Upgrading From PDI 4.3 to 4.4

This document supports Pentaho Business Analytics Suite 4.8 GA and Pentaho Data Integration 4.4 GA, documentation revision October 31, 2012.

Help and Support Resources

If you have questions that are not covered in this guide, or if you would like to report errors in the documentation, please contact your Pentaho technical support representative.

Support-related questions should be submitted through the Pentaho Customer Support Portal at http://support.pentaho.com.

For information about how to purchase support or enable an additional named support contact, please contact your sales representative, or send an email to sales@pentaho.com.

For information about instructor-led training on the topics covered in this guide, visit http://www.pentaho.com/training.

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Introduction

This guide shows current Pentaho Data Integration Enterprise Edition customers how to upgrade from PDI 4.3 to 4.4. If you are upgrading from a version of PDI older than 4.3, refer instead to PDI Upgrade Guide documents from previous PDI releases.

Note: This guide is only for Enterprise Edition upgrades. You cannot upgrade a PDI 4.3 Community Edition deployment to PDI 4.4 Enterprise Edition through this process.

Introducing Instaview

Pentaho Instaview is the fastest way to start using Pentaho Data Integration to analyze and visualize data. Instaview uses templates to manage the complexities of data access and preparation. You can focus on selecting and filtering the data you want to explore, rather than spending time creating source connections and identifying measure and dimension fields.

Once the data has been selected, Instaview automatically generates transform and metadata models, executes them, and launches Pentaho Analyzer. This allows you to explore your data in the Analyzer desktop user interface.

With Instaview, you no longer have to set up a staging database, understand ETL transforms, learn about metadata models, or publish to a server before visualizing data. As your data requirements become more advanced, you have the ability to create your own templates and use the full power of Pentaho Data Integration (PDI).

See the *Getting Started with Pentaho Data Integration Instaview Guide* to understand and learn more about Pentaho Instaview.

New Features in Pentaho Data Integration

Highlighted features include the new PDI Operations Mart and new steps, such as the **Concat** step, **SAS Input** step, and **EDI to XML** step.

PDI Operations Mart

- **The PDI Operations Mart enables administrators to collect and query PDI log data into one centralized data mart for easy reporting and analysis.**
  - The operations mart has predefined samples for Pentaho Analyzer, Interactive Reporting, and Dashboards. You can create individualized reports to meet your specific needs.

    Sample inquiries include

    - How many jobs or transformations have been successful compared to how many failed in a given period?
    - How many jobs or transformations are currently running?
    - What are the longest running jobs or transformations in a given period?
    - What is the highest failure rate of job or transformations in a given period?
    - How many rows have been processed in a particular time period? This enables you to see a trend of rows or time in time series for selected transformations.
  - The operations mart provides setup procedures for MySQL, Oracle, and PostgresSQL databases.
  - Install instructions for the PDI Operations Mart are available in the Pentaho InfoCenter.

Concat Fields Step

- **The Concat Fields step is used to join multiple fields into one target field.**
  - The fields can be delimited by a separator and the enclosure logic is completely compatible with the **Text File Output** step.
  - This step is very useful for joining fields as key/value pairs for the Hadoop **MapReduce Output** step.

SAS Input Step

- **The SAS Input step reads files in sas7bdat format created by SAS software.**

- This step allows PDI developers to import files in sas7bdat format.

EDI to XML Step

- **The EDI to XML step converts EDI message text, which conforms to the ISO 9735 standard, to generic XML.**
  - The XML text is more accessible and enables selective data extraction using XPath and the **Get Data From XML** step.

New Pentaho Data Integration Software Development Kit

- ***Extending and Embedding Pentaho Data Integration*** **enables developers to utilize PDI beyond the out-of-the box functionality.**
  - This guide explains the mechanics of extending PDI plugins. It also explains embedding PDI functionality directly into Java applications. Pentaho provides sample code for all plugin types and embedding scenarios.

Upgrade Best Practices

All production software upgrades, including Pentaho Data Integration, should be performed during off-peak hours and with enough time to restore from a backup before off-peak ends if something should go wrong. Ideally you would perform the upgrade on a test machine that mirrors the production environment, take notes along the way, and perform the same procedure on the production server when you know how long the entire process will take and are sure that there will be no unexpected problems.

This guide contains instructions for performing the safest possible upgrade. There may be quicker ways, but the software's architects recommend the path outlined in this guide for the safest and most predictable transition to PDI 4.4.

Danger: Always back up your production data, and test the backup before proceeding with an upgrade.

Upgrade Checklist

The Upgrade Checklist is a concise list of instructions intended to show a high-level overview of the upgrade process. It also serves as a method of verifying that each task is performed in the correct order. You may find it useful to print the checklist out and physically mark each step in the Done column as you complete it. **The checklist is not the complete instruction set**; consult the verbose instructions throughout this guide for more details on each step.

Step	Procedure	Done
Step 1	Download the PDI client and server packages and the Pentaho Enterprise Console package from the Pentaho Customer Support Portal. See *Downloading Client and Server Packages* on page 9	
Step 2	Stop your DI Server and Pentaho Enterprise Console server. **Ensure that the DI Server process is stopped;** if it is not, file copy and delete commands could silently fail later on.	
Step 3	Back up your content files, database repository or enterprise repository; your ~/.kettle directory; your PDI client tool directory, and your `/pentaho/server/data-integration-server/pentaho-solutions/` directory.	
Step 4	On your PDI server, rename the `/pentaho/server/data-integration-server/` directory to **data-integration-server-old**.	
Step 5	Create a new, empty `/pentaho/server/data-integration-server/` directory.	
Step 6	Rename the `/pentaho/server/enterprise-console/` directory to **enterprise-console-old** directory.	
Step 7	Update the Data Integration Server by unpacking `pdi-ee-server-4.4.0-GA` and copying the appropriate XML files.	
Step 8	Create a new, empty `/pentaho/server/enterprise-console/` directory.	
Step 9	Unpack the new **data-integration-server** archive to the local data-integration-server directory.	
Step 10	Copy all of the **applicationContext** files from `/pentaho/server/data-integration-server-old/pentaho-solutions/system/` (the old solutions directory) to the new one.	
Step 11	Optionally, copy the **pentaho-spring-beans.xml** file from `/pentaho/server/data-integration-server-old/pentaho-solutions/system/` (the old solutions directory) to the new one.	
Step 12	Copy the entire **hibernate** directory from `data-integration-server-old/pentaho-solutions/system`.	
Step 13	Transfer the admin role information and merge any custom changes from your old **pentaho.xml** and **repository.spring.xml** files to the new ones.	
Step 14	Copy the entire **quartz** directory from `/data-integration-server-old/pentaho-solutions/` to the new one.	
Step 15	Copy the entire **repository** directory from `/data-integration-server-old/pentaho-solutions/system/jackrabbit/` to the new one.	
Step 16	Copy over the old JDBC driver JARs for all data sources.	
Step 17	Copy **repository.xml** from the old **jackrabbit** directory to the new one.	
Step 18	Optionally, copy the entire **jre** directory from `/data-integration-server-old/` to the new one.	
Step 19	Merge any custom changes from your old DI Server configuration files to the new ones.	
Step 20	Unpack the **pec-4.8.0-GA** archive to the `/pentaho/server/` directory.	

Step	Procedure	Done
Step 21	Copy the following files from the old Pentaho Enterprise Console to the new one: console.xml, console.properties, login.properties, login.conf, log4j.xml; and the entire `/resource/config/hsqldb/` directory.	
Step 22	Start the DI Server and Pentaho Enterprise Console and test their functionality and availability.	
Step 23	On your PDI workstations, delete the `/pentaho/design-tools/data-integration/` directory after you have ensured that there are no KJB or KTR content files stored there.	
Step 24	Unpack the **pdi-ee-client-4.4.0-GA** archive to the `/pentaho/design-tools/` directory.	
Step 25	Start the Data Integration client tools that you normally use, and ensure that they work properly, can access existing content, create and share new content, run existing schedules, create new schedules, and have a connection to the DI Server (if you are using it).	
Step 26	Perform any other necessary testing, then delete any installation artifacts and the **data-integration-server-old** directory, and inform users that the upgrade is complete.	
Step 27	If you previously used the calculator step, refer to *Calculator Step Bug Fix*.	
Step 28	If you previously used Google Analytics input step, refer to *Upgrading the Google Analytics Input Step*.	

Downloading Client and Server Packages

Log into the Pentaho Customer Support Portal and download individual archive packages for the DI Server and Data Integration client tools. If you don't know your login information, consult the Welcome Kit email that was sent to you after completing the sales process, or contact your Pentaho sales or support representative.

Here are the packages you need for each platform and distribution:

- **DI Server for Windows:** `pdi-ee-server-4.4.0-GA.zip`
- **DI Server for Linux/Solaris/OS X:** `pdi-ee-server-4.4.0-GA.tar.gz`
- **Data Integration client tool Windows package:** `pdi-ee-client-4.4.0-GA.zip`
- **Data Integration client tool Linux/Solaris/OS X package:** `pdi-ee-client-4.4.0-GA.tar.gz`

If you download the **pdi-ee-server** package, you must also download the Pentaho Enterprise Console package:

- **Pentaho Enterprise Console for Linux/Solaris/OS X:** `pec-4.8.0-GA.tar.gz`
- **Pentaho Enterprise Console for Windows:** `pec-4.8.0-GA.zip`

Creating Backups

You should back up your content files or repository and your Kettle settings in case something goes wrong with the upgrade. Refer to the sections below that apply to your situation.

Backing Up Content Files

If you do not use a database or enterprise repository for storing PDI content, then you are saving individual KJB and KTR files on a local or network drive.

Create a zip or tar archive of the PDI content directories and copy the archive to a safe location outside of your local machine, such as a network drive or removable media.

This should be part of your normal production backup routine outside of this upgrade process.

Backing Up a Database Repository

Backing up your PDI database repository is as simple as using the **Export complete repository to XML** functionality in Spoon's **Repository Explorer** dialogue, which is accessible from the **File** menu. Then copy the resulting file to a safe location outside of the machine you are upgrading.

This should be part of your normal production backup routine outside of this upgrade process.

Moving JDBC Drivers for PDI

In order for your existing data source connections to work, you must copy over your old JDBC driver JARs for all of your data sources.

Note: Ensure that there are no other versions of the same vendor's JDBC driver installed in these directories before copying driver JARs. If there are other versions of the same driver, you remove them to avoid class loading problems. This is of particular concern when you are installing a driver JAR for a data source that is the same database type as your Pentaho solution repository. Contact your Pentaho support representative for guidance.

The relevant driver directories are

- **Enterprise Console:** `/pentaho/server/enterprise-console/jdbc/`
- **Data Integration Server:** `/pentaho/server/data-integration-server/tomcat/webapps/pentaho-di/WEB-INF/lib/`
- **Data Integration client:** `/pentaho/design-tools/data-integration/libext/JDBC/`

How to Back Up the Enterprise Repository

Follow the instructions below to create a backup of your PDI enterprise repository.

Note: If you've made any changes to the Pentaho Enterprise Console or DI Server Web application configuration, such as changing the port number or base URL, you will have to modify this procedure to include the entire `/pentaho/server/` directory.

1. Stop the DI Server.

```
/pentaho/server/data-integration-server/stop-pentaho.sh
```

2. Create a backup archive or package of the `/pentaho/server/data-integration-server/pentaho-solutions/` directory.

```
tar -cf pdi_backup.tar /pentaho/server/data-integration-server/pentaho-solutions/
```

3. Copy the backup archive to removable media or an online backup server.

4. Start the DI Server.

```
/pentaho/server/data-integration-server/start-pentaho.sh
```

Your DI Server's stored content, settings, schedules, and user/role information is now backed up.

To restore from this backup, simply unpack it to the same location, overwriting all files that already exist there.

Backing Up the .kettle Directory

The **.kettle** directory stores all of your client tool configuration settings and preferences. It is located in `~/.kettle` on Linux, Solaris, and OS X; and `C:\Documents and Settings\username\.kettle` on Windows, where *username* refers to the user account that the PDI client tools are installed to.

Create a Zip or tar archive of this directory and copy the archive to a safe location before upgrading.

Backing Up the data-integration Directory

The **/design-tools/data-integration/** directory contains the PDI client tool, JDBC drivers, and the command line tools (Pan, Kitchen, and Carte). While there are no configuration files stored here, you may need to back up this directory so that you can restore from a failed upgrade, or to copy over your previous driver JARs.

Create a Zip or tar archive of this directory and copy the archive to a safe location before upgrading.

Upgrading a Data Integration Server

Ensure that the DI Server and Pentaho Enterprise Console are stopped. You must have a PDI 4.3.0 DI Server installed in order to follow this procedure.

Note: For a smoother post-upgrade test experience, you should perform this procedure before upgrading your PDI workstations.

Follow these instructions to upgrade your Data Integration Server to version 4.4.

1. Rename the `/data-integration-server/` directory to **data-integration-server-old**.

   Note: If you have performed a BA Server upgrade, you have a **server_old** directory. If this is the case, use `/server_old/data-integration-server/` in place of `/data-integration-server-old/`.

2. Unpack the **pdi-ee-server-4.4.0-GA** package to the parent of the directory you just renamed.
3. Copy all of the **applicationContext** files from the `/data-integration-server-old/pentaho-solutions/system/` directory to the new one, overwriting the equivalent files that are already there.
4. Copy the **pentaho-spring-beans.xml** file from the `/data-integration-server-old/pentaho-solutions/system/` directory to the new one, overwriting the equivalent file that is already there.
5. Transfer the information about the **admin role** from the following two old files to the new ones: **/pentaho-solutions/system/pentaho.xml** and **/pentaho-solutions/system/repository.spring.xml**

   ```
   <acl-voter>
   <!-- What role must someone be in to be an ADMIN of Pentaho -->
       <admin-role>Admin</admin-role>
   </acl-voter>
   ```

   ```
   <!-- The name of the authority which is granted to all admin users in single-tenancy
    mode. -->
   <bean id="singleTenantAdminAuthorityName" class="java.lang.String">
       <constructor-arg value="Admin" />
   </bean>
   ```

6. Copy the entire old **quartz** directory from `/data-integration-server-old/pentaho-solutions/` to the new one.
7. Copy the entire old **hibernate** directory from `/data-integration-server-old/pentaho-solutions/system` to the new one.
8. Copy the entire old **repository** directory from `/data-integration-server-old/pentaho-solutions/system/jackrabbit/` to the new one.
9. Copy the old `/pentaho-solutions/system/jackrabbit/repository.xml` file to the new jackrabbit directory.
10. Copy the **scripts** directory from `/data-integration-server-old/` directory to the new data-integration-server directory.

    Note: The scripts directory will only exist if you installed PDI from a graphical installation utility. If you installed via archive packages, it won't be there. If you do not see a scripts directory, then skip this step.

11. Copy **logs** directory from `data-integration-server-old`.
12. Copy **log4j.xml** from `old/tomcat/webapps/pentaho/WEB-INF/classes`.
13. If you plan to connect to Hadoop, ensure that the **hadoop-core** JAR in your Hadoop cluster is the same version as the one Pentaho ships with PDI (in `/data-integration/libext/bigdata/`).

    If these JARs are different versions, strange and unusual problems can occur.

14. Copy the entire **jre** directory from `/data-integration-server-old/` to the new one.

    This step is optional. If you already have a supported JRE or JDK installed on your system, you can skip copying this directory and simply ensure that you have a JAVA_HOME or PENTAHO_JAVA_HOME system variable that points to your Java instance.

15. If you have not already done so, merge any custom changes you have made to DI Server configuration files from the old ones to the new ones.

Your DI Server is upgraded to version 4.4. Continue to upgrade the Pentaho Enterprise Console.

Upgrading the Pentaho Enterprise Console

The upgraded DI Server will not work properly without upgrading the Pentaho Enterprise Console. To upgrade, follow the below process.

1. Rename the `/pentaho/server/enterprise-console/` directory to **enterprise-console-old**.

   ```
   mv enterprise-console enterprise-console-old
   ```

2. Unpack the `pec-4.8.0-GA` zip or tar.gz file to `/pentaho/server/`.

   ```
   tar zxvf ~/downloads/pec-4.8.0-GA.tar.gz -C /home/pentaho/pentaho/server/
   ```

3. Copy the following files from your old `/pentaho/server/enterprise-console-old/resource/config/` directory into the new one:

   - console.xml
   - console.properties
   - login.properties
   - login.conf
   - log4j.xml

   ```
   cp /home/pentaho/pentaho/server/enterprise-console-old/resource/config/console.* /
   home/pentaho/pentaho/server/enterprise-console/resource/config/ && cp /pentaho/
   server/enterprise-console-old/resource/config/log* /home/pentaho/pentaho/server/
   enterprise-console/resource/config/
   ```

4. Copy the your old `/enterprise-console/resource/config/hsqldb/` directory to the new Enterprise Console instance, overwriting the files that are there.

   This directory contains PDI-specific settings.

   ```
   cp -r /home/pentaho/pentaho/server/enterprise-console-old/resource/config/hsqldb/ /
   home/pentaho/pentaho/server/enterprise-console/resource/config/
   ```

The Pentaho Enterprise Console has been upgraded to version 4.8.0.

Upgrading a Data Integration Workstation

Ensure that Spoon, Pan, and Kitchen are not running on the machine before proceeding.

Note: If you use an enterprise repository to store your jobs and transformations, you should perform the DI Server upgrade process before begining this procedure in order to properly test DI Server connectivity from the upgraded workstations.

Adjust the installation paths in this procedure to match your scenario.

1. Remove your existing `/data-integration/` directory.

```
rm -rf /home/rwilco/pentaho/design-tools/data-integration/
```

2. Unpack the **pdi-ee-client-4.4.0-GA** package to the same location that you just deleted.

```
cd /home/rwilco/pentaho/design-tools/ && tar zxvf ~/downloads/pdi-ee-client-4.4.0-GA.tar.gz
```

3. Start Pentaho Data Integration and ensure that you can still connect to the DI Server and access your content.

This workstation is now upgraded. Repeat this procedure for other workstations for which you have license keys.

Upgrading a Data Integration Work Station in Ubuntu 12

If you want the Agile BI plugin to work in Ubuntu 12, complete some additional steps.

1. Go to the **Update Manager** and select the **Settings** button.
2. In the resulting dialog box, select **Canonical-supported** and **Community-maintained** options.
3. Click the **Close** button on each dialog to exit the **Upgrade Manager**.
4. Open a terminal and enter
   `sudo apt-get update`
5. To install the library, enter
   `sudo apt-get install libwebkitgtk-1.0-0`
6. Click **Y** when prompted.

The files are installed and you can run Spoon without receiving SWT- or library-related errors.

Calculator Step Bug Fix

In previous versions, the "Date A - Date B (working days)" function of the Calculator step reversed the calculation and required users to perform a workaround to address the incorrect values returned (link to previous workaround: *http://jira.pentaho.com/browse/PDI-6811*). Users were advised to reverse the calculation in order to return the correct values.

Unfortunately, an attempt to fix this bug was erroneously applied to the "Date A - Date B" function, instead of the "Date A - Date B (working days)" function of the Calculator step (details *http://jira.pentaho.com/browse/PDI-7994*).

Both of these bugs, the original bug and the erroneous correction, are addressed and corrected in PDI version 4.4.0.

Upgrading the Google Analytics Step

If you use Google Analytics in a previous version of Pentaho Data Integration, perform some additional steps as you upgrade to PDI version 4.4.0.

The Google Analytics input plugins are upgraded to work with the long-term supported 2.4 API. If you use the Google Analytics input steps, you must add the `Simple API Key` in the step configuration. Obtain the `Simple API Key` by creating a project in the *Google APIs Console*.

Testing and Cleanup

You should now have a complete PDI 4.4 environment, from the DI Server to individual client workstations. Before you go back into production, you should perform the following tests:

- Open old jobs and transformations and ensure that they execute properly.
- If you are using an enterprise repository, ensure that each PDI workstation can connect to it.
- Create a new job, transformation, and/or Agile BI analysis schema and save it as you normally would.
- Schedule a job or transformation and ensure that the schedule executes properly.
- Ensure that existing schedules are still valid.
- If you are using an enterprise repository, share a job or transformation between PDI users and verify that both can access it.
- Physically restart the server and ensure that the DI Server and Enterprise Console are automatically started as services, if you have them configured as such.

Once you're certain that your PDI environment is ready for production, you can remove any installation artifacts, such as ZIP or tar.gz archives and installers. You can also remove your **data-integration-server-old** directory.

Compatibility Matrix: Supported Components

Pentaho aims to accommodate our clients' diverse computing environments. This list provides details about the environment components and versions we support. If you have questions about your particular computing environment, please contact Pentaho support.

Client

Pentaho client software is hardware-independent and runs on client-class computers that comply with these specifications for minimum hardware and required operation systems.

Pentaho Software
Pentaho Aggregation Designer
Pentaho Data Integration
Pentaho Design Studio
Pentaho Metadata Editor
Pentaho Report Designer
Pentaho Schema Workbench

Hardware—32 or 64 bit	Operating System—32 or 64 bit
Processors: • Apple Macintosh Dual-Core • Intel EM64T or AMD64 Dual-Core **RAM:** 2 GB RAM **Disk Space:** 2 GB free after installation	• Apple Macintosh OS 10.7 & 10.8 • Microsoft Windows 7 • Ubuntu Server 10.X and 12.X

Server

Pentaho server software is hardware-independent and runs on server-class computers that comply with these specifications for minimum hardware and required operation systems.

Pentaho Software
Pentaho Business Analysis Server
Pentaho Data Integration Server
Pentaho Enterprise Console

Hardware—64 bit	Operating System—64 bit
• Apple Macintosh Pro Quad-Core or Macintosh Mini Quad-Core • Intel EM64T or AMD64 Dual-Core **RAM:** 8 GB with 4 GB dedicated to Pentaho servers, 1 GB to Pentaho Enterprise Console **Disk Space:** 20 GB free after installation	• Apple Macintosh OS X Server 10.6 & 10.7 • CentOS Linux 5 & 6 • Microsoft Windows 2008 Server R1 & R2 • Red Hat Enterprise Linux 5 & 6 • Solaris 10 • Ubuntu Server 10.X & 12.X

Embedded Software

When embedding Pentaho software into other applications, the computing environment should comply with these specifications for minimum hardware and required operation systems.

Pentaho Software
Embedded Pentaho Reporting
Embedded Pentaho Analysis
Embedded Pentaho Data Integration

Hardware—32 or 64 bit	Operating System—32 or 64 bit
Processors: • Apple Macintosh Pro Quad-Core or Macintosh Mini Quad-Core • Intel EM64T or AMD64 Dual-Core **RAM:** 8 GB with 4 GB dedicated to Pentaho servers **Disk Space:** 20 GB free after installation	• Apple Macintosh OS X Server 10.6 & 10.7 • CentOS Linux 5 & 6 • Microsoft Windows 2008 Server R1 & R2 • Microsoft Windows 7 • Red Hat Enterprise Linux 5 & 6 • Solaris 10 • Ubuntu Server 10.X & 12.X

Application Servers

Servers to which you deploy Pentaho software must run one of these application servers.

Pentaho Software	Application Server
Pentaho Business Analysis Server	• Jboss 5.1.x • Tomcat 6.0.x
Pentaho Data Integration Server	Tomcat 6.0.x

Solution Database Repositories

Pentaho software stores processing artifacts in these solution database repositories.

Pentaho Software	Database Repository
Pentaho Business Analysis Server	• MySQL 5.x • Oracle 10g/11i • PostgreSQL 8.x & 9.1.x*
Pentaho Data Integration Server	Integrated Pentaho-specific, H2 1.2.131

*Default installed solution database

Data Sources

Pentaho software connects to these relational and non-relational data sources.

Pentaho Software	Data Source
Pentaho Reporting	• JDBC 3** • ODBC • OLAP4J • XML • Pentaho Analysis • Pentaho Data Integration • Pentaho Metadata
Pentaho Business Analysis Server, Action Sequences	• Relational (JDBC) • Hibernate • Javascript

Pentaho Software	Data Source
	• Metadata (MQL) • Mondrian (MDX) • XML (XQuery) • Security User/Role List Provider • Data Integration Steps (PDI) • Other Action Sequences • Web Services • XMLA

Pentaho Data Integration	• JDBC 3**
	• OLAP4J
	• Salesforce
	• XML
	• CSV
	• Microsoft Excel
	• Pentaho Analysis
	• Apache Hadoop 0.20.2 & 0.20.203.0***
	• Cloudera CDH3u4***
	• CDH4***
	• MapR 1.1.3 & 1.2.0
	• Cassandra distributions
	  • Apache 1.1.2
	  • DataStax 1.1.2
	• MongoDB 2.0.4

**Use a JDBC 3.x compliant driver that is compatible with SQL-92 standards when communicating with relational data sources. For your convenience, we provide a list of drivers used to get data from relational JDBC databases.

***From one of these distributions: HBase 0.90.5 and Hive 0.7.1

SQL Dialect-Specific

Pentaho software generates dialect-specific SQL when communicating with these data sources.

Pentaho Software	Data Source
Pentaho Analysis	• Access • DB2 • Derby • Firebird • Greenplum • Hive • Hsqldb • Infobright • Informix • Ingres • Interbase • LucidDb • MicrosoftSqlServer • MySql • Neoview • Netezza • Oracle • PostgreSQL

Pentaho Software	Data Source
	• SqlStream • Sybase • Teradata • Vectorwise • Vertica • Other SQL-92 compliant****
Pentaho Metadata	• DB2 • Firebird • H2 • Hypersonic • Ingres • MS Access • ASSQL • MSSQLNative • MySQL • Netezza • Oracle • PostgresSQL • Sybase • Other SQL-92 compliant****
Pentaho Data Integration	• Apache Derby • AS/400 • InfiniDB • Exasol 4 • Firebird SQL • Greenplum • H2 • Hypersonic • IBM DB2 • Infobright • Informix • Ingres • Ingres VectorWise • LucidDB • MaxDB (SAP DB) • MonetDB • MySQL • MS SQL Server • Neoview • Netezza • Oracle • Oracle RDB • PostgreSQL • SQLite • Teradata • UniVerse database • Vertica • Other SQL-92 compliant****

****If your data source is not in this list and is compatible with SQL-92, Pentaho software uses a generic SQL dialect.

Security

Pentaho software integrates with these third-party security authentication systems.

Pentaho Software	Authentication System
Pentaho Business Analysis Server Pentaho Enterprise Console	• Active Directory • CAS • Integrated Microsoft Windows Authentication • LDAP • RDBMS
Pentaho Data Integration Server	• Active Directory • LDAP • RDBMS

Java Virtual Machine

All Pentaho software, except the Pentaho Mobile App, requires the Sun/Oracle version 1.6 (6.0) distribution of the Java Runtime Environment (JRE) or Java Development Kit (JDK).

Web Browsers

Pentaho supports these major versions of Web browsers that are publicly available six weeks prior to when Pentaho begins to finalize a release. We also support the preceding major version.

Pentaho Software	Web Browser
Pentaho User Console Pentaho Enterprise Console Pentaho Report Designer*****	• Apple Safari 5.x • Google Chrome 19 • Microsoft Internet Explorer 8 & 9 • Mozilla Firefox 13 & 14

*****Requires a web browser to preview the exported HTML reports.

Mobile Apps

Pentaho mobile apps run on the Apple iPad 2 and 3 using iOS 5.x and 6.

JDBC Drivers

JDBC Drivers

This reference is a continuous work in progress. If you are viewing it in the Pentaho InfoCenter and see something that is not correct, know of a driver that is not listed here, or have a tip you want to share, please let us know by using the comments fields found in the bottom right corner.

Database	Vendor	URL
Apache Derby	IBM	*http://db.apache.org/derby/derby_downloads.html*
Cache'	InterSystems	*http://www.cachemonitor.de/intersystems-documentation/cache-jdbc-driver*
CUBRID	CUBRID	*http://www.cubrid.org/?mid=downloadsitem=jdbc_driver*
Daffodil DB	Daffodil Software	*http://sourceforge.net/projects/daffodildb/*

Database	Vendor	URL
DB2 AS/400	IBM	*http://www-03.ibm.com/systems/i/software/toolbox/*
DB2 Universal Database	IBM	*http://www-306.ibm.com/software/data/db2/java*
Firebird	Firebird Foundation	*http://www.firebirdsql.org/en/jdbc-driver/*
FrontBase	FrontBase	*http://www.frontbase.com/cgi-bin/WebObjects/FBWebSite*
Greenplum	EMC2	*http://jdbc.postgresql.org/download.html*
H2 Database	H2	*http://www.h2database.com*
Hive	Apache	*http://hive.apache.org/*
HSQLDB	HyperSQL	*http://sourceforge.net/projects/hsqldb/*
Informix	IBM	*http://www-01.ibm.com/software/*
Ingres	Actian	*http://esd.actian.com/product/drivers/JDBC/java*
InterBase	Embarcadero	*http://edn.embarcadero.com*
jTDS Free MS Sybase	jTDS	*http://jtds.sourceforge.net/*
LucidDB	DynamoDB	*http://www.dynamobi.com/c/downloads/stable/*
MaxDB	SAP	*http://maxdb.sap.com*
Mckoi	Mckoi SQL Database	*http://www.mckoi.com/originalmckoisql/index.html*
Mimer	Mimer Information Technology	*http://www.mimer.com*
MonetDB	MonetDB	*http://www.monetdb.org/*
MySQL	Oracle	*http://dev.mysql.com/downloads/connector/j/*
Neoview	HP	*https://h20392.www2.hp.com/portal/swdepot/displayProductInfo.do?productNumber=NEO10*
Netezza	IBM	*http://www.netezza.com*
OpenBase SQL	OpenBase International	*http://www.openbase.com/index.php/products/downloads*
Oracle	Oracle	*http://www.oracle.com/technetwork/database/features/jdbc/index.html*
Pervasive	Pervasive	*http://www.pervasivedb.com/download/Pages/PDBDownloads.aspx*
PostgreSQL	PostgreSQL Global Development Group	*http://jdbc.postgresql.org/*
SAP DB	SAP DB	*http://www.sapdb.org/sap_db_jdbc.htm*
SQLite	Xerial	*http://www.xerial.org/trac/Xerial/wiki/SQLiteJDBC*

Database	Vendor	URL
SQL Server	Microsoft	*http://msdn.microsoft.com/en-us/sqlserver/aa937724.aspx*
Sybase ASE	SAP	*http://www.sybase.com/products/allproductsa-z/softwaredeveloperkit/jconnect*
Sybase SQL Anywhere	SAP	*http://www.sybase.com/products/allproductsa-z/softwaredeveloperkit/jconnect*
SmallSQL	SmallSQL	*http://www.smallsql.de/download.html*
Teradata	Teradata	*http://downloads.teradata.com/download/connectivity/jdbc-driver*
Vertica	HP	*http://www.vertica.com*

Apache Derby

Vendor Name	Details	
Recommended Native Driver		
IBM	**Company URL** *http://www.ibm.com*	
	Driver URL *http://db.apache.org/derby/derby_downloads.html*	
	JDBC URL Syntax by Type Server—jdbc:derby://<server>[:<port>]/<databaseName>[;<URL attribute>=>value>] Embedded—jdbc:derby:<databaseName>[;create=true]	**Default Port** 1527
	JDBC Class org.apache.derby.jdbc.ClientDriver org.apache.derby.jdbc.EmbeddedDriver	**JDBC JAR File Name** derby.jar
	Shipped with Pentaho Products Pentaho Data Integration	
	Comments Open source database	

Caché

Vendor Name	Details
Recommended Native Driver	
InterSystems	**Company URL** *http://www.cachemonitor.de*
	Driver URL *http://www.cachemonitor.de/intersystems-documentation/cache-jdbc-driver*

Vendor Name	Details	
	JDBC URL Syntax by Type Server—jdbc:Cache://<server>[:<port>]/<namespace>	**Default Port** 1972
	JDBC Class com.intersys.jdbc.CacheDriver	**JDBC JAR File Name** cachedb.jar

CUBRID

Vendor Name	Details	
Recommended Native Driver		
CUBRID	**Company URL** ***http://www.cubrid.org***	
	Driver URL ***http://www.cubrid.org/?mid=downloads&item=jdbc_driver***	
	JDBC URL Syntax by Type Server—jdbc:cubrid:<server>:<port>:<databaseName>:<username>:<password> :[?<URL attribute>=<value>[&<URL attribute>=<value>] …]	**Default Port** 33000
	JDBC Class cubrid.jdbc.driver.CUBRIDDriver	**JDBC JAR File Name** N/A
	Comments Open source database highly optimized for Web applications.	

Daffodil DB

Vendor Name	Details	
Recommended Native Driver		
Daffodil Software	**Company URL** *http://db.daffodilsw.com*	
	Driver URL *http://sourceforge.net/projects/daffodildb/*	
	JDBC URL Syntax by Type Server—jdbc:daffodilDB://<server>[:<port>]/<databaseName> Embedded—jdbc:daffodilDB_embedded:<databaseName>	**Default Port** 3456 N/A
	JDBC Class in.co.daffodil.db.rmi.RmiDaffodilDBDriver	**JDBC JAR File Name** DaffodilDB_client.jar DaffodilDB_Embedded.jar,

Vendor Name	Details	
	in.co.daffodil.db.jdbc.DaffodilDBDriver	DaffodilDB_Common.jar
	Comments Open source database	

DB2 AS/400

Vendor Name	Details	
Recommended Native Driver		
IBM	**Company URL** *http://www.ibm.com*	
	Driver URL *http://www-03.ibm.com/systems/i/software/toolbox/*	
	JDBC URL Syntax by Type Server—jdbc:as400:// <server>naming=sql;errors=full	**Default Port** N/A
	JDBC Class com.ibm.as400.access.AS400JDBCDriver	**JDBC JAR File Name** jt400.jar
	Shipped with Pentaho Products Pentaho Data Integration	

DB2 Universal Database

Vendor Name	Details	
Recommended Native Driver		
IBM	**Company URL** *http://www.ibm.com*	
	Driver URL *http://www-306.ibm.com/software/data/db2/java*	
	JDBC URL Syntax by Type Server—jdbc:db2://<server>[:<port>]/ <databaseName>[;<URL attribute>=<value>]	**Default Port** 50000
	JDBC Class com.frontbase.jdbc.FBJDriver	**JDBC JAR File Name** frontbasejdbc.jar

Firebird

Vendor Name	Details
Recommended Native Driver	
Firebird Foundation	**Company URL**

Vendor Name	Details	
	http://www.firebirdsql.org	
	Driver URL *http://www.firebirdsql.org/en/jdbc-driver/*	
	JDBC URL Syntax by Type Server—jdbc:firebirdsql:<server>[/<port>]:/<database-file> (JDBC Type 4, official format) Server—jdbc:firebirdsql://<server>[:<port>]/<database-file> (JDBC Type 4, compatibility format) Server—jdbc:firebirdsql:native//<server>[/<port>]:/<database-file> (JDBC Type 2, compatibility format) Server—jdbc:firebirdsql:native://<server>[:<port>]/<database-file> JDBC Type 2, compatibility format. Requires libraries) Embedded—jdbc:firebirdsql:embedded:/<local-database-file> (JDBC Type 2, compatibility format. Requires libraries)	**Default Port** 3050 3050 3050 3050 N/A
	JDBC Class org.firebirdsql.jdbc.FBDriver	**JDBC JAR File Name** jaybird-full-xxx.jar
	Shipped with Pentaho Products Pentaho Data Integration	

FrontBase

Vendor Name	Details	
Recommended Native Driver		
FrontBase	**Company URL** *http://www.frontbase.com*	
	Driver URL *http://www.frontbase.com/cgi-bin/WebObjects/FBWebSite*	
	JDBC URL Syntax by Type Server— jdbc:FrontBase://<host>[:<port>]/<databaseName>	**Default Port** N/A
	JDBC Class	**JDBC JAR File Name**

Vendor Name	Details	
	com.frontbase.jdbc.FBJDriver	frontbasejdbc.jar

Greenplum

Vendor Name	Details	
Recommended Native Driver		
Greenplum	**Company URL** *http://www.greenplum.com*	
	Driver URL *http://jdbc.postgresql.org/download.html*	
	JDBC URL Syntax by Type Server—jdbc:postgresql://<server>[:<port>]/<databaseName>	**Default Port** 5342
	JDBC Class org.postgresql.Driver	**JDBC JAR File Name** postgresql-8.x-xxx.jdbc4.jar
	Comments Greenplum uses the Postgresql JDBC driver	

H2 Database

Vendor Name	Details	
Recommended Native Driver		
H2	**Company URL** *http://www.h2database.com*	
	Driver URL *http://www.h2database.com*	
	JDBC URL Syntax by Type Server—jdbc:h2:tcp://server[:port]/file-path Embedded—jdbc:h2:file-name	**Default Port** 9092 N/A
	JDBC Class jdbc:h2:tcp://server[:port]/file-path org.h2.Driver	**JDBC JAR File Name** h2-x.x.xxx.jar
	Shipped with Pentaho Products • Pentaho Business Analysis Server • Pentaho Data Integration • Pentaho Metadata-Editor Pentaho Report-Designer	
	Comments	

Vendor Name	Details
	Open source Java SQL database

Hive

Vendor Name	Details	
Recommended Native Driver		
Apache	**Company URL** *http://hive.apache.org/*	
	Driver URL N/A	
	JDBC URL Syntax by Type Server—jdbc:hive://<server>[:<port>]/default	**Default Port** 10000
	JDBC Class org.apache.hadoop.hive.jdbc.HiveDriver	**JDBC JAR File Name** hive-jdbc-x.x.x-pentaho-y.y.y.jar Example: hive-jdbc-0.7.0-pentaho-1.0.1.jar*
	Shipped with Pentaho Products • Pentaho Business Analysis Server • Pentaho Data Integration • Pentaho Metadata-Editor Pentaho Report-Designer	
	Comments Data warehouse infrastructure that provides data summarization and ad hoc querying *x.x.x is the Hive version, y.y.y is the Pentaho version. Pentaho has enhanced the standard Hive JDBC driver	

HSQLDB

Vendor Name	Details	
Recommended Native Driver		
HyperSQL	**Company URL** *http://www.hsqldb.org*	
	Driver URL *http://sourceforge.net/projects/hsqldb/*	
	JDBC URL Syntax by Type Server—jdbc:hsqldb:hsql://<server>[:<port>]/<databaseName> Embedded Memory—jdbc:hsqldb:mem:<databaseName>	**Default Port** 9001 N/A N/A

Vendor Name	Details	
	Embedded File — jdbc:hsqldb:file:<database-file>	
	JDBC Class org.hsqldb.jdbcDriver	**JDBC JAR File Name** hsqldb.jar
	Shipped with Pentaho Products • Pentaho Enterprise-Console • Pentaho Business Analysis Server • Pentaho Aggregation-Designer • Pentaho Data Integration • Pentaho Metadata-Editor • Pentaho Report-Designer	

Informix

Vendor Name	Details	
Recommended Native Driver		
IBM	**Company URL** *http://www.ibm.com*	
	Driver URL =	
	JDBC URL Syntax by Type Server—jdbc:informix-sqli://<server>[:<port>]/<databaseName>:informixserver=<dbservername>	**Default Port** 1533
	JDBC Class com.informix.jdbc.IfxDriver	**JDBC JAR File Name** ifxjdbc.jar
	Shipped with Pentaho Products Pentaho Data Integration	

Ingres

Vendor Name	Details	
Recommended Native Driver		
Actian	**Company URL** *http://www.actian.com/*	
	Driver URL *http://esd.actian.com/product/drivers/JDBC/java*	
	JDBC URL Syntax by Type Server—jdbc:ingres://<server>[:<port>]/<databaseName>	**Default Port** 21071
	JDBC Class	**JDBC JAR File Name**

Vendor Name	Details	
	com.ingres.jdbc.IngresDriver	iijdbc.jar
	Comments Open source relational database management system	

InterBase

Vendor Name	Details	
Recommended Native Driver		
Embarcadero	**Company URL** *http://edn.embarcadero.com*	
	Driver URL N/A	
	JDBC URL Syntax by Type Server—jdbc:interbase://<server>/<full_db_path>	**Default Port** N/A
	JDBC Class interbase.interclient.Driver	JDBC JAR File Name interclient.jar
	Shipped with Pentaho Products Pentaho Data Integration	

jTDS Free MS SQL Sybase

Vendor Name	Details	
Recommended Native Driver		
jTDS	**Company URL** *http://jtds.sourceforge.net/*	
	Driver URL N/A	
	JDBC URL Syntax by Type SQL Server—jdbc:jtds:<server_type>//<server>[:<port>][/<database>][;<property>=<value>[;...]]] Sybase—jdbc:jtds:<server_type>://<server>[:<port>][/<database>]	**Default Port** 1433 7100
	JDBC Class interbase.interclient.Driver	**JDBC JAR File Name** jtds-x.x.x.jar
	Shipped with Pentaho Products • Pentaho Enterprise-Console • Pentaho Business Analysis Server	

Vendor Name	Details
	• Pentaho Aggregation-Designer • Pentaho Data Integration • Pentaho Metadata-Editor • Pentaho Report-Designer

LucidDB

Vendor Name	Details	
Recommended Native Driver		
DynamoDB	**Company URL** *http://www.dynamobi.com*	
	Driver URL *http://www.dynamobi.com/c/downloads/stable/*	
	JDBC URL Syntax by Type Server—jdbc:luciddb:http://<server>[:<port>]	**Default Port** 8034
	JDBC Class org.luciddb.jdbc.LucidDbClientDriver	**JDBC JAR File Name** LucidDbClient-x.x.x.jar
	Shipped with Pentaho Products Pentaho Data Integration	
	Comments **Open source BI solution for Big Data**	

MaxDB

Vendor Name	Details	
Recommended Native Driver		
SAP	**Company URL** *http://www.sap.com*	
	Driver URL *http://maxdb.sap.com*	
	JDBC URL Syntax by Type Server—jdbc:sapdb://<server>[:<port>]/<databaseName>	**Default Port** 7210
	JDBC Class com.sap.dbtech.jdbc.DriverSapDB	**JDBC JAR File Name** sapdbc.jar
	Comments Database management system developed and supported by SAP AG	

Mckoi SQL Database

Vendor Name	Details	
Recommended Native Driver		
Mckoi	**Company URL** *http://www.mckoi.com*	
	Driver URL *http://www.mckoi.com/originalmckoisql/index.html*	
	JDBC URL Syntax by Type Server—jdbc:mckoi://<server>[:<port>][/<schema>]/	**Default Port** 9157
	JDBC Class com.mckoi.JDBCDriver	**JDBC JAR File Name** mckoidb.jar
	Comments Open source SQL database written in Java	

Mimer

Vendor Name	Details	
Recommended Native Driver		
Mimer Information Technology	**Company URL** *http://www.mimer.com*	
	Driver URL N/A	
	JDBC URL Syntax by Type Server—jdbc:mimer:<protocol>://<server>[:<port>]/<database>	**Default Port** 1360
	JDBC Class com.mimer.jdbc.Driver	**JDBC JAR File Name** mimer.jar

MonetDB

Vendor Name	Details	
Recommended Native Driver		
MonetDB	**Company URL** *http://www.monetdb.org*	
	Driver URL N/A	
	JDBC URL Syntax by Type	**Default Port** 50000

Vendor Name	Details	
	Server—jdbc:monetdb://<server>[:<port>]/<database>	
	JDBC Class nl.cwi.monetdb.jdbc.MonetDriver	**JDBC JAR File Name** monetdb-jdbc-x.x.jar
	Shipped with Pentaho Products Pentaho Data Integration	
	Comments An open source database system	

MY SQL

Vendor Name	Details	
Recommended Native Driver		
Oracle	**Company URL** *http://www.mysql.com*	
	Driver URL *http://dev.mysql.com/downloads/connector/j/*	
	JDBC URL Syntax by Type Server—jdbc:mysql://<hostname>[,<failoverhost>][:<port>] /<dbname>[?<URL attribute>=<value>[&<URL attribute>=<value>] ...]	**Default Port** 3306
	JDBC Class com.mysql.jdbc.Driver (official class name) org.gjt.mm.mysql.Driver (older class name)	**JDBC JAR File Name** mysql-connector-java-5.x.xx-bin.jar
	Shipped with Pentaho Product • Pentaho Enterprise-Console • Pentaho Business Analysis Server • Pentaho Aggregation-Designer • Pentaho Metadata-Editor • Pentaho Report-Designer	

Neoview

Vendor Name	Details
Recommended Native Driver	
HP	**Company URL** *http://www.hp.com*

Vendor Name	Details	
	Driver URL *https://h20392.www2.hp.com/portal/swdepot/displayProductInfo.do?productNumber=NEO10*	
	JDBC URL Syntax by Type Server—jdbc:hpt4jdbc://<system>[:<port>]/[:][<URL attribute>= <value>[;<URL attribute>=<value> …]	**Default Port** 18650
	JDBC Class com.hp.t4jdbc.HPT4Driver	**JDBC JAR File Name** N/A

Netezza

Vendor Name	Details	
Recommended Native Driver		
IBM	**Company URL** *http://www.netezza.com*	
	Driver URL N/A	
	JDBC URL Syntax by Type jdbc:netezza://<server>[:<port>]/<database>	**Default Port** 5480
	JDBC Class org.netezza.Driver	**JDBC JAR File Name** N/A

OpenBase SQL

Vendor Name	Details	
Recommended Native Driver		
OpenBase International	**Company URL** *http://www.openbase.com*	
	Driver URL *http://www.openbase.com/index.php/products/downloads*	
	JDBC URL Syntax by Type Server—jdbc:openbase://<server>/<databaseName>	**Default Port** N/A
	JDBC Class com.openbase.jdbc.ObDriver	**JDBC JAR File Name** OpenBaseJDBC.jar

Oracle

Vendor Name	Details	
Recommended Native Driver		
Oracle	**Company URL** *http://www.oracle.com*	
	Driver URL *http://www.oracle.com/technetwork/database/features/jdbc/index.html*	
	JDBC URL Syntax by Type Thin Server—jdbc:oracle:thin:@<server>[:<port>]:<sid> OCI Server—jdbc:oracle:oci:@<server>[:<port>]:<sid>	**Default Port** 1521
	JDBC Class oracle.jdbc.driver.OracleDriver oracle.jdbc.OracleDriver	**JDBC JAR File Name** ojdbcx.jar, ora18n.jar
	Comments The OCI server requires OCI libraries	

Pervasive

Vendor Name	Details	
Recommended Native Driver		
Pervasive	**Company URL** *http://www.pervasivedb.com/Pages/default.aspx*	
	Driver URL *http://www.pervasivedb.com/download/Pages/PDBDownloads.aspx*	
	JDBC URL Syntax by Type Server—jdbc:pervasive://<server>[:<port>]/<datasource>	**Default Port** 1583
	JDBC Class com.pervasive.jdbc.v2.Driver	**JDBC JAR File Name** N/A
	Shipped with Pentaho Products • Pentaho Data Integration • Pentaho Report-Designer	
	Comments The data source is the ODBC DSN	

PostgreSQL

Vendor Name	Details	
Recommended Native Driver		
PostgreSQL Global Development Group	**Company URL** *http://www.postgresql.org/*	
	Driver URL *http://jdbc.postgresql.org/*	
	JDBC URL Syntax by Type Server—jdbc:postgresql://<server>[:<port>]/<databaseName>	**Default Port** 5342
	JDBC Class org.postgresql.Driver	**JDBC JAR File Name** postgresql-8.x-xxx.jdbc4.jar
	Shipped with Pentaho Products • Pentaho Data Integration • Pentaho Report-Designer	

SAP DB

Vendor Name	Details	
Recommended Native Driver		
SAP DB	**Company URL** N/A	
	Driver URL *http://www.sapdb.org/sap_db_jdbc.htm*	
	JDBC URL Syntax by Type Server—jdbc:sapdb://<server>/<database_name>	**Default Port** N/A
	JDBC Class com.sap.dbtech.jdbc.DriverSapDB	**JDBC JAR File Name** sapdbc-x.x.x.jar
	Shipped with Pentaho Products Pentaho Data Integration	
	Comments FREE Enterprise Open Source Database	

SQLite

Vendor Name	Details
Recommended Native Driver	
Xerial	**Company URL**

Vendor Name	Details	
	N/A	
	Driver URL *http://www.xerial.org/trac/Xerial/wiki/SQLiteJDBC*	
	JDBC URL Syntax by Type Server—jdbc:sqlite:<filename.db>	**Default Port** N/A
	JDBC Class org.sqlite.JDBC	**JDBC JAR File Name** sqlite-jdbc-x.x.x.jar
	Shipped with Pentaho Products Pentaho Data Integration	

SQL Server

Vendor Name	Details	
Recommended Native Driver		
Microsoft	**Company URL** *http://www.microsoft.com*	
	Driver URL *http://msdn.microsoft.com/en-us/sqlserver/aa937724.aspx*	
	JDBC URL Syntax by Type Server—jdbc:sqlserver:// <server>[:<port>];DatabaseName=<databaseName>	**Default Port** 1433
	JDBC Class com.microsoft.sqlserver.jdbc.SQLServerDriver	**JDBC JAR File Name** sqljdbc4.jar
	Comments The open source jtds driver also works with MSSQL	

Sybase ASE

Vendor Name	Details	
Recommended Native Driver		
SAP	**Company URL** *http://www.sybase.com*	
	Driver URL *http://www.sybase.com/products/allproductsa-z/softwaredeveloperkit/jconnect*	
	JDBC URL Syntax by Type Server— jdbc:sybase:Tds:<server>[:<port>]/ <databaseName>	**Default Port** 5000

Vendor Name	Details	
	JDBC Class com.sybase.jdbc4.jdbc.SybDriver	**JDBC JAR File Name** N/A
	Comments The open source jTDS driver works with Sybase as well	

Sybase SQL Anywhere

Vendor Name	Details	
Recommended Native Driver		
SAP	**Company URL** *http://www.sybase.com*	
	Driver URL *http://www.sybase.com/products/allproductsa-z/softwaredeveloperkit/jconnect*	
	JDBC URL Syntax by Type Server— jdbc:sybase:Tds:<server>[:<port>]/ <databaseName>	**Default Port** 2638
	JDBC Class com.sybase.jdbc4.jdbc.SybDriver	**JDBC JAR File Name** N/A
	Comments This open source jTDS driver works with Sybase as well	

SmallSQL

Vendor Name	Details	
Recommended Native Driver		
SmallSQL	**Company URL** *http://www.smallsql.de/*	
	Driver URL *http://www.smallsql.de/download.html*	
	JDBC URL Syntax by Type Embedded— jdbc:smallsql:databaseName[?URL attribute=value[URLattribute=value] …]	**Default Port** N/A
	JDBC Class smallsql.database.SSDriver	**JDBC JAR File Name** smallsql.jar
	Comments	

Vendor Name	Details
	Java desktop SQL database engine

Teradata

Vendor Name	Details	
Recommended Native Driver		
Teradata	**Company URL** *http://www.teradata.com*	
	Driver URL *http://downloads.teradata.com/download/connectivity/jdbc-driver*	
	JDBC URL Syntax by Type Server—jdbc:teradata://<dbshost>[/<URL attribute>[;<URL attribute>]…]	**Default Port** N/A
	JDBC Class com.teradata.jdbc.TeraDriver	**JDBC JAR File Name** terajdbc4.jar

Vertica

Vendor Name	Details	
Recommended Native Driver		
HP	**Company URL** *http://www.vertica.com*	
	Driver URL TBD	
	JDBC URL Syntax by Type Server—jdbc:vertica://<server>[:<port>]/<databaseName>	**Default Port** 5433
	JDBC Class com.vertica.Driver	**JDBC JAR File Name** N/A