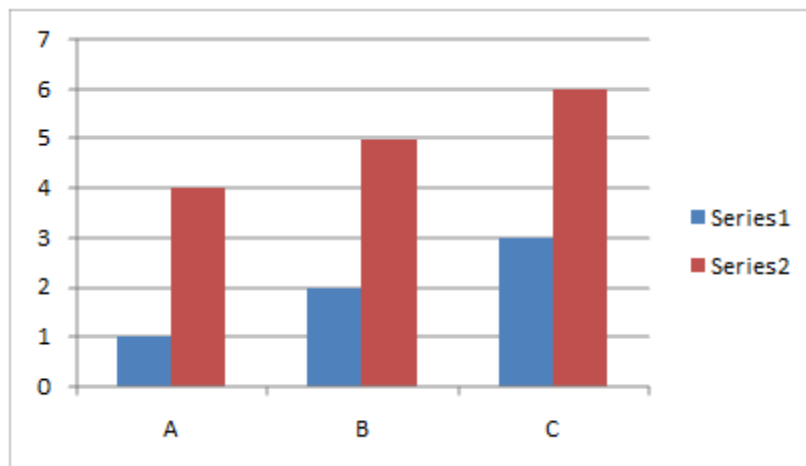
Charts provide a great way to visualize information by displaying a graphical representation of the data. The chart XML files can be reused and shared among different applications, such as a spreadsheet, presentation, and word processing.

Charts come in many different flavors, and this document provides a basic overview of both the different flavors of charts as well as the XML that is used to generate them.

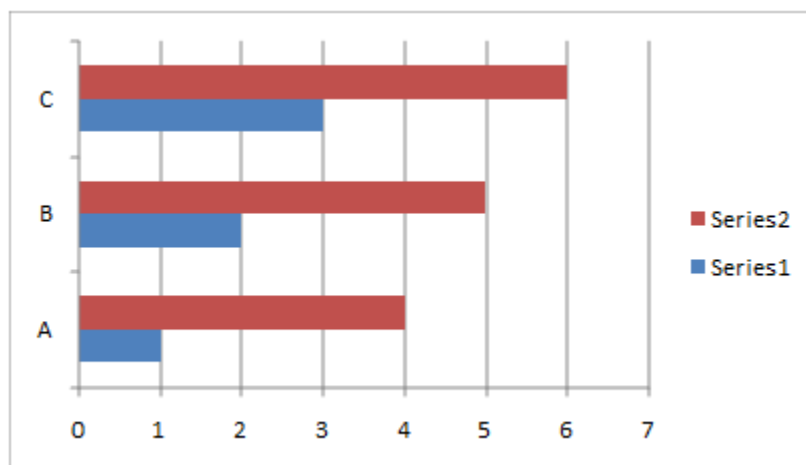
Applications might allow many different runtime behaviors for charts, such as rules for displaying them. This clause and its corresponding reference material define only the XML that is needed to store and generate the charts, and do not dictate any runtime behaviors.

L.4.13.1.1 Basic Chart Types

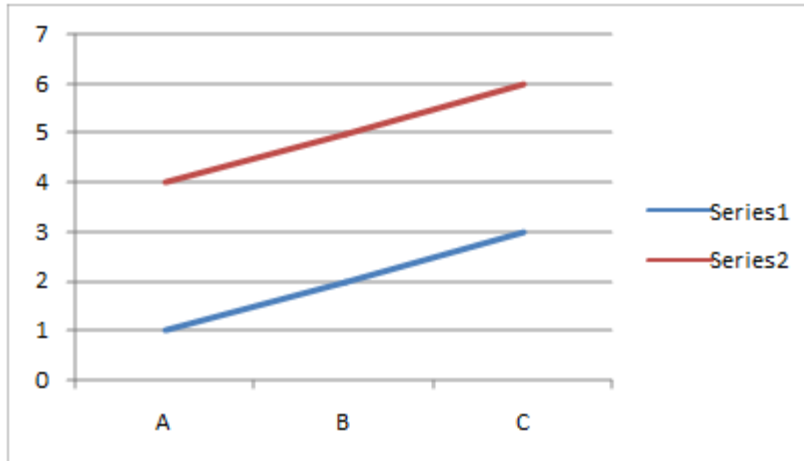
There are 10 basic charts. Below are examples of each basic type of chart:



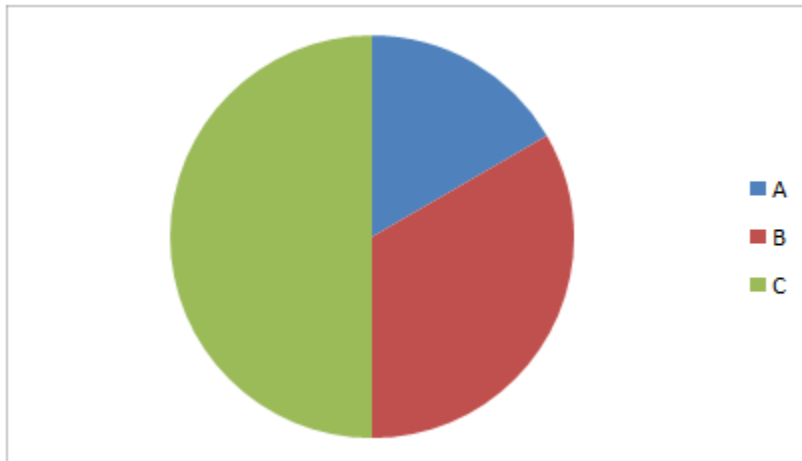
Column Chart (shown above)



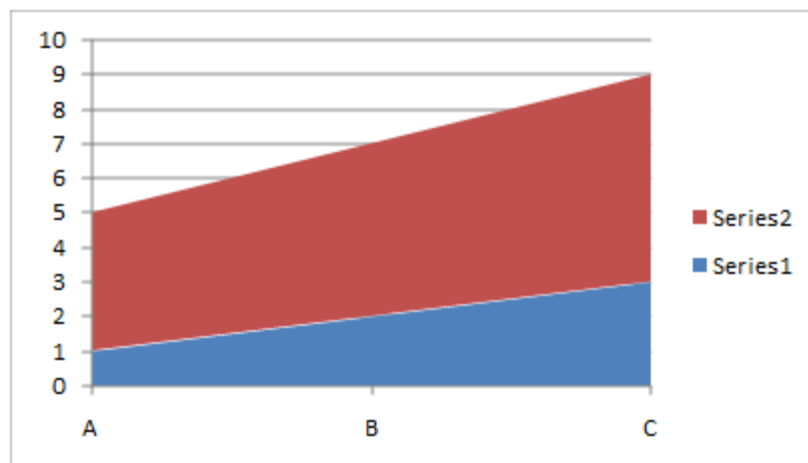
Bar Chart (shown above)



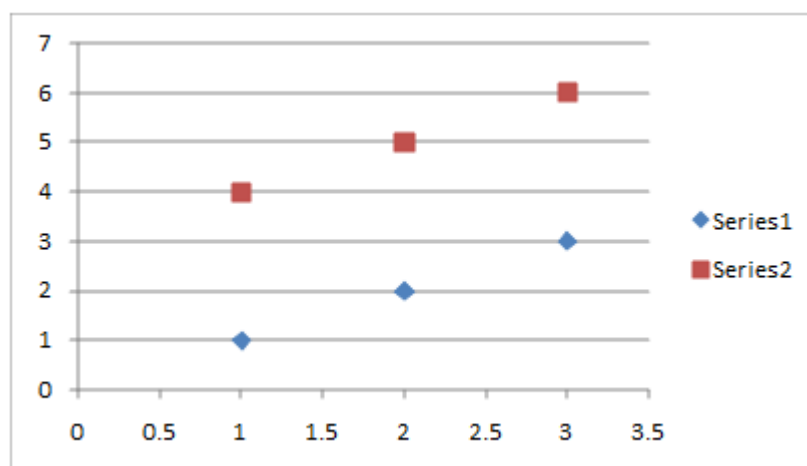
Line Chart (shown above)



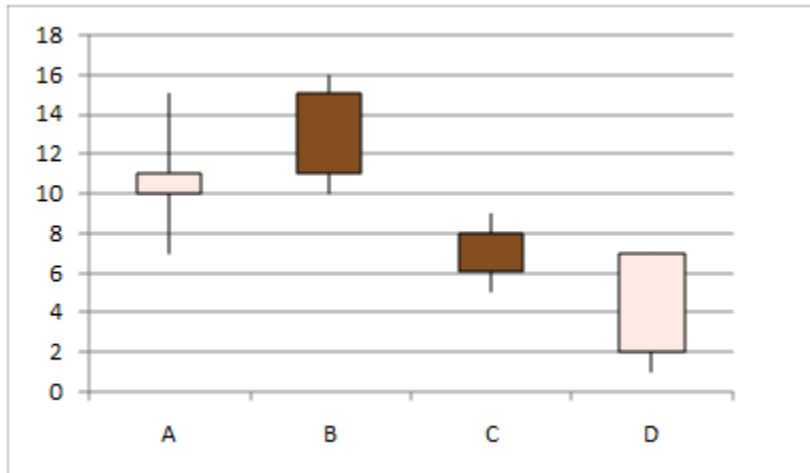
Pie Chart (shown above)



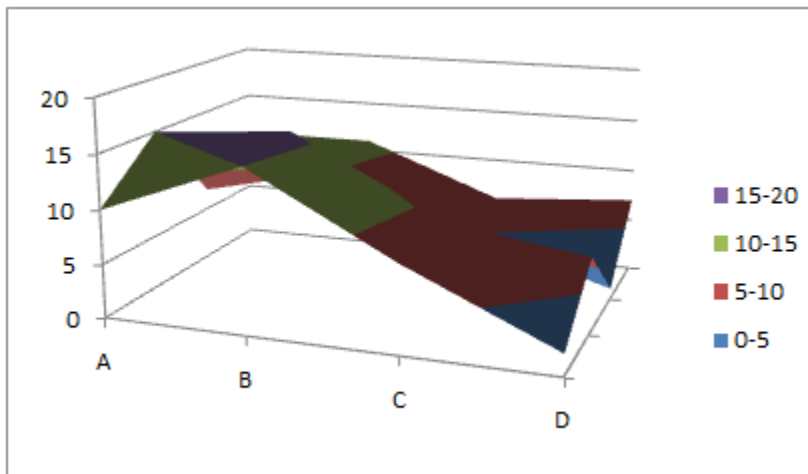
Area Chart (shown above)



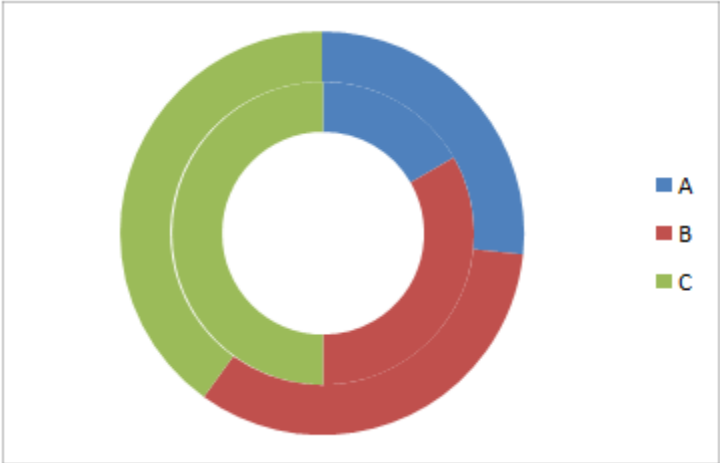
Scatter Chart (shown above)



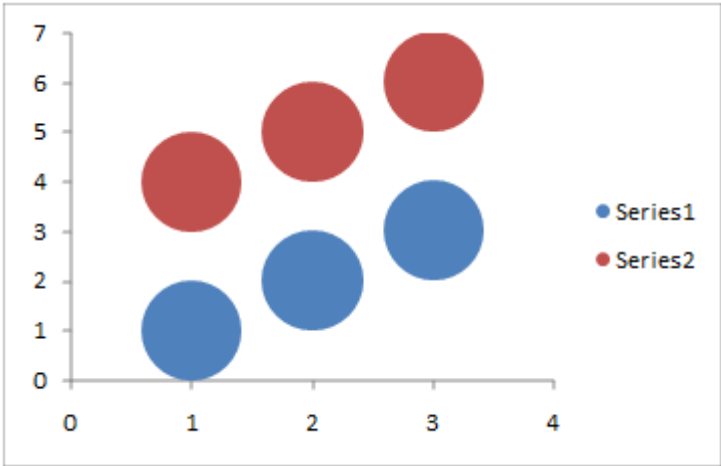
Stock Chart (shown above)



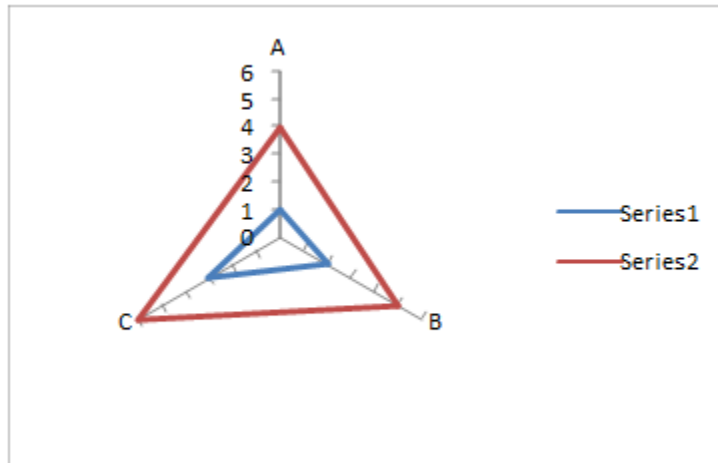
Surface Chart (shown above)



Donut Chart (shown above)



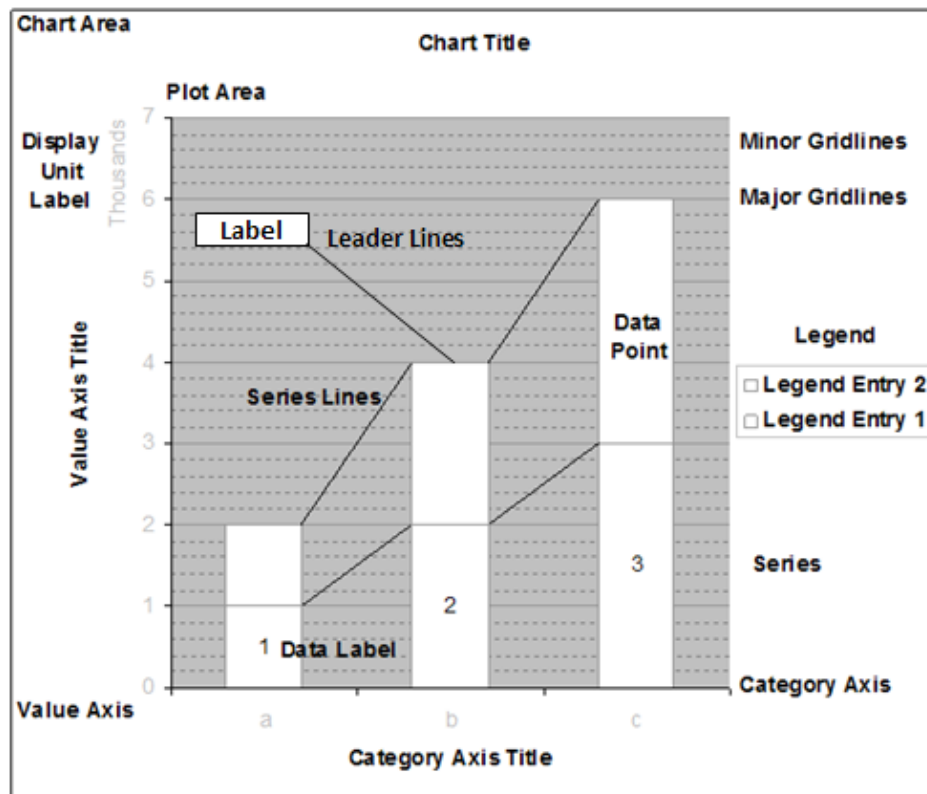
Bubble Chart (shown above)

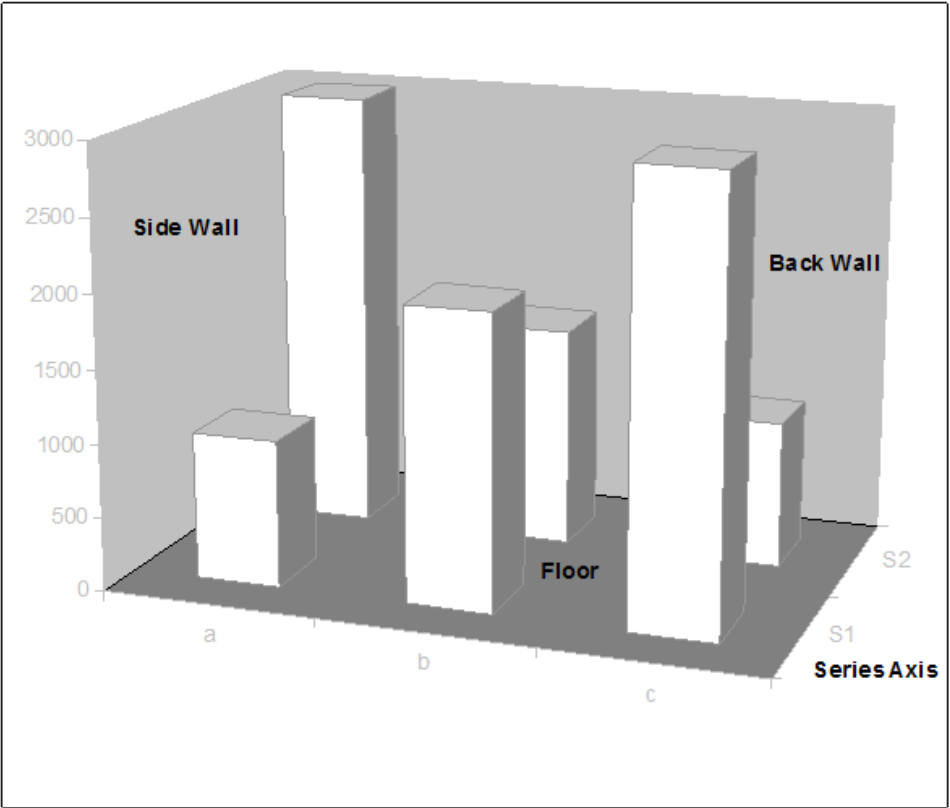
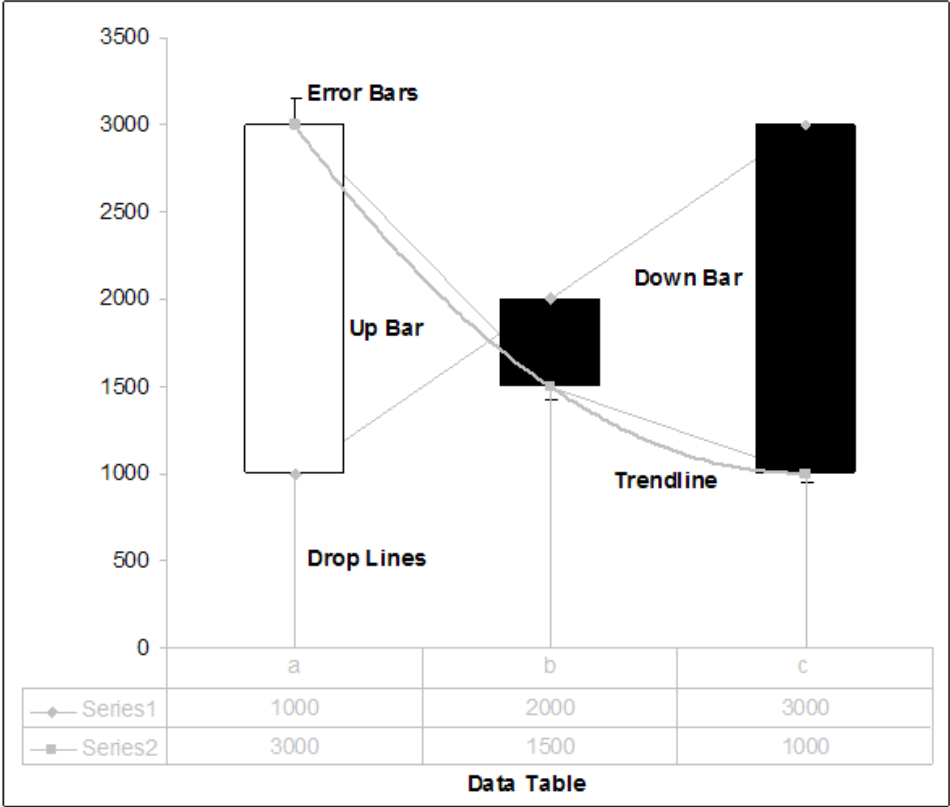


Radar Chart (shown above)

L.4.13.1.2 Basic Chart Components

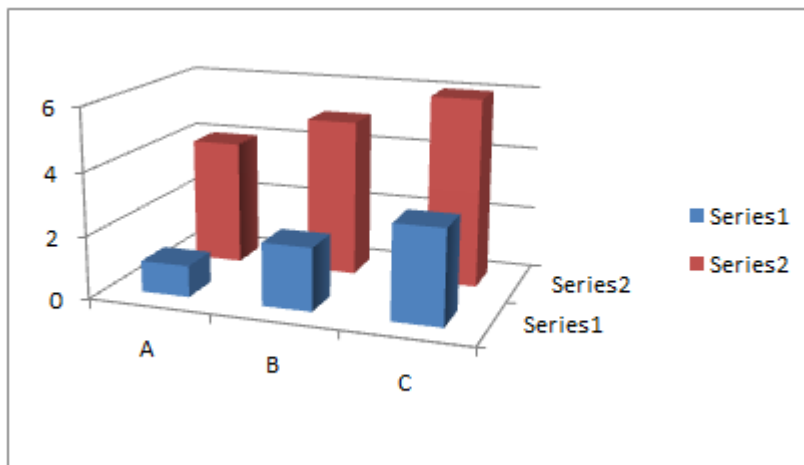
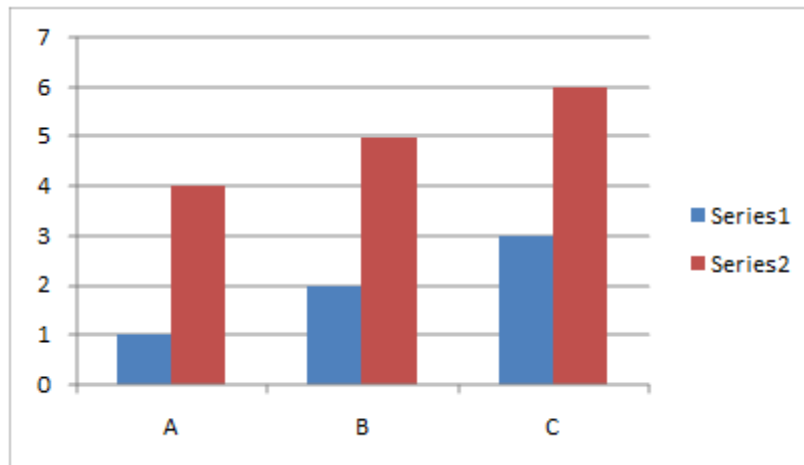
Here are some diagrams that label the different individual components of a chart. Some chart components, such as drop lines, are only shown on certain types of charts.





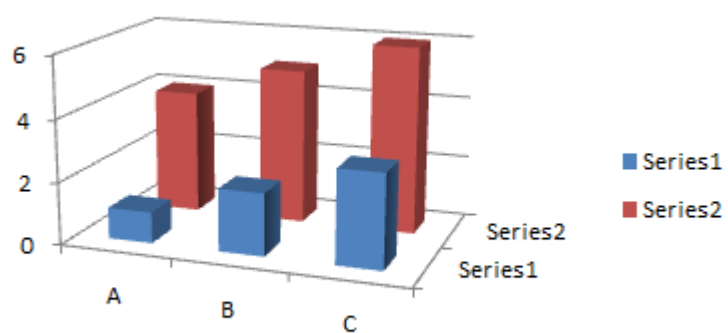
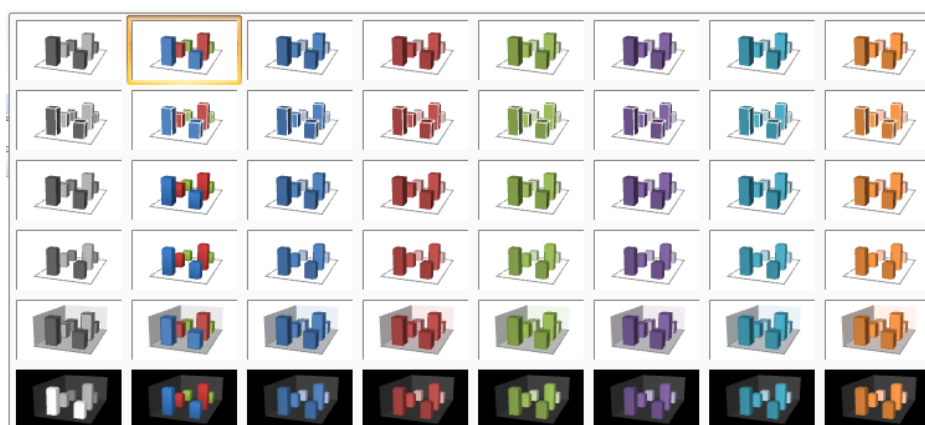
L.4.13.1.3 3D Charts

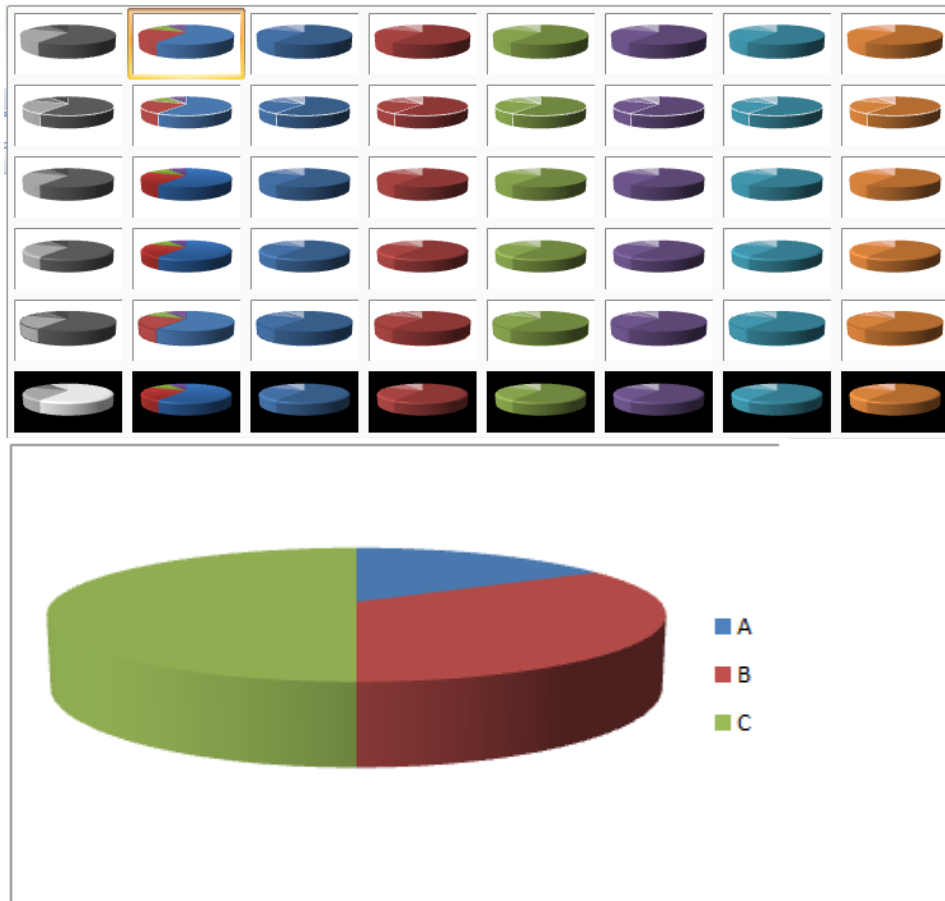
Most chart types also have three-dimensional representations. 3D charts have extra properties to describe depth, floor, or walls, as well as some other rendering effects. Below is a 2D column chart shown with its 3D counterpart.



L.4.13.1.4 Chart Styles

Charts can have different styles applied to them. This is essentially just a coordinated set of coloring and formatting that is applied across an entire chart and all its elements. Styles allow a quick and easy way to coordinate the look and feel of a chart with the rest of the document. Below is a rendering of a column chart and pie chart showing the same data, with the same style applied. There is also a shot of many different types of styles. It is shown for both charts to illustrate how the idea of a style can apply, and be consistent, across different chart types.





L.4.13.2 XML Overview

L.4.13.2.1 Relationships

A Drawing XML part contains a chart element, which expresses a relationship ID. This ID is referenced by the drawing.rels part, which points to the corresponding chart XML part. Chart XML contains the core definition of the chart.

L.4.13.2.2 Chart

Different chart types can have many different components defined in the XML, and not all are shown here. For many charts though, at a very high level, the chart XML is composed of the following pieces:

```

<chartSpace>
  <chart>
    <view3D>
      <perspective val="30"/>
    </view3D>
    <plotArea>
      <layout/>
      <barChart>
        ...
      </barChart>
      <catAx/>
      <valAx/>
    </plotArea>
    <legend>
      ...
    </legend>
  </chart>
  <printSettings>
    ...
  </printSettings>
</chartSpace>

```

chartSpace is the root node, which contains an element defining the chart, and an element defining the print settings for the chart.

chart is the root element for the chart. If the chart is a 3D chart, then a view3D element is contained, which specifies the 3D view. It then has a plot area, which defines a layout and contains an element that corresponds to, and defines, the type of chart.

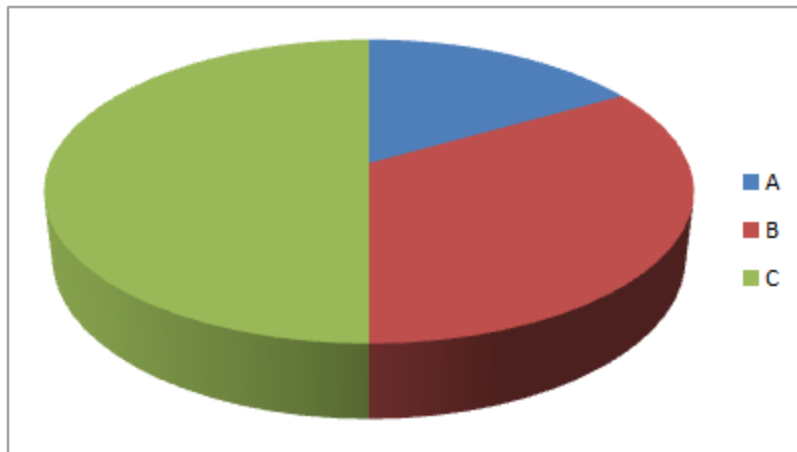
The element that defines the type of chart, barChart in the example above, can also specify caches for both category axis data (which is really just strings for the categories), as well as for the numbers, or values, shown on the chart. The cat element defines the string cache for the category axis, and the val element defines the number caches.

Depending on the type of the chart, the plot area can optionally contain elements that define the axes—such as the value axis and category axis—or shape properties. In the example above, the category axis, catAx, and value axis, valAx are defined. These define things like positioning, orientation, label position, and tick marks for the axis. The actual strings and data that the axis corresponds to are defined by the cat and val elements.

Lastly, the chart element contains a legend element which defines the chart legend.

L.4.13.3 Example

The XML in this clause defines the following 3D chart:



For this example, the xml for the chart element is shown in detail. The xml for the chart element follows:

```
<c:chart>
  <c:view3D>
    <c:rotX val="30"/>
    <c:perspective val="30"/>
  </c:view3D>
  <c:plotArea>
    <c:layout>
      <c:lastLayoutOuter>
        <c:x val="4.5"/>
        <c:y val="4.5"/>
        <c:w val="324.75"/>
        <c:h val="206.25"/>
      </c:lastLayoutOuter>
      <c:lastLayout>
        <c:x val="10.5"/>
        <c:y val="10.5"/>
        <c:w val="312.75"/>
        <c:h val="194.25"/>
      </c:lastLayout>
    </c:layout>
  </c:plotArea>
</c:chart>
```

```

<c:pie3DChart>
  <c:varyColors val="1"/>
  <c:ser>
    <c:idx val="0"/>
    <c:order val="0"/>
    <c:cat>
      <c:strRef>
        <c:f>Sheet1!$A$1:$C$1</c:f>
        <c:strCache>
          <c:pt idx="0">
            <c:v>A</c:v>
          </c:pt>
          <c:pt idx="1">
            <c:v>B</c:v>
          </c:pt>
          <c:pt idx="2">
            <c:v>C</c:v>
          </c:pt>
        </c:strCache>
      </c:strRef>
    </c:cat>
  <c:val>
    <c:numRef>
      <c:f>Sheet1!$A$2:$C$2</c:f>
      <c:numCache>
        <c:pt idx="0">
          <c:v>1</c:v>
        </c:pt>
        <c:pt idx="1">
          <c:v>2</c:v>
        </c:pt>
        <c:pt idx="2">
          <c:v>3</c:v>
        </c:pt>
      </c:numCache>
    </c:numRef>
  </c:val>
</c:ser>
</c:pie3DChart>

```

```

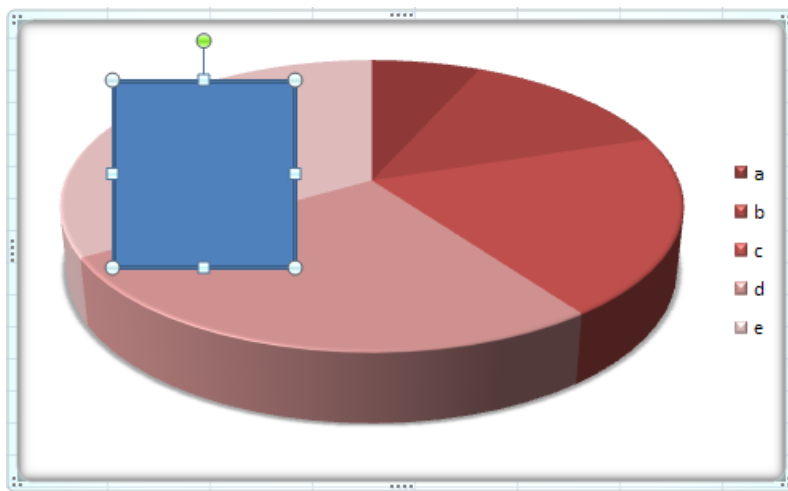
    <c:spPr>
      <a:noFill/>
      <a:ln w="25400">
        <a:noFill/>
      </a:ln>
    </c:spPr>
  </c:plotArea>
  <c:legend>
    <c:legendPos val="r"/>
    <c:layout>
      <c:lastLayout>
        <c:x val="333.75"/>
        <c:y val="81.75"/>
        <c:w val="19.5"/>
        <c:h val="51.75"/>
      </c:lastLayout>
    </c:layout>
  </c:legend>
  <c:plotVisOnly val="1"/>
</c:chart>

```

L.4.14 Chart Drawing

L.4.14.1 Introduction

This subclause provides a high-level overview of DrawingML - Chart Drawing content. The elements in this schema specify how drawing elements are to be described within a chart. For example, suppose we want to specify a rectangle drawing shape within a chart to look like the following:



L.4.14.2 Overview

The elements that specify the drawing objects within a chart are all located within its respective drawing XML file. This file is located under the "drawings" folder inside the spreadsheet file.

L.4.14.3 Chart Drawings

Within the drawing*.xml file there is a single drawing file that contains the userShapes element. This element is the parent element for all the drawing elements within a single chart. Its child specifies the anchoring properties of the drawing elements. It is within this element that the main specifications for the drawing elements are located. For example in the above screenshot with a simple shape located in the chart, the XML for this would look like:

```
<c:userShapes>
  <cdr:relSizeAnchor>
    <cdr:from>
      <cdr:x>0.10417</cdr:x>
      <cdr:y>0.10764</cdr:y>
    </cdr:from>
    <cdr:to>
      <cdr:x>0.51875</cdr:x>
      <cdr:y>0.60069</cdr:y>
    </cdr:to>
    <cdr:sp> ... </cdr:sp>
  </cdr:relSizeAnchor>
</c:userShapes>
```

In the ChartDrawingML code above, there is a single drawing specified almost exactly as it would within the regular DrawingML framework. However, the ChartDrawingML wrapper that is used allows for the specifying of chart specific properties in addition to the normal drawing properties. The most interesting of these are the two anchoring types that define the placement behavior of a drawing within a chart.

L.4.14.3.1 Anchoring Types

To define a drawing within a chart an anchoring type must be chosen. There are two different anchoring types allowed for use within a chart: Absolute Anchoring and Relative Anchoring. These two anchoring types are described in the following two subclauses.

L.4.14.3.1.1 Absolute Size Anchoring

Absolute Anchoring describes the placement of the drawing within the chart based upon absolute chart coordinates. The absSizeAnchor element specifies anchoring behavior, using percentage-based position coordinates for the anchor location and extent coordinates (in EMUs) for drawing objects, as shown in the example below.

```

<cdr:absSizeAnchor>
  <cdr:from>
    <cdr:x>0.10417</cdr:x>
    <cdr:y>0.10764</cdr:y>
  </cdr:from>
  <cdr:ext cx="1895460" cy="1352535"/>
  <cdr:sp>
    <cdr:nvSpPr> ... </cdr:nvSpPr>
    <cdr:spPr> ... </cdr:spPr>
    <cdr:style> ... </cdr:style>
    <cdr:txBody> ... </cdr:txBody>
  </cdr:sp>
</cdr:absSizeAnchor>

```

In this example, there is a single shape specified using absolute anchoring as its anchoring method.

L.4.14.3.1.2 Relative Size Anchoring

Relative Anchoring describes the placement of the drawing within the chart based upon relative chart coordinates. For instance, if the chart increases in size then the shape grows as well. This positioning information includes from and to elements which specify a percentage-based coordinate within the chart bounding box. The relSizeAnchor element is what specifies this anchoring behavior and a sample usage is shown below.

```

<cdr:relSizeAnchor>
  <cdr:from>
    <cdr:x>0.10417</cdr:x>
    <cdr:y>0.10764</cdr:y>
  </cdr:from>
  <cdr:to>
    <cdr:x>0.51875</cdr:x>
    <cdr:y>0.60069</cdr:y>
  </cdr:to>
  <cdr:sp>
    <cdr:nvSpPr> ... </cdr:nvSpPr>
    <cdr:spPr> ... </cdr:spPr>
    <cdr:style> ... </cdr:style>
    <cdr:txBody> ... </cdr:txBody>
  </cdr:sp>
</cdr:relSizeAnchor>

```

In this example, there is a single shape specified using relative anchoring as its anchoring method.

L.4.15 Diagrams

L.4.15.1 Introduction

The DrawingML diagram file format is broken down into the following subjects:

- Data Model
- Colors
- Quick Styles
- Layout

L.4.15.2 Element Property Set

The schema dml-diagram.xsd defines a complex type, CT_ElemPropSet, which is a catch-all for holding element properties and customizations, and is used throughout certain complex types in DrawingML. This complex type contains many properties, and these are explained in subsequent subclauses. The definition of CT_ElemPropSet is as follows:

```
<xsd:complexType name="CT_ElemPropSet">
  <xsd:sequence>
    <xsd:element name="presLayoutVars"
      type="CT_LayoutVariablePropertySet" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="style" type="a:CT_ShapeStyle"
      minOccurs="0" maxOccurs="1" />
  </xsd:sequence>
  <xsd:attribute name="presAssocID" type="ST_ModelId" use="optional" />
  <xsd:attribute name="presName" type="xsd:string" use="optional" />
  <xsd:attribute name="presStyleLbl" type="xsd:string" use="optional" />
  <xsd:attribute name="presStyleIdx" type="xsd:int" use="optional" />
  <xsd:attribute name="presStyleCnt" type="xsd:int" use="optional" />
  <xsd:attribute name="loTypeId" type="xsd:string" use="optional" />
  <xsd:attribute name="loCatId" type="xsd:string" use="optional" />
  <xsd:attribute name="qsTypeId" type="xsd:string" use="optional" />
  <xsd:attribute name="qsCatId" type="xsd:string" use="optional" />
  <xsd:attribute name="csTypeId" type="xsd:string" use="optional" />
  <xsd:attribute name="csCatId" type="xsd:string" use="optional" />
  <xsd:attribute name="coherent3DOff" type="xsd:boolean" use="optional" />
  <xsd:attribute name="phldrT" type="xsd:string" use="optional" />
  <xsd:attribute name="phldr" type="xsd:boolean" use="optional" />
  <xsd:attribute name="custAng" type="xsd:int" use="optional" />
```

```

<xsd:attribute name="custFlipVert" type="xsd:boolean" use="optional" />
<xsd:attribute name="custFlipHor" type="xsd:boolean" use="optional" />
<xsd:attribute name="custSzX" type="xsd:int" use="optional" />
<xsd:attribute name="custSzY" type="xsd:int" use="optional" />
<xsd:attribute name="custScaleX" type="xsd:int" use="optional" />
<xsd:attribute name="custScaleY" type="xsd:int" use="optional" />
<xsd:attribute name="custT" type="xsd:boolean" use="optional" />
<xsd:attribute name="custLinFactX" type="xsd:int" use="optional" />
<xsd:attribute name="custLinFactY" type="xsd:int" use="optional" />
<xsd:attribute name="custLinFactNeighborX" type="xsd:int" use="optional"
/>
<xsd:attribute name="custLinFactNeighborY" type="xsd:int" use="optional"
/>
<xsd:attribute name="custRadScaleRad" type="xsd:int" use="optional" />
<xsd:attribute name="custRadScaleInc" type="xsd:int" use="optional" />
</xsd:complexType>

```

L.4.15.2.1 Presentation Element Properties

The following attributes deal with presentation elements:

- `presLayoutVars` – The layout variable property set.
- `style` – The link to the permutation of the style matrix.
- `presAssocID` – The semantic element associated with this presentation element. This ID is used together with the `presName` to create a unique key for presentation element indexing.
- `presName` – The layout node name of this presentation element. This name is used together with `presAssocID` to create a unique key for presentation element indexing.
- `presStyleLbl` – The layout node style label of this presentation element..
- `presStyleIdx` – The layout node style index of this presentation element..
- `presStyleCnt` – The layout node style count of this presentation element.

L.4.15.2.2 Document Element Properties

The following attributes deal with the document element:

- `loTypeID` – The ID of the current diagram type.
- `loCatId` – The ID of the current diagram category.
- `qsTypeID` – The ID of the current style type.
- `qaCatID` – The ID of the current style category.
- `csTypeID` – The ID of the current color transform.
- `csCatID` – The ID of the current color transform category.
- `coherent3Doff` – Enables or disables coherent 3D behavior for styles that have such behavior defined.

L.4.15.2.3 Semantic Element Properties

The following attributes relate to the semantic element properties:

- `phldrT` – The text used for display in the element if the placeholder flag is set to `true`. If this field is not set, then the default placeholder text is used.
- `phldr` – Indicates that the element is a placeholder or sample item.

L.4.15.2.4 Customization Properties

The following are customization properties or tweaks:

- `custAng` – The amount rotation is customized by, in 60,000th of a degree.
- `custFlipVert` – Vertical flip.
- `custFlipHor` – Horizontal flip.
- `custSzX` – Fixed width override for a shape, in emus.
- `custSzY` – Fixed height override for a shape, in emus.
- `custScaleX` – Amount that the width is scaled by, in 1,000th of a percent.
- `custScaleY` – Amount that the height is scaled by, in 1,000th of a percent.
- `custT` – If text has been customized then layout no longer changes it.
- `custLinFactX` – A percentage of the shape width that is used for offsetting the shape, in 1,000th of a percent.
- `custLinFactY` – A percentage of the shape height that is used for offsetting the shape, in 1,000th of a percent.
- `custLinFactNeighborX` – A percentage of the neighbor's height used for offsetting the shape, in 1,000th of a percent.
- `custLinFactNeighborY` – A percentage of the neighbor's height used for offsetting the shape, in 1,000th of a percent.
- `custRadScaleRad` – Defines how much the radius has been scaled by, in 1,000th of a percent.
- `custRadScaleInc` – Defines how much the include angle has been scaled by, in 1,000th of a percent.

L.4.15.3 Data Model

The schema `dml-diagram.xsd` defines the data model in a diagram. The purpose of the data model is twofold. The first use of the data model is to hold the information contained in a diagram. For example, in figure 1 below, the purpose of the data model would be to hold the information, “one”, “two” and “three” for the diagram.



Figure 11: Example diagram with data.

The second use of the data model is to define an initial state of the diagram. This initial state consists of what can be thought of as placeholder data, which an application uses to display a diagram initially before any data has been entered. Figure 2 shows an example of what a diagram might look like in an initial state containing three empty nodes. In this example, the placeholder data consists of three nodes and two connections, which is explained shortly.



Figure 12: An empty diagram in its initial state.

L.4.15.3.1 Structural Elements

L.4.15.3.1.1 Type of Structural Element

There is a single simple type, `ST_PtType`, used to define the contents of this element; this is defined later. Structural elements hold the data associated with a diagram and are defined in relation to one-another through relationship types. Seven different elements are available to the user:

- `doc` – A document element. The document element is the root element within a diagram and can be thought of as the canvas which the diagram is drawn on.
- `node` – A model element. This is the basic type of an element and can be used to hold text for example.
- `asst` – This is used in hierarchy diagrams and represents an assistant element.
- `pres` – A presentation element. This element defines the visual aspects associated with a node, or rather the presentation aspects of an element.
- `parTrans` – A parent transition element. This element holds the data for a parent-child relationship between two elements of type `node`.

- sibTrans – A sibling transition element. This element holds the data for the relationship defined between two elements of type node whom are peers of one another.
- unknown – A type of element used to maintain backward compatibility.

L.4.15.3.1.2 Relationship Type

There are defined relationships or connections between two model elements. Four types of relationships are defined in the simple type ST_CxnType:

- parOf – Parent-child relationship.
- presOf – Presentation relationship.
- presParOf – Presentation parent of relationship.
- unknownRelationship – An unknown relationship type.

L.4.15.3.1.3 Element

An element is a single item, such as a node or transition in the data model. Within the realm of DrawingML, the complex type CT_Pt holds information describing an element within a diagram. Within this description lies both the data held within the element, and any formatting on that element. A CT_Pt is defined as follows:

```
<xsd:complexType name="CT_Pt">
  <xsd:sequence>
    <xsd:element name="prSet" type="CT_ElemPropSet" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="spPr" type="a:CT_ShapeProperties"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="style" type="a:CT_ShapeStyle"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="t" type="a:CT_TextBody" minOccurs="0"
      maxOccurs="1" />
  </xsd:sequence>
  <xsd:attribute name="modelId" type="ST_ModelId" use="required" />
  <xsd:attribute name="type" type="ST_PtType" use="optional"
    default="node" />
  <xsd:attribute name="cxnId" type="ST_ModelId" use="optional"
    default="0" />
</xsd:complexType>
```

The attribute modelId holds a unique id for a particular element. This unique id can be referenced elsewhere, for example, from within a connection list. This attribute is required for every point defined in the data model.

The last two attributes of the CT_Pt are optional. The first defines the type of point with the default being a node. The second defines a connection id. This connection id is only used if the point type is

parTrans, or sibTrans. The connection id refers to a relationship that is defined elsewhere in the data model.

L.4.15.3.1.4 Relationship

A relationship is a connection between any two model elements. An example of where a relationship would be used can be seen in figures 1 and 2. In each of those examples, the arrows between the nodes have relationships defined. A relationship is defined as follows:

```
<xsd:complexType name="CT_Cxn">
  <xsd:attribute name="modelId" type="ST_ModelId" use="required" />
  <xsd:attribute name="type" type="ST_CxnType" use="optional"
    default="parOf" />
  <xsd:attribute name="srcId" type="ST_ModelId" use="required" />
  <xsd:attribute name="destId" type="ST_ModelId" use="required" />
  <xsd:attribute name="srcOrd" type="xsd:unsignedInt" use="required" />
  <xsd:attribute name="destOrd" type="xsd:unsignedInt" use="required" />
  <xsd:attribute name="parTransId" type="ST_ModelId" use="optional"
    default="0" />
  <xsd:attribute name="sibTransId" type="ST_ModelId" use="optional"
    default="0" />
  <xsd:attribute name="presId" type="xsd:string" use="optional"
    default="" />
</xsd:complexType>
```

The relationship, as with the element, has a unique id associated with it referred to as the modelID.

The srcId and destId attributes refer to ids of the source element and destination element, respectively, that this relationship is defined between.

The srcOrd and destOrd refer to the ordinality of siblings for a given connection. For example, if a node had three siblings, A, B, and C, then the srcOrd would define if they were to show up as A, B, C, or perhaps B, C, and then A.

The presId attribute contains the presentation that is associated with this particular relationship.

L.4.15.3.1.5 Element List

The complex type CT_PtList is simply a sequence of elements. Its definition is as follows:

```
<xsd:complexType name="CT_PtList">
  <xsd:sequence>
    <xsd:element name="pt" type="CT_Pt" minOccurs="0"
      maxOccurs="unbounded"/>
  </xsd:sequence>
</xsd:complexType>
```


L.4.15.3.1.6 Relationship List

This complex type, CT_CxnList, is simply a sequence of connections. Its definition is as follows:

```
<xsd:complexType name="CT_CxnList" oxsd:cname="Relationships">
  <xsd:sequence>
    <xsd:element name="cxn" type="CT_Cxn" minOccurs="0"
      maxOccurs="unbounded" />
  </xsd:sequence>
</xsd:complexType>
```

L.4.15.3.1.7 Data Model

The complex type CT_DataModel defines the data model and contains a sequence of elements. It is defined as follows:

```
<xsd:complexType name="CT_DataModel">
  <xsd:sequence oxsd:emitArgs="flattenSequence">
    <xsd:element name="ptLst" type="CT_PtList" />
    <xsd:element name="cxnLst" type="CT_CxnList" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="bg" type="a:CT_BackgroundFormatting"
      minOccurs="0" />
    <xsd:element name="whole" type="a:CT_WholeE2oFormatting"
      minOccurs="0" />
  </xsd:sequence>
</xsd:complexType>
```

The data model contains a list of elements, a list of connections, and formatting properties for the background object and the diagram container. This complex type is responsible for holding all data-bound information of the diagram being created.

L.4.15.4 Color Transforms

Color transforms define how colors are applied to diagrams. Color transforms define how color is used in the diagram as a whole, and they mandate things such as which theme color or colors are used, if there is a tint or shade applied to a certain color or part of the diagram, or if color is even used at all. Some examples of what color transforms can do to a simple diagram can be seen in figure 3.

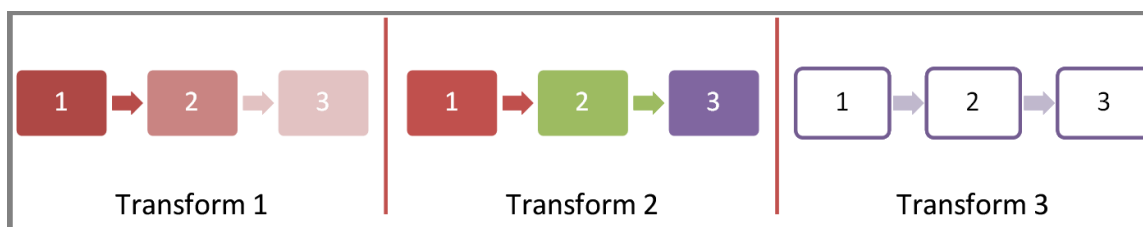


Figure 13: Different examples of a color transform applied to a diagram

L.4.15.4.1 Structural Elements

The structural elements which come together to create a color transform, or rather, the complex type CT_ColorTransform, are as follows:

- CT_CTName
- CT_CTDescription
- CT_CTCategory
- CT_CTCategories
- ST_ClrAppMethod
- ST_HueDir
- CT_Colors
- CT_CTStyleLabel
- CT_CTVersion
- CT_ColorTransformHeader
- CT_ColorTransformHeaderLst

The complex types CT_CTName (name), CT_CTDescription (description), CT_CTCategory (category), and CT_CTCategories (list of categories) work together to name, describe and categorize the particular color transform. These complex types are mirrored elsewhere throughout DrawingML in the different subjects in order to perform the same tasks of naming, describing, and categorizing.

The name consists simply of two strings, one of a name for the color transform, which is required, and an optional language tag. The language allows someone to specify a language for a given title. It is possible to specify multiple titles that are language dependant. The description also has the optional language attribute as in the name, along with a second required string attribute which holds the actual description. The usage of this is exactly the same as within CT_CTName. CT_CTName and CT_CTDescription are defined in the following way:

```
<xsd:complexType name="CT_CTName">
  <xsd:attribute name="lang" type="xsd:string" use="optional" />
  <xsd:attribute name="val" type="xsd:string" use="required" />
</xsd:complexType>
<xsd:complexType name="CT_CTDescription">
  <xsd:attribute name="lang" type="xsd:string" use="optional" />
  <xsd:attribute name="val" type="xsd:string" use="required" />
</xsd:complexType>
```

The category and categories complex types , CT_CTCategory and CT_CTCategories, respectively, define how the color transform is categorized within the user interface of the application. The category contains a name, or type, along with a priority that defines the ordering of the color transform. The lower the priority, the earlier in the category it displays. If there is a tie, the unique id associated with

the color transform decides the order alphabetically. CT_CTCategories is simply a list of CT_CTCategory. The two complex types are defined as follows:

```
<xsd:complexType name="CT_CTCategory">
  <xsd:attribute name="type" type="xsd:anyURI" use="required" />
  <xsd:attribute name="pri" type="xsd:unsignedInt" use="required"/>
</xsd:complexType>
<xsd:complexType name="T_CTCategories">
  <xsd:sequence minOccurs="0" maxOccurs="unbounded">
    <xsd:element name="cat" type="CT_CTCategory" minOccurs="0"
      maxOccurs="unbounded" />
  </xsd:sequence>
</xsd:complexType>
```

L.4.15.4.1.1 Color Application Method

The simple type ST_ClrAppMethod lists the different options for color to be applied to a diagram. There are three options available to the user: span, cycle, and repeat. Given a list of colors, which go from color A to color B, the differences in these three options can be defined. These options are shown below in Figure 4.

The span option, from the start of the diagram to the end of the diagram, interpolates between the colors A through B for every node along the way.

The cycle option interpolates from A to B then back to A from the start of the diagram to the end of the diagram.

The repeat option applies colors A through B one at a time for each point in the diagram, then repeats A through B as needed.

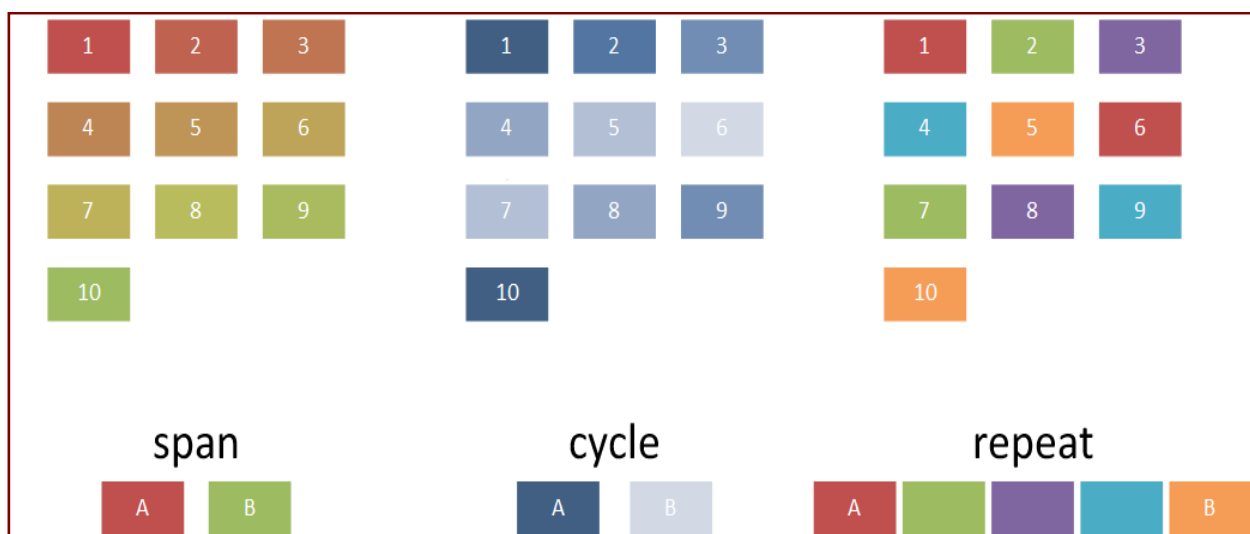


Figure 14: Examples of the three different ways a color transform is applied to a diagram.

L.4.15.4.1.2 Hue Direction

The simple type `ST_HueDir` defines the direction of a hue color shift around a color wheel. A user can either define the shift to occur in the clockwise (cw) direction, or in the counterclockwise (ccw) direction. For example, in Figure 4, the span colors are red and green. The behavior shown in figure 4 is a shift in the cw direction. If the hue shift had been defined in the ccw direction, the colors interpolated between colors A and B would have been in the hues purple and blue. Another example of a hue direction shift in the clockwise can be seen in Figure 5 below along with the color shift from red to yellow and then from yellow to blue along the primary colors. Counterclockwise shifts would occur in the direction of yellow to red and blue to yellow in the examples below.



Hue Direction = Clockwise

Figure 15: Example hue shifts in the clockwise direction around a color wheel applied to two diagrams. The three primary colors, red, yellow, and blue are used to represent the three major sections of a color wheel which ranges between red to yellow to blue to red.

L.4.15.4.1.3 Colors

The complex type `CT_Colors` holds the actual color values that are to be applied to a given diagram and how those colors are to be applied. It contains the color application method and hue shift direction, and is defined as follows:

```
<xsd:complexType name="CT_Colors">
  <xsd:sequence>
    <xsd:group ref="a:EG_ColorChoice" minOccurs="0" maxOccurs="unbounded" />
  </xsd:sequence>
  <xsd:attribute name="meth" type="ST_ClrAppMethod" use="optional"
    default="span" />
  <xsd:attribute name="hueDir" type="ST_HueDir" use="optional"
    default="cw" />
</xsd:complexType>
```

The sequence of colors is defined via the sequence of EG_ColorChoices.

L.4.15.4.1.4 Style Label

The complex type CT_CTStyleLabel packages together colors for the different pieces of a diagram. There are six different aspects to a diagram that can be colored independently of one another. Each of the six parts is of complex type CT_Colors. They are:

- Fill Colors – The colors that actually fill the shapes in the diagram
- Line Colors – The colors of the lines on the shapes in the diagram.
- Effect Colors – The colors of the effects applied to the shapes within the diagram (eg. Glow).
- Text Line Colors – The colors of the lines on the text within the diagram.
- Text Fill Colors – The color of the text within the diagram.
- Text Effect Colors – The colors of the effects applied to the text within the diagram.

The final piece of a style label is simply its name, which is a string. CT_CTStyleLabel is defined as follows:

```
<xsd:complexType name="CT_CTStyleLabel">
  <xsd:sequence>
    <xsd:element name="fillClrLst" type="CT_Colors"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="linClrLst" type="CT_Colors"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="effectClrLst" type="CT_Colors"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="txLinClrLst" type="CT_Colors"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="txFillClrLst" type="CT_Colors"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="txEffectClrLst" type="CT_Colors"
      minOccurs="0" maxOccurs="1" />
  </xsd:sequence>
  <xsd:attribute name="name" type="xsd:string" use="required" />
</xsd:complexType>
```

L.4.15.4.1.5 Version

The simple type ST_CTVersion defines the minimum version of an application that the color transform works with. The version corresponds to build numbers in the major.minor.build.revision format and is defined as follows:

```
[0-9]?[0-9])?(\.[0-9]?[0-9])?(\.[0-9]{4})?(\.[0-9]{4}
```

L.4.15.4.1.6 Color Transform

The complex type CT_ColorTransform brings together all of the pieces into one cohesive structure. This is the actual definition of a color transform, which can be applied to any diagram; it is defined as follows:

```
<xsd:complexType name="CT_ColorTransform">
  <xsd:sequence>
    <xsd:element name="title" type="CT_CTName" minOccurs="0"
      maxOccurs="unbounded" />
    <xsd:element name="desc" type="CT_CTDescription"
      minOccurs="0" maxOccurs="unbounded" />
    <xsd:element name="catLst" type="CT_CTCategories"
      minOccurs="0" />
    <xsd:element name="styleLbl" type="CT_CTStyleLabel"
      minOccurs="0" maxOccurs="unbounded" />
  </xsd:sequence>
  <xsd:attribute name="uniqueId" type="xsd:anyURI" use="optional"/>
  <xsd:attribute name="minVer" type="ST_CTVersion" use="optional"
    default="12.0" />
</xsd:complexType>
```

A color transform contains a title, description, category list, and style label in a sequence along with a unique id and a minimum version.

L.4.15.4.2 Color Transform Header

Two complex types, CT_ColorTransformHeader and CT_ColorTransformHeaderLst, help alleviate potential performance concerns with initially loading in a large number of color transforms. The header information contains the minimum information required to load a color transform into the application. Because of this, color transforms themselves can be loaded only when needed, and other initialization work can progress quickly without loading unneeded information.

CT_ColorTransformHeader contains information about the title of the color transform, the description, how it is categorized, the unique id, minimum version, and resId. It is defined in the following way:

```
<xsd:complexType name="CT_ColorTransformHeader">
  <xsd:sequence>
    <xsd:element name="title" type="CT_CTName" minOccurs="1"
      maxOccurs="unbounded" />
    <xsd:element name="desc" type="CT_CTDescription"
      minOccurs="1" maxOccurs="unbounded" />
    <xsd:element name="catLst" type="T_CTCategories"
      minOccurs="0" o:cname="categories" />
  </xsd:sequence>
```

```

<xsd:attribute name="uniqueId" type="xsd:anyURI" use="required"/>
<xsd:attribute name="minVer" type="ST_CTVersion" use="optional"
  default="12.0" />
<xsd:attribute name="resId" type="xsd:int" use="optional"
  default="0" />
</xsd:complexType>

```

The complex type CT_ColorTransformHeaderLst simply contains a list of color transform headers. It is defined as follows:

```

<xsd:complexType name="CT_ColorTransformHeaderLst">
  <xsd:sequence>
    <xsd:element name="colorsDefHdr" type="CT_ColorTransformHeader"
      minOccurs="0" maxOccurs="unbounded" />
  </xsd:sequence>
</xsd:complexType>

```

L.4.15.5 Style Definition

A style definition is similar to a color transform. A style definition defines items such as the font used, the thickness of a contour line, 3-D properties on the diagram, among other things. Style definitions work in combination with color transforms to give an overall look and feel for the diagram. Some examples of style definitions in use are in figure 5.

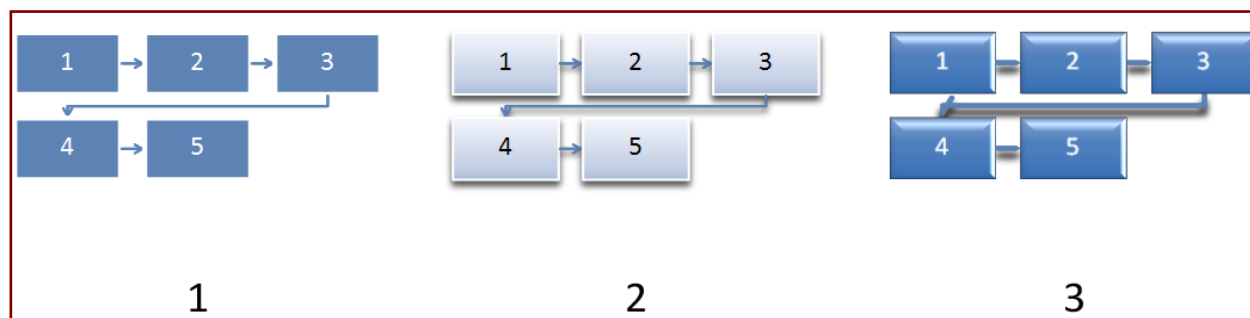


Figure 16: Examples of using three different style definitions on a diagram.

L.4.15.5.1 Structural Elements

The structural elements which come together to create a style definition are as follows:

- CT_SDName
- CT_SDDescription
- CT_SDCategory
- CT_SDCategories
- CT_TextProps
- CT_StyleLabel

- ST_SDVersion
- CT_StyleDefinition
- CT_StyleDefinitionHeader
- CT_StyleDefinitionHeaderLst

CT_SDName, CT_SDDescription, CT_SDCategory, CT_SDCategories, and ST_SDVersion are all defined exactly as they are within color transforms. These complex types were recreated within the style definition area to allow slight differentiations to be made, although, at this time they are defined exactly the same.

The text properties, style label, and then the style definition combine together to create a style definition, which is applied to a diagram.

L.4.15.5.1.1 Text Properties

The complex type CT_TextProps holds any 3-D associated properties of the text that is to be held in the diagram. A CT_TextProps is defined as follows:

```
<xsd:complexType name="CT_TextProps">
  <xsd:sequence>
    <xsd:group ref="a:EG_Text3D" minOccurs="0" maxOccurs="1" />
  </xsd:sequence>
</xsd:complexType>
```

All that is contained within the text properties is an EG_Text3D complex type. The usage of the text properties complex type allows 3-D text properties to be defined for a diagram style.

L.4.15.5.1.2 Style Label

The style label contains information pertaining to the styleable elements within a diagram. These elements include the shape properties and text properties along with any references to the style matrix or document theme. The shape properties are defined in two different ways: the scene3d element that pertains to the scene on a whole (and includes lighting effects, rotations, and the like), and any 3-D and material settings are held in the sp3d element. CT_StyleLabel is defined as follows:

```
<xsd:complexType name="CT_StyleLabel">
  <xsd:sequence>
    <xsd:element name="scene3d" type="a:CT_Scene3D"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="sp3d" type="a:CT_Shape3D" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="txPr" type="CT_TextProps" minOccurs="0"
      maxOccurs="1" />
  </xsd:sequence>
</xsd:complexType>
```



```

    <xsd:element name="style" type="a:CT_ShapeStyle"
      minOccurs="0" maxOccurs="1" />
  </xsd:sequence>
  <xsd:attribute name="name" type="xsd:string" use="required" />
</xsd:complexType>

```

As with many other complex types, the style label has an attribute reserved for a name. This is simply a string that names the particular style label. This style label can then be referenced from within a diagram definition, as we can see below.

Note that the scene3d element contained within a style label acts on the level of an individual shape, rather than the diagram as a whole. A second scene3d element is defined within the style definition; that acts on the diagram level and allows for scene coherent 3-D to be applied to the diagram. A style definition contains a style label.

L.4.15.5.1.3 Style Definition

The style definition complex type, CT_StyleDefinition, is the root element used to define a style definition. As with the root element of a color transform, within the style definition there exists a title, description, category, unique id, and minimum version number. These elements serve the same purpose as they do within the color transform.

The interesting aspects of a style definition complex type are that it holds a style label, another style index (which is contained within the style label as well), and another scene3d (which is also contained within the style label as has been previously mentioned). The scene3d element applies to the diagram on a whole and allows for scene coherent 3-D to be applied to the diagram. The duplication of the style index is two-fold. If a style index is not defined within the style label, then the default style index, or rather, the index defined in this complex type is used. Since a diagram definition can reference a style label, and not a style definition, the style index is also required within the style label. A CT_StyleDefinition is defined as follows:

```

<xsd:complexType name="CT_StyleDefinition">
  <xsd:sequence>
    <xsd:element name="title" type="CT_SDName" minOccurs="0"
      maxOccurs="unbounded" />
    <xsd:element name="desc" type="CT_SDDescription"
      minOccurs="0" maxOccurs="unbounded" />
    <xsd:element name="catLst" type="CT_SDCategories"
      minOccurs="0" />
    <xsd:element name="scene3d" type="a:CT_Scene3D"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="style" type="a:CT_ShapeStyle"
      minOccurs="0" maxOccurs="1" />
  </xsd:sequence>
</complexType>

```

```

    <xsd:element name="styleLbl" type="CT_StyleLabel"
      minOccurs="1" maxOccurs="unbounded" />
  </xsd:sequence>
  <xsd:attribute name="uniqueId" type="xsd:anyURI" use="optional"/>
  <xsd:attribute name="minVer" type="ST_SDVersion" use="optional"
    default="12.0" />
</xsd:complexType>

```

L.4.15.5.1.4 Style Definition Header

The complex types CT_StyleDefinitionHeader and CT_StyleDefinitionHeaderLst perform the same function as the two complex header types in color transforms. They are used to pre-load required information so the actual loading of the style definition can happen only when needed.

L.4.15.6 Layout

The single largest aspect of DrawingML is Layout. Ultimately, layout is responsible for defining all aspects of the diagram outside of color and style. It defines how the diagram looks, how it behaves, and how the data is to be mapped. Figure 6 shows different examples of how layout works to create a diagram holding the data '1', '2', and '3'.

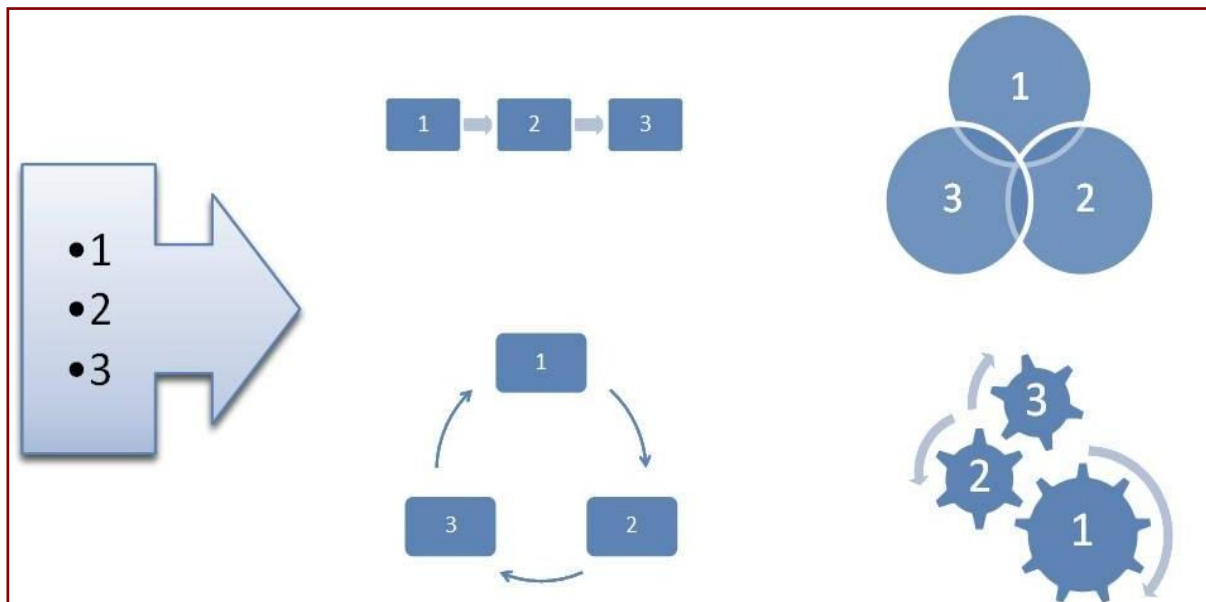


Figure 17: Different layouts mapping the data 1, 2, and 3 to four different diagrams

There are two aspects to layout: defining the numerous complex types utilized by diagram definitions, and the diagram definitions themselves. Diagram definitions are a fundamental part of layout, and utilize everything in order to define new diagrams.

L.4.15.6.1 Basic Layout Types

There are a very large number of simple types defined in this subject. These simple types are all associated with properties of a diagram that can be modified to create a desired behavior. These simple types, along with an explanation of what each does, follow.

L.4.15.6.1.1 Algorithm Type

ST_AlgorithmType is responsible for which algorithm is used to layout the diagram. The algorithm layout chosen determines if the diagram behaves as if it were a simple list, a circular cycle, or some other type of diagram. The algorithms available are:

- unknown – Unknown algorithm type. This type is used for extensibility reasons. Use of this algorithm type can be used by future versions/implementations which define new algorithm types other than the above mentioned algorithm types. By using this type, the current implementations know that they are not able to correctly render the diagram if they have only implemented the above mentioned algorithms for layout.
- composite – The composite algorithm specifies the size and position for all child layout nodes. You can use it to create graphics with a predetermined layout or in combination with other algorithms to create more complex shapes.
- conn – the connector algorithm lays out and routes connecting lines, arrows, and shapes between layout nodes
- cycle – the cycle algorithm lays out child layout nodes around a circle or portion of a circle using equal angle spacing
- hierChild – the hierarchy child algorithm works with the hierRoot algorithm to create hierarchical tree layouts. This algorithm aligns and positions its child layout nodes in a linear path under the hierRoot layout node.
- hierRoot – the hierarchy root algorithm works with the hierChild algorithm to create hierarchical tree layouts. The hierRoot algorithm aligns and positions the hierRoot layout node in relation to the hierChild layout nodes.
- pyra – the pyramid algorithm lays out child layout nodes along a vertical path and works with the trapezoid shape to create a pyramid
- lin – the linear algorithm lays out child layout nodes along a linear path
- sp – the space algorithm is used to specify a minimum space between other layout nodes or as an indication to do nothing with the layout node's size and position
- tx – manages layout of text within a shape
- snake – the snake algorithm lays out child layout nodes along a linear path in two dimensions, allowing the linear flow to continue across multiple rows or columns

L.4.15.6.1.2 Axis Type

The simple type ST_AxisType defines how layout maps data to the diagram for a given point in the diagram. The different ways this can be mapped is as follows:

- self – the layout maps to the current data point

- `ch` – the layout node can map to the children of the current data point, but not to descendants lower in the hierarchy
- `des` – the layout node can map to a descendant of the current data point
- `desOrSelf` – the layout node can map the current data point, or to a descendant of the current data point
- `par` – the layout node maps to the parent data point
- `ancst` – the layout node can map to the ancestors of the current data point (parents, grandparents, great grandparents, etc)
- `ancstOrSelf` – the layout node can map an ancestor data point or the current data point
- `followSib` – the layout node can map to a following sibling peer to the current data point
- `precedSib` – the layout node can map to a preceding sibling peer to the current data point.
- `root` – the layout node can map to the root
- `none` – the layout node doesn't map to any data point

L.4.15.6.1.3 Boolean Operators

Boolean operators, defined by `ST_BoolOperator`, are for layout.

- `none` – no operator defined
- `equ` – 'equal to' operator, returns true if the two compared values are equal, false otherwise
- `gte` – 'greater than or equal to' operator
- `lte` – 'less than or equal to' operator

L.4.15.6.1.4 Child Order Type

The simple type `ST_ChildOrderType` specifies the child order type for a layout node.

- `b` – bottom
- `t` – top

L.4.15.6.1.5 Constraint Types

The simple type `ST_ConstraintTypes` defines the constraints that can be used as limits or modifications to the diagram or the nodes held within the diagram. These constraints manage the behavior of many properties that can be defined within the diagram. The different constraints that can be applied to a diagram are as follows:

- `unknown` – An unknown constraint. This can be used by implementing applications to define a constraint type outside of the scope of what is defined by this simple type.
- `alignOff` – specifies the alignment offset
- `begMarg` – specifies the beginning margin
- `bendDist` – specifies the distance at which a connector bends
- `begPad` – specifies the distance between the edge of the transition node and the connector shape
- `b` – bottom alignment

- bMarg – the bottom margin
- bOff – specifies the amount of offset relative to the bottom of the node
- ctrX – specifies the center of the node in the X-direction
- ctrXOff – specifies the amount of offset of the center of the node in the X-direction
- ctrY – specifies the center of the node in the Y-direction
- ctrYOff – specifies the amount of offset of the center of the node in the Y-direction
- connDist – specifies the distance between connectors. Intended for use with boolean and reference constraints. Overrides values specified in the layout definition part
- diam – specifies the diameter, and is used within the cycle algorithm type
- endMarg – specifies the end margins
- endPad – specifies the distance between the edge of the transition node and the connector shape
- h – specifies the height
- hArH – specifies the arrowhead height
- hOff – specifies the height offset
- l – specifies the left
- lMarg – specifies the amount of left margin
- lOff – specifies the amount of left offset
- r – specifies right
- rMarg – specifies the amount of right margin
- rOff – specifies the amount of right offset
- primFontSz – specifies the primary font size
- pyraAcctRatio - specifies the fraction of the width of the diagram that is reserved for the fly-outs at their shortest distance
- secFontSiz – specifies the secondary font size
- stemThick – specifies the thickness of the shaft on an arrow
- t – specifies the top
- tMarg – specifies the amount of top margin
- tOff – specifies the amount of top offset
- userA through userZ – User defined information. This set of enumerations allow a user to define specific values which can be referenced at a later time within a diagram definition. For example, if the value 5.1 was important to the layout and definition of a diagram, the user could define userA to be equal to 5.1 and then use the userA constraint within the diagram definition. This would allow a single place to update the value across the entire diagram definition.
- w – specifies the width
- wArH – specifies the width of an arrowhead
- wOff – specifies the amount of width offset

L.4.15.6.1.6 Constraint Relationships

The simple type ST_ConstraintRelationship defines the application of retrieval data the constraint is applied to. The following relationships are available:

- self – the constraint is applicable to the current point
- ch – the constraint is applicable to a child of the current point
- des – the constraint is applicable to a descendant of the current point

L.4.15.6.1.7 Type of Element

The simple type ST_ElementType defines the type of element, or point which get created and how they are created from the data at hand. The different ways to pull from the data to create points are as follows:

- all – use all of the data points, nodes and transitions
- doc – use the document level, or root data point
- node – use only data nodes input by the user
- norm – in place for extensibility and behaves exactly opposite of the asst element
- nonNorm – in place for extensibility and behaves exactly opposite of the nonAsst element
- asst – use assistant data nodes within hierarchy algorithm
- nonAsst – use non-assistant nodes within the hierarchy algorithm
- parTrans – Use only parent transitions between nodes. Parent transitions are similar to sibling transitions, except that they represent parent/child relationships. Parent transitions are most commonly used in hierarchy diagrams, such as organization charts, to draw lines between parent and child nodes.
- pres – specifies that the node is related to the presentation level
- sibTrans – Use only sibling transitions between data nodes. These transitions represent sibling relationships between nodes, and are frequently mapped to arrows between shapes in the drawing. A sibTrans value is sometimes used to create white space between nodes.

L.4.15.6.1.8 Parameter ID

The simple type ST_ParameterId defines parameters that can be used to modify the behavior or algorithms. The modifications are as follows:

- horzAlign – specifies the horizontal alignment
- vertAlign – specifies the vertical alignment
- chDir – specifies the child direction
- chAlign – specifies the alignment of the children
- secChAlign – specifies a secondary child alignment
- linDir – specifies whether children are arranged from left to right, right to left, top to bottom, or bottom to top
- secLinDir – specifies a secondary linear direction in which children are
- arranged from left to right, right to left, top to bottom, or bottom to top
- stElem – specifies the point type of the layout node to use as the first shape in the cycle
- bendPt – specifies where the bend point is to be located on connectors

- `connRout` – specifies whether the connector is drawn as a single straight line, orthogonal lines with a single bend, or a curve that uses the `diam` constraint
- `begSty` – specifies whether the beginning of the connector has an arrowhead
- `endSty` – specifies whether the end of the connector has an arrowhead
- `dim` – specifies the connector dimension, 2-D, 3-D, or custom
- `rotPath` - if `rotPath=aLongPath`, the algorithm rotates all children perpendicular to the line from the cycle's center to the child node; otherwise they are not rotated. The `aLongPath` value does not take rotation into account when determining if shapes overlap
- `ctrShpMap` - `None` specifies to place nodes around a circle. First node (`fNode`) specifies to place the first node in the center and the remaining nodes around the circle
- `nodeHorzAlign` – specifies the horizontal node alignment
- `nodeVertAlign` – specifies the vertical node alignment
- `fallback` – specifies if the fallback occurs in a single dimension (e.g. vertically) or if it occurs in two dimensions
- `txDir` – specifies where the text of the first node starts
- `pyraAcctPos` – specifies the placement of the fly-out grandchildren
- `pyraAcctTxMar` – specifies the placement of one edge of the child text
- `txBldir` – Specifies the text block direction, vertical or horizontal
- `txAnchorHorz` – Specifies the horizontal text anchor position.
- `txAnchorVert` – Specifies the vertical text anchor position.
- `txAnchorHorzCh` – Specifies the horizontal text anchor position for child text.
- `txAnchorVertCh` – Specifies the vertical text anchor position for child text.
- `parTxLTRAlign` – Specifies the paragraph alignment of parent text when the shape has only parent text. This parameter applies when the text direction is left to right.
- `partTxRTLAlign` – Specifies the paragraph alignment of parent text when the shape has only parent text. This parameter applies when the text direction is right to left.
- `shpTxLTRAlignCh` – Specifies the paragraph alignment of all text within the shape when the shape contains both parent and child text. This parameter applies when the text direction is left to right.
- `shpTxRTLAlignCh` – Specifies the paragraph alignment of all text within the shape when the shape contains both parent and child text. This parameter applies when the text direction is right to left.
- `autoTxRot` – specifies how text is oriented relative to the shape
- `grDir` – Specifies the direction of growth for the snake algorithm.
- `flowDir` – specifies whether nodes are arranged in rows or columns for the snake algorithm.
- `contDir` – Specifies the direction of subsequent rows or columns in the snake algorithm.
- `bkpt` – specifies the point at which the diagram starts to snake
- `off` – specifies whether each row and column is centered or offset from the previous row or column
- `hierAlign` – specifies the alignment of the hierarchy

- `bkPtFixedVal` – specifies where the `sname` should break if `bkpt` is set to fixed
- `stBulletLvl` – Specifies the level at which to start using bullets for incoming text.
- `stAng` – Specifies the angle at which the first shape is placed. Angles are in degrees, measured clockwise from a line pointing straight upward from the center of the cycle.
- `spanAng` – Specifies the angle the cycle spans. Final `shapealign` text is placed at `stAng+spanAng`, unless `spanAng=360`. In that case, the algorithm places the text so that shapes do not overlap
- `ar` – Specifies the aspect ratio (width to height) of the composite node to use when determining child constraints. A value of 0 means leave the width and height constraints as is. The algorithm can temporarily shrink one dimension to achieve that ratio
- `lnSpPar` – specifies the line spacing of the parent
- `lnSpAfParP` – specifies the line spacing after the parent paragraph
- `lnSpCh` specifies the line spacing of a child
- `lnSpAfChP` – specifies the line spacing after the child paragraph
- `rtShortDist` – Specifies the routing to use the shortest distance for connectors.
- `alignTx` – specifies if to hold text or not
- `pyraLvlNode` – If pyramid has a composite child node, specifies the name of the node that is a child of the composite that makes up the pyramid itself. If the node specifies a trapezoid shape, it modifies the adjustment handles to construct a pyramid.
- `pyraAcctBkgdNode` – If pyramid has a composite child node, specifies the child node that should hold the child text.
- `pyraAcctTxNode` – If pyramid has a composite child node, specifies the name of the node that is a child of the composite that makes up the child flyout shape.
- `srcNode` – Specifies the name of the layout node from which to start the connection.
- `dstNode` – Specifies the name of the layout node from which to end the connection from.
- `begPts` – Specifies the point type for the beginning of a connector.
- `endPts` – Specifies the point type for the end of a connector.
- `unknown` – An unknown parameter id. This can be used by implementing applications to define a parameter id outside of the scope of what is defined by this simple type.

L.4.15.6.1.9 Function Type

The simple type `ST_FunctionType` defines different types of conditional expressions that can be utilized. The different types of expressions are:

- `cnt` – Specifies the count of items.
- `pos` - Retrieves the position of the node in the specified set of nodes.
- `revPos` - Reverse position function.
- `posEven` - Returns 1 if the specified node is at an even numbered position in the data model.
- `posOdd` - Returns 1 if the specified node is in an odd position in the data model.
- `var` - Used to reference a variable.
- `depth` - Specifies the depth of items.

- `maxDepth` - Defines the maximum depth of items.

L.4.15.6.1.10 Function Operator

The simple type `ST_FunctionOperator` defines the different condition expression operators that can be used. The different operators are as follows:

- `equ` – equal
- `neq` – not equal
- `gt` – greater than
- `lt` – less than
- `gte` – greater than or equal to
- `lte` – less than or equal to

L.4.15.6.1.11 Horizontal Alignment

The simple type, `ST_DiagramHorizontalAlignment`, specifies the different options available for alignment horizontally. The options are:

- `l` – left
- `ctr` – center
- `r` – right
- `none` – none

L.4.15.6.1.12 Vertical Alignment

The simple type, `ST_VerticalAlignment`, specifies the different options available for alignment vertically. The options are:

- `t/top` – top
- `mid/center` – middle
- `b/bottom` – bottom
- `none` – none

L.4.15.6.1.13 Child Direction

The simple type `ST_ChildDirection` is used to specify the direction the children are laid out. The different options are:

- `horz` – horizontally
- `vert` – vertically

L.4.15.6.1.14 Child Alignment

The simple type `ST_ChildAlignment` defines the alignment parameter types for children. The different alignment types are:

- `t` – top

- b – bottom
- l – left
- r – right

L.4.15.6.1.15 Secondary Child Alignment

The simple type ST_SecondaryChildAlignment defines secondary alignment parameter types for children. The simple type ST_ChildAlignment is mirrored here with the addition of the none type.

L.4.15.6.1.16 Linear Direction

The simple type ST_LinearDirection defines the linear direction parameter types. The direction types are as follows:

- fromL – from left
- fromR – from right
- fromT – from top
- fromB – from bottom

L.4.15.6.1.17 Secondary Linear Direction

The simple type ST_SecondaryLinearDirection defines a secondary linear direction parameter. This simple type mirrors exactly the simple type ST_LinearDirection with the addition of none.

L.4.15.6.1.18 Starting Element

The simple type ST_StartingElement specifies the first node point type for a cycle diagram. The different starting elements are:

- node – node
- trans – transition

L.4.15.6.1.19 Rotation Path

The simple type ST_RotationPath specifies the way in which the algorithm rotates children. The different rotation types are:

- none – no rotation is performed
- alongPath – the children are rotated perpendicular to the line from the cycle's center to the child node

L.4.15.6.1.20 Center Shape Mapping

The simple type ST_CenterShapeMapping specifies how the first node of a cycle diagram is laid out within the diagram. The different places to put the first node are:

- none – the node is laid out around the circle
- fNode – the node is placed in the center of the circle and the remaining nodes along the outside of the circle

L.4.15.6.1.21 Bend Point

The simple type `ST_BendPoint` specifies where the bend point is to be located along elbow connectors. The different options are:

- beg – beginning
- def – default
- end – end

L.4.15.6.1.22 Connector Routing

The simple type `ST_ConnectorRouting` defines how the routing of a connector happens within the diagram. The different routing options are:

- stra – straight
- bend – an elbow connection
- curve – a curved connection
- longCurve – a curved connection with a larger radius than simple curve

L.4.15.6.1.23 Arrowhead Style

The simple type `ST_ArrowheadStyle` defines the style of the arrowhead used on a connector. The different options are:

- auto – automatic
- arr – an arrowhead is used
- noArr – no arrowhead is used

L.4.15.6.1.24 Connector Dimension

The simple type `ST_ConnectorDimension` defines the dimension of a connector used in a diagram. The different dimension types are:

- 1D – a single dimension connector, for example, a line
- 2D – a two dimensional connector, for example, an arrow
- cust – custom

L.4.15.6.1.25 Connector Point

The simple type `ST_ConnectorPoint` defines the point at which the connector starts and ends. The different beginning and ending types are:

- auto – automatic
- bCtr – bottom center
- ctr – center
- midL – middle left
- midR – middle right
- tCtr – top center

- bL – bottom left
- bR – bottom right
- tL – top left
- tR – top right
- radial – radial

L.4.15.6.1.26 Node Horizontal Alignment

The simple type `ST_NodeHorizontalAlignment` defines the alignment of a node in the horizontal direction. The different alignments are:

- l – left
- ctr – center
- r – right

L.4.15.6.1.27 Node Vertical Alignment

The simple type `ST_NodeVerticalAlignment` defines the alignment of a node in the vertical direction. The different alignments are:

- t – top
- mid – mid
- b – bottom

L.4.15.6.1.28 Fallback Dimension

The simple type `ST_FallbackDimension` defines the number of dimensions to be used if fallback causes the diagram to be resized. The different options are:

- 1D – fallback occurs in a single dimension (X or Y)
- 2D – fallback occurs in two dimensions (X and Y)

L.4.15.6.1.29 Text Direction

The simple type `ST_TextDirection` specifies where the text on the first node starts. The different text directions are:

- fromT – from top
- fromB – from bottom

L.4.15.6.1.30 Pyramid Accent Position

The simple type `ST_PyramidAccentPosition` defines where the position of the fly-out grandchildren. The possible positions are:

- bef – before
- after – after

L.4.15.6.1.31 Pyramid Text Margin

The simple type `ST_PyramidAccentTextMargin` specifies the alignment of the text in the fly-out grandchildren. The different alignments are:

- step – the text is against the edge of the pyramid
- stack – the text aligns

L.4.15.6.1.32 Text Block Direction

The simple type `ST_TextBlockDirection` defines the text block direction. The different direction the text can have are:

- vert – vertical
- horz – horizontal

L.4.15.6.1.33 Text Anchor Horizontal

The simple type `ST_AnchorHorizontal` is responsible for anchoring text horizontally. The available options are:

- none – no anchor set
- ctr – the text is anchored the center

L.4.15.6.1.34 Text Anchor Vertical

The simple type `ST_AnchorVertical` is responsible for anchoring the text vertically. The available options are:

- t – top anchor
- mid – middle anchor
- b – bottom anchor

L.4.15.6.1.35 Text Alignment

The simple type `ST_TextAlignment` defines the text alignment. The available options are:

- l – left
- ctr – ctr
- r – right

L.4.15.6.1.36 Auto Text Rotation

The simple type `ST_AutoTextRotation` defines the behavior of the text as the containing shape is rotated. The following options are available:

- none – no rotation, the text rotates with the shape
- upr – upright
- grav – gravity

L.4.15.6.1.37 Grow Direction

The simple type ST_GrowDirection defines the growing behavior of the snake algorithm. The following options are available:

- tL – grow from the top left
- tR – grow from the top right
- bL – grow from the bottom left
- gR – grow from the bottom right

L.4.15.6.1.38 Flow Direction

The simple type ST_FlowDirection Specifies whether nodes are arranged in rows or columns for the snake algorithm. The following options are available:

- row – Row
- col – column

L.4.15.6.1.39 Continue Direction

The simple type ST_ContinueDirection specifies the direction of the subsequent row or column in the snake algorithm. The following options are available:

- revDir – reverse direction
- sameDir – same direction

L.4.15.6.1.40 Breakpoint

The simple type ST_Breakpoint defines the behavior of a snake diagram's breaking behavior. The available options are:

- endCnv – end of canvas
- bal – balanced
- fixed – fixed

L.4.15.6.1.41 Offset

The simple type ST_Offset defines the behavior of whether each row or column in the snake algorithm is offset from the previous row or column. The available options are:

- ctr – the offset is center based
- off – there is an offset defined

L.4.15.6.1.42 Hierarchy Alignment

The simple type ST_HierarchyAlignment specifies the relationship between parent and children in a hierarchy diagram. The following options exist:

- tL – top left

- tR – top right
- tCtrCh – top center children
- tCtrDes – top center descendants
- bL – bottom left
- bR – bottom right
- bCtrCh – bottom center children
- bCtrDes – bottom center descendants
- lT – left top
- lB – left bottom
- lCtrCh – left center children
- lCtrDes – left center descendants
- rT – right top
- rB – right bottom
- rCtrCh – right center children
- rCtrDes – right center descendants

L.4.15.6.2 Variable Type

The simple type ST_VariableType defines the type of the conditional expression. These variables turn user interface options on and off. The available variable types are:

- unknown – Unknown variable type. This can be used by implementing applications to define a variable type outside of the scope of what is defined by this simple type.
- orgChart – organizational chart command
- chMax – used for the insert shape dropdown commands
- chPref – used for the insert shape button
- bulEnabled – used for the insert bullet command
- dir – diagram direction, RTL or LTR
- hierBranch – stores the different layouts for org chart
- animOne – exposes options for animation
- animLvl – exposes options for animation

L.4.15.6.2.1 Output Shape Type

The simple type ST_OutputShapeType defines special shape types which are unique to diagrams. The unique shape types are:

- none – none
- conn – connector

L.4.15.6.3 Diagram Definitions

Diagram definitions define the look of a diagram. They utilize almost all the aspects of the file format discussed thus far in order to create layout properties which get translated into visual diagrams.

There are a few more simple types that need to be defined before talking about the larger aspects of what it takes to create a diagram definition. Many of these simple types are provided as wrappers or lists of the above mentioned simple types.

L.4.15.6.3.1 Lists

There are a group of simple types which act as lists of the simple types already mentioned. They are all defined in the following general way:

```
<xsd:simpleType name= "NAME OF TYPE" >
  <xsd:list itemType= "NAME OF SIMPLE TYPE" />
</xsd:simpleType>
```

The list of these list types are the following simple types:

- ST_AxisTypes – list of ST_AxisType
- ST_ElementTypes – list of ST_ElementType
- ST_Ints – list of xsd:int
- ST_UnsignedInts – list of xsd:unsignedInt
- ST_Booleans – list of xsd:boolean

L.4.15.6.3.2 Function Value

The simple type ST_FunctionValue is a value for a condition expression. It is defined as:

```
<xsd:simpleType name="ST_FunctionValue" final="restriction">
  <xsd:union memberTypes="xsd:int xsd:boolean ST_Direction
    ST_HierBranchStyle ST_AnimOneStr ST_AnimLvlStr" />
</xsd:simpleType>
```

L.4.15.6.3.3 Direction

The simple type ST_Direction defines the direction the diagram is to be laid out. The directions available are:

- norm – normal
- rev – reversed

L.4.15.6.3.4 Hierarchy Branch Style

The simple type ST_HierBranchStyle changes the behavior of the branch style in hierarchy, or org chart, diagrams. This value can be modified by a user directly from the user interface. The different types of branch styles are:

- l – left
- r – right
- hang – hanging
- std – standard

- init – initial

L.4.15.6.3.5 One by One Animation

The simple type ST_AnimOneStr allows for differentiation in the way a one-by-one animation is displayed in the user interface. The following options are available:

- none – nothing is displayed
- one – the term one-by-one is used
- branch – the term branch one-by-one is used to distinguish a hierarchy diagram

L.4.15.6.3.6 Level Animation

The simple type ST_AnimLvlStr acts very much like the simple type ST_AminOneStr, as it allows for two different descriptions of a single animation depending upon the desired behavior for a particular diagram. The following allows for differentiation of radial diagrams. The different options are:

- none – nothing
- lvl – normal depth first traversal
- ctr – allows a radial diagram to be shown with the center node first

L.4.15.6.3.7 Org Chart Flag

The complex type CT_OrgChart defines that the diagram is an organizational chart. Organizational charts contain special behavior in that assistants can now be utilized correctly. The complex type is defined as follows:

```
<xsd:complexType name="CT_OrgChart">
  <xsd:attribute name="val" type="xsd:boolean" default="false"
    use="optional" />
</xsd:complexType>
```

L.4.15.6.3.8 Node Count

The simple type ST_NodeCount holds a value that is used by the complex types CT_ChildMax and CT_ChildPref.

L.4.15.6.3.9 Child Max

This complex type defines when the user interface for inserting a child shape is to become disabled for a given node, or rather the max number of children that the user interface is enabled for. This complex type is defined as:

```
<xsd:complexType name="CT_ChildMax">
  <xsd:attribute name="val" type="ST_NodeCount" default="-1"
    use="optional" />
</xsd:complexType>
```

L.4.15.6.3.10 Child Preference

This complex type defines how many children are inserted with a single action through the user interface to add a child. This is useful in hierarchy diagrams in which one would like to specify that every shape should have three children. A single click of the add shape button would add three children. The complex type is defined as follows:

```
<xsd:complexType name="CT_ChildPref">
  <xsd:attribute name="val" type="ST_NodeCount" default="-1"
    use="optional" />
</xsd:complexType>
```

L.4.15.6.3.11 Bullets Enabled

This complex type defines if the user interface for inserting a bullet into a shape is enabled or disabled for a given node. The complex type is defined as follows:

```
<xsd:complexType name="CT_BulletEnabled">
  <xsd:attribute name="val" type="xsd:boolean" default="false"
    use="optional" />
</xsd:complexType>
```

L.4.15.6.3.12 Direction

This complex type defines the direction of the diagram, be it normal or reversed. The complex type is defined as:

```
<xsd:complexType name="CT_Direction">
  <xsd:attribute name="val" type="ST_Direction" default="norm"
    use="optional" />
</xsd:complexType>
```

L.4.15.6.3.13 Hierarchy Branch Style

This complex type defines the hierarchy branch style for a diagram. The complex type is defined as:

```
<xsd:complexType name="CT_HierBranchStyle">
  <xsd:attribute name="val" type="ST_HierBranchStyle" default="std"
    use="optional" />
</xsd:complexType>
```

L.4.15.6.3.14 Animate as One

This complex type defines the animate as one value for a diagram. The complex type is defined as:

```
<xsd:complexType name="CT_AnimOne" >
  <xsd:attribute name="val" type="ST_AnimOneStr" default="one"
    use="optional" />
</xsd:complexType>
```

L.4.15.6.3.15 Animate by Level

This complex type defines the animate by level value for a diagram. The complex type is defined as:

```
<xsd:complexType name="CT_AnimLvl">
  <xsd:attribute name="val" type="ST_AnimLvlStr" default="none"
    use="optional" />
</xsd:complexType>
```

L.4.15.6.3.16 Layout Property Set

The complex type CT_LayoutPropertySet holds all of the layout properties for a given diagram. The layout property set is a single structure which contains most of what has been talked about thus far in a diagram definition. The layout property set is defined as:

```
<xsd:complexType name="CT_LayoutVariablePropertySet">
  <xsd:sequence>
    <xsd:element name="orgChart" type="CT_OrgChart"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="chMax" type="CT_ChildMax" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="chPref" type="CT_ChildPref"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="bulletEnabled" type="CT_BulletEnabled"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="dir" type="CT_Direction" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="hierBranch" type="CT_HierBranchStyle"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="animOne" type="CT_AnimOne" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="animLvl" type="CT_AnimLvl" minOccurs="0"
      maxOccurs="1" />
  </xsd:sequence>
</xsd:complexType>
```

Because all of the contents of this complex type have already been discussed, no further detail on this complex type needs to be given.

L.4.15.6.3.17 Iterators

The attribute group AG_IteratorAttributes defines the attributes used by the iterators forEach, presOf, and if. The attribute group is defined as follows:

```

<xsd:attributeGroup name="AG_IteratorAttributes">
  <xsd:attribute name="axis" type="ST_AxisTypes" use="optional"
    default="none" />
  <xsd:attribute name="ptType" type="ST_ElementTypes"
    use="optional" default="all" />
  <xsd:attribute name="hideLastTrans" type="ST_Booleans"
    use="optional" default="true" />
  <xsd:attribute name="st" type="ST_Ints" use="optional" default="1" />
  <xsd:attribute name="cnt" type="ST_UnsignedInts" use="optional"
    default="0" />
  <xsd:attribute name="step" type="ST_Ints" use="optional" default="1" />
</xsd:attributeGroup>

```

L.4.15.6.3.18 Constraints

The attribute group AG_ConstraintAttributes defines the attributes used to specify a constraint. The attribute group is defined as:

```

<xsd:attributeGroup name="AG_ConstraintAttributes">
  <xsd:attribute name="type" type="ST_ConstraintType" use="required" />
  <xsd:attribute name="for" type="ST_ConstraintRelationship"
    use="optional" default="self" />
  <xsd:attribute name="forName" type="xsd:IDREF" use="optional" />
  <xsd:attribute name="ptType" type="ST_ElementType" use="optional"
    default="all" />
</xsd:attributeGroup>

```

L.4.15.6.3.19 Constraint References

The attribute group AG_ConstraintRefAttributes defines the attributes used to specify a constraint reference. The attribute group is defined as:

```

<xsd:attributeGroup name="AG_ConstraintRefAttributes">
  <xsd:attribute name="refType" type="ST_ConstraintType"
    use="optional" default="unknown" />
  <xsd:attribute name="refFor" type="ST_ConstraintRelationship"
    use="optional" default="self" />
  <xsd:attribute name="refForName" type="xsd:IDREF"
    use="optional" />
  <xsd:attribute name="refPtType" type="ST_ElementType"
    use="optional" default="all" />
</xsd:attributeGroup>

```

L.4.15.6.3.20 Constraint

The complex type CT_Constraint define a constraint within the layout framework. A constraint acts as a limit or sets a value to a given parameter in a diagram definition, for example, it can be used to specify that all nodes of a give point type are the same size. A constraint is defined as:

```
<xsd:complexType name="CT_Constraint">
  <xsd:attributeGroup ref="AG_ConstraintAttributes" />
  <xsd:attributeGroup ref="AG_ConstraintRefAttributes" />
  <xsd:attribute name="op" type="ST_BoolOperator" use="optional"
    default="none" />
  <xsd:attribute name="val" type="xsd:double" use="optional"
    default="0" />
  <xsd:attribute name="fact" type="xsd:double" use="optional"
    default="1" />
</xsd:complexType>
```

L.4.15.6.3.21 Constraint List

The complex type CT_Constraints is a sequence of CT_Constraint complex types. It is defined as:

```
<xsd:complexType name="CT_Constraints">
  <xsd:sequence>
    <xsd:element name="constr" type="CT_Constraint" minOccurs="0"
      maxOccurs="unbounded" />
  </xsd:sequence>
</xsd:complexType>
```

L.4.15.6.3.22 Rule

The complex type CT_NumericRule defines a layout framework constraint rule. Rules are run after the diagram is created in order to specify what happens when the diagram doesn't fully fit within the bounds. This allows for specific behavior to be defined rather than using default rules for fitting the diagram. A rule is defined in the following way:

```
<xsd:complexType name="CT_NumericRule" >
  <xsd:attributeGroup ref="AG_ConstraintAttributes" />
  <xsd:attribute name="val" type="xsd:double" use="optional"
    default="NaN" />
  <xsd:attribute name="fact" type="xsd:double" use="optional"
    default="NaN" />
  <xsd:attribute name="max" type="xsd:double" use="optional"
    default="NaN" />
</xsd:complexType>
```

L.4.15.6.3.23 Rule List

The complex type CT_Rules is simply a list of CT_NumericRule complex types. It is defined in the following manner:

```
<xsd:complexType name="CT_Rules">
  <xsd:sequence>
    <xsd:element name="rule" type="CT_NumericRule"
      minOccurs="0" maxOccurs="unbounded" />
  </xsd:sequence>
</xsd:complexType>
```

L.4.15.6.3.24 Presentation Of

The complex type CT_PresentationOf defines the mapping between data and the diagram. The complex type is defined in the following manner:

```
<xsd:complexType name="CT_PresentationOf">
  <xsd:attributeGroup ref="AG_IteratorAttributes" />
</xsd:complexType>
```

L.4.15.6.3.25 Layout Shape

The simple type ST_LayoutShapeType is a simple type that contains all of the shapes available which can be used within a diagram. The simple type is defined as a union of ST_OutputShapeType and an externally defined ST_ShapeType.

L.4.15.6.3.26 Index1

The simple type ST_Index1 defines a 1-based index that is used to index values elsewhere. The simple type is defined as:

```
<xsd:simpleType name="ST_Index1">
  <xsd:restriction base="xsd:unsignedInt">
    <xsd:minInclusive value="1" />
  </xsd:restriction>
</xsd:simpleType>
```

L.4.15.6.3.27 Adjust Handle

The complex type CT_Adj specifies a shape adjust handle modification. The shapes within a diagram can be modified based on their adjust handles, for example, the radius of the corner rounding in a rounded rectangle can be adjusted using this complex type. The complex type is defined in the following manner:

```
<xsd:complexType name="CT_Adj">
  <xsd:attribute name="idx" type="ST_Index1" use="required" />
  <xsd:attribute name="val" type="xsd:double" use="required" />
</xsd:complexType>
```

L.4.15.6.3.28 Adjust Handle List

The complex type CT_AdjLst holds all of the adjust handles for a given shape. The number of adjust handles accessible varies shape by shape, but there are usually less than four for a given shape. The complex type is defined in the following way:

```
<xsd:complexType name="CT_AdjLst" o:cname="CAdjList">
  <xsd:sequence>
    <xsd:element name="adj" type="CT_Adj" minOccurs="0"
      maxOccurs="unbounded" />
  </xsd:sequence>
</xsd:complexType>
```

L.4.15.6.3.29 Shape

The complex type CT_Shape specifies a shape for a layout node. The shape complex type holds all of the information associated with the particular layout node and all of the adjustments or modifications that can be made to the shape. The rot attribute specifies a rotation on the shape. The blip attribute specifies an image that is used as a background fill for the shape and the blipPhldr attribute specifies whether or not the shape shows up with an image placeholder. The zOrderOff attribute specifies an offset to be used for the z-ordering of this shape, while the lkTxEntry attribute prevents text editing within the shape. A shape is defined in the following manner:

```
<xsd:complexType name="CT_Shape">
  <xsd:sequence>
    <xsd:element name="adjLst" type="CT_AdjLst" minOccurs="0"
      maxOccurs="1" />
  </xsd:sequence>
  <xsd:attribute name="rot" type="xsd:double" use="optional" default="0" />
  <xsd:attribute name="type" type="ST_LayoutShapeType"
    use="optional" default="none" />
  <xsd:attribute ref="r:blip" use="optional" />
  <xsd:attribute name="zOrderOff" type="xsd:int" use="optional"
    default="0" />
  <xsd:attribute name="hideGeom" type="xsd:boolean" use="optional"
    default="false" />
  <xsd:attribute name="lkTxEntry" type="xsd:boolean" use="optional"
    default="false" />
  <xsd:attribute name="blipPhldr" type="xsd:boolean" use="optional"
    default="false" />
</xsd:complexType>
```

L.4.15.6.3.30 Parameter

The complex type CT_Parameter holds the information regarding an algorithm parameter. The complex type is defined as:

```

<xsd:complexType name="CT_Parameter">
  <xsd:attribute name="type" type="ST_ParameterId" use="required" />
  <xsd:attribute name="val" type="xsd:string" use="required" />
</xsd:complexType>

```

L.4.15.6.3.31 Algorithm

The complex type CT_Algorithm defines the algorithm which the diagram uses to layout the nodes which contain the data. Also defined here are the optional list of parameters which are associated with this algorithm and modify its behavior. An algorithm is defined in the following manner:

```

<xsd:complexType name="CT_Algorithm" >
  <xsd:sequence>
    <xsd:element name="param" type="CT_Parameter" minOccurs="0"
      maxOccurs="unbounded" />
  </xsd:sequence>
  <xsd:attribute name="type" type="ST_AlgorithmType" use="required" />
  <xsd:attribute name="rev" type="xsd:unsignedInt" use="optional"
    default="0" />
</xsd:complexType>

```

L.4.15.6.3.32 Layout Node

The complex type CT_LayoutNode is the main building block of a diagram. A layout node contains enough information to lay out itself and its children. The name attribute is simply a unique string given to the layout node. The styleLbl attribute references the style label that is used to style the layout node. This style label has already been defined in this document. A layout node is defined in the following manner:

```

<xsd:complexType name="CT_LayoutNode">
  <xsd:choice minOccurs="0" maxOccurs="unbounded">
    <xsd:element name="alg" type="CT_Algorithm" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="shape" type="CT_Shape" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="presOf" type="CT_PresentationOf"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="constrLst" type="CT_Constraints"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="ruleLst" type="CT_Rules" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="varLst"
      type="CT_LayoutVariablePropertySet" minOccurs="0"
      maxOccurs="1" />
  </xsd:choice>

```



```

    <xsd:element name="forEach" type="CT_ForEach" />
    <xsd:element name="layoutNode" type="CT_LayoutNode" />
    <xsd:element name="choose" type="CT_Choose" />
  </xsd:choice>
  <xsd:attribute name="name" type="xsd:ID" use="optional" />
  <xsd:attribute name="styleLbl" type="xsd:string" use="optional" />
  <xsd:attribute name="chOrder" type="ST_ChildOrderType"
    use="optional" default="b" />
  <xsd:attribute name="moveWith" type="xsd:IDREF" use="optional" />
</xsd:complexType>

```

L.4.15.6.3.33 For Each

The complex type CT_ForEach defines a for each iterator. The iteration behaves as if it were a for each loop. The complex type is defined as:

```

<xsd:complexType name="CT_ForEach">
  <xsd:choice minOccurs="0" maxOccurs="unbounded">
    <xsd:element name="alg" type="CT_Algorithm" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="shape" type="CT_Shape" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="presOf" type="CT_PresentationOf"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="constrLst" type="CT_Constraints"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="ruleLst" type="CT_Rules" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="forEach" type="CT_ForEach" />
    <xsd:element name="layoutNode" type="CT_LayoutNode" />
    <xsd:element name="choose" type="CT_Choose" />
  </xsd:choice>
  <xsd:attribute name="name" type="xsd:ID" use="optional" />
  <xsd:attribute name="ref" type="xsd:IDREF" use="optional" />
  <xsd:attributeGroup ref="AG_IteratorAttributes" />
</xsd:complexType>

```

L.4.15.6.3.34 When

The complex type CT_When defines an if conditional expression. The complex type is usually used in conjunction with the else counterpart which is defined next. The CT_When complex type is defined in the following manner:

```

<xsd:complexType name="CT_When">
  <xsd:choice minOccurs="0" maxOccurs="unbounded">
    <xsd:element name="alg" type="CT_Algorithm" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="shape" type="CT_Shape" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="presOf" type="CT_PresentationOf"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="constrLst" type="CT_Constraints"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="ruleLst" type="CT_Rules" minOccurs="0"
      maxOccurs="1" o:cname="Rules" />
    <xsd:element name="forEach" type="CT_ForEach" />
    <xsd:element name="layoutNode" type="CT_LayoutNode" />
    <xsd:element name="choose" type="CT_Choose" />
  </xsd:choice>
  <xsd:attribute name="name" type="xsd:ID" use="optional" />
  <xsd:attributeGroup ref="AG_IteratorAttributes" />
  <xsd:attribute name="func" type="ST_FunctionType"
    use="required" />
  <xsd:attribute name="arg" type="ST_FunctionArgument"
    use="optional" />
  <xsd:attribute name="op" type="ST_FunctionOperator"
    use="required" />
  <xsd:attribute name="val" type="ST_FunctionValue"
    use="required" />
</xsd:complexType>

```

L.4.15.6.3.35 Otherwise

The complex type CT_Otherwise is the else counterpart to the already defined if conditional expression. The complex type is defined as:

```

<xsd:complexType name="CT_Otherwise" o:cname="DDOtherwise">
  <xsd:choice minOccurs="0" maxOccurs="unbounded">
    <xsd:element name="alg" type="CT_Algorithm" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="shape" type="CT_Shape" minOccurs="0"
      maxOccurs="1" />
    <xsd:element name="presOf" type="CT_PresentationOf"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="constrLst" type="CT_Constraints"
      minOccurs="0" maxOccurs="1" />
    <xsd:element name="ruleLst" type="CT_Rules" minOccurs="0"
      maxOccurs="1" />
  </xsd:choice>

```

```

    <xsd:element name="forEach" type="CT_ForEach" />
    <xsd:element name="layoutNode" type="CT_LayoutNode" />
    <xsd:element name="choose" type="CT_Choose" />
  </xsd:choice>
  <xsd:attribute name="name" type="xsd:ID" use="optional" />
</xsd:complexType>

```

L.4.15.6.3.36 Choose Statement

The complex type CT_Choose packages together the if and else conditions into an actual if/else statement. The complex type is defined in the following manner:

```

<xsd:complexType name="CT_Choose" o:cname="DDChoose">
  <xsd:sequence>
    <xsd:element name="if" type="CT_When" maxOccurs="unbounded" />
    <xsd:element name="else" type="CT_Otherwise" minOccurs="0" />
  </xsd:sequence>
  <xsd:attribute name="name" type="xsd:ID" use="optional" />
</xsd:complexType>

```

L.4.15.6.3.37 Sample Data

The complex type CT_SampleData defines how the data model is to be populated in an initial manner. The complex type holds a temporary data model when there is no data model present in order to display a diagram on an initial insert. The complex type is defined by:

```

<xsd:complexType name="CT_SampleData">
  <xsd:sequence>
    <xsd:element name="dataModel" type="CT_DataModel" minOccurs="0" />
  </xsd:sequence>
  <xsd:attribute name="useDef" type="xsd:boolean" use="optional"
    default="false" />
</xsd:complexType>

```

L.4.15.6.3.38 Common Structures

CT_Category, CT_Categories, CT_Name, CT_Description, and ST_Version are defined just as their counterparts in the subclauses above, and they perform the same tasks.

L.4.15.6.3.39 Diagram Definition

The complex type CT_DiagramDefinition is the root element for a diagram definition. It is defined in the following manner:

```

<xsd:complexType name="CT_DiagramDefinition">
  <xsd:sequence>
    <xsd:element name="title" type="CT_Name" minOccurs="0"
      maxOccurs="unbounded" />

```

```

<xsd:element name="desc" type="CT_Description"
  minOccurs="0" maxOccurs="unbounded" />
<xsd:element name="catLst" type="CT_Categories" minOccurs="0" />
<xsd:element name="sampData" type="CT_SampleData" minOccurs="0" />
<xsd:element name="styleData" type="CT_SampleData" minOccurs="0" />
<xsd:element name="clrData" type="CT_SampleData" minOccurs="0" />
<xsd:element name="layoutNode" type="CT_LayoutNode" />
</xsd:sequence>
<xsd:attribute name="uniqueId" type="xsd:anyURI" use="optional" />
<xsd:attribute name="minVer" type="ST_Version" use="optional"
  default="12.0" />
<xsd:attribute name="defStyle" type="xsd:anyURI" use="optional" />
</xsd:complexType>

```

L.5 Introduction to VML

This clause contains a detailed introduction to the components of Vector Markup Language (VML).

L.5.1 Introduction

This subclause provides an overview of the most common parts of VML. The VML format is a legacy format originally introduced with Office 2000 and is included and fully defined in ECMA-376 for backwards compatibility reasons. The DrawingML format is a newer and richer format created with the goal of eventually replacing any uses of VML in the Office Open XML formats. VML is a transitional format; it is included in Office Open XML for legacy reasons only.

Conversion from VML to DrawingML can result in information loss, as they use different models. For example,

- VML uses a flat XML structure, whereas DrawingML uses one that is hierarchical. In general, inferring hierarchical structure from flat XML is much more difficult than generating flat XML from a hierarchy.
- VML allows combinations of attributes that are mutually incompatible in DrawingML.

VML is an XML-based exchange, editing, and delivery format for high-quality vector graphics. VML facilitates the exchange and subsequent editing of vector graphics between a wide variety of productivity and design applications. VML is based on XML 1.0, which is an open, simple, text-based language for describing structured data. VML also supports other World Wide Web Consortium standards, such as Cascading Style Sheets 2.0 (CSS), which specifies style information and 2-D positioning.

As the VML format is a format provided for backward compatibility, many VML elements are defined in the same `urn:schemas-microsoft-com:vml` namespace that is currently used by millions of documents already using VML. In the documentation this is typically shortened to a `v:` prefix in the VML tag by defining `xmlns:v="urn:schemas-microsoft-com:vml"`. The namespaces used for VML are

legacy namespaces. Once again, VML should be considered a deprecated format included in Office Open XML for legacy reasons only and new applications that need a file format for drawings are strongly encouraged to use preferentially DrawingML .

Additional elements and attributes are defined in namespaces that reflect how they are used (all VML namespaces defined in ECMA-376 maintain the legacy namespace structure for backward compatibility):

- urn:schemas-microsoft-com:office:office (office document)
- urn:schemas-microsoft-com:office:word (word-processing document)
- urn:schemas-microsoft-com:office:excel (spreadsheet document)
- urn:schemas-microsoft-com:office:powerpoint (presentation document)

L.5.2 Shape Element

The Shape element is the basic building block of VML. A shape can exist on its own or within a Group element. Shape defines many attributes and sub-elements that control the look and behavior of the shape. A shape must define at least a Path and size (Width, Height). VML also uses properties of the CSS2 style attribute to specify positioning and sizing.

Note that this subclause also applies to the set of pre-defined shape primitives provided by the VML elements Arc, Curve, Image, Line, Oval, Polyline, Rect, and RoundRect.

The following attributes are used to define a minimal shape:

Attribute	Description
FillColor	Brush color that fills the closed path of a shape.
Position	Type of positioning used to place an element.
Top	Position of the shape relative to the element above it in the flow of the page.
Left	Position of the shape relative to the element left of it in the document flow.
Width	Width of the shape.
Height	Height of the shape.
Path	Line that makes up the edges of a shape.

The following example creates a minimal shape:

```
<v:shape fillcolor="green"
  style="position:relative;top:1;left:1;width:50;
  height:50" path="m 1,1 l 1,50, 50,50, 50,1 x e">
</v:shape>
```



Although there is no official categorization of the Shape element's attributes or sub-elements, it is useful to think of them in groups. The following sections broadly describe the characteristics of the

Shape element. A few fundamental attributes and elements are introduced here. For complete details, see the VML reference in Part 4.

L.5.2.1 Geometry

The following attributes affect the basic structure or outline of the shape.

Attribute	Description
Adj	Adjustment value used to define values for a formula.
Height*	Height of the shape.
Path	Line that makes up the edges of a shape.
Width*	Width of the shape.

* indicates a CSS2 style property

Element	Description
Callout	Defines a callout for a shape.
Extrusion	Defines an extrusion for a shape.
Path	Defines a path for a shape.
Skew	Defines a skew for a shape.
Stroke	Defines a stroke for a shape.
TextBox	Defines a textbox for a shape.
TextPath	Defines a text path for a shape.

L.5.2.1.1 Height and Width Attributes

Height and Width can be specified using any of the following units. If no unit is specified, pixels is assumed.

Relative	
em	Height of the element's font
ex	Height of the letter "x"
px	Pixels
%	Percentage

Absolute	
in	Inches
cm	Centimeters
mm	Millimeters
pt	Points

Absolute	
pc	Picas

For example:

```
style="position:relative;top:1;left:1;width:50;height:50"
style="position:relative;top:1;left:1;width:10%;height:10%"
```

L.5.2.1.2 Path Attribute

The Path attribute contains specially formatted text that describes a set of points and line connections between them that define the shape's outline. The path defined must be closed. A path is begun by specifying **m** and a coordinate. This indicates a move to the given coordinate. Line segments are drawn using **l** (lineto) and specifying subsequent coordinates. A line is closed with **x** after the closing coordinate. The path is ended with **e**.

For example:

```
path="m 1,1 l 1,50, 50,50, 50,1 x e"
```

This starts at (1,1), draws a line to (1,50), (50,50) and (50,1), where the line is closed and the path ended.

The coordinates specified correspond to relative coordinate space (the size of units in relative space can be set by the CoordSize attribute). The shape's actual size is determined by the Height and Width attributes.

For example:

```
<v:shape style="position:relative;top:1;left:1;width:5000;
height:5000" fillcolor="teal"
path="m 1,1 l 1,10 10,10 10,1 1,1 x e" />
```



```
<v:shape style="position:relative;top:1;left:1;width:2500;
height:2500" fillcolor="teal"
path="m 1,1 l 1,10 10,10 10,1 1,1 x e" />
```



More than one closed line path can be specified in the Path attribute and each closed region is filled.

```
<v:shape style="position:relative;top:1;left:1;width:5000;
height:5000" fillcolor="teal"
path="m 1,1 l 1,10 10,10 10,1 1,1 x m 20,20 l 20,40 40,40
40,20 20,20 x e" />
```



The optional Path element, which allows for the creation of more complex paths and regions, overrides the Path attribute if it is specified.

L.5.2.2 Placement

These attributes affect the layout and placement of shapes. Placement can be defined relative to other shapes or non-VML content that also exists in the container holding the shape.

Attribute	Description
AllowOverlap	Determines if a shape can overlap other shapes.
CoordOrigin	Specifies the coordinate unit origin of the rectangle that bounds a shape.
CoordSize	Specifies the horizontal and vertical units of the rectangle that bounds a shape.
Flip*	Switches the orientation of a shape.
Left*	Determines the position of the shape relative to the element left of it in the document flow.
Margin-Bottom*	Specifies the bottom edge of the shape's containing rectangle relative to the shape anchor.
Margin-Left*	Specifies the left edge of the shape's containing rectangle relative to the shape anchor.
Margin-Right*	Specifies the right edge of the shape's containing rectangle relative to the shape anchor.
Margin-Top*	Specifies the top edge of the shape's containing rectangle relative to the shape anchor.
MSO-Position-Horizontal*	Specifies the horizontal positioning data for objects in WordprocessingML.
MSO-Position-Horizontal-Relative*	Specifies relative horizontal position data for objects in WordprocessingML.
MSO-Position-Vertical*	Specifies the vertical position data for objects in WordprocessingML.
MSO-Position-Vertical-Relative*	Specifies relative vertical position data for objects in WordprocessingML.
MSO-Wrap-Distance-Bottom*	Defines the distance from the bottom side of the shape to the text that wraps around it.
MSO-Wrap-Distance-Left*	Defines the distance from the left side of the shape to the text that wraps around it.
MSO-Wrap-Distance-Right*	Defines the distance from the right side of the shape to the text that wraps around it.
MSO-Wrap-Distance-Top*	Defines the distance from the shape top to the text that wraps around it.
MSO-Wrap-Edited*	Determines whether the wrap coordinates were customized by the user.
MSO-Wrap-Mode*	Defines the wrapping mode for text.
Position*	Defines the type of positioning used to place an element.

Attribute	Description
RelativePosition	Defines a relative position for an object.
Rotation*	Defines the angle that a shape is rotated.
Top*	Defines the position of the shape relative to the element above it in the flow of the page.
Z-Index*	Determines the display order of overlapping shapes.

* indicates a CSS2 style property

L.5.2.2.1 CoordOrigin and CoordSize Attributes

These attributes define the relative coordinate space of a shape. This space is scaled up or down to match the specified Width and Height of the shape. Coordinates in the Path attribute (or element) are relative to the space defined by CoordOrigin and CoordSize, so the Path definition never needs to change simply to scale the shape.

CoordSize defines the “width” and “height” of the local coordinate space. CoordOrigin defines the top-left coordinate of this space.

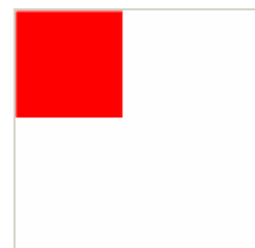
For example:

<code>coordorigin="0,0"</code> <code>coordsize="200,200"</code>	Extents of local space are (0,0) to (200,200)
<code>coordorigin="-100,-100"</code> <code>coordsize="200,200"</code>	Extents of local space are (-100,-100) to (100,100)

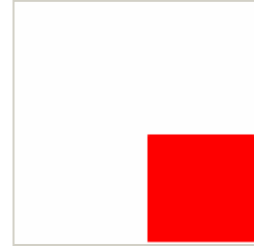
This local space definition affects the position of the shape. Changing the CoordOrigin translates the shape within the local space. Changing the CoordSize affects the size of the shape by changing the size of the local space relative to the shape’s Width and Height.

For example:

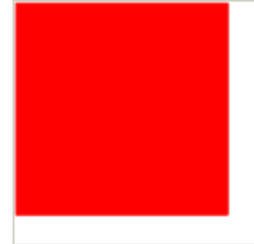
```
coordorigin="0,0"
coordsize="500,500"
style="position:absolute;top:0;left:0;width:100pt;
height:100pt"
```



```
coordorigin="-250,-250"
coordsize="500,500"
style="position:absolute;top:0;left:0;width:100pt;
height:100pt"
```



```
coordorigin="0,0"
coordsize="250,250"
style="position:absolute;top:0;left:0;width:100pt;
height:100pt"
```



L.5.2.2.2 Position Attribute

Position can be specified as “static”, “relative” or “absolute”. Static positioning keeps the shape inline with the current flow of the surrounding content – the Top and Left attributes are ignored. Relative uses the Top and Left attributes to position the shape relative to its position in the current flow. Absolute uses the Top and Left attributes to position the shape with respect to its container.

L.5.2.3 Formatting

These attributes and elements affect the fill and line properties of the shape.

Attribute	Description
BorderBottomColor	Bottom border color of an inline shape.
BorderLeftColor	Left border color of an inline shape.
BorderRightColor	Right border color of an inline shape.
BorderTopColor	Top border color of an inline shape.
BWMode	Determines how a shape renders for black-and-white output devices.
BWNormal	Defines the black-and-white mode for normal black-and-white output devices.
BWPure	Defines the black-and-white mode for pure black-and-white output devices.
ChromaKey	Defines a color that is transparent and shows anything behind the shape.
FillColor	Defines the brush color that fills the closed path of a shape.
Filled	Determines whether the closed path is filled.
ForceDash	Determines whether a dashed outline is used to draw a shape when a shape has no line or fill.
HR	Specifies that a shape is a horizontal rule.
HRAlign	Defines the alignment of a horizontal rule.
HRHeight	Defines the thickness of a horizontal rule.

Attribute	Description
HRNoShade	Determines whether a horizontal rule is displayed with 3-D shading.
HRPct	Defines the length of a horizontal rule as a percentage of page width.
HRStd	Determines whether a shape is a standard horizontal rule.
HRWidth	Defines the length of a horizontal rule.
StrokeColor	Defines the brush color that strokes the path of a shape.
Stroked	Defines whether the path is stroked.
StrokeWeight	Defines the brush thickness that strokes the path of a shape.

Element	Description
Fill	Defines a fill for a shape.
Imagedata	Defines image data for a shape.
Shadow	Defines a shadow for a shape.

L.5.2.4 Other

These are miscellaneous attributes and elements.

Attribute	Description
Alt	Defines alternative text to be displayed instead of a graphic.
AllowInCell	Determines whether a shape can be placed in a table.
Bullet	Determines whether a shape is a graphical bullet.
Button	Determines whether a shape is processed as a button.
Class	Refers to a definition of a CSS style.
ConnectorType	Indicates the type of connector used for joining shapes.
DoubleClickNotify	Sends an event message when a shape is double-clicked.
HRef	Defines a URL for a shape. When the shape is clicked, the browser loads the URL.
ID	Provides a unique identifier for an element.
InsetMode	Specifies whether the host calculates the internal text margin instead of using the inset attribute of the textbox element.
OLE	Specifies whether the shape is an embedded OLE object.
OLEIcon	Determines whether an OLE object is displayed as an icon.
OnEd	Determines whether the extra handles of a shape are hidden.
OnMouseOver	Triggers a mouse event for a shape.
PreferRelative	Determines whether the original size of an object is saved after reformatting.
Print	Determines whether the shape is printed.

Attribute	Description
ReGroupID	Defines a previous group for a shape.
RuleInitiator	Determines whether a rules engine is used.
RuleProxy	Determines whether a proxy for the rules engine is used.
Spt	Defines a number used to identify types of shapes.
TableLimits	List of minimum height values for each row in a table.
TableProperties	Determines table properties.
Target	Defines a frame or window that a URL is displayed in.
Title	Defines the text displayed when the mouse pointer moves over the shape.
Type	Defines a reference to the ID of a ShapeType element.
UserDrawn	Determines whether the user has added the shape to a master slide.
UserHidden	Determines whether a script anchor is hidden.
Visibility	Determines whether a shape is displayed.
WrapCoords	Defines the bounding polygon that surrounds a shape.

Element	Description
Formulas	Defines formulas for a shape.
Handles	Defines handles for a shape.
Locks	Defines a lock for a shape.

L.5.3 Group Element

The Group element is used to collect multiple objects so they can be positioned and transformed as a single unit. Objects that reference their parent container's coordinate space become relative to the group's local space when inserted into a group. Using groups supports creation of complex shapes, composed of many sub-shapes, that can be treated as a single entity.

Group supports a subset of the Shape element's attributes.

Attribute			
AllowInCell	Class	HRPct	Style
AllowOverlap	CoordOrig	HRStd	TableLimits
Alt	CoordSize	HRWidth	TableProperties
BorderBottomColor	DoubleClickNotify	ID	Target
BorderLeftColor	HR	OnEd	Title
BorderRightColor	HRAlign	OnMouseOver	UserDrawn
BorderTopColor	HRef	Print	UserHidden
Bullet	HRHeight	ReGroupID	WrapCoords

Attribute			
Button	HRNoShade	RelativePosition	

The following elements are allowed inside a Group:

Element			
Arc	Image	Polyline	Shape
Curve	Line	Rect	ShapeType
Group	Oval	RoundRect	

L.5.4 ShapeType Element

The ShapeType element defines a definition, or template, for a shape. Such a template is “instantiated” by creating a Shape element that references the ShapeType. The shape can override any value specified by its ShapeType, or define attributes and elements the ShapeType does not provide. A ShapeType cannot reference another ShapeType.

The attributes and elements a ShapeType uses are identical to those of the Shape element, with these exceptions.

ShapeType cannot use the Type element.

CSS positioning attributes are ignored and not passed to individual Shape instances.

Visibility is always hidden.

A VML authoring agent can make the ShapeType visible, in which case the CSS positioning attributes are meaningful.

The ShapeType element is used to define a shape once and reference it multiple times throughout a document. One of the most useful attributes or elements a ShapeType defines is a complex Path. Since Path coordinates are defined in a relative coordinate space that scales with a shape’s height and width, this is very flexible for defining a shape outline that can be custom scaled and formatted for a given use.

L.5.5 VML Usage in the Office Open XML Format

L.5.5.1 OfficeArt Shapes

WordprocessingML takes advantage of the template-based shape definition VML provides. This example shows how the two shapes in the screenshot below are created.



The star is first defined using a ShapeType.

```
<v:shapetype id="_x0000_t12" coordsize="21600,21600" o:spt="12"
  path="m10800,18280,8259,,8259r6720,514614200,21600r6600,
-5019117400,21600,14880,13405,21600,8259r-8280,xe">
  <v:stroke joinstyle="miter" />
  <v:path gradientshapeok="t" o:connecttype="custom"
...
  o:connectlocs="10800,0;0,8259;4200,21600;17400,21600;21600,8259"
  textboxrect="6720,8259,14880,15628" />
</v:shapetype>
```

The first star is created by referencing the ShapeType via the Type attribute. It sets its own positioning and scaling.

```
<v:shape id="_x0000_s1026" type="#_x0000_t12"
  style="position:absolute;margin-left:33pt;margin-top:25.5pt;
  width:47.25pt;height:47.25pt;z-index:251656704" />
```

The second star is created by referencing the ShapeType and providing its own positioning, scaling and formatting.

```
<v:shape id="_x0000_s1027" type="#_x0000_t12"
  style="position:absolute;margin-left:145.5pt;margin-top:25.5pt;
  width:47.25pt;height:47.25pt;z-index:251657728"
  fillcolor="#4f81bd [3204]" strokecolor="#f2f2f2 [3041]"
  strokeweight="3pt">
  <v:shadow on="t" type="perspective" color="#27405e [1604]"
    opacity=".5" offset="1pt" offset2="-1pt" />
</v:shape>
```

The example contains only the two star shapes. What follows is the entire document:

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
<w:document "...">
  <w:body>
    <w:p>
      <w:r w:rsidR="00496863">
        <w:rPr>
          <w:noProof />
        </w:rPr>
        <w:pict>
          <v:shapetype id="_x0000_t12" coordsize="21600,21600"
            o:spt="12"
```

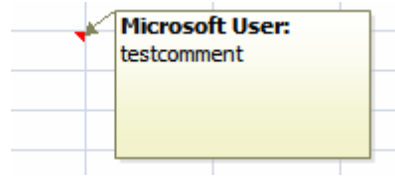
```

path="m10800,18280,8259,,8259r6720,514614200,21600r6600,
-5019117400,21600,14880,13405,21600,8259r-8280,xe">
<v:stroke joinstyle="miter" />
<v:path gradientshapeok="t" o:connecttype="custom"
o:connectlocs="10800,0;0,8259;4200,21600;
17400,21600;21600,8259"
textboxrect="6720,8259,14880,15628" />
</v:shapetype>
<v:shape id="_x0000_s1026" type="#_x0000_t12"
style="position:absolute;margin-left:33pt;
margin-top:25.5pt;
width:47.25pt;height:47.25pt;z-index:251656704" />
</w:pict>
</w:r>
<w:r w:rsidR="00496863">
<w:rPr>
<w:noProof />
</w:rPr>
<w:pict>
<v:shape id="_x0000_s1027" type="#_x0000_t12"
style="position:absolute;margin-left:145.5pt;
margin-top:25.5pt;width:47.25pt;height:47.25pt;
z-index:251657728" fillcolor="#4f81bd [3204]"
strokecolor="#f2f2f2 [3041]" strokeweight="3pt">
<v:shadow on="t" type="perspective"
color="#27405e [1604]"
opacity=".5" offset="1pt" offset2="-1pt" />
</v:shape>
</w:pict>
</w:r>
</w:p>
<w:sectPr w:rsidR="00953D70" w:rsidSect="00667294">
<w:pgSz w:w="12240" w:h="15840" />
<w:pgMar w:top="1440" w:right="1440" w:bottom="1440"
w:left="1440"
w:header="720" w:footer="720" w:gutter="0" />
<w:cols w:space="720" />
<w:docGrid w:linePitch="360" />
</w:sectPr>
</w:body>
</w:document>

```

L.5.5.2 SpreadsheetML Comments

The visible box shown for comments attached to cells is persisted using VML. The comment contents are stored separately as part of SpreadsheetML.



The package item xl/worksheets/sheet1.xml contains the following reference:

```
<legacyDrawing r:id="rId1" />
```

This is a relationship defined in xl/worksheets/_rels/sheet1.xml.rels:

```
<Relationship Id="rId1" Type=".../legacyDrawing"
  Target="../drawings/legacyDrawing1.vml" />
```

The package item xl/drawings/legacyDrawing1.vml defines the yellow gradient rectangle. Again, note that the basic rectangle is defined using a ShapeType. This is reused if multiple comments exist.

```
<xml "...">
  <o:shapelayout v:ext="edit">
    <o:idmap v:ext="edit" data="1" />
  </o:shapelayout>
  <v:shapetype id="_x0000_t202" coordsize="21600,21600" o:spt="202"
    path="m,l,21600r21600,l21600,xe">
    <v:stroke joinstyle="miter" />
    <v:path gradientshapeok="t" o:connecttype="rect" />
  </v:shapetype>
  <v:shape id="_x0000_s1027" type="#_x0000_t202"
    style="position:absolute;
    margin-left:107.25pt;margin-top:52.5pt;width:96pt;height:55.5pt;
    z-index:1" fillcolor="#f2f3cb" strokecolor="#81835a"
    o:insetmode="auto">
    <v:fill color2="#fefefb" type="gradient">
      <o:fill v:ext="view" type="gradientUnscaled" />
    </v:fill>
    <v:shadow on="t" color="silver" opacity=".5" obscured="t" />
    <v:path o:connecttype="none" />
    <v:textbox style="mso-direction-alt:auto">
      <div style="text-align:left" />
    </v:textbox>
    <x:ClientData ObjectType="Note">
```



```

    <x:MoveWithCells />
    <x:SizeWithCells />
    <x:Anchor>2, 15, 3, 10, 4, 15, 7, 4</x:Anchor>
    <x:AutoFill>False</x:AutoFill>
    <x:Row>4</x:Row>
    <x:Column>1</x:Column>
    <x:Visible />
  </x:ClientData>
</v:shape>
</xml>

```

L.5.5.3 WordprocessingML Text Box

WordprocessingML stores all textbox geometry using VML. This example shows how a simple text box is stored.



All the VML is embedded directly in the word/document.xml file as it is intermingled with other XML. VML is used to define the graphic content. Within the VML textbox tag, additional information about the text box text is added. The following is the section of the document.xml that defines the text box.

```

<w:r w:rsidR="00735D93">
  <w:rPr>
    <w:noProof />
  </w:rPr>
  <w:pict>
    <v:roundrect id="_x0000_s1027" style="position:absolute;
      margin-left:193.2pt;margin-top:-18pt;width:385.75pt;
      height:36.5pt;z-index:251660288;mso-width-percent:900;
      mso-position-horizontal-relative:page;
      mso-position-vertical-relative:margin;mso-width-percent:900;
      mso-width-relative:margin" arcsize="2543f" o:allowincell="f"
      stroked="f">
      <v:shadow on="t" type="perspective" color="#4f81bd [3204]"
        origin="-.5,-.5" offset="-3pt,-3pt" offset2="6pt,6pt"
        matrix=".75,,,.75" />
      <v:textbox style="mso-next-textbox:#_x0000_s1027;
        mso-fit-shape-to-text:t" inset="",36pt,18pt">
        <w:txbxContent>
          <w:p>
            <w:pPr>
              <w:rPr>

```

```

        <w:i />
        <w:color w:val="7F7F7F" w:themeColor="background1"
            w:themeShade="7F" />
    </w:rPr>
</w:pPr>
<w:r w:rsidR="00CA19B3">
    <w:rPr>
        <w:i />
        <w:color w:val="7F7F7F" w:themeColor="background1"
            w:themeShade="7F" />
    </w:rPr>
    <w:t>Text box</w:t>
</w:r>
</w:p>
</w:txbxCContent>
</v:textbox>
<w10:wrap type="square" anchorx="page" anchory="margin" />
</v:roundrect>
</w:pict>
</w:r>

```

This general format is used for any textbox, such as those added automatically when a cover page is added to a document.

L.6 Introduction to Shared MLs

L.6.1 Math

In the Office Math Markup Language (OMML), all mathematical text appears in math zones. Such text can consist of equations, mathematical expressions or simple variables. A math zone is represented by the oMath and oMathPara elements. There are two kinds of math zones: inline and display. An inline math zone appears on a line or lines along with text that is not in the math zone. A display math zone fills a whole paragraph. More specifically, a display math zone consists of a math paragraph, which is represented by the oMathPara element. The math paragraph is a group of one or more equations or expressions separated by soft carriage returns; that is, they are separate mathematical entities that comprise a single paragraph. A math paragraph has its own justification that can differ from that of the parent (non-math) paragraph. All objects within a math paragraph have the same type of justification.

Display and inline math zones have innately different formatting characteristics. Inline math zones typically consume less vertical space to help minimize or eliminate changes in the non-math paragraph line spacing. This is accomplished, for example, by reducing the size of inline fractions and n-ary objects relative to their display sizes. OMML has document-level properties that set the default choices for some math-zone properties. These include the display math-zone properties of whether integral and

other n-ary limits are displayed by default below and above an n-ary operator or as subscripts and superscripts.

The following subclauses introduce each of the math objects that comprise the majority of the OMML schema. Since this language is designed for text processing rather than calculations, when writing math zones in an XML representation, more attention is given to the layout and appearance of mathematical text than to mathematical semantics. That is, \overrightarrow{abc} and \overleftarrow{abc} are represented by the same object, although they have different mathematical meanings, because both consist of text paired with a stretching character. Similarly, $\frac{n}{k}$ and $\frac{n}{k}$ are both represented by a fraction object. Though mathematically they have different meaning, their layout is similar. Another example is x^2 , which could be x squared or a tensor component. Regardless of these semantics, it is represented by a superscript object.

Although the functionality described in this clause is primarily about the appearance of expressions and mathematical text, other markup defined in ECMA-376 provides independent functionality enabling mathematical formulas and expressions to be calculated. Formulas in SpreadsheetML (§L.2.15.1) and Fields in WordprocessingML (§L.1.17.1) are two examples.

L.6.1.1 Accent Object

The accent object is used to represent any baseline text having a combining diacritical mark placed above the base. The accent has only one child, the base element. The accent mark itself is stored as a property.

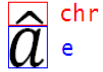
For example, consider the following letters having diacritical marks:

$\acute{a} \ddot{a} \tilde{a} \hat{a} \vec{a}$

The XML for the last letter in this example is:

```
<m:acc>
  <m:accPr>
    <m:chr m:val="→" />
  </m:accPr>
<m:e>
  <m:r>
    <m:t>a</m:t>
  </m:r>
</m:e>
</m:acc>
```

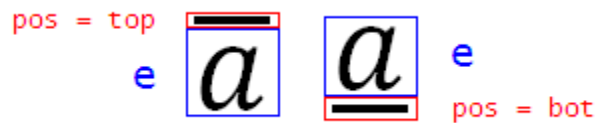
In this example, the only difference in the XML representations of these letters is the accent character.



L.6.1.2 Bar Object

The bar object consists of baseline text with a bar drawn above or below the base. The bar has only one child, the base element. The location of the bar is stored as a property.

For example:



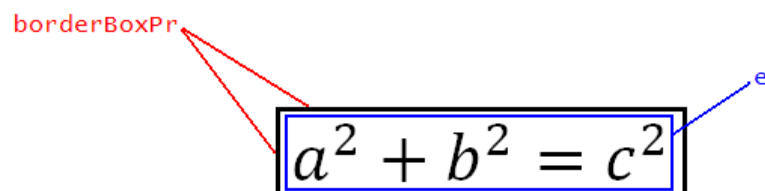
The XML for the two expressions in this example is:

```
<m:oMathPara>
  <m:oMath>
    <m:bar>
      <m:barPr>
        <m:pos m:val="top" />
      </m:barPr>
      <m:e>
        <m:r>
          <m:t>a</m:t>
        </m:r>
      </m:e>
    </m:bar>
    <m:bar>
      <m:e>
        <m:r>
          <m:t>a</m:t>
        </m:r>
      </m:e>
    </m:bar>
  </m:oMath>
</m:oMathPara>
```

If `<m:pos m:val="top" />` is omitted, the bar defaults to the bottom (as shown in the second instance of the bar element).

L.6.1.3 Border Box Object

The Border Box object consists of math text—often a formula the author wishes to call out or give special attention to—surrounded by a border. Any combination of the edges of the border can be hidden. For example:



The Border Box can also be used to "cross out" text with a horizontal, vertical, or diagonal (from top-left to bottom-right or from top-right to bottom-left) strikethrough, as illustrated by the following example:

$$\boxed{a^2 = b^2 + c^2}$$

Example XML:

```
<m:oMathPara>
  <m:oMath>
    <m:borderBox>
      <m:borderBoxPr>
        <m:strikeTLBR m:val="on" />
      </m:borderBoxPr>
      <m:e>
        <m:sSup>
          <m:e>
            <m:r>
              <m:t>a</m:t>
            </m:r>
          </m:e>
          <m:sup>
            <m:r>
              <m:t>2</m:t>
            </m:r>
          </m:sup>
        </m:sSup>
        <m:r>
          <m:t>=</m:t>
        </m:r>
        <m:sSup>
          <m:e>
            <m:r>
              <m:t>b</m:t>
```

```

        </m:r>
    </m:e>
    <m:sup>
        <m:r>
            <m:t>2</m:t>
        </m:r>
    </m:sup>
</m:sSup>
<m:r>
    <m:t>+</m:t>
</m:r>
<m:sSup>
    <m:e>
        <m:r>
            <m:t>c</m:t>
        </m:r>
    </m:e>
    <m:sup>
        <m:r>
            <m:t>2</m:t>
        </m:r>
    </m:sup>
</m:sSup>
</m:e>
</m:boxed>
</m:oMath>
</m:oMathPara>

```

L.6.1.4 Box Object

The Box object is used to group components of an expression or equation (such as the multiple characters of a compound operator), to apply a single property to everything in the box. The Box serves a number of distinct purposes, including grouping characters to form a single operator (an operator emulator), and thereby inheriting the alignment and manual break properties of operators; grouping a differential such as dx ; preventing line breaks from occurring within; and allowing text inside to have a different script level.

An example of a Box serving as an operator emulator is:

$$a \boxed{=} b$$

Example:

$$a == b$$

Example XML:

```
<m:oMathPara>
  <m:oMath>
    <m:r>
      <m:t>a</m:t>
    </m:r>
    <m:box>
      <m:boxPr>
        <m:opEmu m:val="on" />
      </m:boxPr>
      <m:e>
        <m:r>
          <m:t>==</m:t>
        </m:r>
      </m:e>
    </m:box>
    <m:r>
      <m:t>b</m:t>
    </m:r>
  </m:oMath>
</m:oMathPara>
```

L.6.1.5 Delimiters

Delimiters consist of opening and closing delimiting characters (such as parentheses, braces, brackets, and vertical bars), and an element contained inside. If two or more elements are contained within delimiters, separating characters are used.

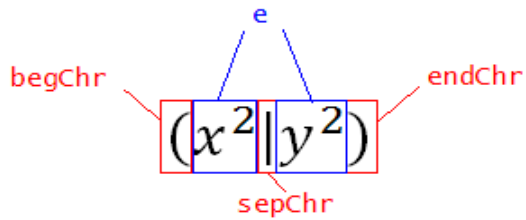
Delimiters can grow to the height of the object they contain. For example, parentheses could grow quite

tall to enclose this multi-row matrix:

$$\begin{pmatrix} 1 & & & & & \\ & 1 & & & & \\ & & 1 & & & \\ & & & 1 & & \\ & & & & 1 & \\ & & & & & 1 \end{pmatrix} \begin{pmatrix} 1 & & & & & \\ & 1 & & & & \\ & & 1 & & & \\ & & & 1 & & \\ & & & & 1 & \\ & & & & & 1 \end{pmatrix}. \text{ Or, at}$$

the user's discretion, they can maintain their height regardless of the content inside, as in $\left[\frac{a}{b+\frac{c}{d}} \right] \left[\frac{a}{b+\frac{c}{d}} \right]$.

Delimiters have a single child object, the base argument, which can be used multiple times in the object to signify that a separator character is to be used. For example:



If the separator character is not specified in XML, the vertical bar is used.

Example:

$$(x^2|y^2)$$

Example XML:

```
<m:oMathPara>
  <m:oMath>
    <m:d>
      <m:e>
        <m:sSup>
          <m:e>
            <m:r>
              <m:t>x</m:t>
            </m:r>
          </m:e>
          <m:sup>
            <m:r>
              <m:t>2</m:t>
            </m:r>
          </m:sup>
        </m:sSup>
      </m:e>
      <m:e>
        <m:sSup>
          <m:e>
            <m:r>
              <m:t>y</m:t>
            </m:r>
          </m:e>
          <m:sup>
            <m:r>
              <m:t>2</m:t>
            </m:r>
          </m:sup>
        </m:sSup>
      </m:e>
    </m:d>
  </m:oMath>
</m:oMathPara>
```



```

    </m:e>
  </m:d>
</m:oMath>
</m:oMathPara>

```

L.6.1.6 Array Object

The Array object consists of one or more expressions or equations grouped as an object. Within the array, multiple components can be aligned to each other.

Examples of arrays are:
$$\begin{array}{l} 2x + 3y + z = 10 \\ 4x + y - z = 3 \end{array}$$
 and $f(x) = \begin{cases} -x, & x < 0 \\ x, & x \geq 0 \end{cases}$

Example XML (left example):

```

<m:eqArr>
  <m:e>
    <m:r>
      <m:t>2&x+&3&y+&z=&10&</m:t>
    </m:r>
  </m:e>
  <m:e>
    <m:r>
      <m:t>4&x+&y-&z=&3&</m:t>
    </m:r>
  </m:e>
</m:eqArr>

```

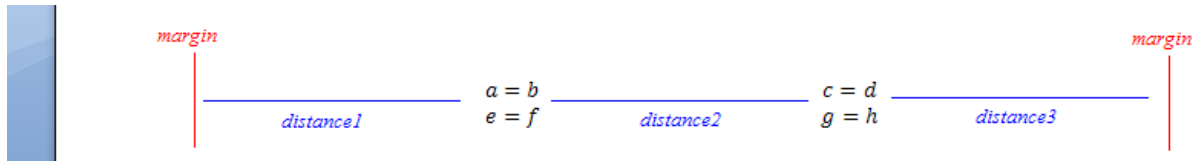
Note: The '&'s above are used for alignment. See Literal Operators and Operator Emulators below for more on these.

Arrays can have "maximum distribution" such that they occupy the entire width of the column that contains them, as in:

$$\begin{array}{l} a = b \\ e = f \end{array}$$

$$\begin{array}{l} c = d \\ g = h \end{array}$$

Or, they can have "object distribution" such that there is even spacing between the margin and text (distance1 = distance2 = distance 3):



L.6.1.7 Fraction Object

The Fraction object consists of a numerator and denominator usually separated by a fraction bar. The Fraction object is used to classify the different styles of fractions. It is also used to classify the stack object, which places one element above another, with no fraction bar. The four types of fractions are shown below:

Stacked Fraction:	$\frac{a}{b}$
Skewed Fraction:	$\frac{a}{b}$
Linear Fraction:	$\frac{a}{b}$
Stack (noBar) Fraction:	$\frac{n}{k}$

Example XML (Linear Fraction Shown Above):

```

<m:oMathPara>
  <m:oMath>
    <m:f>
      <m:fPr>
        <m:type m:val="lin" />
      </m:fPr>
      <m:num>
        <m:r>
          <m:t>a</m:t>
        </m:r>
      </m:num>
      <m:den>
        <m:r>
          <m:t>b</m:t>
        </m:r>
      </m:den>
    </m:f>
  </m:oMath>
</m:oMathPara>

```

L.6.1.8 Function Apply Object

The Function Apply object consists of a function name applied to the function argument(s) given in a base element. The function name, by default, does not use math italics. The Function Apply object consists of a function name (a string or object) and a base element acted upon.

Example 1:

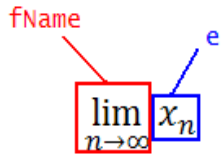
$\sin x$

Example 1 XML:

```
<m:oMathPara>
  <m:oMath>
    <m:func>
      <m:funcPr>
        <m:ctrlPr>
          <w:rPr>
            <w:i />
          </w:rPr>
        </m:ctrlPr>
      </m:funcPr>
      <m:fName>
        <m:r>
          <m:rPr>
            <m:sty m:val="p" />
          </m:rPr>
          <m:t>sin</m:t>
        </m:r>
      </m:fName>
    <m:e>
      <m:r>
        <m:t>x</m:t>
      </m:r>
    </m:e>
  </m:func>
</m:oMath>
</m:oMathPara>
```

Example 2:

The following Function Apply object is more complex:



Example 3:

$$\lim_{n \rightarrow \infty} x_n$$

Example 3 XML:

```

<m:oMathPara>
  <m:oMath>
    <m:func>
      <m:fName>
        <m:limLow>
          <m:e>
            <m:r>
              <m:rPr>
                <m:sty m:val="p" />
              </m:rPr>
              <m:t>lim</m:t>
            </m:r>
          </m:e>
        <m:lim>
          <m:r>
            <m:t>n→∞</m:t>
          </m:r>
        </m:lim>
      </m:limLow>
    </m:fName>
  </m:e>
  <m:sSub>
    <m:e>
      <m:r>
        <m:t>x</m:t>
      </m:r>
    </m:e>
  <m:sub>
    <m:r>
      <m:t>n</m:t>
    </m:r>
  </m:sub>
</m:sSub>

```

```

    </m:e>
  </m:func>
</m:oMath>
</m:oMathPara>

```

The user can modify the text in a function name, or can add strings to be recognized automatically by the text processor as function names.

L.6.1.9 Group Character Object

The Group Character object consists of a character drawn above or below text, often with the purpose of visually grouping items. Alternatively, text can be drawn above or below a stretched character

(example: $\overbrace{\text{this is some text}}$). In the following example, the text above the overbrace is not part of the group character object; it is included only to demonstrate a real-world example of the object in use:

groupChr $\overbrace{(x + x + \dots)}^{k \text{ times}}$

L.6.1.10 Upper and Lower Limits

Upper Limits and Lower Limits are treated as separate (but similar) objects in the XML representation. Both consist of text on the baseline and reduced-size text immediately above or below it. Examples include:

$\lim_{n \rightarrow \infty}$ and $\overbrace{x + x + \dots}^{k \text{ times}}$, where in the second example the upper limit is $k \text{ times}$ and the base is $x + x + \dots$

L.6.1.11 Matrix Object

The Matrix object consists of one or more elements laid out in one or more rows and one or more columns (delimiters not included). Examples include $\begin{pmatrix} 1 & 2 \\ 3 & 4 \\ 5 & 6 \end{pmatrix}$ and $\begin{bmatrix} 1 & \\ & 1 \end{bmatrix}$.

Example XML (left matrix):

```

<m:oMathPara>
  <m:oMath>
    <m:d>
      <m:e>
        <m:m>
          <m:mPr>
            <m:mCS>
              <m:mC>

```

```

        <m:mcPr>
            <m:count m:val="2" />
            <m:mcJc m:val="center" />
        </m:mcPr>
    </m:mc>
</m:mcs>
</m:mPr>
<m:mr>
    <m:e>
        <m:r>
            <m:t>1</m:t>
        </m:r>
    </m:e>
    <m:e>
        <m:r>
            <m:t>2</m:t>
        </m:r>
    </m:e>
</m:mr>
<m:mr>
    <m:e>
        <m:r>
            <m:t>3</m:t>
        </m:r>
    </m:e>
    <m:e>
        <m:r>
            <m:t>4</m:t>
        </m:r>
    </m:e>
</m:mr>
<m:mr>
    <m:e>
        <m:r>
            <m:t>5</m:t>
        </m:r>
    </m:e>
    <m:e>
        <m:r>
            <m:t>6</m:t>
        </m:r>
    </m:e>
</m:mr>

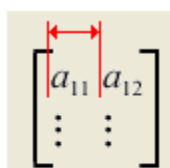
```

```

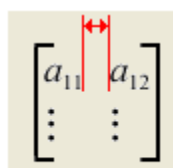
    </m:m>
  </m:e>
</m:d>
</m:oMath>
</m:oMathPara>

```

The entire matrix can be aligned, with respect to the surrounding text, at the center, with the top row, or with the bottom row. This property is defined as `baseJc`. Spacing between columns can be defined using `cGp`, `cGpRule`, and `cSp`. Column Gap refers to the space between the end of one column and the start of the next; column spacing refers to the space between two corresponding edges of adjacent columns.

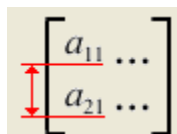


Column Spacing

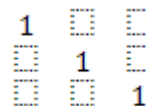


Column Gap

Row spacing can also be defined using `rSp` and `rSpRule`. Row spacing is defined as the distance between baselines on adjacent matrix rows:



Finally, a matrix can have hidden placeholders (`hidePlc`). The identity matrix above has hidden



placeholders, while the following matrix has placeholders showing:

L.6.1.12 N-ary Object

The n-ary object consists of an n-ary character, a base (or operand), and optional upper and lower limits, as in:

$$\int_0^1 x \, dx \quad \sum_k \binom{n}{k} \quad \prod_{k=1}^n A_k \quad \bigcup_{n=1}^m (X_n \cap Y_n)$$

Example XML (third n-ary object only):

```

<m:oMathPara>
  <m:oMath>
    <m:nary>
      <m:naryPr>

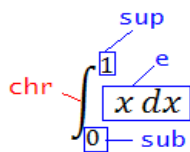
```

```

    <m:chr m:val="∫" />
    <m:limLoc m:val="undOvr" />
  </m:naryPr>
  <m:sub>
    <m:r>
      <m:t>k=1</m:t>
    </m:r>
  </m:sub>
  <m:sup>
    <m:r>
      <m:t>n</m:t>
    </m:r>
  </m:sup>
  <m:e>
    <m:sSub>
      <m:e>
        <m:r>
          <m:t>A</m:t>
        </m:r>
      </m:e>
      <m:sub>
        <m:r>
          <m:t>k</m:t>
        </m:r>
      </m:sub>
    </m:sSub>
  </m:e>
</m:nary>
</m:oMath>
</m:oMathPara>

```

The components of an n-ary object are as follows:



Other properties of the n-ary object are:

- **grow**: specifies whether the n-ary object grows to the height of its operand, or stays a fixed height
- **limLoc**: specifies the placement of n-ary limits: either to the right of the n-ary operator (the subSup position) or centered above and below (the undOvr position).

- supHide: specifies that an empty upper limit is hidden and no placeholder shows
- subHide: specifies that an empty lower limit is hidden and no placeholder shows

L.6.1.13 Literal Operators and Operator Emulators

Literal Operators and Operator Emulators are two special operators in the Office Open XML Math Markup Language. These operator types and their properties have been well documented and published as a Unicode Technical Note (<http://www.unicode.org/notes/tn28/UTN28-PlainTextMath-v2.pdf>).

Linear format operators such as “=”, “+”, and “[”, are usually single Unicode characters that have special meaning. For example, the “/” linear format operator usually signals that it and its operands should be “built up” into a fraction. Consequently, the linear string “a/b” is interpreted to mean $\frac{a}{b}$. The Literal Operator “\” can be used to strip the implied special meaning of the “/” operator so that this build up does not occur. This happens because the literal operator dictates that the following Unicode character be interpreted literally and not be given its usual special meaning.

An example linear string with a literal operator might be “c = a \ b”. This string would indicate that the “/” character should be taken literally and not used to build the equation into $c = \frac{a}{b}$. With the literal operator “\”, the result is the equation $c = a/b$. The XML for this equation is as follows: (looks inline, i.e., not a math para)

```
<m:oMathPara>
  <m:oMath>
    <m:r>
      <m:t>c=a</m:t>
    </m:r>
    <m:r>
      <m:rPr>
        <m:lit />
      </m:rPr>
      <m:t></m:t>
    </m:r>
    <m:r>
      <m:t>b</m:t>
    </m:r>
  </m:oMath>
</m:oMathPara>
```

Single-character linear format operators have the ability to be aligned, serve as line break points, or have associated argument size attributes. Sometimes it is desirable to have multi-character operators that have these properties, such as “==”, which is where the operator emulator element (opEmu) and the box element (box) are useful. A box element, as explained previously, is used to group components

of an expression or equation. Note that the box is not a visible box. It is only a grouping mechanism. The `opEmu` element is also used to signify that the box and its contents must behave as a single operator and inherit the properties of an operator. This means, for example, that the grouped characters can serve as a point for a line break and can be aligned to other operators. Operator Emulators are often used when one or more characters combine to form an operator, such as “==”, “++”, etc. A good example of a box and `opEmu` combination is shown in §7.1.4, Box Object.

Alignment points are one of the unique properties of operators. They allow multiple objects in a single math zone to be aligned against their various operators to improve readability. Alignment points are set through linear format using the “&” character. An example of equations being aligned to their operators is shown in §7.1.6, Array Object. In that example and the example below, ampersands are interpreted as alternating *align* and *spacer* values. A spacer value is implied at the beginning of each line (represented by an `<m:e>` element) while every following odd ‘&’ is an alignment point and every even ‘&’ is a place where space can be added to align expressions or equations. A brief example of this is as follows:

Example:

$$\begin{array}{l} x + 9y = 15 \\ 8x + y = 5 \end{array}$$

Example XML:

```
<m:eqArr>
  <m:e>
    <m:r>
      <m:t>&x+&9&y =&15&</m:t>
    </m:r>
  </m:e>
  <m:e>
    <m:r>
      <m:t>8&x+&&y =&5&</m:t>
    </m:r>
  </m:e>
</m:eqArr>
```

L.6.1.14 Phantom Object

The Phantom object allows extra spacing, horizontal, vertical, or both, to be added or suppressed during layout for enhanced appearance.

In the following example, the two radicals are unbalanced: $\sqrt{\frac{a}{b}} = \sqrt{x} \sqrt{\frac{a}{b}} = \sqrt{x}$. For enhanced typography, the radical bars and bottom points should line up. To accomplish this, the user should

adjust the height of the second radical, to make it the height of the fraction. However, no extra padding should be added to the width. The user can accomplish this by inserting a phantom of the fraction under the second radical, as in: $\sqrt{\frac{a}{b}} = \sqrt{x}$. In this case, the radicals line up, and the phantom fraction acts as ghost text that adds vertical space but no width (zeroWid). The phantom can also be used to add horizontal space, alone or in conjunction with vertical space.

Phantoms are not always invisible. The "smash" is a type of phantom in which the content remains visible. However, part or all of the smash can be ignored during layout of text around it. For example, examine the following two radicals:

ascend of "d" causes radical to be higher.

when the ascent of "d" is smashed, the gap is narrowed.

A discerning typographer might desire less vertical spacing between the tip of the "d" and the radical bar in the first example. By placing the differential in a smash and assigning it zero height (zeroAsc), the spacing is reduced.

Note that in this same example, when the differential term is placed inside a phantom, the spacing between the first and second characters changes. Again, the discerning typographer wishes that despite the presence of the phantom, differential spacing is retained. By assigning the phantom transparency for spacing (transp), proper spacing is preserved.

Finally, zeroDesc phantom allows the descent of the phantom base to be ignored during layout. The following example illustrates the usage of zeroDesc:

height of radical

height of radical when the descent of y is suppressed

Each of the phantom properties can be applied whether the phantom is visible or hidden (the show property).

Example:

$$\sqrt{y}$$

Example XML:

```
<m:rad>
  <m:e>
    <m:phant>
      <m:phantPr>
```

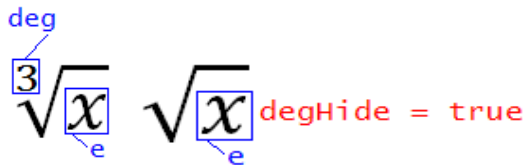
```

    <m:zeroDesc m:val="on" />
  </m:phantPr>
  <m:e>
    <m:r>
      <m:t>y</m:t>
    </m:r>
  </m:e>
</m:phant>
</m:e>
</m:rad>

```

L.6.1.15 Radical Object

The Radical object consists of a radical, a base *e*, and an optional degree. When the degree is not shown and a placeholder character is not to appear, the property `degHide` is used.



L.6.1.16 Scripts (Superscript, Subscript, SubSuperscript, PreSubSuperscript)

There are four distinct but related objects that consist of a base and a smaller “script” term either raised or lowered, on the left or right of the base. These are the Subscript, Superscript, SubSuperscript, and PreSubSuperscript:

$$x_n \quad x^n \quad x_m^n \quad {}_m^n x$$

Example XML (second and third examples above only):

```

<m:oMathPara>
  <m:oMath>
    <m:sSup>
      <m:e>
        <m:r>
          <m:t>x</m:t>
        </m:r>
      </m:e>
    <m:sup>
      <m:r>
        <m:t>n</m:t>
      </m:r>
    </m:sup>
  </m:sSup>
  <m:r>

```

```

    <m:t xml:space="preserve"></m:t>
  </m:r>
  <m:sSubSup>
    <m:e>
      <m:r>
        <m:t>x</m:t>
      </m:r>
    </m:e>
    <m:sub>
      <m:r>
        <m:t>m</m:t>
      </m:r>
    </m:sub>
    <m:sup>
      <m:r>
        <m:t>n</m:t>
      </m:r>
    </m:sup>
  </m:sSubSup>
</m:oMath>
</m:oMathPara>

```

The SubSuperscript has the option of aligning scripts (alignScr), as in:

alignScr = true vs. alignScr = false .

L.6.1.17 Math Paragraphs

Math paragraphs exist between oMathPara elements and are comprised of one or more equations or expressions. (The examples in this subclause are all based on expressions) .Each expression exists within its own <m:oMath> block. An example of how expressions would be laid out in a single math paragraph is shown below:

```

<m:oMathPara>
  <m:oMathParaPr>
    ...math paragraph properties
  </m:oMathParaPr>
  <m:oMath>
    ...an expression
  </m:oMath>

```

```

    <m:oMath>
      ...another expression
    </m:oMath>
  </m:oMathPara>

```

When part of an Office Open XML WordprocessingML document, Math Paragraphs exist inside the <w:body> block of the document. They also always exist in <w:p> blocks even if there is no additional text in the paragraph. An example of the above XML as part of a WordprocessingML document is shown below:

Example XML:

```

<?xml version="1.0"?>
<w:document xmlns:w="...">
  <w:body>
    <w:p>
      <m:oMathPara>
        <m:oMathParaPr>
          ...math paragraph properties
        </m:oMathParaPr>
        <m:oMath>
          ...an expression
        </m:oMath>
        <m:oMath>
          ...another expression
        </m:oMath>
      </m:oMathPara>
    </w:p>
  </w:body>
</w:document>

```

Display equations or expressions (typically, these are simply referred to as just "Display Equations" for the sake of brevity) are always inside a Math Paragraph. Inline equations or expressions (typically referred to as just "Inline equations"), however, might not be part of a Math Paragraph if they are inside an existing WordprocessingML paragraph (<w:p> block). Such an inline equation is illustrated by the following example:

Example:

The following formula calculates the area of a circle: $A = \pi r^2$.

Example XML:

```
<w:document>
  <w:body>
    <w:p>
      <w:r>
        <w:t>The following formula calculates the ares of a circle:</w:t>
      </w:r>
      <m:oMath>
        <m:r>
          <m:t>A=π</m:t>
        </m:r>
        <m:sSup>
          <m:e>
            <m:r>
              <m:t>r</m:t>
            </m:r>
          </m:e>
          <m:sup>
            <m:r>
              <m:t>2</m:t>
            </m:r>
          </m:sup>
        </m:sSup>
      </m:oMath>
      <w:r>
        <w:t>.</w:t>
      </w:r>
    </w:p>
  </w:body>
</w:document>
```

When inside a WordprocessingML document, <m:oMath> blocks commonly include WordprocessingML at various points to describe desired formatting such as color, font, character effects, annotations, and other non-math-specific effects and display features. DrawingML and other mark-ups defined in the Office Open XML standard can also exist inside oMath blocks. These additional non-OMML components are optional when defining an expression or equation. The following example includes WordprocessingML to describe desired text effects.

Example:

$$E = mc^2$$

Example XML:

```

<m:oMathPara>
  <m:oMath>
    <m:r>
      <w:rPr>
        <w:rFonts w:ascii="Cambria Math" w:hAnsi="Cambria Math" />
        <w:emboss />
        <w:sz w:val="32" />
        <w:szCs w:val="32" />
      </w:rPr>
      <m:t>E=m</m:t>
    </m:r>
    <m:sSup>
      <m:sSupPr>
        <m:ctrlPr>
          <w:rPr>
            <w:rFonts w:ascii="Cambria Math" w:hAnsi="Cambria Math" />
            <w:i />
            <w:emboss />
            <w:sz w:val="32" />
            <w:szCs w:val="32" />
          </w:rPr>
        </m:ctrlPr>
      </m:sSupPr>
      <m:e>
        <m:r>
          <w:rPr>
            <w:rFonts w:ascii="Cambria Math" w:hAnsi="Cambria Math" />
            <w:emboss />
            <w:sz w:val="32" />
            <w:szCs w:val="32" />
          </w:rPr>
          <m:t>c</m:t>
        </m:r>
      </m:e>
    </m:sSup>
    <m:r>
      <w:rPr>
        <w:rFonts w:ascii="Cambria Math" w:hAnsi="Cambria Math" />
        <w:emboss />
        <w:sz w:val="32" />
        <w:szCs w:val="32" />
      </w:rPr>
      <m:t>2</m:t>
    </m:r>
  </m:oMath>
</m:oMathPara>

```



```

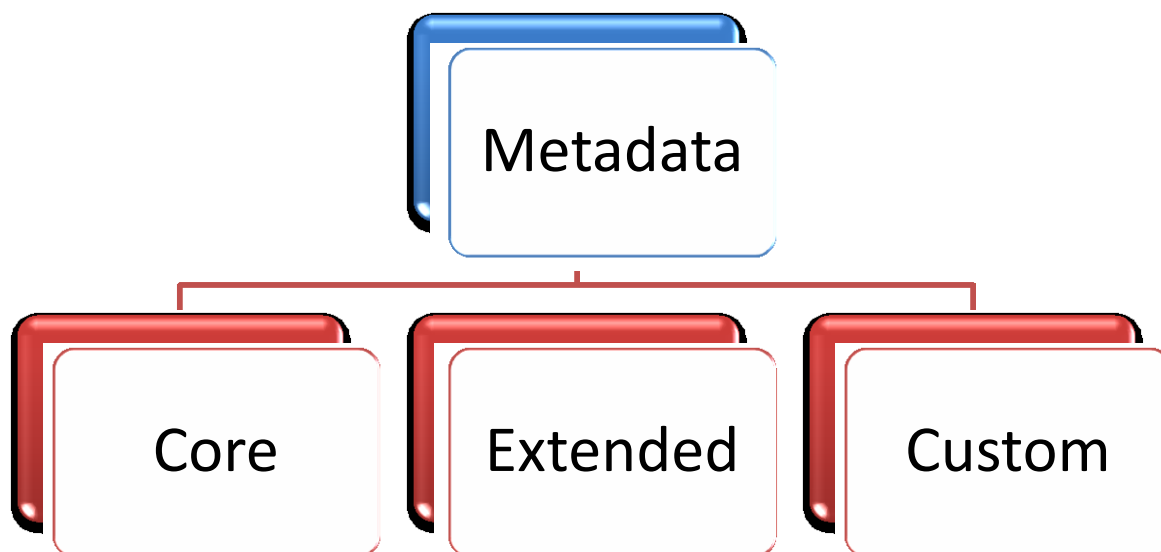
    </m:r>
  </m:sup>
</m:sSup>
</m:oMath>
</m:oMathPara>

```

In the above example, WordprocessingML is used to describe the font used, the character effect desired, and the character size desired. The `<w:rFonts>` tag in this example would only be necessary if “Cambria Math” were not the default font for this document. Document editors have the option of being overly explicit at the expense of adding potentially unnecessary / redundant XML.

L.6.2 Metadata

Office Open XML document metadata consists of 43 well-defined properties and user-defined custom properties. Metadata properties are divided into three categories: Core, Extended, and Custom.



Each metadata category is represented by a document part with a corresponding relationship type, content type, and schema. Each metadata property is associated with exactly one metadata part.

The following table lists all well-defined metadata properties:

Property	Category
category	Core
contentStatus	Core
Created	Core
Creator	Core

Property	Category
description	Core
identifier	Core
keywords	Core
language	Core
lastModifiedBy	Core
lastPrinted	Core
modified	Core
revision	Core
subject	Core
title	Core
version	Core
Application	Extended
AppVersion	Extended
Characters	Extended
CharactersWithSpaces	Extended
Company	Extended
DigSig	Extended
DocSecurity	Extended
HeadingPairs	Extended
HiddenSlides	Extended
HLinks	Extended
HyperlinkBase	Extended
HyperlinksChanged	Extended
Lines	Extended
LinksUpToDate	Extended
Manager	Extended
MMClips	Extended
Notes	Extended
Pages	Extended
Paragraphs	Extended
PresentationFormat	Extended
ScaleCrop	Extended
SharedDoc	Extended
Slides	Extended

Property	Category
Template	Extended
TitlesOfParts	Extended
TotalTime	Extended
Words	Extended

L.6.2.1 Metadata Properties

Metadata properties are represented as XML elements with associated name and datatype. There are two kinds of properties: simple and complex. Simple properties are singular XML elements whose data type and value is defined by the datatype and value of that XML element. Complex properties contain nested variant type XML elements that define the datatype and value of complex data such as arrays and vectors. Metadata properties are non-repeatable and must be defined within their associated metadata part. All metadata properties can be empty or omitted. If all properties of a metadata part are omitted, that part can be excluded from the document.

Simple property and custom complex property

```
<dc:creator>John Smith</dc:creator>
<property fmtid="{D5CDD505-2E9C-101B-9397-08002B2CF9AE}" pid="2"
name="Editor">
  <vt:lpwstr>John Smith</vt:lpwstr>
</property>
```

L.6.2.2 Core Properties

Core properties are a predefined set of metadata properties common to all packages, and are discussed in detail in ECMA-376-2, §11.

L.6.2.3 Extended Properties

Extended properties are a predefined set of metadata properties that are specifically applicable to Office Open XML documents. Extended properties consist of 24 simple properties and 3 complex properties stored in the part targeted by the relationship of type:

<http://purl.oclc.org/ooxml/officeDocument/relationships/extendedProperties>.

L.6.2.4 Custom Properties

Custom properties allow users to extend pre-defined metadata properties with user-defined properties. Custom properties are stored in the part targeted by the relationship of type:

<http://purl.oclc.org/ooxml/officeDocument/relationships/customProperties>. Each property is represented as a property XML element and uniquely identified through the name, fmtid, and pid attributes. All custom properties are considered complex properties. The datatype and value of custom properties are specified by its child variant type XML elements.

L.6.2.5 Variant Types

Office Open XML defines 35 XML elements representing commonly-used variant types to enable the representation and round-tripping of complex data. Variant type XML elements are used as child elements of complex metadata properties to define the datatype and value.

L.6.3 Custom XML Data

Within an Office Open XML document, it is sometimes desirable or necessary to store custom XML data (that is, data in a format not defined by this Office Open XML specification) within the contents of the package. To accommodate this need, Office Open XML allows the storage of any arbitrary XML within a package as the target of the <http://purl.oclc.org/ooxml/officeDocument/relationships/customXml> relationship (source parts are listed within Part 1).

The following examples illustrate potential uses of this mechanism:

- A document which collects and displays information from a backend data source might want to store the original form of that backend data, so it can be manipulated and uploaded to the original data source at a later date.
- A document author might wish to store additional metadata in an XML format not defined by this Office Open XML specification's existing metadata schemas.
- A document management system might wish to store data tracking the workflow status, retention policies, and so on for this document along with the document.

Once present within a package, this custom XML data must be maintained as a distinct part separate from the contents of the document, spreadsheet, or presentation. If there are multiple distinct streams of custom XML data, each is maintained as a separate part within the package, so that each can be manipulated independently of all others.

Each Custom XML Data part can also have an implicit relationship to a Custom XML Data Properties part which stores:

- The target namespace of all XML schemas which must be used to validate the content of the custom XML data part.
- A GUID which must remain constant over the lifetime of this part (and can therefore be used to uniquely identify it).

L.6.4 Bibliography

Office Open XML offers functionality to store bibliography entries to permit automatic formatting of citations and bibliographies in the document according to a set of documentation rules defined in an XSLT.

L.6.4.1 Types of Sources

The Office Open XML formats support a collection of predefined source types for bibliography entries based on the categories most commonly used in various citation and bibliography style guidelines. The

set of predefined source types can be extended as needed. The recommended approach for extending this set is to use the Misc source type, and then leverage the methods described in ECMA-376-3 for extending the format with new attributes or elements. The following types of sources are predefined:

- Book (Book)
- BookSection (Book Section)
- JournalArticle (Journal Article)
- MagOrNewsArticle (Magazine or Newspaper Article)
- ConferenceProceedings (Conference Proceedings)
- Report (Report)
- SoundRecording (Sound Recording)
- Performance (Performance)
- Art (Art)
- DocumentFromInternetSite (Document from Internet Site)
- InternetSite (Internet Site)
- Film (Film)
- Interview (Interview)
- Patent (Patent)
- ElectronicSource (Electronic Source)
- Case (Case)
- Misc (Miscellaneous)

L.6.4.2 Child Elements

Each Source element has a number of elements as children, each of which represents a different piece of data for the bibliography entries. For example, a book might have an author, title, publisher, year, and city. Most are self-explanatory, but this document pays special attention to some of the more complex children.

The child elements are:

- AbbreviatedCaseNumber
- AlbumTitle
- Author
- BookTitle
- Broadcaster
- BroadcastTitle
- CaseNumber
- ChapterNumber
- City
- Comments
- ConferenceName
- Country

- CountryRegion
- Court
- Day
- DayAccessed
- Department
- Distributor
- Edition
- Guid
- Institution
- InternetSiteTitle
- Issue
- JournalName
- LCID
- Medium
- Month
- MonthAccessed
- NumberVolumes
- Pages
- PatentNumber
- PeriodicalTitle
- PlacePublished
- ProductionCompany
- PublicationTitle
- Publisher
- RecordingNumber
- RefOrder
- Reporter
- SourceType
- ShortTitle
- StandardNumber
- StateProvince
- Station
- Tag
- Theater
- ThesisType
- Title
- Type
- URL
- Version
- Volume

- Year
- YearAccessed

An example of the XML defining a source of type Book with the title Office Open XML formats, and two Authors named Jones, Brian and Davis, Tristan is:

```
<b:Source>
  <b:Tag>Las07</b:Tag>
  <b:SourceType>Book</b:SourceType>
  <b:Author>
    <b:Author>
      <b:NameList>
        <b:Person>
          <b:Last>Jones</b:Last>
          <b:First>Brian</b:First>
        </b:Person>
        <b:Person>
          <b:Last>Davis</b:Last>
          <b:First>Tristan</b:First>
        </b:Person>
      </b:NameList>
    </b:Author>
  </b:Author>
  <b>Title>Office Open XML formats</b>Title>
  <b:Year>2007</b:Year>
  <b:City>Trondheim</b:City>
  <b:Publisher>Publisher</b:Publisher>
  <b:Comments>Comments</b:Comments>
  <b:RefOrder>1</b:RefOrder>
  <b:Guid>{DCC25FA1-67CC-4013-B56A-2D42CED7FF0C}</b:Guid>
  <b:LCID>0</b:LCID>
</b:Source>
```

L.6.4.3 Author

There are two elements with the same name: Author. The first Author element is a container for the set of contributors attributed to the current source. The second Author element is a child of the first and is used to represent a single contributor. The set of contributors is defined as:

- Artist
- Author
- BookAuthor
- Compiler
- Composer
- Conductor

- Counsel
- Director
- Editor
- Interviewee
- Interviewer
- Inventor
- Performer
- ProducerName
- Translator
- Writer

For example, a bibliographic source with an author (Davis, Tristan), editor (Jaeschke, Rex), and translator (Jones, Brian) would be represented by a group of elements representing the three contributors and their specific roles inside an outer Author element, as in:

```
<b:Author>
  <b:Author>
    <b:NameList>
      <b:Person>
        <b:Last>Davis</b:Last>
        <b:First>Tristan</b:First>
      </b:Person>
    </b:NameList>
  </b:Author>
  <b:Editor>
    <b:NameList>
      <b:Person>
        <b:Last>Jaeschke</b:Last>
        <b:First>Rex</b:First>
      </b:Person>
    </b:NameList>
  </b:Editor>
  <b:Translator>
    <b:NameList>
      <b:Person>
        <b:Last>Jones</b:Last>
        <b:First>Brian</b:First>
      </b:Person>
    </b:NameList>
  </b:Translator>
</b:Author>
```


L.6.4.4 LCID, Guid, Tag, and RefOrder

Four of the child elements for the Source element support important functionality for consuming applications that generate bibliographies using an externally defined stylesheet. The LCID element describes the language to be used when displaying the bibliography entry. This piece of data provides an instruction to the consuming application on the grammar of the citations and bibliography (including international name formats, date formats, and punctuation marks).

The Guid and Tag elements can be leveraged if an application wishes to uniquely identify the bibliography entry described in the Source element. For example, when a Source element is brought into a document and the Tag value for that Source element matches that of another Source element already in the document, the existing Source elements values could be overwritten with the new Source element. Two Source elements with the same Tag element value cannot exist in the same document. GUIDs can then be used in conjunction with Tags to indicate whether a Source element has been edited. When a Source element from one document has been edited, an application might decide to apply the edits to matching Source elements in other documents.

The RefOrder element for a source indicates the position, in numeric sequence, for the first reference to the source within the document text. This information is used in bibliography styles that sort sources by order in the document rather than alphabetical order.

L.7 Miscellaneous Topics

L.7.1 Additional Characteristics

Office Open XML provides a way for a producer to provide information to consumers regarding how the data was created and how it should be interpreted. This information is provided by one or more *additional characteristics*.

A producing application has the option of writing out as many or as few additional characteristics as desired.

A consuming application has the option of acting on the additional characteristics or ignoring them

The additional characteristics are stored in a separate XML part, as follows:

```
<additionalCharacteristics>
  <characteristic name="name of characteristic"
    relation="well defined set of relation types"
    val="string" vocabulary="uri"/>
</additionalCharacteristics>
```

For example, consider the case in which numColumns is the characteristic name to specify the maximum number of columns supported by the producing SpreadsheetML application, so that the consuming application can understand how to distinguish cell references and variables unambiguously.

The relation attribute specifies the way in which the val attribute should be interpreted. The possible values for relation are: lt | le | eq | gt | ge, which mean <, <=, =, >=, >, respectively, and relate to numerical comparison for values and alphabetical comparison for ordering of strings. These relations permit expression of the maximum value, the minimum value, the value, and so on.

The vocabulary attribute is a URI that provides a namespace for the specific characteristic names provided as values of the name attribute. This allows for the creation of a vocabulary of characteristics of interest within a given domain of application without concern for name conflict between vocabularies.

Another example use case would be for a producer to inform the consumer that the computations used to calculate the stored numbers in the SpreadsheetML formulas have a particular numeric precision expressed by the mantissa and exponent. A consumer can optionally check those values to determine whether, for example, the values should be recalculated. The XML to represent these characteristics might look like the following:

```
<additionalCharacteristics>
  <characteristic name='precisionMantissa'
    relation='gt'
    val='-9007199254740992' />
  <characteristic name='precisionMantissa'
    relation='lt' val='9007199254740992' />
  <characteristic name='precisionExponent'
    relation='ge' val='-1075' />
  <characteristic name='precisionExponent'
    relation='le' val='970' />
</additionalCharacteristics>
```

L.7.2 Embeddings

Office Open XML provides facilities allowing the embedding of any object within a document. For example, a WordprocessingML document might include data as an embedded SpreadsheetML document rather than a native WordprocessingML table, in order to allow that data to be edited and recalculated by a SpreadsheetML calculation engine, rather than having it stored as a static table of data.

Office Open XML provides for two classes of embedded objects:

- *Embedded Packages* - An embedded Office Open XML document embedded within another Office Open XML document, with both documents stored in the format defined by this Office Open XML specification. For example, a PresentationML document embedded within a SpreadsheetML document results in an embedded package.
- *Embedded Objects* - Any other embedded object data. The data stored in the object must be identified by a unique string, referred to as its *ProgID*. This string must be used to determine

both the type of data and the application (if any) that must be used to load and edit the embedded object data.

Office Open XML also allows an image to be optionally associated with the embedded object data, for use when the embedded object application and data itself is not used by the consuming application (e.g. when the object cannot be loaded – the object is from an unknown source; the object is known, but the application has chosen not to load it for performance reasons, and so on).

L.7.2.1 Embedded Packages

Whenever an Office Open XML document is stored as an embedded object, the embedding must be referred to as an embedded package. Embedded packages must be the target of the Embedded Package relationship defined in Part 1: <http://purl.oclc.org/ooxml/officeDocument/relationships/package>. this Office Open XML specification

L.7.2.2 Embedded Objects

For all other embeddings, the embedded object is stored in an arbitrary format defined by the application whose data is being embedded. These generic embedded objects must be the target of the Embedded Object relationship: <http://purl.oclc.org/ooxml/officeDocument/relationships/oleObject>. When parsing the data stored in an embedded object part, an application must use the associated ProgID (whose location is described in the following subclauses) for the object.

L.7.2.3 Embeddings in a WordprocessingML Document

When an embedding is stored in a WordprocessingML document, it is stored in one of the following ways:

- In line with text - The object is displayed within the regular text stream (modifying line height and so on to accommodate it).
- Floating – The object is positioned absolutely or relatively within the document and text flow is modified as needed around it.

Each case permits the storage of both the object and the optional image representation that can be used when the object data is not used by the hosting application as follows:

L.7.2.3.1 Embeddings In Line With Text

When the embedding is present in line with text, it is stored as follows:

- The WordprocessingML object element specifies the presence of an embedded object in line with text.
- The child objectEmbed or objectLink element must specify the details about the embedding itself, including an explicit relationship to the appropriate Embedded Package or Embedded Object part.
- The child inline element must specify the image which can be used to represent the object.

For example, if we embed a SpreadsheetML worksheet in a WordprocessingML document, the following run content would be present:

```
<w:r>
  <w:object w:dxaOrig="7247" w:dyaOrig="2920">
    <w:objectEmbed drawAspect="content" r:id="rId7" progId="Excel.Sheet.8"
      shapeId="10"/>
    <w:drawing>
      <wp:inline> ... </wp:inline>
    </w:drawing>
  </w:object>
</w:r>
```

If we examine this markup, it can be seen that:

- We have an inline embedded object, as defined by the object element.
- The objectEmbed element specifies that that object is stored as an embedding, and that its ProgID is Excel.Sheet.8 (the ProgID code for Microsoft Excel worksheets); it also specifies that the associated image (when the object data cannot be used) is stored in the shape with an ID of 10.
- The associated shape with an ID of _x0000_i1026 must be used in place of the object whenever it is not loaded - this shape is stored in the inline element in the same object element as the objectEmbed element. This shape specifies its desired size and provides an explicit relationship to the part that stores the image data.

L.7.2.3.2 Floating Embeddings

When the embedding is present as a floating object, it is stored as follows:

- The WordprocessingML pict element specifies the presence of a floating image in the document.
- The child objectEmbed or objectLink element must specify the details about the embedding itself, including an explicit relationship to the appropriate Embedded Package or Embedded Object part.
- The child anchor element must specify the image that can be used to represent the object in place of loading the actual object data.

For example, if we embed a SpreadsheetML worksheet in a WordprocessingML document as a floating object, the following run content would be present:

```
<w:r>
  <w:object>
    <w:objectEmbed drawAspect="content" r:id="rId5" progId="Excel.Sheet.8"
      shapeId="18"/>
  </w:object>
</w:r>
```

```

    <w:drawing>
      <wp:anchor> ... </wp:anchor>
    </w:drawing>
  </w:object>
</w:r>

```

If we examine this markup, it can be seen that:

- We have a floating image, as defined by the `pict` element.
- The `objectEmbed` element specifies that that floating image is actually an embedding that is stored as an `Embed`, and that its `ProgID` is `Excel.Sheet.8` (the `ProgID` code for Microsoft Excel worksheets); it also specifies that the associated image (when the object data cannot be used) is stored in the shape with an ID of 18.
- The associated shape with an ID of 18 must be used in place of the object whenever it is not loaded - this shape is stored in the `anchor` element in the same object element as the corresponding `OLEObject` element. This shape specifies its desired size and provides an explicit relationship to the part which stores the image data.

L.7.2.4 Embeddings in a SpreadsheetML Document

When an embedding is present in a SpreadsheetML document, it must be stored as follows:

- In the worksheet, the `oleObjects` element must store one or more `oleObject` child elements, one for each embedding within the current worksheet. Each of those `oleObject` child elements must also store: an explicit relationship to the associated `Embedded Package` or `Embedded Object` part, the `ProgID` for that embedded object, and (optionally) the ID for the associated shape. [*Note: For backward compatibility, note that VML shape IDs are of the form `_x0000_s####`, where # specifies a single Arabic numeral, and only the last four digits are stored as the ID. end note*]
- In the worksheet, the sibling `objectPr` element must contain an explicit relationship to the `Drawing` part that (optionally) contains the image data which can be used in place of loading the actual object data.

For example, if we embed a `Example Test` object (an example for illustration) in a SpreadsheetML document, the following markup would be stored in the appropriate `Sheet` part:

```

<s:worksheet>
  ...
  <s:oleObjects>
    <s:oleObject progId="Example.Test.1" shapeId="1025" r:id="rId5">
      <s:objectPr cf="pict" r:id="rId9"> ... </s:objectPr>
    </s:oleObject>
  </s:oleObjects>
</s:worksheet>

```

If we examine this markup, it can be seen that:

- The `oleObject` element specifies that we have one embedded object on the worksheet. Its attributes specify that the object is of type `Example.Test.1` and that the explicit relationship to the embedded object is `rId5`.
- The child `objectPr` element specifies that the Drawing part which contains the associated drawing data is contained at the target of the relationship with an ID of `rId9`.
- If we examine the Drawing part's contents, we'll see shape `10`, which contains the alternate image for the object.

L.7.2.5 Embeddings in a PresentationML Document

When an embedding is present in a PresentationML document, it must be stored as follows:

- In the slide, the embedding is stored as a graphic frame using the `graphicFrame` element in PresentationML.
- The `graphicData` element for the frame must have the appropriate URI for its contents: `http://purl.oclc.org/ooxml/presentationml/ole`. Its child element must be the PresentationML `oleObj` element, which stores an explicit relationship to the associated Embedded Package or Embedded Object part, the `ProgID` for that embedded object, and (optionally) the shape ID for the associated shape.
- The `oleObj` element shall have a `pic` child element that (optionally) contains the image data to be used in place of loading the actual object data.

For example, if we embed the `Equation.3` object in a PresentationML document, the following markup would be stored in the shape tree of the appropriate Slide part:

```
<p:graphicFrame>
...
<a:graphic>
  <a:graphicData
    uri="http://purl.oclc.org/ooxml/presentationml/ole">
    <p:oleObj spid="10" name="Equation" r:id="rId3"
      imgW="320" imgH="272" progId="Equation.3">
      <p:embed />
      <p:pic>
        ...
      </p:pic>
    </p:oleObj>
  </a:graphicData>
</a:graphic>
</p:graphicFrame>
```

If we examine this markup, it can be seen that:

- The uri attribute on the graphicData element is `http://purl.oclc.org/ooxml/presentationml/ole`, which dictates that this is an embedded object
- It contains an oleObj element that specifies the properties of the embedded object. Its attributes specify that the object is of type `Equation.3` and that the explicit relationship to the embedded object is `rId3`.
- The oleObj element can also contain DrawingML defining the shape with ID `10` (if present) which defines the alternate image.

L.7.3 Future Extensibility

This clause provides a high-level overview of the extensibility model for Office Open XML documents, and a description of packaging conventions in the context of DrawingML and PresentationML. Two main constructs are described: extensibility lists (`extLst/ext`) and alternate content blocks (`AlternateContent`).

To illustrate certain points, a number of examples refer to versions of a (fictitious) PresentationML consumer/producer called PML. The 2003 version is called PML 2003; the 2007 version is called PML 2007; and so on.

L.7.3.1 Terminology

Here are some terms useful when discussing future extensibility.

- *Round tripping* involves the interchange of documents between different consumers/producers, as well as between different versions of the same consumer/producer. The pair of consumers/producers can be on the same or different platforms. Consider the case in which a document is created by the PML 2007. This document is then opened by PML 2003, edited, and saved. The edited document is now opened and used by PML 2007. In this case, the document originally created by PML 2007 has been round-tripped through PML 2003. It is also possible to round-trip a document created by PML 2003 through PML 2007.
- A *Downrev* (or down-level) version of a consumer/producer refers to one that understands an older version of a given schema. An *Uprev* (or up-level) version of a consumer/producer refers to one that understands a newer version of a given schema. The terms Downrev and Uprev are typically used in relative reference to one another. As an example, let's consider again, the two consumer/producer PML 2003 and PML 2007, where PML 2007 was released sometime after PML 2003, and, consequently, PML 2007 understands a newer revision of the DrawingML schema than does PML 2003. PML 2003 is referred to as the Downrev version while PML 2007 is referred to as the Uprev version. It is assumed that the Downrev version has less capability than the Uprev version.

L.7.3.2 What is Future Extensibility?

The main objective of future extensibility is to design an infrastructure that allows the file format to be extended for representation of data structures in future versions of a given consumer/producer.

On the surface, that isn't hard to do; there could be a special extension bit bucket allocated across every existing schema element, and any future extension could be placed there. However, the problem is more complex than that. The infrastructure must allow document interoperability between current consumers/producers and future consumers/producers, some which have not yet even been designed or built. That is, future extensibility involves building forward compatibility into the document infrastructure while remaining compatible with the current version.

L.7.3.3 Future Extensibility Requirements

There are three design goals to be considered: visual fidelity, editability, and security.

- *Visual fidelity* involves the desire for users of two consumers/producers to see visually the same thing. This seems like a simple design goal to meet, but, in practice, is not easy to achieve. The difference lies in the capabilities of an Uprev and Downrev consumer/producer. Typically, an Uprev consumer/producer has been extended to have new base capabilities that are not present in the Downrev consumer/producer. As such, the Downrev client does not have the base primitives necessary to express visually the new capability introduced in the Uprev consumer/producer.

Consider the case in which PML 2007 has the capability to highlight text with a given color, while PML 2003 does not. Given the desire to have PML 2007 documents interoperate with PML 2003, it is necessary for PML 2003 to some way to express visually that text highlight. For example, it might insert a picture of the highlighted text instead of inserting the text itself, since PML 2003 does know how to deal with pictures.

- *Editability* involves the desire for two consumers/producers to be able to edit the same content. Using the highlighted text example from above, despite the fact that PML 2003 and PML 2007 have different capabilities, one would still desire to edit highlighted text a regardless of which version of PML is in use. Again, this becomes difficult when the underlying capabilities of the consumer/producer versions are different.
- *Security* involves the desire to have multiple representations of the same data synchronized. This desire is referred to as security for the reason that out-of-sync representation can have dire consequences. For example, there might be multiple representations for a sensitive piece of information such as a Social Security number. If this piece of information were edited, it would be critical to keep all alternate representations in sync. What if that information were deleted altogether? If only one representation was deleted but others remained, it would be possible for one to have sensitive information in a document when the intent was to have it deleted.

One solution to try to solve the visual fidelity and editability goals is to have two equivalent representations for the same construct. In the highlighted text example above, a picture of the highlighted text (also called a rasterized version of the highlighted text) is an equivalent representation of the highlighted text itself. One might use the highlighted text representation when the underlying consumer/producer is capable of understanding it; otherwise, the picture version would be used.

Clearly, these design goals compete with each other. While a picture representation of text is capable of capturing full visual fidelity of how extended text looks, obviously that representation doesn't offer the same editability properties of text. One can't manipulate a picture of text nearly as easily as the text itself.

The competing nature of these design characteristics requires that one choose an extensibility construct that offers the best mix of desired characteristics. It is not always possible to have visual fidelity, editability, and security, at the same time.

L.7.3.4 Future Extensibility Constructs

The two extensibility constructs used to represent extensions in OOXML schemas are:

L.7.3.4.1 extLst/ext

The extLst construct is used for straight-up extension of existing schemas of a non-visual nature. The term *straight up* refers to the notion that sometimes extension means refining the semantics of existing constructs. In doing so, an extension sometimes overrides the meaning of previous schemas. extLst and ext were not designed for this scenario. Instead of overriding existing meaning, these two constructs purely augment existing schemas. The nature of the augmentation must be such that it does not overlap any semantics embedded in existing schema constructs.

Consider a schema that represents an address, which contain a house number, a street name, a city, a state, and a postal code. An example of a straight-up extension is the addition of a field that describes whether this address is a business or residential location. This is a straight-up extension because the notion of whether an address is business or residential does not conflict with any information that is embedded in the existing schema. Now let's consider the case in which the Postal Service replaces a purely numeric postal code with one that can contain alphanumeric characters. Such a change would not be a straight-up extension because the new representation conflicts with the old representation of the same data, namely the postal code.

Some extensions are visual in nature. An example would be extending a schema to represent text that has been highlighted. By definition, highlighting text is a visual extension. Contrast that to the case of adding a business or residential classification. The latter does not necessarily involve any visual change to the way data is presented.

The extLst and ext constructs are for extensions of a non-visual nature. The main reason their use is limited to this scenario lies in the fact that they do not offer the capability to create alternative representations of the same data.

L.7.3.4.1.1 extLst/ext Syntax

The extLst and ext elements can be placed only at specific locations within the OOXML schemas. Its syntax is as below:

```

<extLst mod="true">
  <ext uri="http://schemas.openformats.org/presentationml/someextensionpoint">
    <new:foo xmlns:new=
      "http://schemas.openformats.org/presentationml/2008/presentationml">
      ...
    </new:foo>
  </ext>
  <ext uri="http://schemas.somevendor.com/presentationml/someextensionpoint">
    <somevendor:bar xmlns:somevendor=
      "http://schemas.somevendor.com/V20/ournamespace">
      ...
    </somevendor:bar>
  </ext>
  ...
</extLst>

```

An extLst is a list of extension blocks that are placed one after the other. Each extension block has a uri attribute, which serves as an identifier to indicate the kind of extension that has been placed here. Upon encountering an extension block, a processing consumer determines whether it knows how to process extensions matching that uri attribute. If the consumer knows how to process such an extension, the markup contained within that extension block is processed. Otherwise, the extension block is preserved so long as the underlying structure being extended by the extLst has not been deleted.

There is no limit to the number of ext extension block constructs. The order of extension blocks can be arbitrary.

An optional modified attribute, mod, is available on extLst. This attribute is set to true whenever an edit has occurred at the extended location. Its presence is to aid up-level clients that receive modified documents that have been edited in down-level consumers/producers.

L.7.3.4.1.2 Round-Trip Behavior of ext Blocks

When extLsts are processed, some consumers/producers understand some extensions but not others. The preservation model of ext blocks is that unprocessed extensions are always preserved and retained as long as the underlying schema extended by the structure remains.

L.7.3.4.1.3 Example

Consider the case in which the notion that each shape can be associated with a given layer, is to be added. The schema for this might look like the following:

```

<p:sld xmlns:a="http://schemas.openxmlformats.org/drawingml/2006/3/main"
      xmlns:r="http://schemas.openxmlformats.org/officeDocument/2006/relationships"
      xmlns:p="http://schemas.openxmlformats.org/presentationml/2006/3/main">
  <p:cSld name="">
    <p:spTree>
      <p:nvGrpSpPr>...
      <p:grpSpPr>...
      <p:sp>
        <p:nvSpPr>
          <p:cNvPr id="3" name="Rectangle 3" descr=""/>
          <p:cNvSpPr/>
          <p:nvPr/>
          <p:extLst mod="false">
            <p:ext uri="http://.../layerExtension">
              <p14:spLayer xmlns:p14="http://schemas.openxmlformats.org/drawingml/2009/3/main" layer="1"/>
            </p:ext>
          </p:extLst>
        </p:nvSpPr>
        <p:spPr>...
        <p:style>...
        <p:txBody>...
      </p:sp>
    </p:spTree>
  </p:cSld>
  <p:clrMapOvr>...
  <p:timing>...
</p:sld>

```

The extLst block is under the non-visual shape properties (i.e., p:nvSpPr). A uri attribute identifies the extension.

Now consider how this markup is processed by PML 2007 and PML 2009, where PML 2009 is an up-level version of PML 2007.

PML 2007 processes the above markup, and ignores the ext block because it doesn't understand this extension. However, this block is preserved for any other consumer/producer that can understand it.

PML 2009 processes the above markup, and understands how to deal with layer extensions as indicated by the uri. The spLayer extension is returned, PML 2009 processes the extension and is responsible for writing out any updates to this markup, as required. For example, layer might be changed from 1 to 2.

Note that the extension is a straight-up extension in that layer information is orthogonal to all other non-visual properties, such as the ID, name, and description.

Being non-visual in nature, the information in this extension does not directly affect the appearance of the shape.

L.7.3.4.2 AlternateContent Blocks

An *alternate content block* allows for an alternative representation of information. In some cases, the desire is to revise a schema with a newer representation. It is also common to express visual differences using alternate content blocks. Recall that typically lower-level clients do not have the same capability as their future cousins (i.e., the up level version). As such, any future extension done in the up-level version needs to be expressed in a form that the lower-level version can understand. Hence, the need for alternate representations.

L.7.3.4.2.1 AlternateContent Syntax

```

<AlternateContent>
  <Choice Requires="namespacefoo">
    <Somemarkup/>
  </Choice>
  <Choice Requires="namespacefoo namespacefoobar">
    <Somealternatemarkup/>
  </Choice>
  <Fallback>
    <Choiceoflastresort/>
  </Fallback>
</AlternateContent>

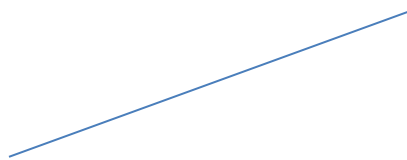
```

The AlternateContent element and its children, Choice and Fallback, are used to provide alternates for specified content. Each Choice element is examined in turn. The Requires attribute specifies a set of space-delimited namespaces that must be understood in order to select that choice. If there is a match between required namespaces and what the consumer understands, the appropriate Choice is returned. If there are multiple possible matches, only the first match is returned. An optional Fallback element can be used, and is utilized as a default when no match occurs.

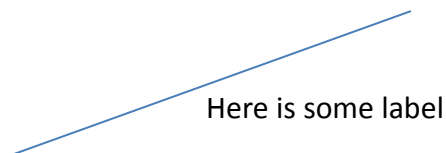
L.7.3.4.2.2 Example

Using PML 2007 and PML 2009, let's assume that PML 2007 understands some current schema version while PML 2009 understands some future extended version of the current schema.

PML 2007 knows how to handle connectors:



Now let's suppose that we desire to add a notion of labels on connectors:



Two alternate representations are required: PML 2009's schema has been extended to natively understand how to represent a label on a connector; however, PML 2007 does not. With PML 2007, we approximate this feature by representing the connector and label independently. The label is represented using a textbox. To keep the two elements together, for convenience sake, they are grouped.

Looking at the corresponding XML, PML 2007's markup looks as follows:



```

<Choice Requires="p">
  <p:nvGrpSpPr>...
  <p:grpSpPr>...
  <p:grpSp>
    <p:nvGrpSpPr>...
    <p:grpSpPr>
      <a:xfrm>...
    </p:grpSpPr>
  <p:cxnSp>
    <p:nvCxnSpPr>
      <p:cNvPr id="31" name="Straight Connector 31" descr=""/>
      <p:cNvCxnSpPr/>
      <p:nvPr/>
    </p:nvCxnSpPr>
    <p:spPr>...
    <p:style>...
  </p:cxnSp>
  <p:sp>
    <p:nvSpPr>...
    <p:spPr>
      <a:xfrm>...
      <a:prstGeom prst="rect">...
      <a:noFill/>
    </p:spPr>
    <p:txBody>
      <a:bodyPr wrap="none">...
      <a:lstStyle/>
      <a:p>
        <a:r>
          <a:rPr lang="en-US" dirty="0" smtClean="0"/>
          <a:t>Here is some label</a:t>
        </a:r>
        <a:endParaRPr smtClean="0"/>
      </a:p>
    </p:txBody>
  </p:sp>
</p:grpSp>
</Choice>

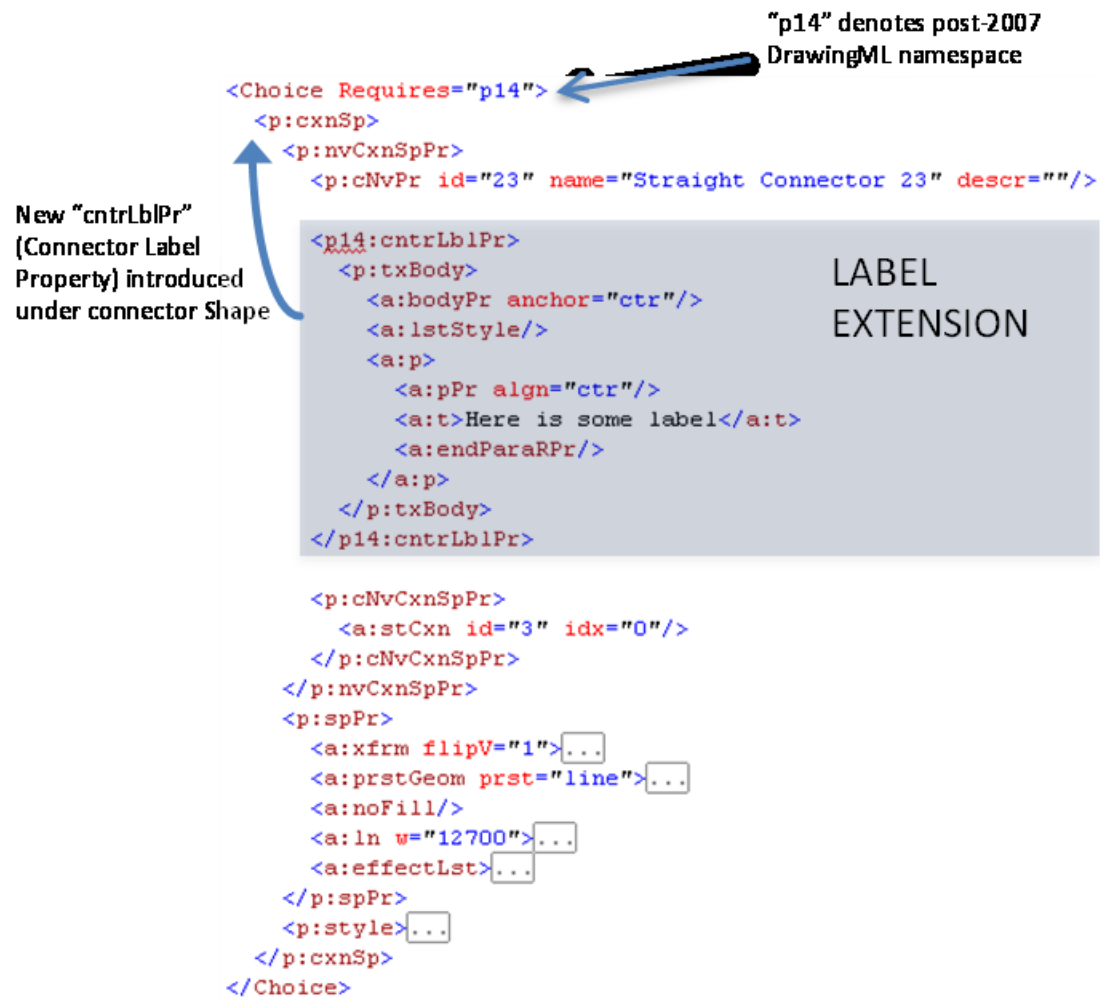
```

CONNECTOR

TEXTBOX

Note use of "p" to denote 2007 DrawingML namespace

PML 2009 has been extended such that we can represent a label natively:



The final markup putting these choices together is as follows:

```

<p:sld xmlns:a="http://schemas.openxmlformats.org/drawingml/2006/3/main"
  xmlns:r="http://schemas.openxmlformats.org/officeDocument/2006/relationships"
  xmlns:p="http://schemas.openxmlformats.org/presentationml/2006/3/main"
  xmlns:p14="http://schemas.openxmlformats.org/presentationml/2008/3/main">
  <p:cSld name="">
    <p:spTree>
      <p:nvGrpSpPr>...
      <p:grpSpPr>...
      <AlternateContent>
        <Choice Requires="p14">
          <!-- Uplevel Choice goes here -->
        </Choice>
        <Choice Requires="p">
          <!-- Downlevel Choice goes here -->
        </Choice>
      </AlternateContent>
    </p:spTree>
  </p:cSld>
  <p:clrMapOvr>...
  <p:timing>...
</p:sld>

```

AlternateContent Block

L.7.3.4.2.3 AlternateContent Round-Trip Behavior

AlternateContent maintains multiple representations for the same content. Consider an extreme case. Using the example above, let's suppose one edited the label using PML 2007. As PML 2007 wouldn't understand future representations, there is no possibility that it could keep PML 2009's markup consistent with the edit performed. Considering a simple case, let's suppose one deleted the label in its entirety. PML 2007 would only know how to delete the corresponding textbox, and would not know how to update the corresponding cntrLblPr.

If this textbox contained sensitive information, one might consider this a security leak. The user's belief is that the information in the textbox was deleted, yet it persists in an alternate representation.

To solve this problem, all AlternateContent choices are discarded when an edit is performed at the location the AlternateContent is placed. It is the consuming client's responsibility to replace the discarded AlternateContent with a new representation.

If an edit to the label occurred in PML 2007, the PML 2009 version is discarded.

If an edit occurs in PML 2009, since PML 2009 understands both PML 2007 and PML 2009 schemas, it is possible for PML 2009 to write an updated AlternateContent Block encompassing an update to both choices.

End of informative text.

Annex M.

(informative)

Differences Between ECMA-376:2012 and ECMA-376:2006

This annex is informative.

This annex highlights the differences between the versions of the Strict form of the Office Open XML schemas, as defined in ECMA-376:2012 and the schemas as defined by ECMA-376:2006.

M.1 WordprocessingML

The following changes occurred to the WordprocessingML schema:

- 58 compatibility settings were removed.
- The algorithmName, hashValue, saltValue, and spinCount attributes were added to documentProtection (§17.15.1.29) and writeProtection (§17.15.1.93)
- The allStyles, customStyles, latentStyles, stylesInUse, headingStyles, numberingStyles, tableStyles, directFormattingOnRuns, directFormattingOnParagraphs, directFormattingOnNumbering, directFormattingOnTables, clearFormatting, top3HeadingStyles, and visibleStyles attributes were added to the stylePaneFormatFilter element (§17.15.1.85)
- The bdo element (§17.3.2.3) was added
- The characterSet attribute was added to the charset element (§17.8.3.2)
- The compatSetting element (§17.15.3.4) was added
- The conformance attribute was added to document (§17.2.3)
- The content model of ST_HpsMeasure (§17.18.42) was modified to allow ST_PositiveUniversalMeasure (§22.9.2.12)
- The content model of ST_OnOff (§22.9.2.7) was changed to an xsd:boolean, removing the values on and off
- The content model of ST_SignedHpsMeasure (§17.18.80) was modified to allow ST_UniversalMeasure (§22.9.2.15)
- The content model of ST_SignedTwipsMeasure (§17.18.81) was modified to allow ST_UniversalMeasure (§22.9.2.15)
- The contentPart element (§17.3.3.2) was added
- The cryptProviderType, cryptAlgorithmClass, cryptAlgorithmType, cryptAlgorithmSid, cryptSpinCount, cryptProvider, algIdExt, algIdExtSource, cryptProviderTypeExt,

cryptProviderTypeExtSource, hash, and salt attributes were removed from documentProtection (§17.15.1.29) and writeProtection (§17.15.1.93)

- The dir element (§17.3.2.8) was added
- The end element (§17.4.10) was added
- The end element (§17.4.11) was added
- The end element (§17.4.12) was added
- The end element (§17.4.13) was added
- The firstRow, lastRow, firstColumn, lastColumn, noHBand, and noVBand attributes were added to the tblLook element (§17.4.54; §17.4.55)
- The firstRow, lastRow, firstColumn, lastColumn, oddVBand, evenVBand, oddHBand, evenHBand, firstRowFirstColumn, firstRowLastColumn, lastRowFirstColumn, and lastRowLastColumn attributes were added to the cnfStyle element (§17.3.1.8; §17.4.8; §17.4.7)
- The fldData element was removed
- The following enumeration values were added to the ST_Border simple type (§17.18.2): earth3, triangle1, triangle2, triangleCircle1, triangleCircle2, shapes1, shapes2, custom
- The following enumeration values were added to the ST_CalendarType simple type (§22.9.2.1): gregorianArabic, gregorianMeFrench, and gregorianUs.
- The following enumeration values were added to the ST_Jc simple type (§17.18.44): start, end
- The following enumeration values were added to the ST_NumberFormat simple type (§17.18.59): bahtText, dollarText, custom
- The following enumeration values were added to the ST_TabJc simple type (§17.18.84): start, end
- The following enumeration values were added to the ST_TextDirection simple type (§17.18.93): tb, r1, lr, tbV, r1V, and lrV.
- The following enumeration values were removed from the ST_Border simple type (§17.18.2): tribal1, tribal2, tribal3, tribal4, tribal5, tribal6
- The following enumeration values were removed from the ST_Jc simple type (§17.18.44): left, right
- The following enumeration values were removed from the ST_TabJc simple type (§17.18.84): left, right
- The following enumeration values were removed from the ST_TextDirection simple type (§17.18.93): btLr, lrTb, lrTbV, t1LrV, tbLrV, tbR1, and tbR1V.
- The fontSz attribute on the readModeInkLockDown element (§17.15.1.66) was modified to use ST_DecimalNumberOrPercent (§17.18.11)
- The format attribute was added to the numFmt element (§17.9.17)
- The hdrShapeDefaults element was removed
- The header element (§17.4.18) was added
- The headers element (§17.4.19) was added
- The id attribute was added to the left element (§17.6.7) and right element (§17.6.15)
- The id attribute was added to the tc element (§17.4.65)

- The id, bottomLeft, and bottomRight attributes were added to the bottom element (§17.6.2)
- The id, topLeft, and topRight attributes were added to the top element (§17.6.21)
- The jc element (§17.4.28) was modified to use the ST_JcTable simple type (§17.18.45)
- The label element (§17.5.2.19) was added
- The left element was removed
- The left, leftChars, right, rightChars attributes were added to the ind element (§17.3.1.12)
- The longDesc element (§17.15.2.23) was added
- The numberingChange element was removed
- The objectEmbed element (Part1, §17.3.3.20) was added
- The objectLink element (§17.3.3.21) was added
- The percent attribute on the zoom element (§17.15.1.94) was modified to use ST_DecimalNumberOrPercent (§17.18.11)
- The right element was removed
- The shapeDefaults element was removed
- The ST_ColorSchemeIndex simple type was renamed to ST_WmlColorSchemeIndex (§17.18.103)
- The ST_DecimalNumberOrPercent (§17.18.11) simple type was added
- The ST_Direction simple type (§17.18.12) was added
- The ST_DocType simple type (§17.18.19) was modified to allow any xsd:string
- The ST_JcTable simple type (§17.18.45) was added
- The ST_LangCode simple type was removed
- The ST_MailMergeDataType simple type (§17.18.54) was modified to allow any xsd:string
- The ST_ObjectDrawAspect simple type (§17.18.60) was added
- The ST_ObjectUpdateMode simple type (§17.18.61) was added
- The ST_StyleSort simple type (§17.18.82) was added
- The ST_UnqualifiedPercentage simple type (Part 4, §9.10.8) was added
- The start element (§17.4.33) was added
- The start element (§17.4.34) was added
- The start element (§17.4.35) was added
- The start element (§17.4.36) was added
- The start, startChars, end, endChars attributes were added to the ind element (§17.3.1.12)
- The tabIndex element (§17.5.2.41) was added
- The target attribute was added to the optimizeForBrowser element (§17.15.2.33)
- The tblCaption element (§17.4.40) was added
- The tblDescription element (§17.4.46) was added
- The title element (§17.15.2.42) was added
- The uiCompat97To2003 element was removed
- The val attribute was removed from the charset element (§17.8.3.2)
- The val attribute was removed from the cnfStyle element (§17.3.1.8; §17.4.8; §17.4.7)
- The val attribute was removed from the stylePaneFormatFilter element (§17.15.1.85)

- The val attribute was removed from the tblLook element (§17.4.54; §17.4.55)
- The vendorID and dllVersions attributes on the activeWritingStyle element (§17.15.1.1) was modified to use ST_String (§22.9.2.13)

M.2 SpreadsheetML

The following changes occurred to the SpreadsheetML schema:

- The algorithmName, hashValue, saltValue, and spinCount attributes were added to sheetProtection (§18.3.1.85; §18.3.1.84), protectedRange (§18.3.1.71), sheetProtection (§18.3.1.85), and fileSharing (§18.2.12)
- The anchor element (§18.3.1.1) was added
- The characterSet attribute was added to the textPr element (§18.13.12) and the webPublishing element (§18.2.24)
- The codePage attribute was removed from the textPr element (§18.13.12)
- The codePage attribute was removed from the webPublishing element (§18.2.24)
- The commentPr element (§18.7.5) was added
- The conformance attribute was added to the workbook element (§18.2.27)
- The controlPr element (§18.3.1.20) was added
- The drawingHF element (§18.3.1.37) was added
- The end element (§18.8.16) was added
- The left element was deleted
- The leftLabels attribute was removed from the dataConsolidate element (§18.3.1.29)
- The legacyDrawing element was deleted
- The legacyDrawingHF element was deleted
- The objectPr element (§18.3.1.56) was added
- The paperHeight and paperWidth attributes were added to the pageSetup element (§18.3.1.63)
- The paperHeight and paperWidth attributes were added to the pageSetup element (§18.3.1.64)
- The password attribute was removed from sheetProtection (§18.3.1.85; §18.3.1.84), protectedRange (§18.3.1.71), and the sheetProtection elements (§18.3.1.85)
- The refreshedDate attribute was removed from the pivotCacheDefinition element (§18.10.1.67)
- The refreshedDateIso attribute was added to the pivotCacheDefinition element (§18.10.1.67)
- The reservationPassword attribute was removed from the fileSharing element (§18.2.12)
- The right element was deleted
- The Schema element (§18.16.4) now allows mixed content
- The SchemaLanguage attribute was added to the schema element (§18.16.4)
- The securityDescriptor attribute was removed from the protectedRange element (§18.3.1.71)
- The securityDescriptor element (§18.3.1.77) was added
- The shapeId attribute was added to the comment element (§18.7.3)

- The ST_CalendarType simple type (§22.9.2.1) now allows an enumeration value of saka
- The ST_CellType simple type (§18.18.11) now allows an enumeration value of d
- The ST_FileType simple type (§18.18.29) now allows enumeration values of lin and other
- The ST_PivotAreaType simple type (§18.18.58) no longer allows an enumeration value of topRight
- The ST_PivotAreaType simple type (§18.18.58) now allows an enumeration value of topEnd
- The ST_TextHAlign simple type (§18.18.80) was added
- The ST_TextVAlign simple type (§18.18.81) was added
- The ST_XmlDataType simple type (§18.18.93) was modified to allow any xsd:string
- The start element (§18.8.37) was added
- The startLabels attribute was added to the dataConsolidate element (§18.3.1.29)
- The val and maxVal attributes were removed from the dynamicFilter element (§18.3.2.5)
- The vallso and maxVallso attributes were added to the dynamicFilter element (§18.3.2.5)
- The workbookPassword, workbookPasswordCharacterSet, revisionsPassword, and revisionsPasswordCharacterSet attributes were removed from the workbookProtection element (§18.2.29)
- The workbookPasswordCharacterSet, revisionsPasswordCharacterSet, revisionsAlgorithmName, revisionsHashValue, revisionsSaltValue, revisionsSpinCount, workbookAlgorithmName, workbookHashValue, workbookSaltValue, and workbookSpinCount attributes were added to the workbookProtection element (§18.2.29)

M.3 PresentationML

The following changes occurred to the PresentationML schema:

- The algorithmName, hashValue, saltValue, and spinCount attributes were added to the modifyVerifier element (§19.2.1.19)
- The cryptProviderType, cryptAlgorithmClass, cryptAlgorithmType, cryptAlgorithmSid, cryptSpinCount, cryptProvider, algIdExt, algIdExtSource, cryptProviderTypeExt, cryptProviderTypeExtSource, hash, and salt attributes were removed from the modifyVerifier element (§19.2.1.19)
- The conformance attribute was added to the presentation element (§19.2.1.26)
- The contentPart element was added (§19.3.1.14)
- The pubBrowser attribute on the htmlPubPr element (Part 4, §11.2.1.1) was renamed target
- The spid attribute was removed from the oleObj element (§19.3.2.4) and the control element (§19.3.2.1)
- The ST_HtmlPublishWebBrowserSupport simple type was removed and replaced by xsd:string

M.4 DrawingML

M.4.1 DrawingML – Main

The following changes occurred to the DrawingML Main schema:

- The builtIn attribute was removed from the snd element (§19.5.68)
- The content model of ST_Coordinate (§20.1.10.16) was modified to allow ST_UniversalMeasure (§22.9.2.15)
- The content model of ST_Coordinate32 (§20.1.10.17) was modified to allow ST_UniversalMeasure (§22.9.2.15)
- The content model of ST_FixedPercentage (§20.1.10.24) was modified to allow ST_FixedPercentage (§22.9.2.3) and remove ST_FixedPercentageDecimal
- The content model of ST_Percentage (§20.1.10.40) was modified to allow ST_Percentage (§22.9.2.9) and remove ST_PercentageDecimal
- The content model of ST_PositiveFixedPercentage (§20.1.10.44) was modified to allow ST_PositiveFixedPercentage (§22.9.2.10) and remove ST_PositiveFixedPercentageDecimal
- The content model of ST_PositivePercentage (§20.1.10.45) was modified to allow ST_PositivePercentage (§22.9.2.11) and remove ST_PositivePercentageDecimal
- The contentType attribute was added to the videoFile (§20.1.3.6) and audioFile elements (§20.1.3.2)
- The header element (§21.1.3.3) was added
- The headers element (§21.1.3.4) was added
- The id attribute was added to the tc element (§21.1.3.16)
- The rtl element (§21.1.2.2.8) was added
- The ST_PresetColorVal simple type (§20.1.10.47) now allows enumeration values of: darkBlue, darkCyan, darkGoldenrod, darkGray, darkGrey, darkGreen, darkKhaki, darkMagenta, darkOliveGreen, darkOrange, darkOrchid, darkRed, darkSalmon, darkSeaGreen, darkSlateBlue, darkSlateGray, darkSlateGrey, darkTurquoise, darkViolet, dkGrey, dkSlateGrey, dimGrey, grey, lightBlue, lightCoral, lightCyan, lightGoldenrodYellow, lightGray, lightGrey, lightGreen, lightPink, lightSalmon, lightSeaGreen, lightSkyBlue, lightSlateGray, lightSlateGrey, lightSteelBlue, lightYellow, ltGrey, ltSlateGrey, mediumAquamarine, mediumBlue, mediumOrchid, mediumPurple, mediumSeaGreen, mediumSlateBlue, mediumSpringGreen, mediumTurquoise, mediumVioletRed, slateGrey
- The ST_TextFontScalePercent simple type was renamed to ST_TextFontScalePercentOrPercentString (§20.1.10.66) and modified to allow ST_Percentage (§22.9.2.9) and remove ST_TextFontScalePercent
- The ST_TextPoint simple type (§20.1.10.73) was modified to allow ST_UniversalMeasure (§22.9.2.15)

- The ST_TextSpacingPercent simple type was renamed to ST_TextSpacingPercentOrPercentString (§20.1.10.76) and modified to allow ST_Percentage (§22.9.2.9) and remove ST_TextSpacingPercent
- The title attribute was added to the cNvPr element (§20.1.2.2.8)

M.4.2 DrawingML – Chart

The following changes occurred to the Chart schema:

- The legacyDrawingHF element was removed
- The paperHeight and paperWidth attributes were added to the pageSetup element (§21.2.2.134)

M.4.3 DrawingML – Diagrams

The following changes occurred to the Diagram schema:

- The ST_HorizontalAlignment simple type was renamed to ST_DiagramHorizontalAlignment (§21.4.7.24)
- The ST_TextAlignment simple type was renamed to ST_DiagramTextAlignment (§21.4.7.25)

M.4.4 DrawingML – Spreadsheet Drawing

The following changes occurred to the Spreadsheet Drawing schema:

- The contentPart element (§20.5.2.12) was added

M.5 VML

All VML schemas have been removed.

M.6 Shared

M.6.1 Shared – Bibliography

The following changes occurred to the Bibliography schema:

- The ST_String255 simple type was removed and replaced by ST_String (§22.9.2.13)

M.6.2 Shared – Custom Properties Variant Types

The following changes occurred to the Custom Properties Variant Types schema:

- The cf element was removed
- The ST_Cf simple type was removed

M.6.3 Shared – Math

The following changes occurred to the Math schema:

- The ST_YAlign simple type (§22.9.2.20) now uses an enumeration value of bottom in place of bot, and allows values inside and outside
- The ST_XAlign simple type (§22.9.2.18) now allows values inside and outside
- The content model of ST_OnOff (§22.9.2.7) was changed to an xsd:boolean, removing the values on and off

M.6.4 Shared Simple Types

The following changes occurred to shared simple types:

- The ST_UniversalMeasure simple type (§22.9.2.15) was added
- The ST_Algorithm simple type (Part 4, §15.1.2.1) was removed
- The ST_Algorithm simple type (Part 4, §15.1.2.2) was removed
- The ST_CryptProv simple type (Part 4, §15.1.2.4) was removed
- The content model of ST_OnOff (§22.9.2.7) was changed to an xsd:boolean, removing the values on and off
- The content model of ST_TwipsMeasure (§22.9.2.14) was modified to allow ST_PositiveUniversalMeasure (§22.9.2.12)
- The ST_PositiveUniversalMeasure simple type (§22.9.2.12) was added
- The ST_Percentage simple type (§22.9.2.9) was added
- The ST_FixedPercentage simple type (§22.9.2.3) was added
- The ST_PositivePercentage simple type (§22.9.2.11) was added
- The ST_PositiveFixedPercentage simple type (§22.9.2.10) was added

M.7 Custom XML Schema References

The following changes occurred to the Custom XML Schema References schema:

- The schemaLanguage attribute was added to the schema element (§23.2.1)

End informative annex.

Bibliography

The following documents are useful references for implementers and users of this International Standard, in addition to the Normative References:

OLE DB, [http://msdn.microsoft.com/en-us/library/ms722784\(v=vs.85\).aspx](http://msdn.microsoft.com/en-us/library/ms722784(v=vs.85).aspx)

Information on elements, attributes, and OPC parts in ECMA-376 (OOXML),
<http://purl.oclc.org/ooxml/onlineInfomativeAnnexes>

Requirements for Japanese Text Layout, W3C Working Group Note 4 June 2009,
http://www.w3.org/TR/jlreq/#en-subheading1_6