



Create Custom Dashboards



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Introduction

This document explains dashboard theory and content and template design with Pentaho software. There are three ways to create a dashboard from Pentaho content:

Method	Purpose
Pentaho Dashboard Designer	Quick and easy dashboards based on existing Pentaho content produced by Report Designer, Interactive Reporting or Analyzer; or charts and data tables created through Dashboard Designer or the Data Source Wizard. Basically, Dashboard Designer enables you to display content in a predefined layout; there is a low degree of customization, but greater ease of use than other dashboard methodologies.
Community Dashboard Framework (CDF)	CDF is an open, community-supported framework for creating dashboards from XML configuration files and HTML templates. CDF dashboards must be created by hand from a text editor and are thus not nearly as quick and easy to create as Dashboard Designer dashboards, but there is much more flexibility with how content is displayed and refreshed.
Custom JSPs	If you are a Java Web developer (or have one on staff), you can create your own JSPs that display Pentaho content in whatever ways are possible through the BI Platform's content and service APIs. Of course this is the most difficult way to create a dashboard, but it allows you complete freedom in terms of the type of content that can be displayed, and how that content is laid out. Depending on the complexity of the design and the technical details of the implementation, a JSP dashboard could perform better than CDF or Dashboard Designer, but will take considerably longer to develop.

Dashboard Theory

Pentaho dashboards provide immediate insight into individual, departmental, or enterprise-wide performance by incorporating key metrics, reports, Analyzer reports, and/or custom content in a cohesive, visually rich interface.

Dashboards are useful for providing quick, at-a-glance key performance indicators (KPIs). Stoplight indicators are a staple of traditional dashboards; they indicate the status of a major KPI in terms of colors, or a dial on an analog gauge. Simple and colorful charts are just as useful for quick KPI analysis in dashboards. Typically you wouldn't provide a high level of detail in a dashboard -- that's what reports are for -- and even if some of your dashboard content is drillable, you probably wouldn't replace a good, detailed, drillable Analyzer report with a dashboard.

Dashboard Designer

This section contains information on Pentaho Dashboard Designer. If you don't know where to start with dashboards, read this section first.

Use Dashboard Designer

Creating a dashboard in Dashboard Designer is as simple as choosing a layout template, theme, and the content you want to display. In addition to displaying content generated from Interactive Reports and Analyzer, Dashboard Designer can also include these content types.

- **Charts:** simple bar, line, area, pie, and dial charts created with Chart Designer
- **Data Tables:** tabular data
- **URLs:** Web sites that you want to display in a dashboard panel

Dashboard Designer has dynamic filter controls, which enable dashboard viewers to change a dashboard's details by choosing different values from a drop-down list, and to control the content in one dashboard panel by changing the options in another. This is known as content linking.



Note: All graphics displayed in this section show the [Onyx](#) theme.

Create a New Dashboard

You must be logged into the User Console. Use these steps to create a new dashboard.

1. From the User Console **Home** page, click **Create New**, then select **Dashboard**.
2. On the bottom of the page, click the **Properties** tab, and enter a title for your dashboard page in the **Page Title** text box.
The name you entered appears on the top left corner of the dashboard. This name helps you identify the page if you want to edit, copy, or delete it later.
3. Click **Templates** to choose a dashboard layout.
A blank dashboard with the layout you selected appears.
4. Click **Theme** to choose a theme for your dashboard.
The theme you selected is applied to your dashboard.

You now have the basic framework for a Pentaho dashboard.

Work with the Chart Designer

The Chart Designer allows you to create bar, pie, line, dial, and area charts that can be added to a dashboard. Below are the general steps associated with creating a chart:

1. Select a data source.
2. Build a query.
3. Set the data definitions: values, series, category.
4. Select a chart type and theme.
5. Enter labels for the chart title, and x,y axes.
6. If applicable, adjust scaling and label rotation.
7. Place your chart in the dashboard.
8. Save your dashboard.

If you are new to charting, here are guidelines that may help you determine what type of chart is best suited for the data you want to present in your dashboard:

Bar Charts

If you want to compare items during a specific time period, consider using a bar chart. Key words to think about when creating a bar chart are *compare* or *rank*. For example if you want to compare items sold to show which one made the most profit, you might create a bar chart that ranks the products from the lowest to highest profit. The bar's length

determines its ranking; the label identifies the item. Bar chart data can be presented horizontally or vertically depending on your requirements.

Pie Charts

If you are comparing parts of a whole, consider using a pie chart. Key words associated with charts include, *portion*, *share*, and *percentage*. If for example, you want to demonstrate the proportion of the company's budget spent on health insurance, use a pie chart. To make the chart easier to read, limit the number of slices to five. Pie charts can also be *exploded*, which means certain slices are pulled away from the remainder of the chart for emphasis.

Line Charts

Line charts are useful for showing changes over time. Key words associated with data that is best suited for a line chart are *trend*, *growth*, and *decline*. If, for example, you want to show how product sales have changed over five years, use a line chart. The slope of the line helps users quickly identify the direction of the trend.

Dial Charts

Dial charts are often associated with Key Performance Indicators (KPIs). Dial charts are circular and contain a scale, a needle, and one or more a dial sectors. The dial sector is used to identify a specified area on a dial chart using a particular color. For example, you could have a dial plotting inventory with a minimum dial value of 10000 and a maximum dial value of 50000. There could be a red dial sector for the region between 2000 and 4000 indicating that if the needle is in this area, there is a danger of a supply inventory shortage.

Area Charts

Area charts can be used to show a comparison of the same thing during different points in time. Area charts are not designed to provide exact data but they do give users visual clues of the relative sizes of the items they are representing.

Rotate Chart Axis Labels

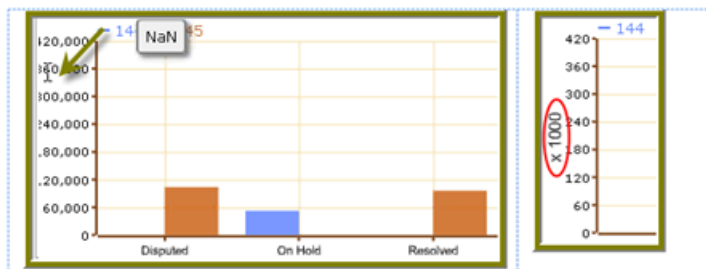
If your chart axis labels become unreadable because they are too long, **Label Rotation** may correct the problem.

1. In the Chart Designer, display your chart.
2. Under **Label Rotation**, choose **Diagonal** or **Vertical** and click **Apply**.
The labels display with the rotation you set.
3. Click **OK** to display the chart in the dashboard panel.

Correct Scaling Issues

Use the scaling feature in instances where numeric values in a chart are so long that they affect the display.

1. Preview your chart in the Chart Designer.
2. Under **Scale**, click to display the drop-down list of scaling options. In the example below, the scaling option used is "1000." Notice the change in the display of numeric values when scaling is applied. Users of the chart can see actual values when they hover over the bars in the chart.

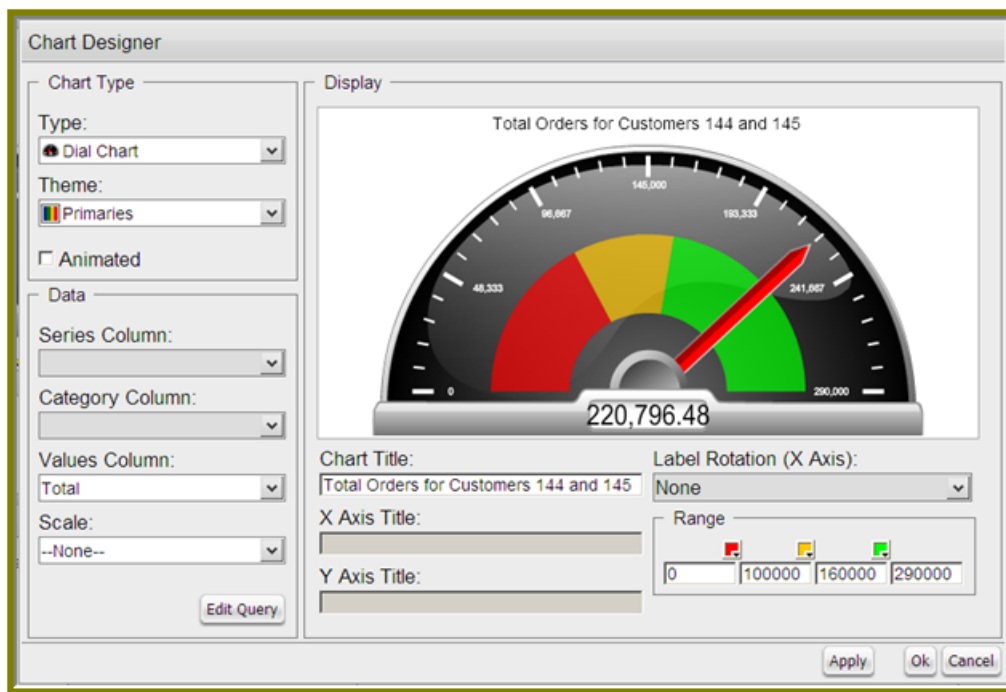


3. Click **OK** to display the chart in the dashboard.

The scaling feature is available for all chart types except pie.

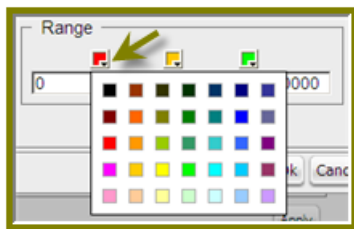
Work with Dial Charts

For dial charts to display correctly, you must enter values for your range and the chart title. In the example below, the dial chart preview is displaying ranges associated with sales. Notice that each dial sector is represented by a color, red, yellow, or green. The needle is positioned in the 220796.48 range, indicating that total orders, while not stellar, are not near the danger zone indicated by the red sector in the dial.



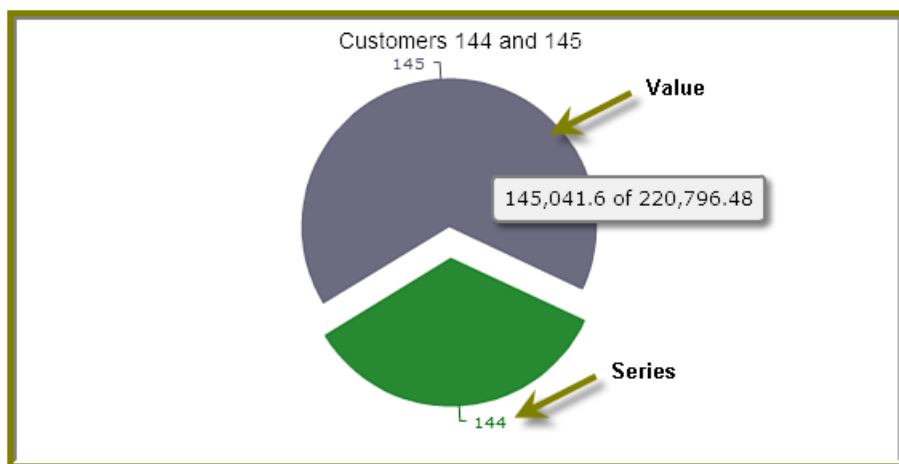
Changing Dial Sector Colors

You can change the color of a dial sector by clicking the small down arrow in the color boxes associated with Range. Select a color from the palette so that you can preview it on your dial chart. Click **Apply** to preview your dial chart. Click **OK** to place your dial chart into the dashboard.

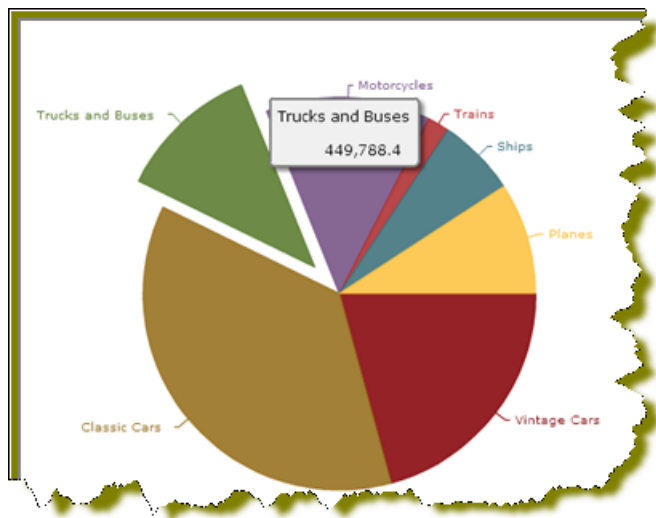


Work with Pie Charts

A pie chart gives dashboard consumers an immediate visual clue of the relative sizes of the shares of a whole. Categories are represented by individual slices. The size of the slice in a pie chart is determined by the value.



You can animate a pie chart if you want its pieces to be *exploded*, which means that the individual slices of the pie can be pulled away from the rest of the pie.



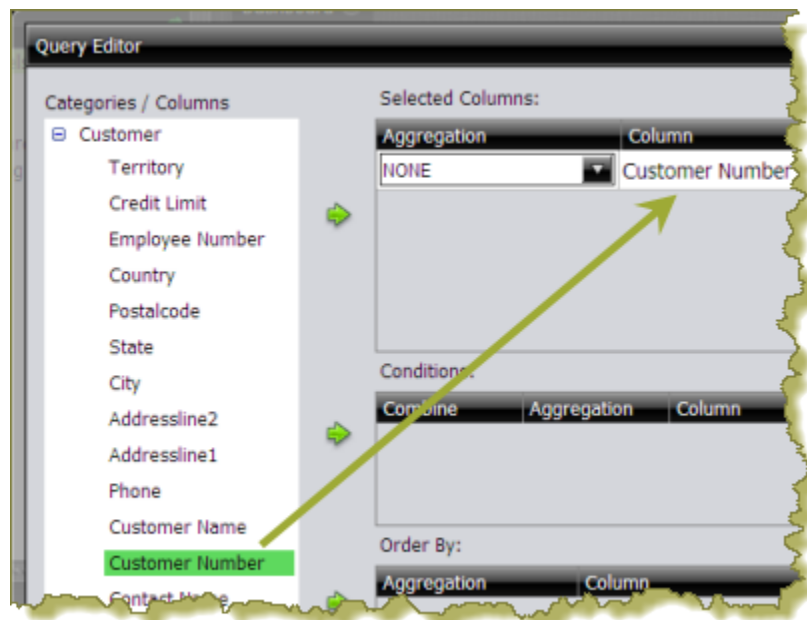
To animate a pie, enable **Animated** check box in the Chart Designer.

Add Data to a Chart

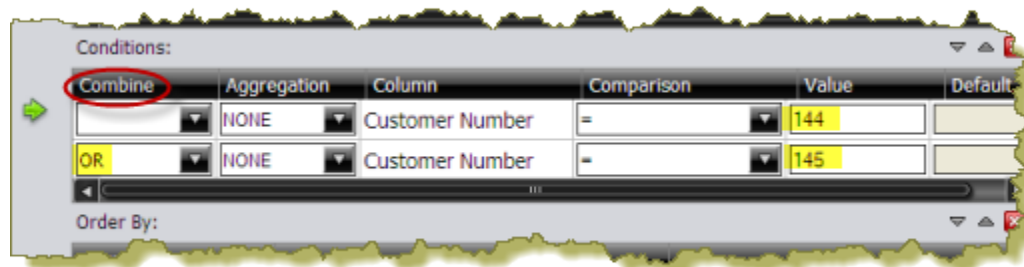
Before you can start creating a chart you must choose a data source that contains the data you want to use. You must then define the data that will be displayed in the chart. If you are unsure what chart type is best for displaying your data, see [Choosing the Correct Chart Type](#) for more information.

Use these steps to add data to your chart.

1. In the Dashboard, choose a dashboard panel and click (Insert) and choose **Chart**. The **Select a Data Source** dialog box appears.
2. Select the data source from the list of available choices. The data source contains the content you want to display in your chart. The **Query Editor** appears.
3. The Query Editor allows you to retrieve dynamic data from a database for display in a chart. Defining your query is the first step in ensuring that the correct data is selected. In the Query Editor, click (+) next to a category name to display its associated table columns.
4. Click the small green arrow to place the column name under **Selected Columns**. In the example below, the **Customernumber** column has been selected and moved under Selected Columns. Notice that the column names appear under Selected Columns. Continue adding columns as needed.



5. Now add the **Conditions**; these are your constraints that filter what you are choosing. You can add multiple conditions. In the example below, the search is limited to customer numbers.

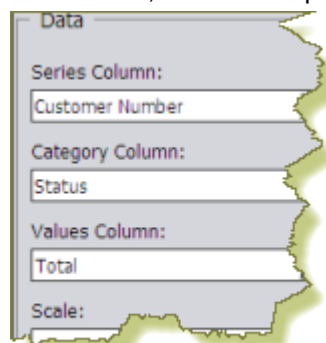


Under **Combine**, you can choose your constraint (and, or, and not, or not) from the drop-down list. Under **Comparisons** you can click the drop-down list to display options for comparisons, =, <, >, and so on; (for example, where the customer number is *equal* to 144 *or* 145). You can also choose an aggregation type from the drop-down list for table columns that contain numeric data. The table below contains a definition for each aggregate type:

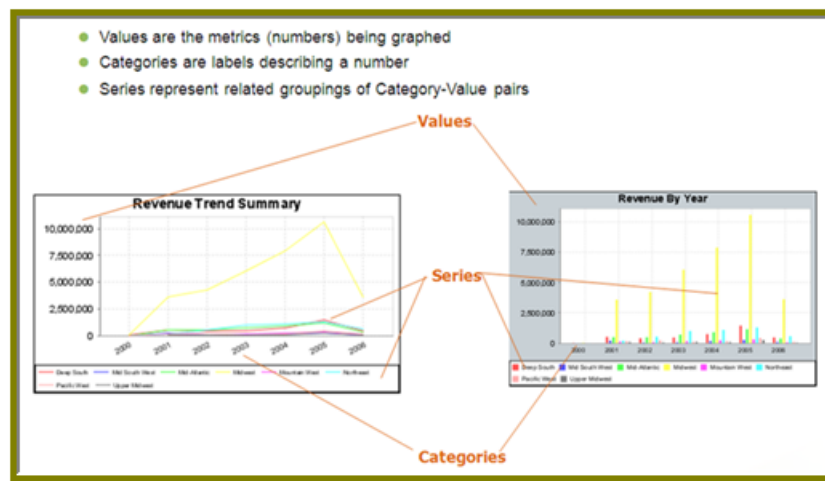
Aggregate Type	Description
SUM	Sums a column's values
COUNT	Counts a column's values
AVG	Averages a column's values
MIN	Selects the minimum column value
MAX	Selects the maximum column value

Click **Preview** at any time to view the data associated with your query.

6. Add the columns that you want to **Order By**. The ordering of the selected data is accomplished by one or more columns in a table. For example, you can sort the data by customer name and address.
7. Click **OK** in the Query Editor when you are done.
The Chart Designer appears.
8. Under **Data**, click the drop-down arrow to display and choose the table columns.



Data Definition	Description
Series Column	Series show up as the individual columns on a bar chart and as individual lines in a line chart. Area charts display each series as a point.
Category Column	Categories are displayed as bars or groups of bars on the x-axis (horizontal axis). In line charts, categories are usually associated with time periods. In area charts, the x-axis displays the category labels. If you don't want to display categories, choose None .
Values Column	The value is always numeric. The value determines the height of columns in a bar chart and the height of lines in a line chart. In area charts, the y-axis values determine the heights of the points.



A preview of the chart appears in a box in the upper-right corner of the Chart Designer as you choose your options.

9. Under **Chart Type**, click a chart type to choose it.

By default, pie and dial charts display in "animated" Flash mode. You can turn animation off by disabling the **Animated** check box in the Chart Designer. Animated charts bring focus to important aspects of your data. For example, animation allows you to bring out a data point if it reaches a critical value, such as high or low sales numbers.

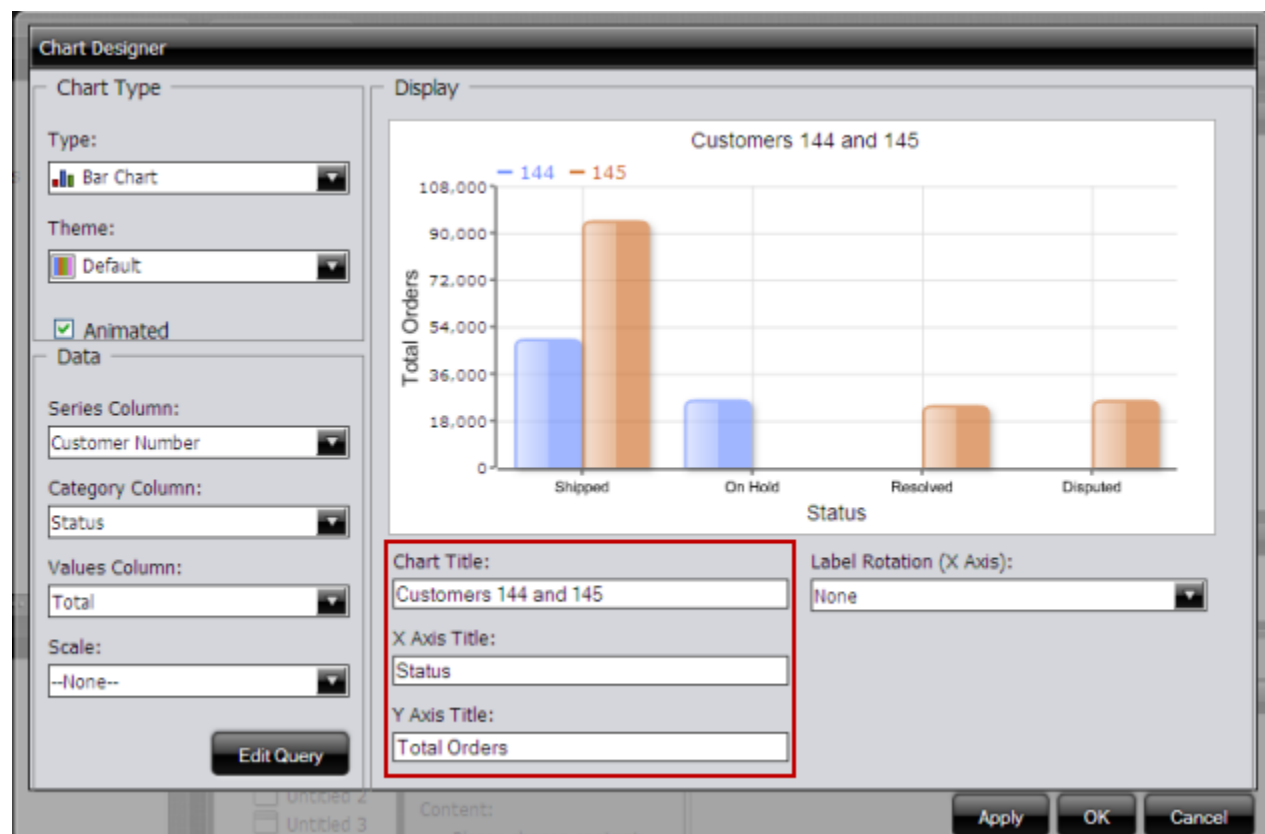
If you selected a pie or dial chart, see [Working with Pie Charts](#) or [Working with Dial Charts](#), respectively.

10. Under **Theme**, choose a theme from the list.

The theme is applied to your chart.

11. Enter the labels for the **Chart Title**, **X Axis Title** (horizontal axis), and **Y Axis Title** (vertical axis).

Entries are displayed in the chart preview.




12. Click **Apply** to see the chart preview.

13. Click **OK** display your chart in the dashboard panel.

Add a Data Table to a Dashboard

The Data Table feature allows you to display a tabular representation of a database query in a dashboard. It also allows you and consumers of the dashboard to manipulate the display of the data in the data table, while in the dashboard. For example, users can resize, sort, and change the order of columns. Follow the instructions below to add a data table to your dashboard.

1. Select a panel in the Dashboard Designer.
2. Click  (Insert) and choose **Data Table**.
The **Select a Data Source** dialog box appears.
3. Select a data source from the list of available data sources and click **OK**.
The Query Editor opens.
4. Begin building your query. Click (+) next to the category name to display its associated table columns. When the column names appear, click to choose the column that contains the data you want displayed in your data table.
5. Click the small yellow arrow to place the column name under **Selected Columns**.
6. Now add the **Conditions**; these are your constraints that filter what you are choosing. You can add multiple conditions.
Under **Combine**, you can choose your constraint (and, or, and not, or not) from the drop-down list. Under **Comparisons** you can click the drop-down list to display options for comparisons, =, <, >, and so on; (for example, where the customer number is *equal* to 144 *or* 145). You can also choose an aggregation type from the drop-down list for table columns that contain numeric data. The table below contains a definition for each aggregate type:

Aggregate Type	Description
SUM	Sums a column's values
COUNT	Counts a column's values
AVG	Averages a column's values
MIN	Selects the minimum column value
MAX	Selects the maximum column value

Click **Preview** at any time to view the data associated with your query.

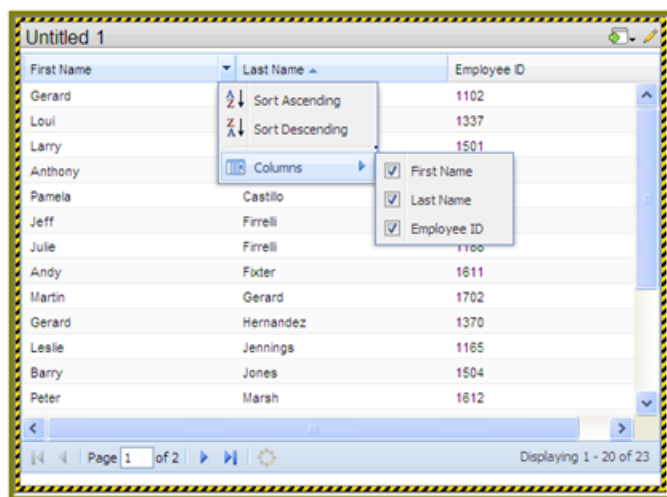
7. Add the columns that you want to **Order By**. The ordering of the selected data is accomplished by one or more columns in a table. For example, you can sort the data by customer name and address.
8. Click **OK** in the Query Editor when you are done.
The Data Table appears in the dashboard panel.

Update the Data Table Display

You can edit the data table display directly in the dashboard panel.

Sorting Column Data

To change the sort order data under a column, click the drop-down arrow in the header and choose **Sort Ascending** or **Sort Descending**. You can also hide one or more columns by disabling the appropriate check boxes next to the column names.

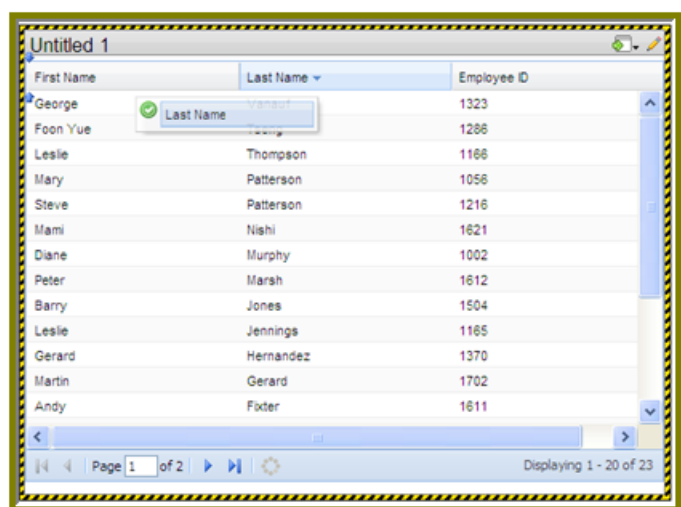


Adjusting Column Width

You can adjust the width of a column by clicking the right border of the column header and dragging it to the right or left. Release the mouse button when you are done.

Moving Columns

To move the placement of a column, click and drag the column it to the appropriate location in the Data Table as shown in the example below:




Paginating

The pagination feature allows you to page through a large number of records.

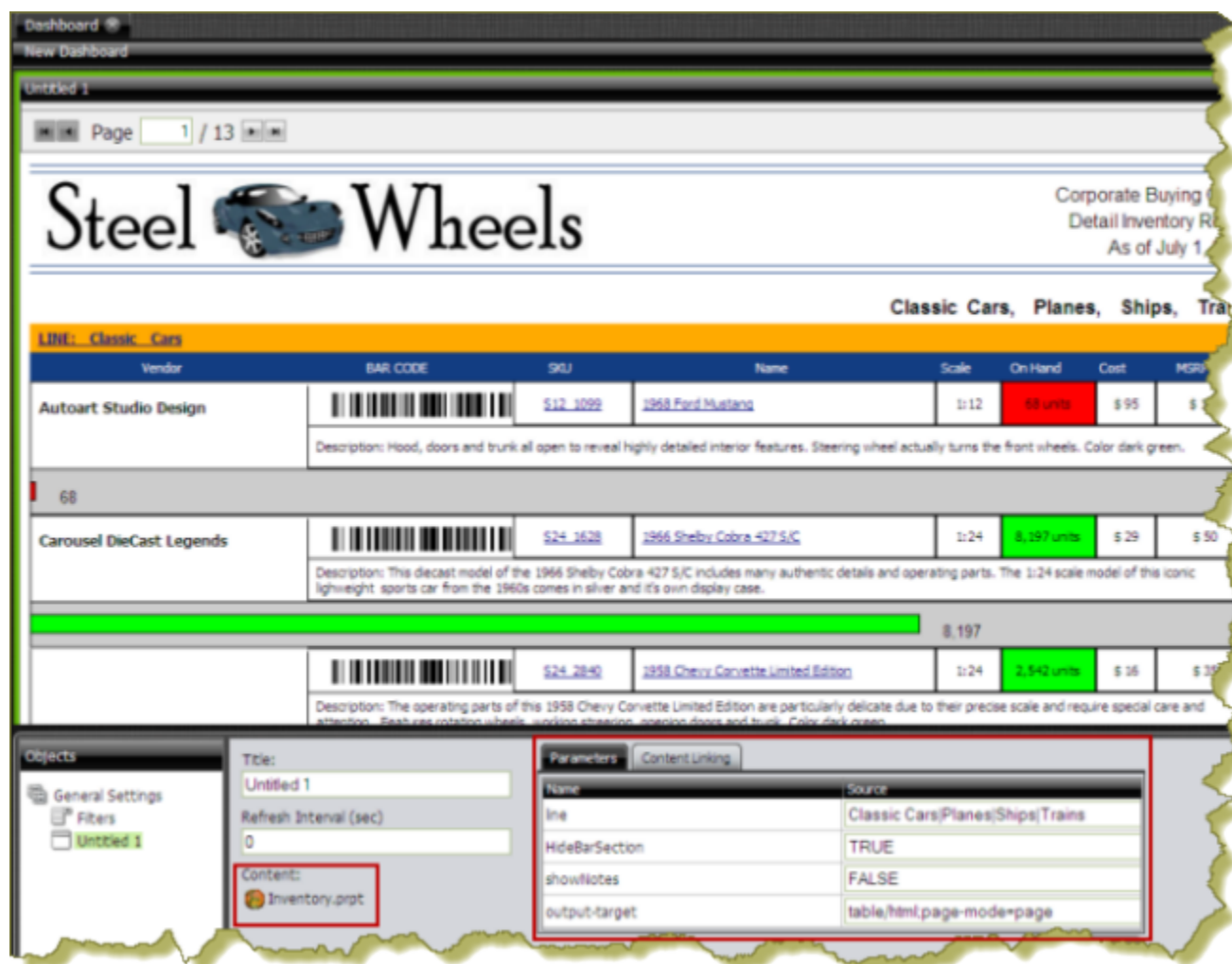
First Name	Last Name	Employee ID
Gerard		1102
Loui		1337
Larry		1501
Anthony		
Pamela	Castillo	
Jeff	Firrelli	
Julie	Firrelli	1100
Andy	Fixter	1611
Martin	Gerard	1702
Gerard	Hernandez	1370
Leslie	Jennings	1165
Barry	Jones	1504
Peter	Marsh	1612

Add a Report Designer Report to a Dashboard

Use these steps to add a report created with Report Designer.

1. Select a panel in the Dashboard Designer.
2. Click  (Insert) and choose **File**.
A browser window opens.
3. Locate the appropriate report file.
4. Click **Select** to place the report inside the dashboard panel.

Pagination control arrows at the top of a report allows you to scroll through long reports. Notice that the report file name, *Inventory.prpt*, appears under **Content:** in the dashboard edit pane in the sample below. This sample report contains parameters. You can enter values manually and link them to a dashboard filter in the text boxes under **Source**. When the report renders again, the parameter value(s) you entered are included in the report.



Important: If you choose a Report Designer file to place in a dashboard, but do not supply values for required parameters, the report will show up blank.



Add an Analyzer Report to a Dashboard

Use these steps to display an Analyzer report in a dashboard.

1. Select a panel in the Dashboard Designer.
2. Click **Insert** and choose **File**.
3. Locate the appropriate Analyzer report and click **Select**.
The Analyzer Report appears inside the dashboard panel.

Add a Web Site to a Dashboard

Use these steps to display contents of a Web site in a dashboard panel.

1. Select a panel in the Dashboard Designer.
2. Click  (Insert) and choose **URL**.
The **Enter Web site** dialog box appears.
3. Enter the Web site URL in the text box and click **OK**.
4. If applicable, click  (Edit) to make changes.
5. Save your dashboard when you are done.

Use Prompts on Dashboards

Prompts display a subset of data based on the dashboard user's point of view. For example, a European user may only want to see EMEA region sales data, whereas the dashboard's default region is the NA region. To ensure that a prompt

links to the correct content in a dashboard, the content to which you are linking (data table or chart) must contain at least one parameter.

Below are general instructions below for adding prompts to your dashboard:

1. In the dashboard page, choose **Edit** (the pencil icon), which will make the **Objects** pane appear.
2. Under **General Settings**, choose **Prompts**.
The **Prompts** pane appears on the right. No prompts are listed if this is the first time you are assigning prompts.
3. To display a prompt toolbar to users of the dashboard, enable **Show Prompt Toolbar**.
The prompt toolbar appears at the top of the dashboard.
4. Click the **Add** button to start adding prompts.
The **Prompts** dialog box appears.
5. In the **Prompts** dialog box, enter a display name for the control label. For example, "Region."
6. Enable **Display Name as Control Label** if you want users to see the display name in the prompts toolbar.
7. Select your control type. Control types define how your prompt values are selected; for example, in a drop down list, radio button, check box, and so on.

The table below contains a description of each control type.

Control Type	Description
Drop Down	Users choose a prompt value from a drop-down list.
List	Users choose a prompt value from a scrolling list. This prompt control supports multiple selections.
Radio button	Users click a radio button to choose a prompt value.
Check box	Users enable a check box to choose a prompt value. This prompt control supports multiple selections.
Button	User click a button to choose a prompt value. This prompt control supports multiple selections.
Text Field	Users enter a text string or number into a text field manually.
Date Picker	Users examine prompt values based on calendar date.

Your dashboard now has a prompt.

If you plan to provide hard-coded names and values for your dashboard users, or produce a dynamic prompt list, continue on to the next few sections.

Add a Prompt to a Dashboard

You can create a prompt tool bar that enables users to refine report results in a dashboard. First create the **Prompt Toolbar**. Then customize the toolbar so that the appropriate options appear.

Creating a Prompt Toolbar for Dashboards

1. Open a dashboard that contains at least one parameterized report.
2. Click the **Edit Content** icon to open the editing options in the dashboard.
3. In the bottom section, inside the **Objects** pane, choose **Prompts** to access the Prompt pane.
4. Click **Show Prompt Toolbar** to display the prompt toolbar to dashboard users.
5. Click **Add** to add a prompt.
The **Prompt** dialog box appears.
6. In the **Name** field, enter the title for the prompt toolbar.
7. In the **Control** box, click the format for the prompt options. For example, you can choose the **Drop Down** control if you want a list that appears when users click the first option.
8. Ensure that **Static List** is selected under **Type**.

Customizing a Prompt Toolbar for Dashboards

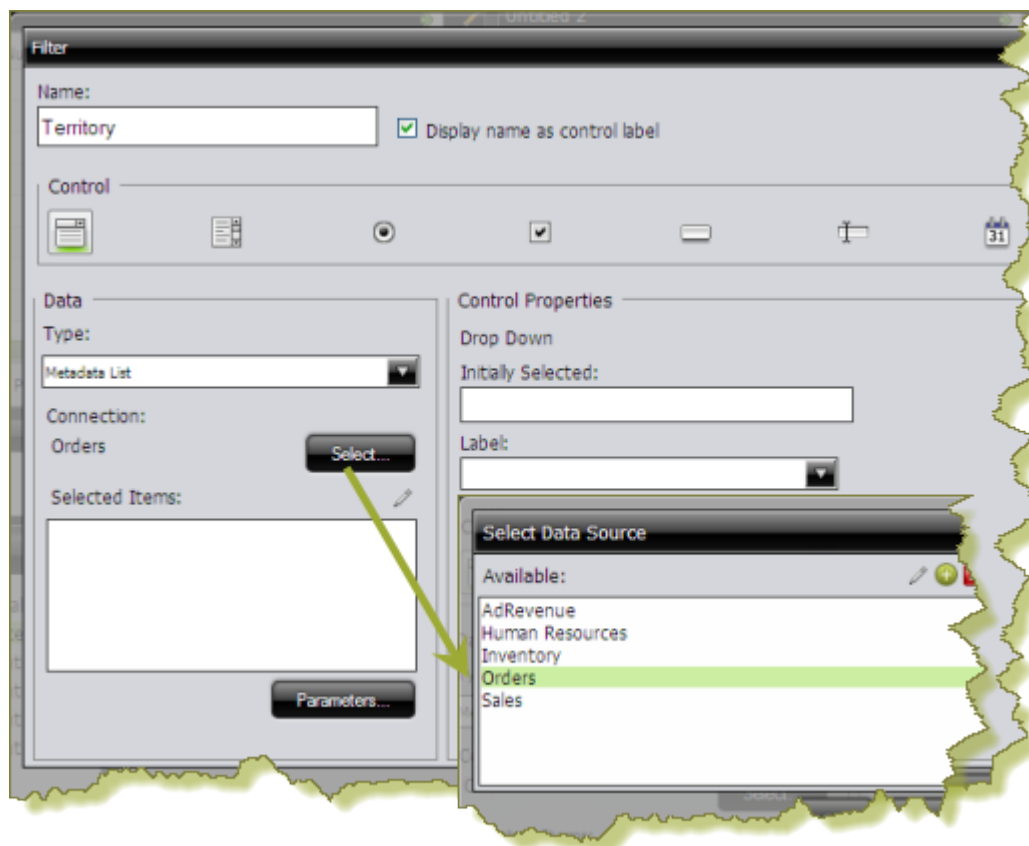
1. In the **Data** box, click **Add**.
The **List Value** dialog box appears.

2. In the **Label** field, enter the option name as you want it to appear to dashboard users.
3. In the **Value** field, enter the parameter source name. For example, using the Steel Wheels sample, enter `Classic Cars`.
4. Add labels and values for each parameter you want to filter. Click **Close** to exit the **List Value** dialog box.
If you are filtering an Analyzer report and using a static list, you can add the option **All**. This option drops the filter from the report and shows all values.
5. In the **Control Properties** box, under **Initially Selected**:, choose which item you want to appear first in the prompt list. Choose **Use First Value** to set the default to the first value in the list, or you can choose **Specify** if you want a specific value to appear first.
6. Click **OK**.
7. In the **Objects** pane, choose the title of the report you want to filter. Click the **Parameters** tab and choose the correct **Source** for the parameter from the list. The source should be the name of your prompt.
8. Click **Save**.

Create a Metadata List

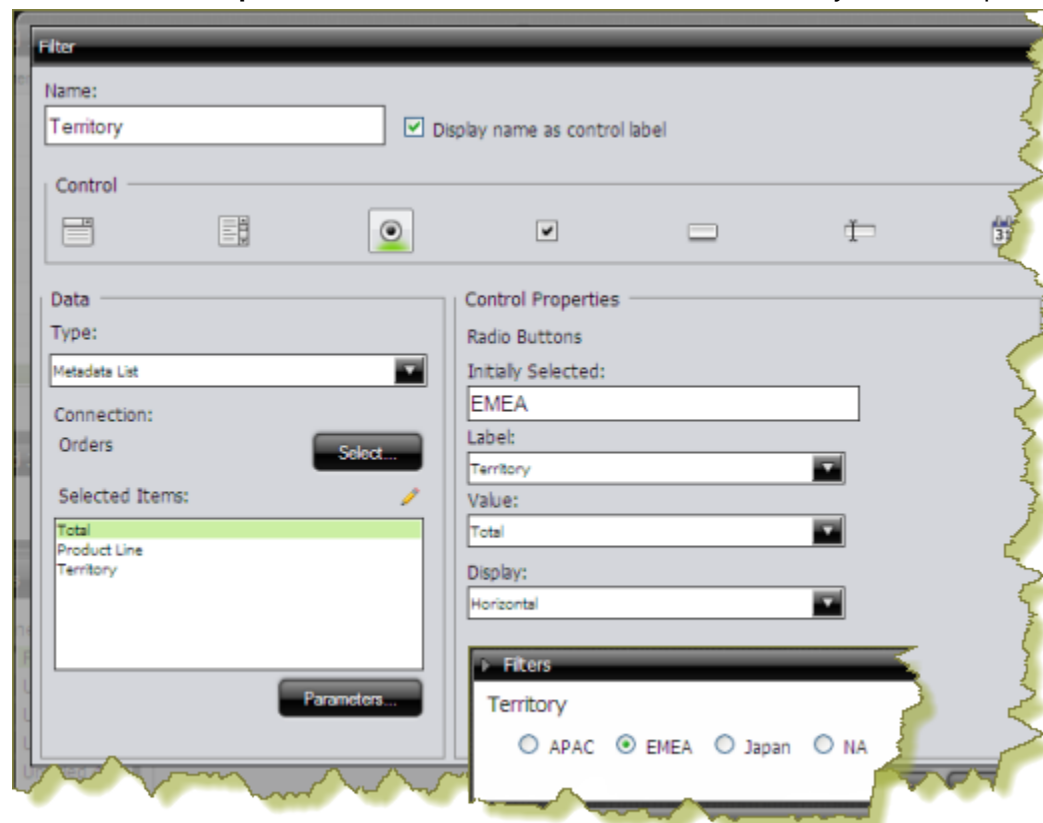
You must have a data table or chart that contains at least one parameter for your prompt control to function correctly.

When you create a Metadata List, you are defining a query to retrieve a list of display names and corresponding values from a metadata data source provided by your administrator.



1. In the dashboard page, under **General Settings**, choose **Prompts**.
The Prompt Editor appears on the right. No prompts are listed if this is the first time you are assigning prompts.
2. To display a prompt toolbar to users of the dashboard, enable **Show Prompt Toolbar**.
A placeholder for the prompt toolbar appears at the top of the dashboard.
3. Click **+** (Add) to add a prompt.
The **Prompts** dialog box appears.
4. In the **Prompts** dialog box, enter a **Name** for your prompt.
5. Under **Data Type**, choose **Metadata List**.
6. Click **Select** to choose the data source that contains the content you need to set options from the drop-down list and click **OK**.
The **Query Editor** opens.

7. In the **Query Editor**, build a query to choose either a single column (that represents both a name and a value), or two columns representing the display names and corresponding values.
If a single column query is defined, the values of that column will be used for both the display names and the values.
8. Click **OK** to exit the Query Editor.
Your options appear under **Selected Items** in the Prompts dialog box.
9. Under **Control Properties**, enter a **Default Label/Value** for the *initially selected* option in your prompt control.

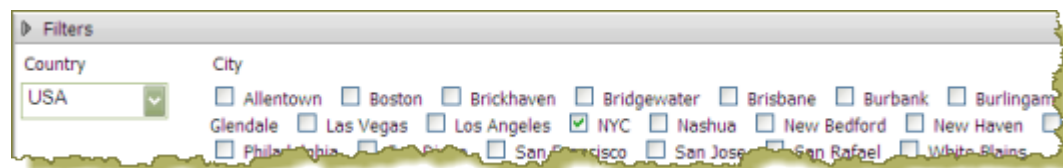


10. Select a **Label** to display in the prompt control; this is the user-friendly name that users will see in the dashboard.
11. Select the **Value**; this is the value in the database that is associated with the Label you selected in the previous step.
12. If applicable, choose your **Display** type from the list.
Some prompt controls allow you to choose the position of your prompt options. If you have a long list of options, for example, a list of cities, options may not appear correctly in the user console unless you change the Display type to **Horizontal**.
13. Click **OK**.

The list of values appear in the prompts toolbar in the dashboard.

Create a Cascading Prompt

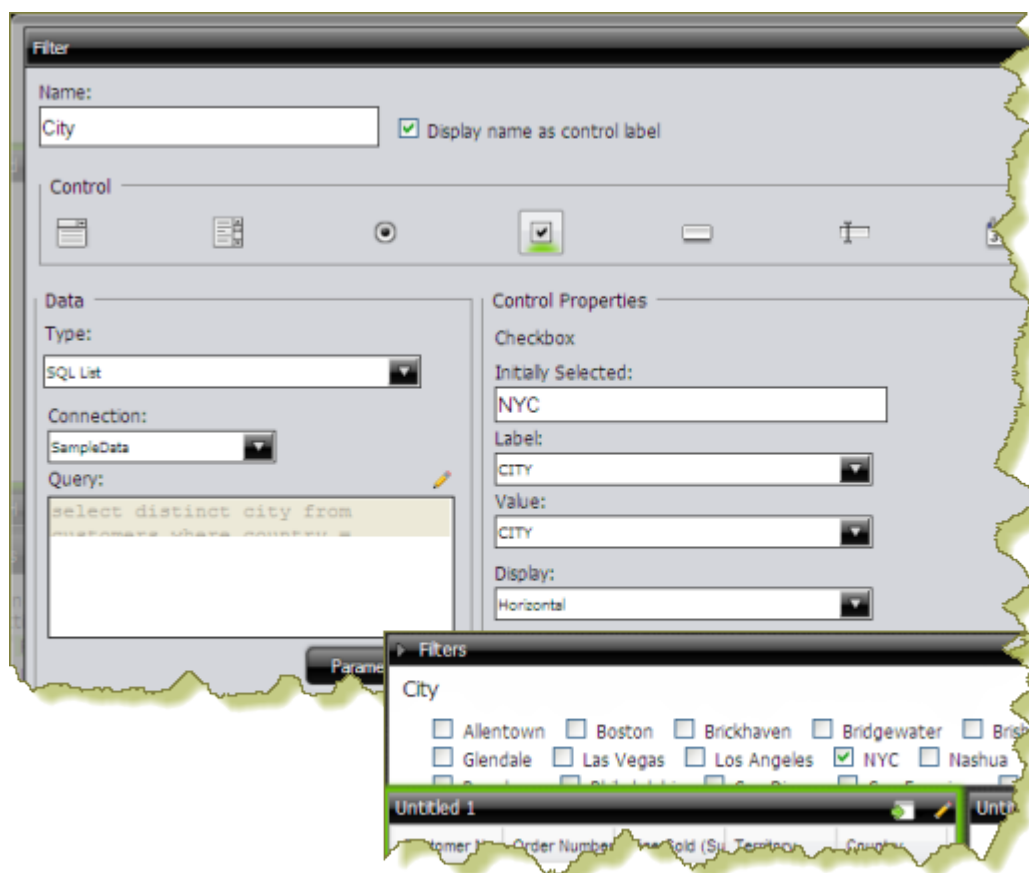
A cascading prompt changes based on a value a user selects. When the value in the drop down list, (Country), changes, the prompt is automatically applied to the second prompt, (City) thus changing its values.



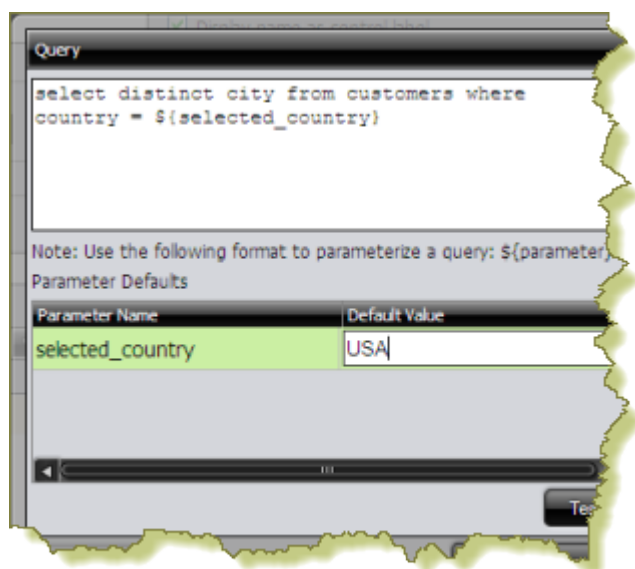
The example above was created using a Metadata List for the drop-down prompt (Country).



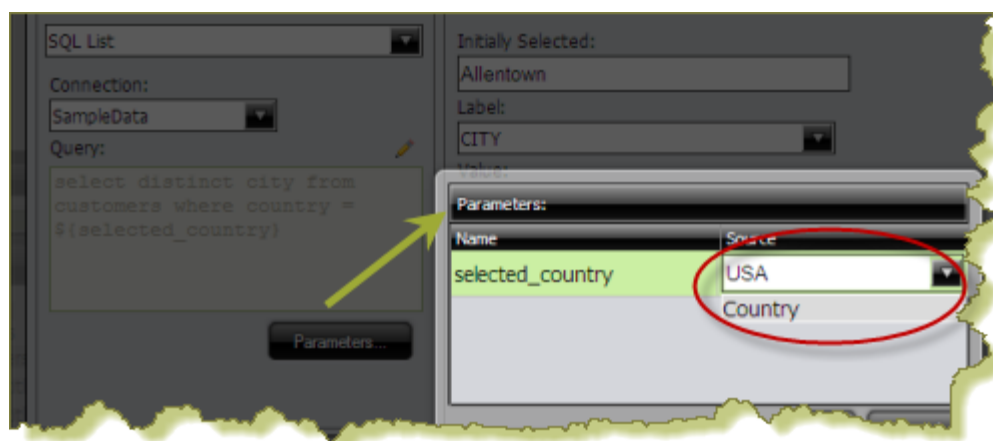
A SQL List that included a parameter, `${selected_country}`, in its associated query was used for the check box prompt (City).



The **Default Value** for the **selected_country** parameter was set to **USA** with New York City (NYC) as the initially selected value for the check box prompt.



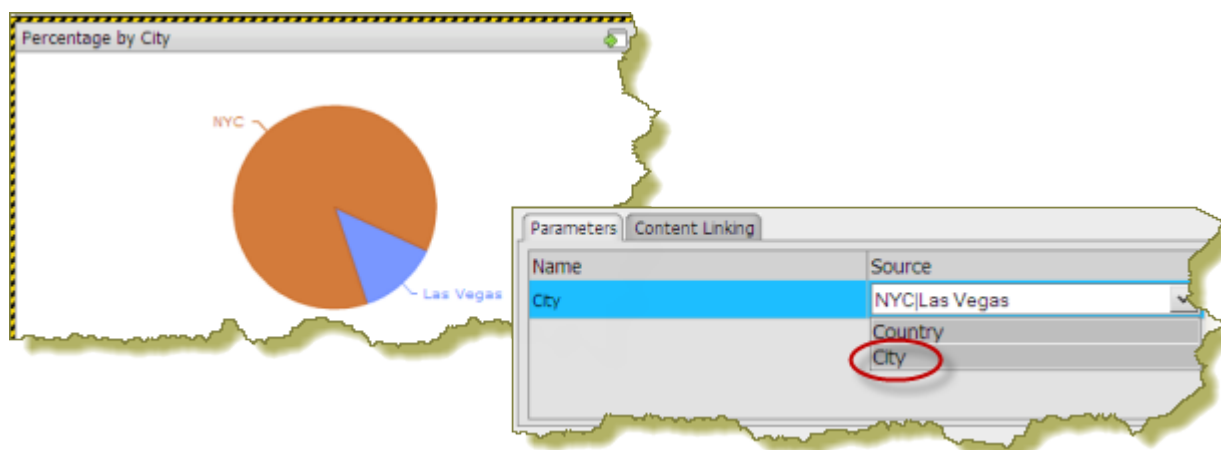
To link the City prompt to the Country prompt, another **Source** for the **selected_country** parameter was chosen. The alternate source is the **Country** prompt.



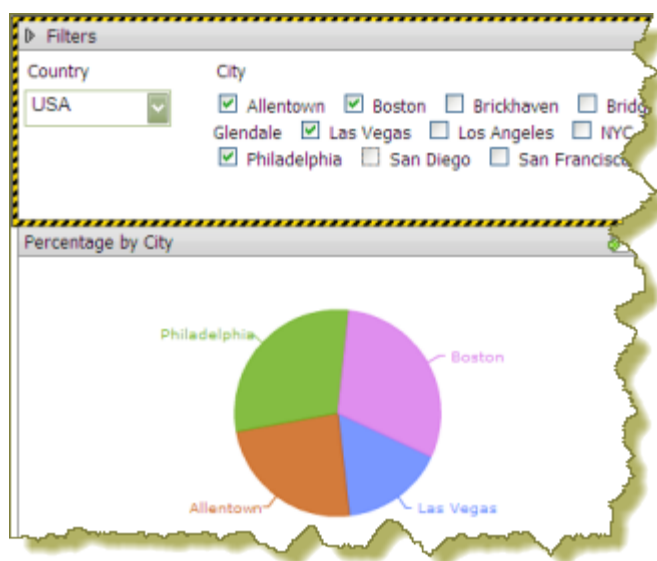
When the prompts are linked, users can choose a country and then choose a city (or cities) in the country of their choice.

Using this example, the report designer can now add a data table, chart, or other content in the dashboard that can be driven by the prompt he or she just created. Suppose the designer decides to add a pie chart to the dashboard. The pie chart will display the percentage of sales per city.

In the Query Editor, the report designer creates a parameter, **{City}**, with an extended default value: **NYC|Las Vegas**. The resulting pie chart displays values for New York City and Las Vegas. Under the Parameters tab associated with the pie chart, the **Source** value for the City parameter is changed to the **City** prompt.



When the report is saved, users of the dashboard can see results for a country and multiple cities in that country.



Link Dashboard Prompts to Analyzer Parameters

This process only applies to dashboards that include parameterized Analyzer reports. You must have an Analyzer report with a query parameter in it in order to proceed.

The instructions below explain how to parameterize an Analyzer report.

1. In Analyzer, choose a field in your report to which you want to link; then, right-click and choose **Filter**.

In the example below, data will be filtered by **Territory**.

Territory	Line			
	Classic Cars	Motorcycles	Planes	Ships
	Sales	Sales	Sales	Sales
APAC	193,086	89,969	74,854	4,176
	167,198	99,849	46,572	34,176
	132,890	4,176	-	14,176
	101,459	26,048	17,860	9,176
EMEA	20,137	-	5,625	31,176
	157,182	-	7,586	35,176
	153,552	47,867	34,375	29,176
	388,951	226,390	108,156	66,176
	148,315	7,498	23,001	5,176
	31,689	4,953	11,784	1,176
Show Subtotals	133,183	11,609	113,718	17,176
Tell me about...	134,787	51,769	29,501	12,176
Remove from Report	476,165	74,635	89,986	12,176

- In the **Filter** dialog box, enter a name for the parameter in the **Parameter Name** text box and click the check box to enable it.

Showing 5 values

☒ TERRITORY_PARAM Parameter Name

- Select the values you want associated with the parameter. Use the arrows to add values to the box on the right.

Filter on Territory

☒ Select from a list (Includes, Excludes)

☐ Match a specific string (Contains, Doesn't Contain)

Choose values from list:

Currently **Included**

- ☒ APAC
- ☒ EMEA
- ☒ Japan
- ☒ NA

- Click **OK** to exit the Filter dialog box.
- Save your Analyzer report.

In the upper left corner of the report, you can see that a filter is in use. Click  (Edit) to edit your filter; click  to delete the filter.

1 Filter in use

Territory includes APAC, EMEA, Japan and NA

		Line	
		Classic Cars	Motorcycles
Territory	Country	Sales	Sales
	Australia	193,086	89,9
APAC	New Zealand	167,198	99

6. Create a dashboard and drag the Analyzer report into a panel.

The name of the parameter appears in the lower portion of the dashboard under **Parameters**.

7. Add a filter to the dashboard based on the parameter you created in your Analyzer report.

The filter appears in the dashboard.

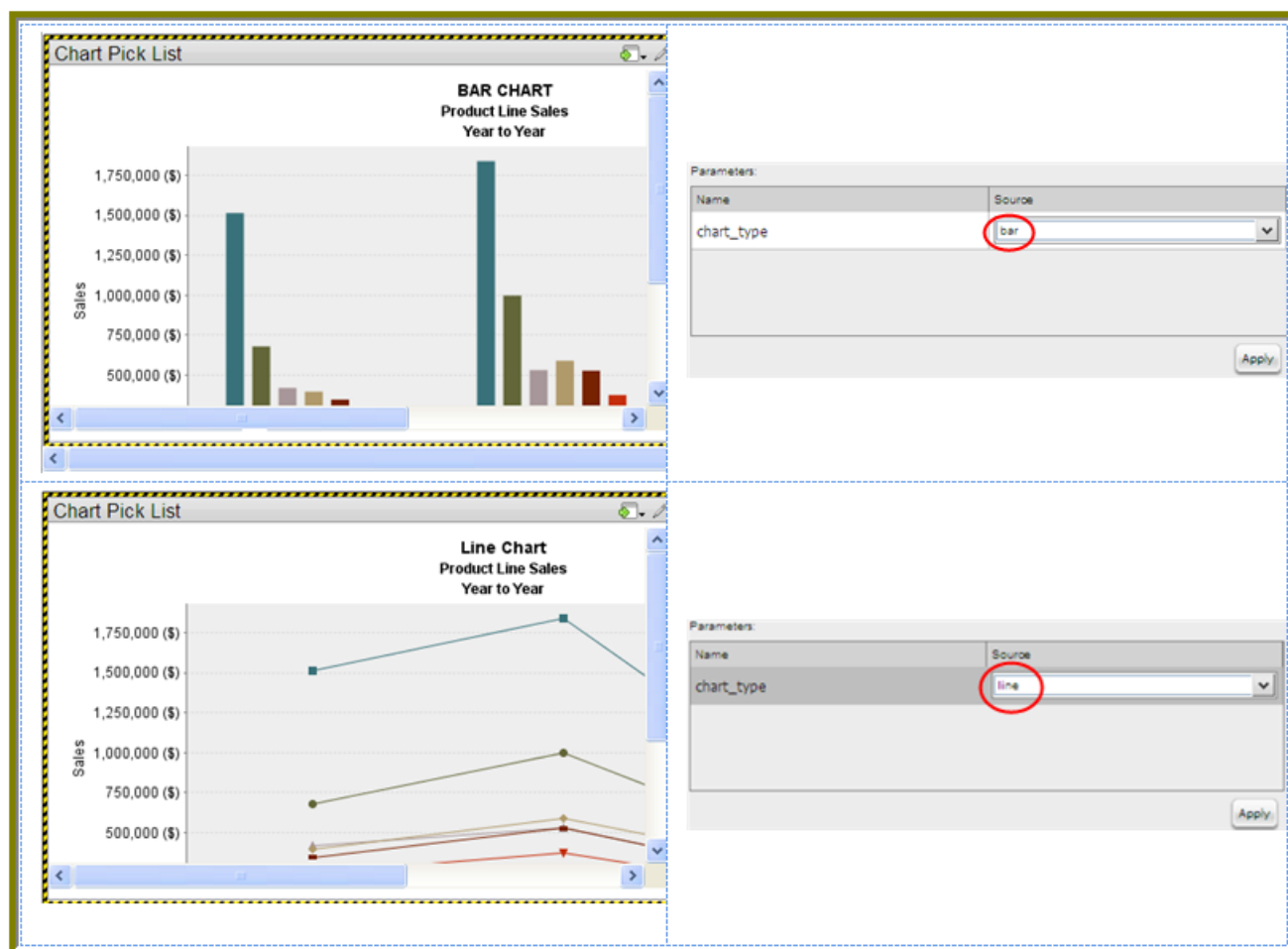
Edit Prompts

You can edit prompts as needed. Use these steps to edit prompts.

1. Locate the prompts pane at the top of the panes in the dashboard.
2. Located the different prompts and the drop-down menus next to them.
3. Select the prompt you want to edit and choose an alternative prompt from the drop down menu.
The prompt changes, causing the graphs and charts in the dashboard to change appropriately.

Dashboard Parameters

If you are placing a file, such as an .xaction or .prpt, inside a dashboard panel, it is possible that the author of the file defined meaningful parameters for the content. If previously defined, the parameters and their associated default values, appear under **Parameters** in the edit pane of the dashboard. In the example below, when the chart initially rendered, it displayed a parameter called, "chart_type" with a default value called, "bar." A user can change the value of the parameter to see the content rendered as a pie, line, or area chart.



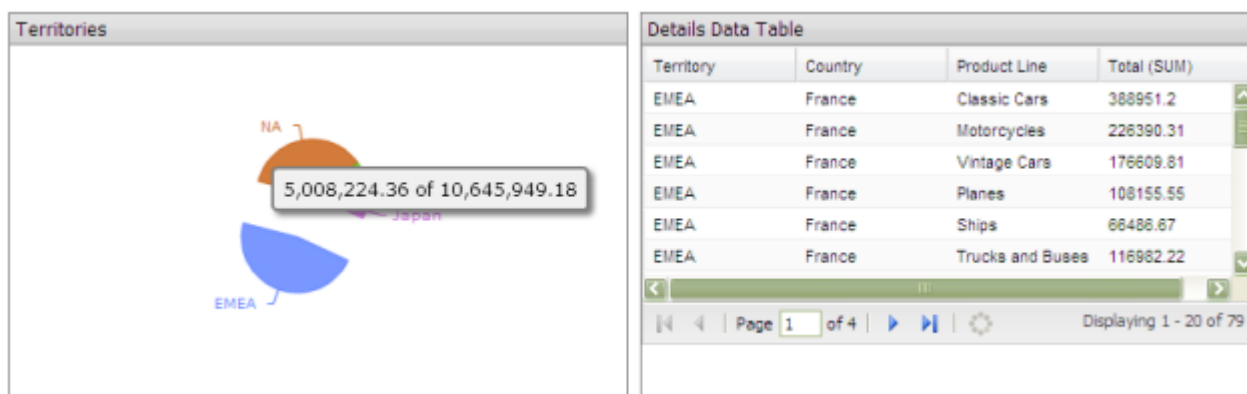
Parameter names are "hard-coded," in the file; that means they cannot be changed. Neither can you change the number of parameters associated with a file. When you create a chart using the Chart Designer, embed a URL into a dashboard, or create a data table, you can change both the name and value of a parameter.

In Windows, the URL Parameters have a maximum limit of 2,048 characters, minus the number of characters in the actual path.

Create Chart or Data Table Parameters With the Query Editor

When you place a chart in a dashboard panel, you use the Query Editor to retrieve data from a database for display on your chart or data table. If applicable, you can add conditions or constraints that filter the data so that the chart or data table displays the information you want dashboard consumers to see.

Using parameters is critical if you plan on using dashboard prompts or linking content in one dashboard panel to content on another dashboard panel. For example, suppose you create a pie chart and you want to filter details associated with an exploded pie slice in the adjoining data table as shown in the example below. In this instance, you must use a parameter that allows the data table to update when a dashboard consumer clicks on a pie slice. Optionally, you can parameterize the query condition so that the content is updated based on a user interaction, such as changing a prompt value.



To create a parameter, in the **Value** field, enter the name of the parameter inside curly braces, as in **{Parameter Name}**. In the example below, the designer created a parameter called, **{TERRITORY}**; the default value, or source, for the parameter is, "NA" (North America). When a chart or data table renders, it displays data associated with North America. Remember that this is a *default value*. When you enclose a parameter name with curly braces, you are creating a *parameter query*. That means, that users can change the query dynamically by replacing the default, "NA," with a different territory acronym, (for example, EMEA), when the query runs.

Combine	Aggregation	Column	Comparison	Value	Default
	NONE	Territory	exactly matches	{TERRITORY}	NA

You can define multiple default parameter values by adding a pipe (|) between the values, as in NA|EMEA|APAC.

Suppose a dashboard designer chooses to limit the data to North America (NA) exclusively? In this instance, he or she would not include the curly braces around "NA," (as shown in the example below), and **Default** (value) is disabled. This is an example of a static query.

Combine	Aggregation	Column	Comparison	Value	Default
	NONE	Territory	exactly matches	NA	

Use Content Linking to Create Interactive Dashboards

Depending on your needs, you can create a "static" dashboard, which contains content in each panel that is separate but related. For example, you may provide users with a bar chart that contains total sales figures by region. Additionally, you may provide a data table that displays sales details for each state in a specific region. You may also want to provide sales data associated with each salesperson in a specific region. The content in your dashboard is useful to dashboard consumers, but to make it more "interactive," you may want to consider using *content linking*.

The content linking features in dashboards allow you to associate (link) content in one dashboard panel to content on another dashboard panel as long as query parameters have been defined. These features are particularly helpful for drilling down or for dynamic filtering; for example, when dashboard consumers explode a single slice in a pie chart to launch content in a data table associated with that pie slice. In this instance, dashboard consumers are moving from a summary view to a detailed view interactively.

You can use content linking if your dashboard panel contains a data table, chart, .xaction, .prpt, and Analyzer report.

Content Linking and Query Parameters

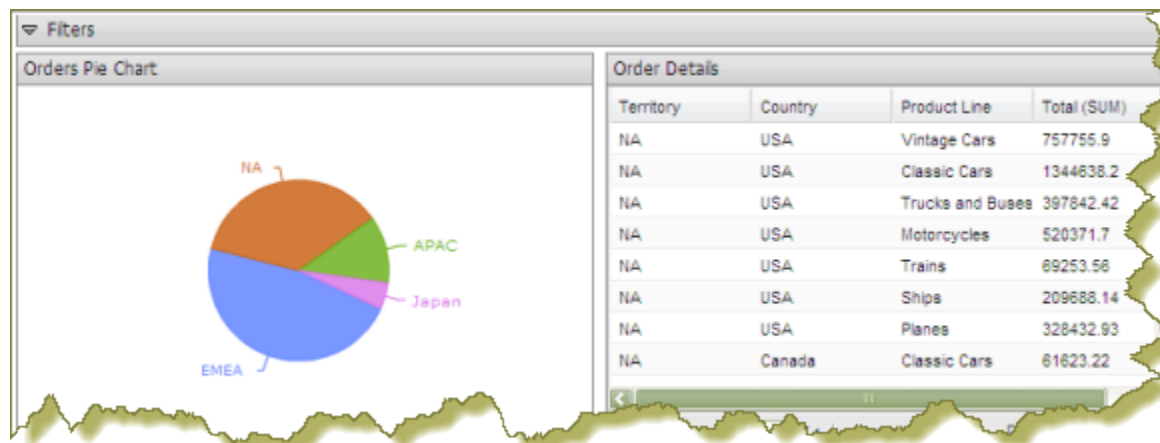
Query parameters are required for content inside a dashboard panel to receive values used to filter data from a filter control. They are also required when receiving values from content in other dashboard panels that are broadcasting values associated with Content Linking. The way in which query parameters are defined is different depending on the type of content you are placing inside your dashboard panels:

If	Then
You are defining parameters in the Analyzer ...	See Adding Query Parameters to Analyzer Reports
You are defining parameters for a chart or data table ...	Use the Query Editor to define your parameterized query. See Linking Charts and Data Tables and Linking Columns in a Data Table to Content in other Dashboard Panels

Link Charts and Data Tables

Below are general instructions for linking charts and data tables in a dashboard. This is just an example. You must adjust the instructions when working with your own data.

1. Create a simple dashboard that contains a chart and a data table. At this point, none of the content has been linked and you have a "static" dashboard.



Notice the pie chart in the example above. You want dashboard consumers to click a slice (NA, APAC, Japan, EMEA) and have the data table on the right update with the values associated with that slice exclusively. For example, if a report consumer clicks the EMEA slice, the data table will display values associated with EMEA and nothing else. To get the correct filter display, you must first create a parameterized query that drives the content in the data table.

2. Click the **Edit** Button to open up the **Edit** Pane at the bottom of the screen. Within the **Objects** pane, choose the report you want to parameterize.

Parameterizing a query, as described here, allows you to pass values dynamically and update the chart based on events triggered by other elements of the dashboard such as a user choosing an item from a filter control or following links defined in content associated with another panel in the dashboard.

3. Click the **{p}** button next to the **Title** box.
The **parameters** will populate after the title in the **Title** box.
4. Click the **Parameters** tab and ensure that the parameters name is linking to the correct **Source**.
5. Click **Apply**.

The new source for the parameter corresponds to the title of the dashboard panel that contains the chart as shown in the example above. This new source will now drive the display in the data table.

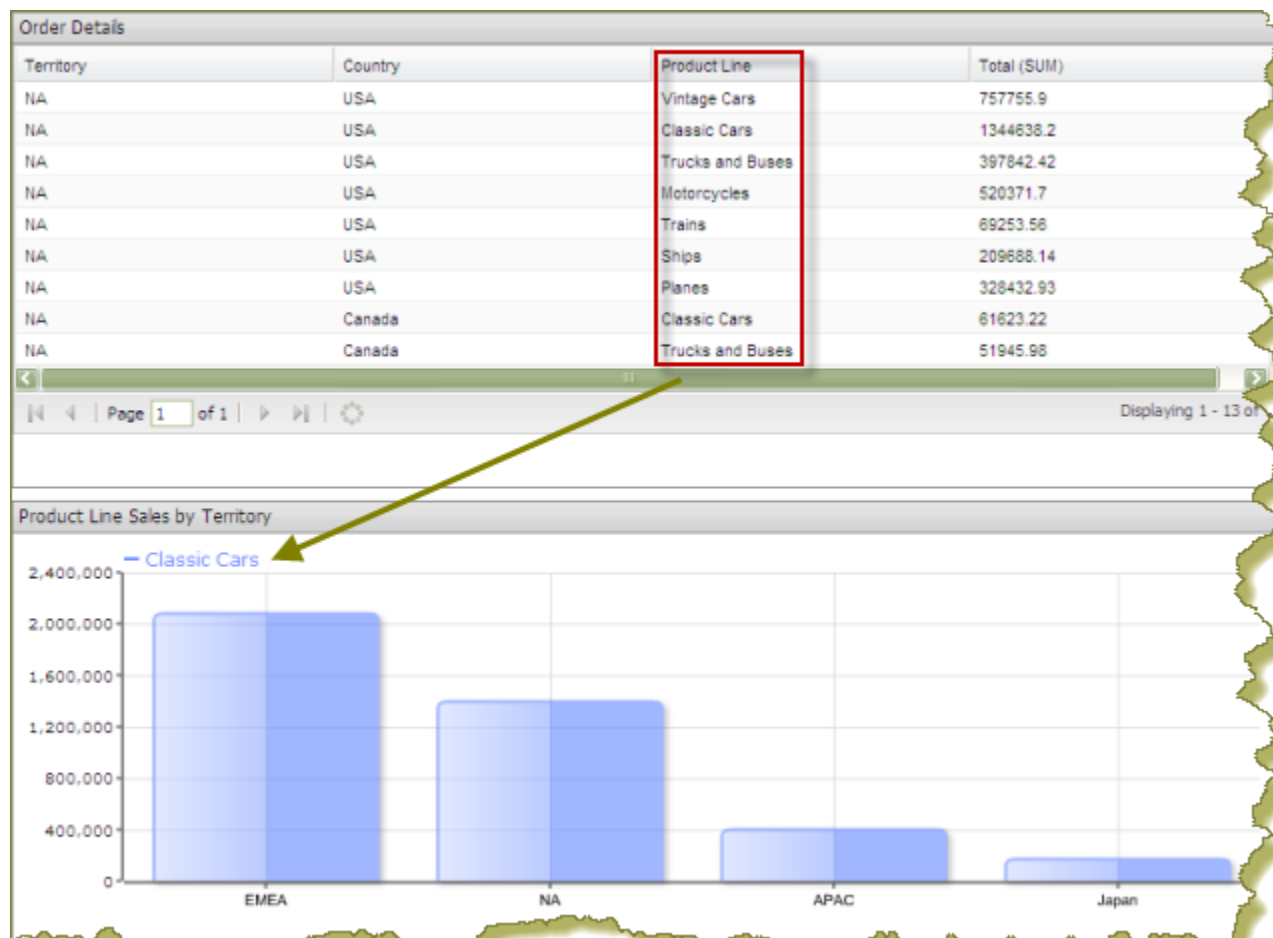
6. Click the **Edit** button (pencil icon) to exit the edit mode.
The filters will appear after the panel titles.
7. Save your dashboard. See [Saving Your Dashboard](#).

When users click a pie slice or bar in a chart, the data table displays content associated with that specific pie slice or bar. The currently applied filters appear after the title.

Link Columns in a Data Table to Content in other Dashboard Panels

The instructions that follow show you how to link a chart to a column in a data table. You must adjust the instructions when working with your own data.

1. Create a simple dashboard that contains a data table and a bar chart. At this point, none of the content has been linked and you have a "static" dashboard.



Notice the data table in the example above. You want dashboard consumers to click a product in the **Product Line** column and have the bar chart update with information about sales by territory for that specific product line.

2. Add a parameterized condition to the query for the bar chart by specifying a parameter name in curly braces in the **Value** text box; then, provide a default value for that parameter in the **Default** text box. In the example below, a parameter called **Productline** with a default value of **Classic Cars** has been created.

Query Editor

Categories / Columns

- Customer
- Orders
- Products
- Payments

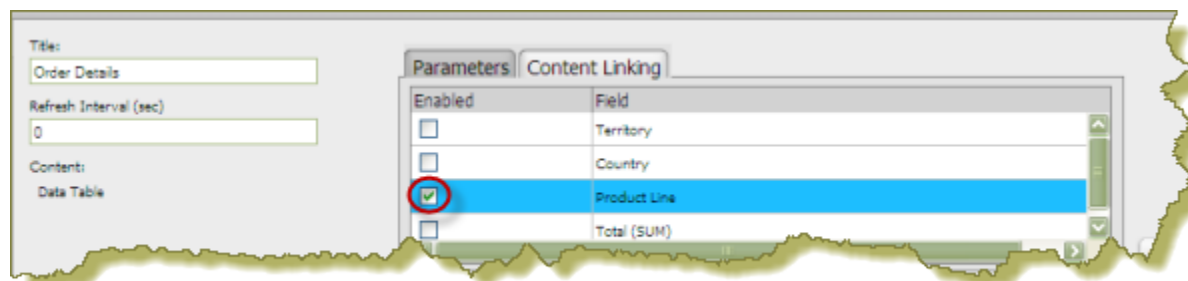
Selected Columns:

Aggregation	Column
NONE	Territory
NONE	Product Line
SUM	Total

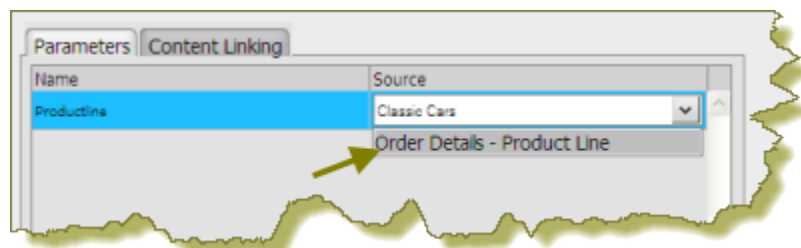
Conditions:

In	Aggregation	Column	Comparison	Value	Default
	NONE	Product Line	exactly matches	{Productline}	Classic Cars

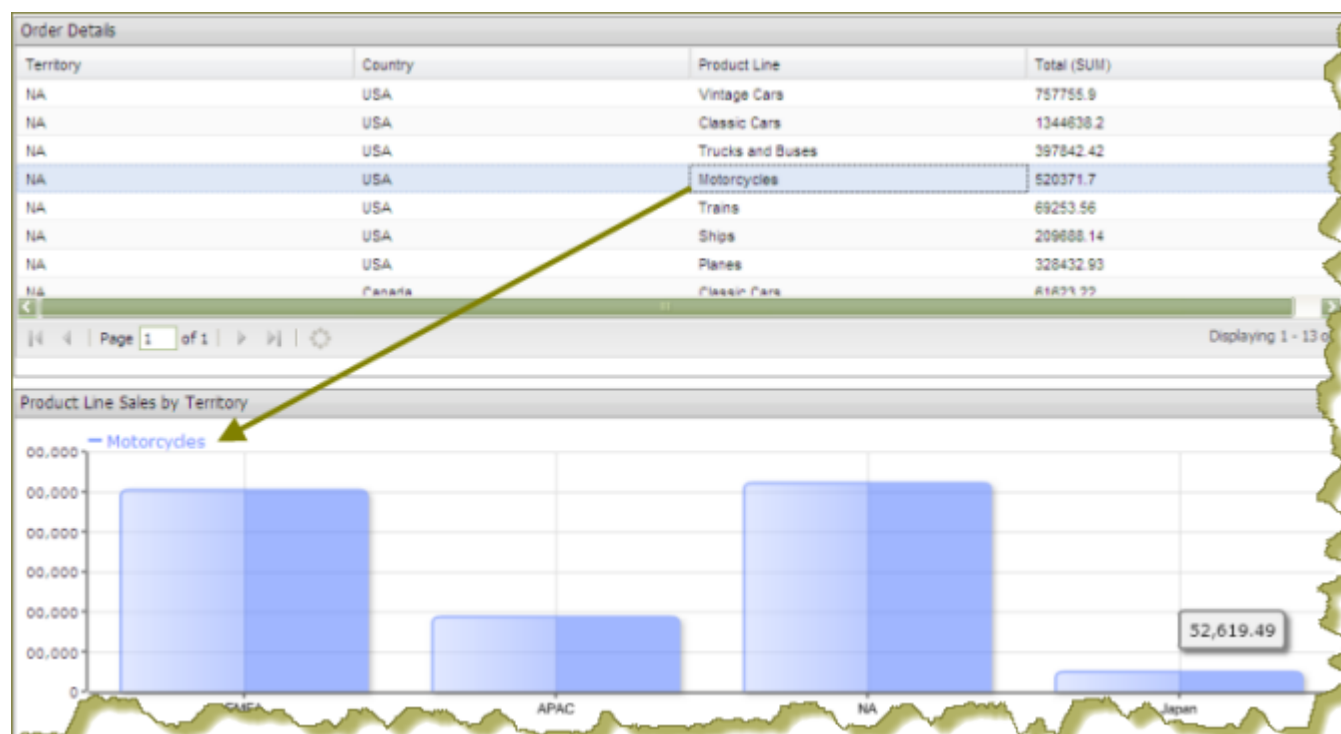
3. In the Chart Designer, set the data definitions for the series, category and values columns associated with your bar chart and click **OK**.
4. Under **General Settings**, choose the data table and click the **Content Linking** tab. Enable content linking on the column in your data table that will filter content in your chart. Each of the columns in a data table are able to broadcast values to other dashboard components.



- Under **General Settings**, choose the chart and click the **Parameters** tab. Click the down arrow, in the **Source** text box to display another source for the parameter you created. In the example below, notice that **Order Details - Product Line**, (this is the name of the dashboard panel that contains the data table), can now be selected as a source for the **Productline** parameter.



- Save your dashboard.
 - In the data table, choose an item in the column that has content linking enabled.
The content in the chart updates in response to the item that was clicked in the data table.
- In the example below, the **Product Line** column was enabled for content linking.



Create Content to Content Links in an Analyzer Report

Below are general instructions for creating content links in an Analyzer report, (inside a dashboard), that can be used to drive the *parameter values* of content in other dashboard panels. You must adjust the instructions when working with your own data.

- Create a simple dashboard that contains an Analyzer Report and a data table. At this point, none of the content has been linked and you have a "static" dashboard.

Untitled 1

No Filter in use ✔ Your report is ready

Line	Classic Cars	Motorcycles	Planes	Ships	Trains	Trucks and Buses	Vintage Cars
Territory	Sales	Sales	Sales	Sales	Sales	Sales	Sales
APAC	411,956	189,818	121,426	38,393	9,907	145,666	36,411
EMEA	2,091,601	507,138	491,655	427,265	138,506	500,979	851,111
Japan	181,601	52,619	109,733	33,016	16,802	57,848	52,311
NA	1,406,261	524,549	353,943	249,997	69,254	449,788	798,211

Untitled 2

Customer Name	City	State
American Souvenirs Inc.	New Haven	CT
Auto-Moto Classics Inc.	Brickhaven	MA
Boards & Toys Co.	Glendale	CA
Cambridge Collectables Co.	Cambridge	MA
Canadian Gift Exchange Network	Vancouver	BC
Classic Gift Ideas, Inc.	Philadelphia	PA
Classic Legends Inc.	NYC	NY
Collectable Mini Designs Co.	San Diego	CA
Collectables For Less Inc.	Brickhaven	MA
Corporate Gift Ideas Co.	San Francisco	CA
Dist. Classics Inc.	Alle	

In the example above, when content linking is achieved, the list of territories (APAC, EMEA, Japan, and NA) will become hyperlinks that, when clicked, will update customer details data table. To get the correct filter display, a [parameterized query](#) that drives the content in the data table must be created.

2. Add a parameterized condition to the query for the data table by specifying a parameter name in curly braces in the **Value** text box; then, provide a default value for that parameter in the **Default** text box. In the example below, a parameter called **TERRITORY** with a default value of **NA** has been created.

Parameterizing a query, as described here, allows you to pass values dynamically and update the chart based on events triggered by other elements of the dashboard such as a user choosing an item from a filter control or following links defined in content associated with another panel in the dashboard.

Conditions:

Combine	Aggregation	Column	Comparison	Value	Default
	NONE	Territory	exactly matches	{TERRITORY}	NA

Under **General Settings**, click the data table and examine its available parameters. In the example below, there is an available parameter called **TERRITORY** with a default source value of NA (North America). A drop-down arrow in the **Source** text box indicates that there are additional values to control the available parameter. In this example, there are no additional source values that control the TERRITORY parameter.

Title: Customer Details

Refresh Interval (sec): 0

Content: Data Table

Parameters

Name	Source
TERRITORY	NA

3. Under **General Settings**, choose the Analyzer report. Click the **Content Linking** tab then click the check box next to the field/column name you want enabled for content linking. Click **Apply**.

Title: Territory Sales by Product Line

Refresh Interval (sec): 0

Content: Product Line Share by Territory Content Linking

Enabled	Field
<input type="checkbox"/>	Line
<input checked="" type="checkbox"/>	Territory

In the Analyzer report, the values under the **Territory** become hyperlinks.

Territory	Line	
	Classic Cars	Motorcycles
APAC	411,956	189,818
EMEA	2,091,601	507,138
Japan	181,601	52,619
NA	1,406,261	524,549

4. Under **General Settings**, choose the data table and examine its available parameters. Notice that there is a drop-down arrow in the **Source** text box. Click the down arrow to display and choose a new source value for the available parameter. Click **Apply**.
5. Save your dashboard.

In the example below, content linking was applied. When users click a territory hyperlink in the Analyzer report, the data table updates and displays customer-related details associated with that specific territory exclusively.

Territory Sales by Product Line

No Filter in use

Your report is ready. Rows: 4

Territory	Line						
	Classic Cars	Motorcycles	Planes	Ships	Trains	Trucks and Buses	Vintage Cars
APAC	411,956	189,818	121,426	38,393	9,907	145,666	364,55
EMEA	2,091,601	507,138	491,655	427,265	138,506	500,979	851,0
Japan	181,601	52,619	109,733	33,016	16,802	57,848	52,33
NA	1,406,261	524,549	353,943	249,997	69,254	449,788	798,269

Customer Details

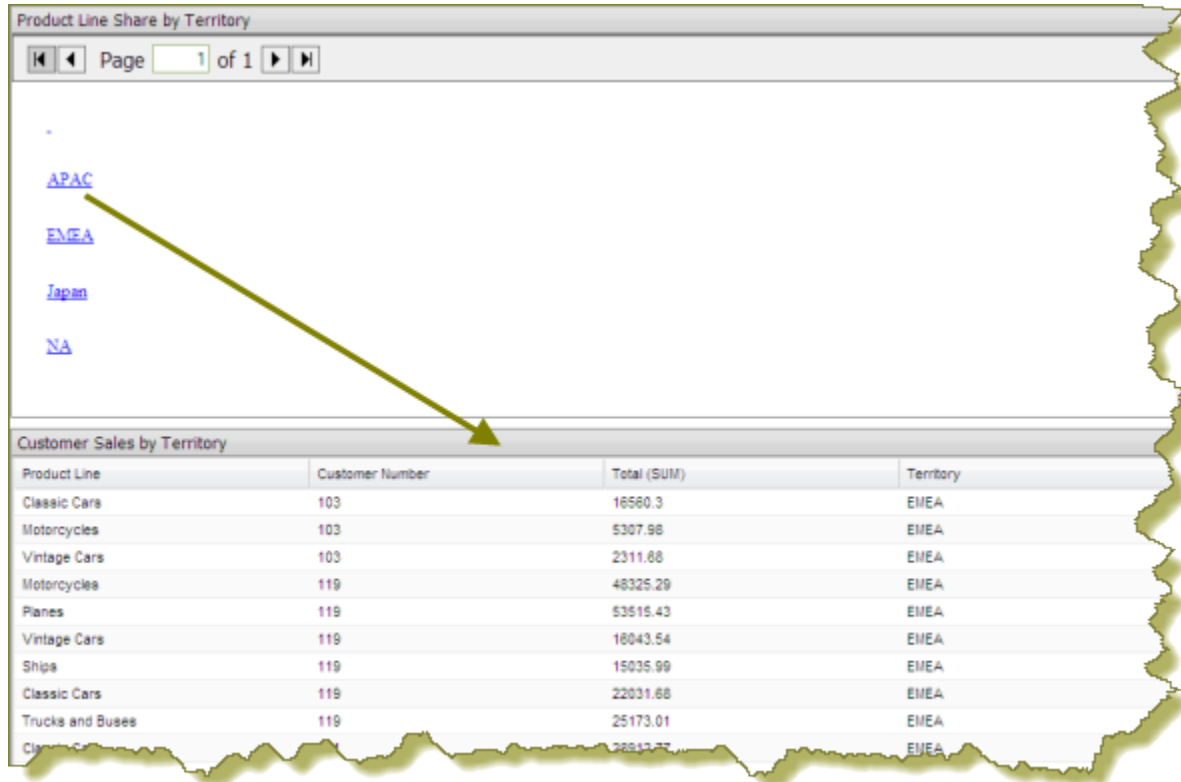
Customer Name	City	State
AV Stores, Co.	Manchester	null
Alpha Cognac	Toulouse	null
Amica Models & Co.	Torino	null
Atelier graphique	Nantes	null
Auto Associés & Cie.	Versailles	null
Auto Canal+ Petit	Paris	null
Baane Mini Imports	Stavern	null
Bavarian Collectables Imports, Co.	Munich	null
Blauer See Auto, Co.	Frankfurt	null

Control a Dashboard Parameter From a PRPT Hyperlink

You must have a report (.prpt) that contains a hyperlink before you can complete this task. See the [Design Print-Quality Reports](#) section for instructions about adding hyperlinks to a report.

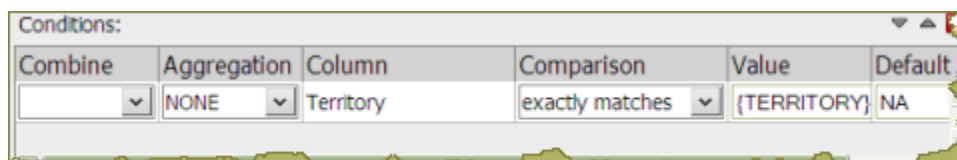
The instructions that follow show you how a link inside a Report Designer report (.prpt) can drive a parameter in content on another dashboard panel. You must adjust the instructions when working with your own data.

1. Create a simple dashboard that contains a .prpt report and a data table. At this point, none of the content has been linked and you have a "static" dashboard.



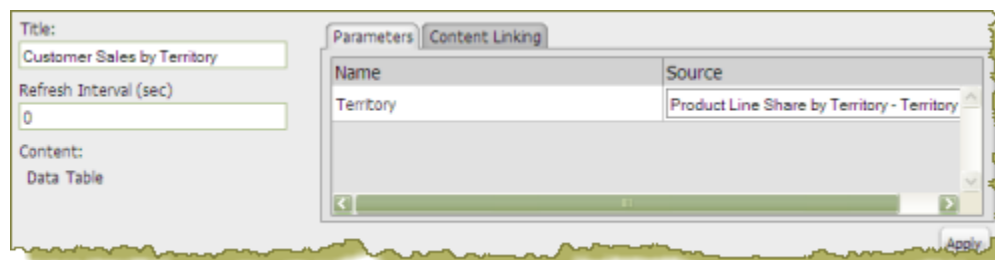
Notice the report (.prpt) in the example above. You want dashboard consumers to click a territory (APAC, EMEA, etc.), hyperlink and have the data table update with information about that territory specifically.

2. Under **General Settings**, choose the report (.prpt) and click the **Content Linking** tab. Click the checkbox next to the field you want used for content linking.
3. Add a parameterized condition to the query for the data table by specifying a parameter name in curly braces in the **Value** text box; then, provide a default value for that parameter in the **Default** text box. In the example below, a parameter called **TERRITORY** with a default value of **NA** has been created.



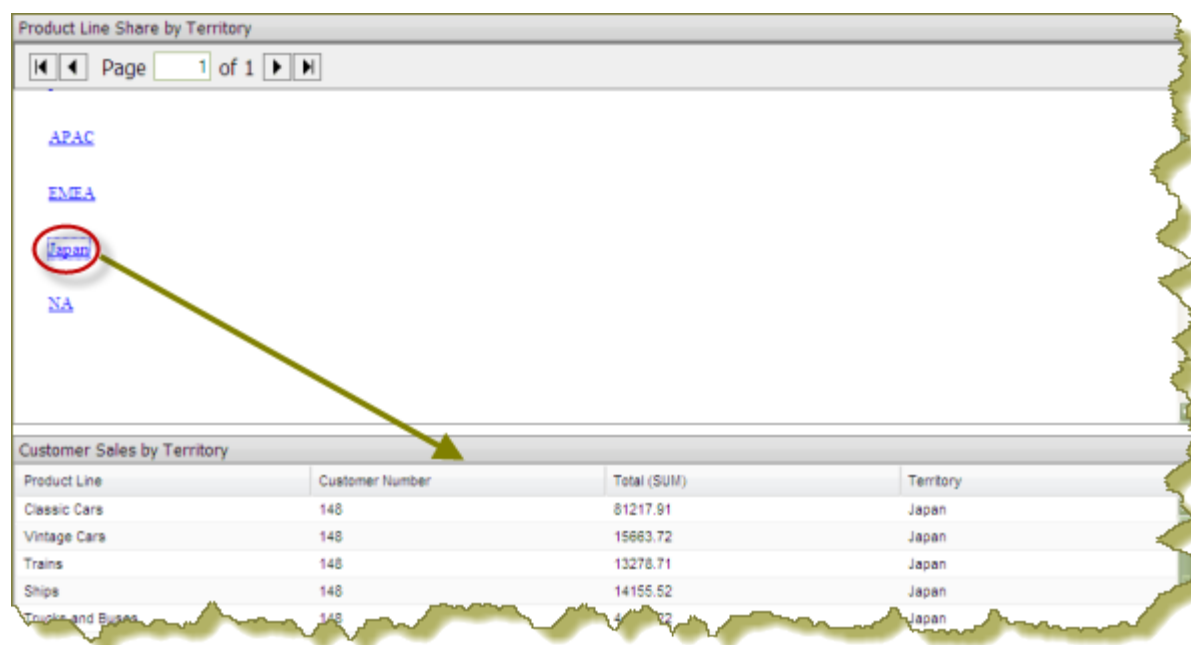
Parameterizing a query, as described here, allows you to pass values dynamically and update the data table based on events triggered by other elements of the dashboard such as a user choosing an item from a filter control or following links defined in content associated with another panel in the dashboard.

4. Under **General Settings**, choose the data table and click the **Content Linking** tab. Click the drop-down arrow, in the **Source** text box to display another source for the parameter you created. In the example below, notice that **Product Line Share by Territory - Territory**, (this is the name of the dashboard panel that contains the .prpt), is now selected as a source for the **Territory** parameter.



5. Save your dashboard. See [Saving Dashboards](#).

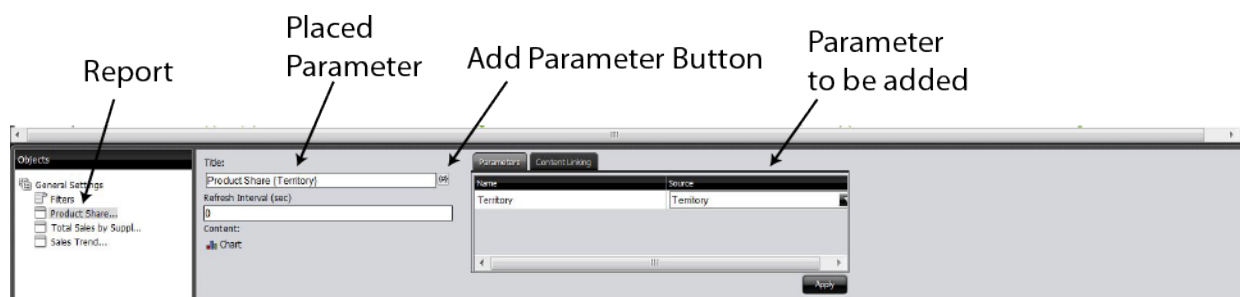
When content linking is achieved, the data table updates when a link in the report (.prpt) is clicked as shown in the example below.



Dynamic Dashboard Titles

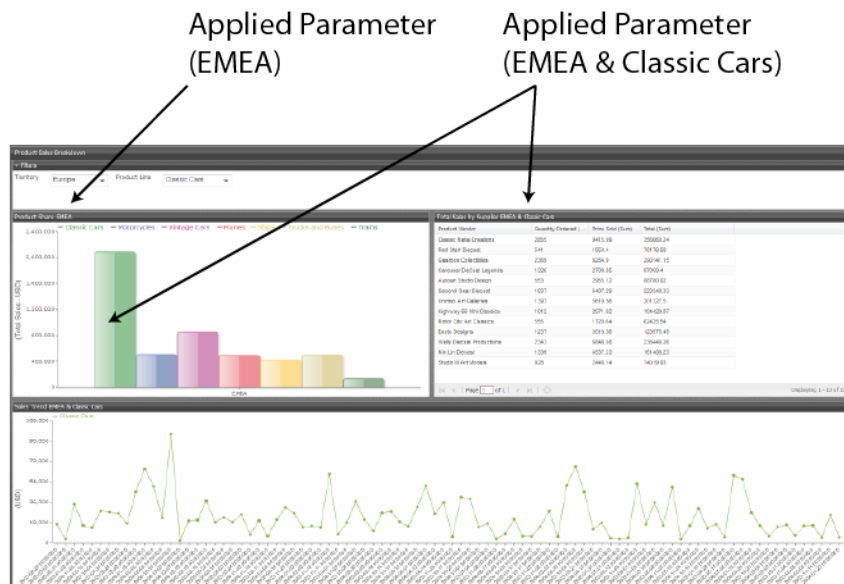
While in Dashboard, each panel has the ability to show a title with current parameters.

1. Click the edit (pencil) icon in the top toolbar.
The Edit Pane appears at the bottom of the screen
2. Click the report that has the parameters you are going to change. You will need to go through this process for each report to which you want to add parameters.
3. Click the **Add Parameter** button.



Placed parameter appears after the title.

4. Click **Apply**
5. Close the Edit Pane by clicking the edit (pencil) icon.



The title will now show the parameters applied to it.

Saving Dashboards

You must be in **Edit** mode to save a dashboard.

1. Click the **Save As** button, which is a floppy disk and pencil button, to open the **Save As** dialog box.
2. In the **File Name** text box, type a file name for your dashboard.
3. Enter the path to the location where you want to save the dashboard. Alternatively, use the up/down arrows or click **Browse** to locate the solution (content files) directory in which you will save your dashboard.
4. Click **Save**.

The report saves with the name specified.

Add Content to a Dashboard Using Drag-and-Drop

Use these steps to add an existing chart, table, or file to your dashboard panels using the drag-and-drop feature.

1. Create a new dashboard. See [Creating a New Dashboard](#) for specific instructions.
2. In the left pane of the Pentaho User Console, under **Files**, locate to the content (chart, table, or file) you want added to your dashboard.
3. Click and drag the content into a blank panel on your dashboard. You will see the "title" of the content as you move it around the dashboard. Notice that the title background is red; it turns green when you find a panel where the content can be dropped.

Repeat steps 2 and 3 until your dashboard contains all the content you want to display. To swap content from one panel to another, click the title bar of the panel that contains the content you want moved and drag it over the panel you want swapped. You will see the swap icon as you are moving the content.

If you are working with an existing dashboard, you can perform steps 2 and 3 steps; however, a warning message appears when you try to place content in a panel that already contains content. The new content will override the existing content.

4. Save your dashboard.

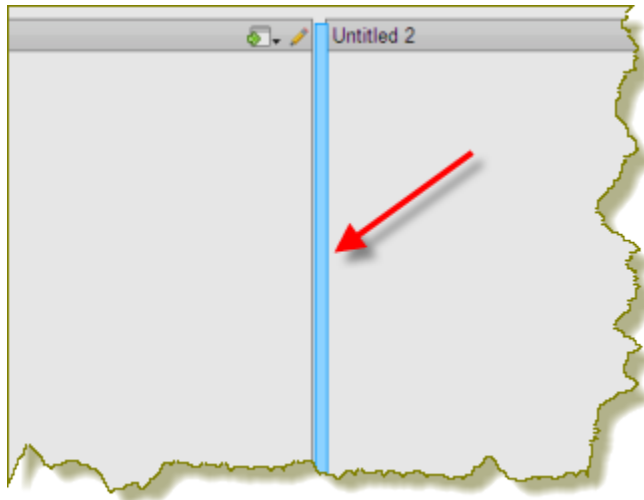
Adjust White space in Dashboard Panels

Sometimes you must adjust the white space in dashboard panels, (or the filter panel), so that content appears correctly. Use these steps to adjust white space.

1. Open an existing dashboard.
2. In the lower pane, click **General Settings** and then click the **Properties** tab.
3. Click **Resize Panels**.

The white space between the dashboard panels turns blue.

- Adjust the panel size by clicking and holding the left mouse button down as you move the blue lines (white space) around. Release the mouse button when you are satisfied with the positioning of the panel.



- Click **Close** in the lower-right corner of the dashboard to exit resize layout mode.
- Examine the dashboard contents to make sure they are placed correctly. You can return to the resize layout mode if you need to make additional changes.
- Save your dashboard.

Set the Refresh Interval

The content in your dashboard may need to be refreshed periodically if users are examining real-time data. You can set refresh intervals for individual panels on your dashboard or for the entire dashboard.

To set the refresh interval for *individual panels* in the dashboard, click the edit button and then choose the panel that contains the content you want refreshed in the **Objects** panel. Under **Refresh Interval (sec)** enter the interval time in seconds and click **Apply**.

If you want the *entire dashboard* to refresh, click the **Prompts** tab in the dashboard and set your refresh interval.

Create a Dashboard Designer Template

Follow the directions below to create a new Pentaho Dashboard Designer template.



Note: You will have to migrate this template by hand if/when you upgrade Dashboard Designer, since the template files will be stored in the Dashboard Designer plugin directory. The upgrade procedure that Pentaho provides does not typically cover customizations like this one, except to mention that they must be migrated by hand.

- Stop the BA Server.
- Navigate to the `/pentaho/server/biserver-ee/pentaho-solutions/system/dashboards/templates/xul/` directory.
- If you want to remove all templates that you know will never be used, you can safely delete their corresponding XUL files now. When you are done, also remove the corresponding files from the **html** sibling directory.
- Copy the existing XUL file that most closely resembles the template layout you want to create, giving the new XUL file a name that starts with a two-digit number that represents the template's order in the hierarchy, followed by a short description of its dimensions.

All Dashboard Designer templates follow this naming convention.

- Create a **.properties** file that corresponds to the one you just copied in the previous step, and put one item in it: **name=Description here**, where "Description here" represents the display name of this template.
- Create a thumbnail graphic that fits the same dimensions as the other PNG thumbnails in this directory, and give it the same name as the previous two files, with a PNG extension.

You should now have three new files, all with the same name, with three different extensions: `.xul`, `.properties`, and `.png`.

7. Edit the new **.xul** file and change the **box** attributes to match your template specifications.

A **vbox** node creates a column; an **hbox** node creates a row; a **box** element defines an individual panel in each row.

height and **width** define static widths in pixels; the **flex** size attribute defines a percentage of the total width of the dashboard. If you'd like more extensive definitions of XUL elements, refer to the official XUL documentation: http://developer.mozilla.org/en/XUL_Reference.



Note: Ensure that each box, vbox, and hbox node has its own unique **id**.

8. Save and close all open files, then start the BA Server.
9. Test your new template and adjust its configuration accordingly.

You now have a custom Dashboard Designer template deployed to your BA Server.

You must copy the template files by hand if you upgrade the BA Server or Dashboard Designer in the future. You may want to back up your custom templates to a safe location right now just in case you forget to copy them over during a future upgrade.

Community Dashboard Framework (CDF)

CDF dashboards are extremely flexible and work well with Pentaho content, but it takes a good understanding of HTML, CSS, and JavaScript to develop them. This section explains how to view some Pentaho-supplied CDF examples and how to create a simple dashboard.

This document represents the only official, maintained, and up-to-date documentation that Pentaho provides on the Community Dashboard Framework. If you need to purchase further CDF development support, contact your Pentaho account representative. You can also purchase more in-depth documentation and examples directly from [WebDetails](#).

Exploring the CDF Sample Content

Pentaho ships sample CDF dashboards with the archive package and graphical installer for the BA Server. By default, the samples are not exposed in the solution repository.

To make them visible, edit the `/pentaho-solutions/plugin-samples/` file and set the value of the `<visible>` element to `true`, then refresh your solution repository.

Once you have exposed the samples, you can find the CDF content in the `cdf-samples` directory within `bi-developers`. Each example is minimally self-documented; you should examine each sample to read the comments in the code and in the rendered dashboard to find out more about how CDF works.