Upgrading to Pentaho Business Analytics 4.8

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

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Help and Support Resources

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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 provides procedures and advice for system administrators who are upgrading from the Pentaho BA Suite Enterprise Edition 4.5.0-GA to Pentaho Business Analytics version 4.8.0-GA. This encompasses the BA Server (formerly "BI Server"), DI Server and any Pentaho client tools that you may have purchased licenses for. **This guide is not intended for upgrades to or from any other Business Analytics or BA Suite version, including release candidates (RC) and betas.**

If you only need to update the Pentaho Data Integration server and client tools, you may find it easier to follow the *Pentaho Data Integration 4.3 to 4.4 Upgrade Guide* instead of trying to follow only the PDI sections of this larger Business Analytics document.

You must upgrade to the latest BA and DI Server versions using either archive packages or the manual WAR build and deployment process (BA Server only). Once the new version is installed, migrate your solutions and server configuration settings from the old instance to the new one. Upgrading the Pentaho client tools is a much simpler operation that will take less time and effort. If you have a large number of client tool deployments, however, you may want to find a way to automate part or all of the client tool upgrade process.

Warning: Do not skip ahead! Optional procedures are clearly defined. If you omit any required part of the upgrade process, you **will** be left with a non-functioning configuration and will very likely have to restore your previous configuration and start over from the beginning.

New Features in 4.8

There are many new features in Pentaho Business Analytics 4.8 that make it easier and more efficient to access Pentaho analytics and visualizations.

Introducing Pentaho Mobile

Pentaho Mobile enables you to access business analytics content while on-the-go, using the Apple iPad.

Pentaho Mobile allows you to

- Browse your repository
- View your reports and drill deeper into your data
- Deep-dive into your data using ad hoc OLAP analytics
- Mark reports as favorites for easy access
- Set default start-up reports
- Many other features that allow for quicker and easier access to the data you need

You can read more about Pentaho Mobile in the *Pentaho User Console Guide* and under the **Help** menu while in Pentaho Mobile.

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 Big Data

Connectors for the most popular Hadoop distributions, including Cloudera's **CDH4** release, are built into Pentaho Data Integration. Configuring Pentaho applications to use these built-in connections is easy. Integration with **Sqoop**, **Oozie**, and **Avro** has been added to Pentaho Data Integration along with improvements to the **Cassandra Input** transformation step and the **MongoDB Input** step.

Hadoop Shim

- **The new Hadoop Shim simplifies connecting Pentaho Big Data technologies with the underlying Hadoop distribution.**
  - The Hadoop Shim makes it easier to configure specific Hadoop distributions and versions.
  - The Hadoop Shim is used by all Pentaho applications that access Hadoop data, including PDI, BA Server and DI Server.
  - When accessing big data you no longer have to manually remove files and libraries or hand copy new ones.
  - To change to a different Hadoop version, you only need to change a single setting in a configuration file.
  - The libraries for the most popular Hadoop distributions and versions are included.

Sqoop

- **A new PDI job step orchestrates importing and exporting data between the Hadoop Distributed File System (HDFS) and relational databases using Apache Sqoop**.
  - Sqoop implements MapReduce to perform the bulk movement of data, which provides fast parallel operation as well as fault tolerance.

Oozie

- **A new job step allows PDI to orchestrate Oozie workflows within jobs**.
  - Oozie is a workflow and coordination system that manages Apache Hadoop jobs. Oozie is integrated with the rest of the Hadoop stack.
  - PDI's ability to integrate with many non-Hadoop technologies and Oozie's use of Hadoop's speed and scalability make for a powerful combination.

Avro

- **A new transformation step for streaming, reading, and decomposing the rich data structures stored using the Apache Avro serialization format**.
  - The data can be transformed using a variety of PDI transformation steps and then can later be used for reporting, analysis, or storage in another system.

CDH4

- **Pentaho Big Data now supports Cloudera's distribution including Apache Hadoop (CDH) version 4.**

Performance Enhancements and Improvements

- **Pentaho has made performance enhancements to the Cassandra Input and MongoDB Input transformation steps.**

WEKA

There have been improvements to WEKA. For information about these improvements, see *http://weka.pentaho.com/*.

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.

New Features in Analyzer, Dashboards, and Interactive Reporting

Highlighted enhancements include visualization speed, as well performance enhancements for data presentation and analysis.

Pentaho Analyzer

- **Column-Line Combo chart visualization**
  - You can include the **Column-Line Combo** visualization in Analyzer reports to display numeric measures as lines, with an independent secondary y-axis, on a bar chart.
- **Client-side chart rendering that improves the performance of interactivity**
  - The new client-side chart rendering makes visualization interactivity faster by limiting server to client latency.
- **Increased number of maximum plot points per chart type**
  - Each chart type has a unique limit on the maximum number of plot points. You can increase the defaults to support a larger volume of data display.
- **Show missing data rows**
  - Some reports and visualizations benefit from the display of missing data rows that were previously hidden by default. You can change this setting on a report-by-report basis.
- **Support for drill-down when filters are applied**
  - Improvements to Analyzer's MDX generation supports drill-down to underlying records even when filters are applied. Previous reports that used a workaround for drill-down support may now benefit from simplification.
- **Consolidated toolbar increases the available report area**
- **Export to PDF/Excel Settings**
  - When exporting to PDF or Excel, you can specify page setup information, such as page format and orientation, for the generated output. These settings are saved in the report for future exports.
  - Exports to Excel are generated as .xlsx files.

Pentaho Interactive Reporting

- **Enhanced report filtering includes the ability to create grouped constraints**
  - Report authors can create more advanced filter conditions including grouped constraints. For example a filter definition such as `(Territory = EMEA AND Sales > 1,000) OR (Territory = APAC AND Sales > 500)`

Pentaho Dashboard Designer

- **Ability to print dashboards**
  - Dashboard users can print a screenshot of a dashboard or an individual dashboard panel. Dashboard printing applies to dashboards created with Pentaho Dashboard Designer and the printing capability must be enabled by an administrator.

New Features in Information Assets

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.

Reorganization of the Pentaho InfoCenter

- **The Pentaho InfoCenter has been organized according to usage roles.**
  - It is easier to find the information that you need in the reorganized Pentaho InfoCenter. Guides are organized by usage role, so you can click a role and instantly navigate to the guide that you need.

Pentaho InfoCenter Link Generation

- **The Pentaho InfoCenter has a link generator button so you can easily create a direct link to the page you are viewing.**

Best Practices for Production Upgrades

In order to minimize downtime for your users and ensure the integrity of your solution data, it's best to perform the upgrade on a test server that has an exact copy of your production BA Server. Once you've verified the upgrade process on your test machine, you can perform the same procedure on your production server with confidence.

You can work with your test server at any time without having to worry about disturbing your users, but you may want to schedule the production upgrade for a weekend, evening, or other period of planned downtime so that no users are interrupted in the process.

Some users may need additional training or documentation for Interactive Reporting, Pentaho Data Integration, and Analyzer. The latest Pentaho documentation can always be found in the Pentaho InfoCenter at http://infocenter.pentaho.com. In addition, Pentaho now provides most of its Enterprise Edition documentation in PDF format with every BA Server archive package and the graphical installer. To access the PDFs, log into the Pentaho User Console and go to the **Help** menu. Most of the Pentaho client tools also ship with up-to-date PDF documentation.

To arrange for Web-based or classroom training sessions, contact your Pentaho sales representative.

Prerequisites

To complete the upgrade, you need the following:

- A currently running Pentaho BA Server Enterprise Edition version 4.5-GA. **Other BA Server versions are not covered or supported in this guide.**
- A test server or virtual machine that contains a software environment identical to your production server.
- The knowledge and permissions to access and make changes to your production server.
- Administrator permissions in your existing Pentaho Enterprise Console.
- Sufficient time to complete each phase of the upgrade. The exact amount of time depends on the complexity of your security infrastructure, the size of your solution repository database, and the speed of your server hardware.
- See the *Compatibility Matrix: Supported Components* to ensure that you have the correct versions of hardware, drivers, and software.

Backing Up

Warning: You must quit all Pentaho programs and stop all Pentaho-related services (including the BA Server, DI Server, Pentaho Enterprise Console, and the solution database) before creating backups. After this point, do not start any of these programs or services until directed to do so.

Before you proceed with a production upgrade, you should back up every part of the BA Server that will change. The easiest way to back up a directory is to create a compressed archive of it. Generally on a Windows system you would use the Zip or RAR formats through programs like 7-zip or WinRAR. On Linux, BSD, and Solaris, you would use GNU Tar or bsdtar. No matter which program you use, you should end up with either one single file that encompasses the entire `/pentaho/` directory (for graphical installer and archive deployments), or the `/pentaho/` directory plus the **pentaho.war** file from your application server (for manual deployments).

Stopping the Solution Database Service on Windows

If you installed the BA Server on Windows through the graphical installation utility, the solution database will be running as a Windows service. To stop this service, go to the **Service Manager** in the Windows Control Panel, then stop the **Pentaho Solution Repository** service.

Verifying That the Server is Stopped

If you are a Linux user run this command from a terminal window:

```
$>  ps -ef | grep tomcat
```

If you are a Windows user open the task manager and search for the **Tomcat6.exe** process. If you are on Windows 7 or Windows 2008, you can access **Services** and see if it shows as running or stopped.

How to Check Your Java Version

Pentaho Business Analytics requires a Java Runtime Environment (JRE) or Java Development Kit (JDK). Follow this procedure to see which version of Java is installed on your system and configured to be the default Java executable. There may be multiple JREs or JDKs on your system, but only one can be set as the global default. If a particular JRE or JDK is not specified by an application on startup, the default is used. Pentaho establishes a specific system variable named **PENTAHO_JAVA_HOME** to declare which Java instance it will use.

1. Open a terminal or command prompt window.
2. Type this command in: **java -version** and press **Enter**.

   Along with the Java version, the bit-ness, 32-bit or 64-bit, and patch level also shows in the output. For example ...

```
java version "1.6.0_21"
Java(TM) SE Runtime Environment (build 1.6.0_21-b06)
Java HotSpot(TM) 64-Bit Server VM (build 17.0-b16, mixed mode)
```

Default Port Configuration

You must be able to assign ports during installation. We recommend that you contact your system or database administrator for help when you encounter port-related conflicts.

Below is the default port information:

Enterprise Console	Startup Port: 8088
MySQL Server	Startup Port: 3306
PostgreSQL	Startup Port: 5432
Tomcat BA Server	Startup Port: 8080
Tomcat Data Integration Server	Startup Port: 9080

Upgrading the BA Server

There are three upgrade paths for the BA Server, depending on how you installed the previous Pentaho release:

1. **Manual deployment:** If you built a Pentaho WAR and deployed it to your own application server, you will follow the same process to upgrade it. After the WAR is deployed, you'll merge your old pentaho-solutions directory with the new one, then upgrade the Pentaho Enterprise Console. Client tools are upgraded separately by using archive packages. The instructions for this path begin here: *Manual WAR Deployment* on page 15.
2. **Archive deployment:** If you deployed Business Analytics from individual archive packages, you'll download 4.8.0-GA packages, unpack them, and merge your old pentaho-solutions directory with the new one. The instructions for this path begin here: *Archive-Based Deployment* on page 23.
3. **Graphical installer deployment:** If you previously used the graphical installation utility to install a Business Analytics environment, the easiest upgrade path is to use a BA Server archive package to replace Enterprise Console and the BA Server, then merge your old pentaho-solutions directory with the new one. The instructions for this path begin here: *Business Analytics Graphical Installer Deployment* on page 32.

Refer to the sections below that refer to your chosen upgrade path.

Manual WAR Deployment

If you previously used the manual deployment process to build a BA Server WAR, you should use the same process to upgrade to 4.8.0-GA.

Note: If you aren't making any custom changes to the WAR, and you aren't running any other applications on your application server, it may be easier to use the archive-based deployment method instead. The BA Server archive package includes a preconfigured Tomcat server with the pentaho.war already deployed.

Manual Deployment 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 upgrade materials from the Pentaho Customer Support Portal.	
Step 2	Stop your application server, the Pentaho Enterprise Console server, and your solution database.	
Step 3	Back up your `/pentaho/` directory and the Pentaho Web application (pentaho.war or the uncompressed WAR directory in your application server's deploy or webapps directory).	
Step 4	Rename the `/pentaho/server/` directory to `/pentaho/server_old/`.	
Step 5	Unpack the biserver-manual-ee package to a temporary location.	
Step 6	Upgrade the Oracle schema for the existing solution database	
Step 7	Remove the BA Server's Xalan JAR from the build materials.	
Step 8	If you are using an Oracle solution repository, copy the **quartz-oracle-x.x.x.jar** file to the appropriate directory to be included in the WAR build.	
Step 9	If you have made any changes to **web.xml**, merge your customizations with the `/biserver-manual-ee/build-resources/pentaho-webapp/WEB-INF/web.xml` file, then copy that merged file to the `/biserver-manual-ee/build-resources/WEB-INF/` directory.	
Step 10	Copy your old **context.xml** file (for Tomcat deployments), or your **pentahoHibernate-ds.xml** and **quartz-ds.xml** files (for JBoss deployments) to the `/biserver-manual-ee/build-resources/custom-pentaho-webapp/META-INF/` directory.	

Step	Procedure	Done
Step 11	If you have a Pentaho Analysis Enterprise Edition license, unpack the pentaho-analysis-ee archive to a temporary location, then copy the requisite JARs to the `/biserver-manual-ee/build-resources/custom-pentaho-webapp/WEB-INF/lib/` directory, and the requisite configuration files to the `/biserver-manual-ee/build-resources/custom-pentaho-webapp/WEB-INF/classes/` directory.	
Step 12	Build new Pentaho WAR packages with the BA Server 4.8.0 manual deployment materials.	
Step 13	Remove the old pentaho.war and pentaho-style.war files or directories from your application server's webapps or deploy directory.	
Step 14	Delete any old Pentaho-related temporary files or directories created by your application server.	
Step 15	Copy the new WARs to the `/server/webapps/` directory in Tomcat, or the `/server/default/deploy/` directory in JBoss.	
Step 16	Create a new `/pentaho/server/biserver-ee/` directory in the same location as the old one that you renamed earlier, and move the `/biserver-manual-ee/build/pentaho-solutions/` directory to it.	
Step 17	Unpack any Pentaho User Console plugins you may have licenses for (Analyzer, Dashboard Designer, Interactive Reporting, Mobile) to the `/pentaho/server/biserver-ee/pentaho-solutions/system/` directory.	
Step 18	Copy all of your solutions directories from the `/pentaho/server_old/biserver-ee/pentaho-solutions/` directory to the new one.	
Step 19	Copy the files documented in *Merging Your BA Server Configuration Files* on page 43 to the new pentaho-solutions directory.	
Step 20	Edit the following files and merge in the changes as instructed: pentahoObjects.spring.xml, applicationContext-spring-security.xml, and web.xml.	
Step 21	Perform the documented steps for upgrading single-sign on if you previously used this as your authentication method.	
Step 22	If you're a PDI Enterprise Edition customer, continue on to the section that describes the DI Server upgrade process.	
Step 23	Unpack the new Pentaho Enterprise Console from the archive package to the `/pentaho/server/` directory.	
Step 24	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 25	If you have not already done so, move data source JDBC driver JARs from the old directories to the new ones. This includes the BA Server and Enterprise Console.	
Step 26	Start your solution database, Tomcat or JBoss service, and the Pentaho Enterprise Console and check for any obvious errors or failures in the console output or log file.	
Step 27	**Ensure that all of your content is accessible.** Log into the Pentaho User Console and verify that your product licenses work. Run a new report in Interactive Reporting to ensure that it is ready for production. Verify at least two existing analysis views or Analyzer reports for each data source. Verify that any previously created dashboards are functioning properly. Run all reports that have been published from Report Designer. Lastly, check all of your schedules to ensure that they are still properly configured and operational.	
Step 28	On workstations, unpack applicable client tools to the empty `/pentaho/design-tools/` directory.	

Step	Procedure	Done
Step 29	Verify that all client tools can access old content and publish to the BA Server. Verify that PDI can connect to the DI Server, if applicable.	
Step 30	Remove the `/pentaho/server_old/` directory on each upgraded machine, and any archive packages and temporary directories you used during the upgrade.	

Obtaining the Pentaho BA Server Build Materials

Enterprise Edition customers can obtain the BA Server build package from the Pentaho Customer Support Portal by using their Pentaho account login credentials. If you are unfamiliar with these details, consult the Welcome Kit provided to you by Pentaho customer support as part of the Enterprise Edition enablement process.

The only strictly required package is `biserver-manual-ee-4.8.0-GA.zip`. It is platform-agnostic, so there is only one download for all operating systems, databases, and application servers. Download and unpack this file to a directory approved by your system administrator. The location does not matter to the BA Server, but it should be in a directory that is not over- or under-restricted by the operating system. This directory and the files in it are only used for building the BA Server. Once the software has been configured and built, it will be deployed directly to your application server as a WAR archive.

Packages

The packages you will need for a Windows, Linux, Solaris and Mac OS servers are:

- **BA Server:** biserver-manual-ee-4.8.0-GA.zip
- **Dashboard Designer:** pdd-plugin-ee-4.8.0-GA.zip (if licensed)
- **Interactive Reporting:** pir-plugin-ee-1.1.0-GA.zip (if licensed)
- **Analyzer:** paz-plugin-ee-4.8.0-GA.zip (if licensed)
- **Pentaho Enterprise Console:** pec-4.8.0-GA.zip
- **Pentaho Mobile:**pentaho-mobile-plugin-ee-4.8.0-GA.zip (if licensed)

Caution: Ensure that the application server, the Pentaho Enterprise Console, and the solution database are stopped before beginning the upgrade process.

Changes to the Solution Database

The default solution database engine for the 4.5.0-GA release of the Pentaho BA Server was MySQL. The default solution database engine for the 4.8.0-GA release of the Pentaho BA Server is PostgreSQL. If you are accustomed to using the default solution database or just wish to keep your existing solution database, Pentaho's recommendation for migrating from 4.5.0-GA to 4.8.0-GA is to configure your 4.8.0-GA BA Server to use your existing 4.5.0-GA solution database instance. There is no technical reason that you need to switch to the default PostgreSQL technology. The proper configuration copies over as part of the exercise in the section *Merging Your BA Server Configuration Files*. Because it is not necessary, the process of migrating from MySQL to PostgreSQL is not included in our instruction set. No additional instructions are necessary to make this change.

The Solution Database: Upgrading the Quartz Schema

The Quartz scheduling engine has been upgraded in the Pentaho BA Server 4.8.0-GA. As part of the upgrade, several columns were changed or added to the Quartz tables. Follow these instructions to upgrade the Quartz schema that is part of your existing solution database. This upgrade process does not affect your data.

1. Navigate to /pentaho/server/biserver-ee/data/<RDBMS>, where <RDBMS> is the type of solution database RDBMS that your 4.5.0-GA installation is configured to use (oracle10g, postgresql, or mysql5).
2. Execute the migrate_quartz_<rdbms>.sql script using your preferred utility. For example, to upgrade the Quartz schema for a MySQL solution database, you would execute the following:

```
mysql -u root -p <migrate_quartz_mysql.sql
```

Your solution database Quartz schema is up-to-date.

Removing the Xalan JAR for JBoss Deployments

JBoss includes a Xalan JAR file that interferes with one included in the BA Server; they are different versions, so there is a class-cast exception whenever Xalan is called by BA Server content.

To fix this problem, remove the Xalan JAR from the BA Server build materials before building the WAR:

```
rm ./biserver-manual-ee/build-resources/pentaho-third-party/xalan-2.6.0.jar
```

This will force the BA Server to use the newer JBoss-supplied Xalan instance.

Note: If you've already built a WAR and don't want to rebuild it, you can unpack the WAR and remove this JAR from the lib directory by hand.

Copying the Oracle Quartz JAR Pre-Build

This section is only for administrators who are using an Oracle database for the Pentaho solution repository. You do not need to do this for Oracle data sources; only for Oracle solution repositories.

1. Create a `/biserver-manual-ee/build-resources/custom-pentaho-webapp/WEB-INF/lib/` directory.
2. Copy the `/biserver-manual-ee/build-resources/pentaho-third-party/quartz-oracle-1.7.2.jar` to the newly created `/biserver-manual-ee/build-resources/custom-pentaho-webapp/WEB-INF/lib/` directory.

The WAR build process includes the defined file. You are ready to proceed to the WAR build instructions.

Installing the Analysis Enterprise Edition Plugin

Follow the instructions below to install the Pentaho Analysis Enterprise Edition package, which contains Analysis engine enhancements for large ROLAP deployments. This procedure does not cover Pentaho Analyzer installation.

Note: If you are performing a manual WAR build and deployment, and you want to add the Pentaho Analysis Enterprise Edition JARs into the WAR pre-build, you can substitute `/biserver-manual-ee/build-resources/custom-pentaho-webapp/WEB-INF/` for `/WEB-INF/` references below.

1. If you have not already done so, retrieve the **pentaho-analysis-ee-4.8.0-GA** package from the Pentaho Customer Support Portal (login credentials were emailed to you with your Welcome Kit).
2. Unpack the archive to a temporary location.
3. If it is currently running, shut down the BA Server.
4. Copy only the following JARs from the `/pentaho-analysis-ee/lib/` directory to the `/tomcat/webapps/pentaho/WEB-INF/lib/` directory.
   - infinispan-core- 4.2.1.FINAL
   - jboss-transaction-api-1.0.1.GA
   - jcip-annotations-1.0
   - jgroups-2.12.0.CR5
   - marshalling-api-1.2.3.GA
   - memcached-0.0.1-PENTAHO
   - pentaho-analysis-ee-3.5.0-GA-obf
   - river-1.2.3.GA
5. Copy all of the configuration files from `/pentaho-analysis-ee/config/` to the `/tomcat/webapps/pentaho/WEB-INF/classes/ directory`.
6. Depending on the installation type; there would not be a **pentaho.war** (in archive based installations and executable based installations the **pentaho.war** is already deployed and the application will show as: `/tomcat/webapps/pentaho/`.
7. Remove the temporary **pentaho-analysis-ee** directory.

Pentaho Analysis Enterprise Edition is now installed with the default Infinispan configuration.

If you need to switch from Infinispan to Memcached, continue to the next section.

Switching to Memcached

In order to complete this procedure, you must have your own pre-configured Memcached instance. You should have also installed the Analysis Enterprise Edition package to your BA Server or standalone Mondrian engine.

If you already use the Memcached cache framework in your organization and would like to hook it up to the Pentaho Analysis ROLAP engine, follow the directions below to switch from the default Infinispan cache framework configuration.

Caution: Pentaho and Mondrian developers recommend against using Memcached. You are almost certain to have better performance with Infinispan.

1. If the BA Server or standalone Mondrian engine are running, shut them down now.
2. If you performed a default install of the Pentaho Analysis Enterprise Edition package, then you should have all of the required JARs installed to the BA or Mondrian server. If you aren't sure, verify now that the following JARs are present in the `/WEB-INF/lib/` directory inside of your deployed pentaho.war or Mondrian engine:
   - pentaho-analysis-ee
   - commons-lang
   - commons-io
   - commons-codec
   - pentaho-ee-dsc-core
   - memcached
3. Edit the **pentaho-analysis-config.xml** in the `/WEB-INF/classes/` directory inside the deployed pentaho.war or Mondrian engine, and change the value of **SEGMENT_CACHE_IMPL** to match the class name referenced below:

   ```
   <entry key="SEGMENT_CACHE_IMPL">com.pentaho.analysis.segmentcache.impl.memcached.
   MemcachedSegmentCache</entry>
   ```

4. Edit the **memcached-config.xml** in the `/WEB-INF/classes/` directory inside the deployed pentaho.war or Mondrian engine, and change the values of **SALT**, **SERVERS**, and **WEIGHT** to match your preference:

   ```
   <entry key="SALT">YOUR SECRET SALT VALUE HERE</entry>
   <entry key="SERVERS">192.168.0.1:1642,192.168.0.2:1642</entry>
   <entry key="WEIGHTS">1,1</entry>
   ```

Your Pentaho Analysis Enterprise Edition instance is now configured to use Memcached for ROLAP segment caching.

Memcached Configuration Options

These properties control Memcached settings, and are set in the **memcached-config.xml** file in the `/WEB-INF/classes/` directory inside of your deployed pentaho.war or Mondrian engine.

Note: This is not a comprehensive list of the potential Memcached settings; the options explained below are the ones most critical to Memcached configuration for Pentaho Analysis.

Property	Purpose
SERVERS	A comma-separated list of servers and port numbers representing the Memcached nodes usable by the plugin.
WEIGHTS	A comma-separated list of numbers representing the relative caching capacity of the servers defined in the SERVERS property. There must be exactly as many values of WEIGHTS as there are values of SERVERS. As an example, if the first server has a capacity of 128 megabytes, and the second has a capacity of 256 megabytes, the correct values for the WEIGHTS property should be "1,2", indicating that the first server has a relative size of half of the second one.
SALT	A secret key prefix to be used when saving and loading segment data from the Memcached nodes. This property must be the same for all Mondrian nodes that share their

Property	Purpose
	caches. If the SALT value is different from one node to the next, the nodes will not be able to share their cache data.

Building New WAR Files

We advise you to keep your 4.5 WAR files in case you have to merge some of your content. However, you must build and deploy new Web Application Archive (WAR) files as part of the Pentaho 4.8 upgrade if you want to use your own application server.

Building and Deploying a New JBoss WAR

Ensure that the application server and solution database are halted before continuing with the upgrade.

This process walks you through building a new pentaho.war and deploying it to your application server. You will have to adjust the paths in the examples to match your environment.

1. If you have made any customizations to your old **web.xml** file in the `/jboss/server/default/deploy/pentaho.war/WEB-INF/` directory, merge them into the new web.xml in `/biserver-manual-ee/build-resources/pentaho-webapp/WEB-INF/` and copy the merged file to `/biserver-manual-ee/build-resources/custom-pentaho-webapp/WEB-INF/`.
2. Open a terminal window and navigate to the `/biserver-manual-ee/` directory.
3. Run the following Ant command, changing the database to whichever one you're currently using for your solution repository: `ant -Darchive.target=war-pentaho-jboss-no-portal -Ddb=mysql5`

   This builds an application server- and database-specific WAR. Possible database values are:

   - mysql5
   - postgresql
   - oracle10g
4. Delete all of the old Pentaho WARs from the `/jboss/server/default/deploy/` directory.

   The relevant files are: pentaho.war and pentaho-style.war.
5. Copy the newly-built `pentaho.war` file from the `/biserver-manual-ee/build/pentaho-wars/jboss/portal/` directory to your existing `/jboss/server/default/deploy/` directory.
6. Copy the newly-built `pentaho-style.war` file from the `/biserver-manual-ee/build/pentaho-wars/` directory to your existing `/jboss/server/default/deploy/` directory.
7. Delete the `/jboss/server/default/tmp/` and `/jboss/server/default/work/` directories.

   These directories contain temporary files that, when missing, will force your application server to recompile all of your JSPs. This is a necessary step and will not cause any harm to JBoss.

Your instance of the Pentaho BA Server is updated to version 4.8, though there is much more to do before your upgrade is complete.

Building and Deploying a New Tomcat WAR

Ensure that the application server and solution database are halted before continuing with the upgrade.

This process walks you through building and deploying a new BA Server WAR archive for Tomcat 6. You will have to adjust the paths in the examples to match your environment.

1. Copy your current **context.xml** file from your old Pentaho WAR directory to the **META-INF** subdirectory in `/biserver-manual-ee/build-resources/custom-pentaho-webapp/`.

   

   Note: If you have made any changes to context.xml, you must delete the **pentaho.xml** file that Tomcat automatically generates based on the context.xml embedded in the Pentaho WAR. Tomcat will not overwrite this file on its own, so any context.xml changes will not be recognized until the old pentaho.xml is removed. Typically this file is located in **/tomcat/conf/Catalina/localhost/**. If this file is not present, then you probably didn't make any changes to context.xml and there is nothing to worry about.

   ```
   cp /pentaho/server/biserver-ee/tomcat/webapps/pentaho/META-INF/context.xml /home/pgibbons/biserver-manual-ee/build-resources/custom-pentaho-webapp/META-INF/
   ```
2. If you have made any customizations to your old **web.xml** file in the `/tomcat/webapps/pentaho/WEB-INF/` directory, merge them into the new web.xml in `/biserver-manual-ee/build-resources/pentaho-webapp/`

`WEB-INF/` and copy the merged file to `/biserver-manual-ee/build-resources/custom-pentaho-webapp/WEB-INF/`.

3. Delete the unpacked WAR directories in `/tomcat/webapps/`, which are: **pentaho** and **pentaho-style**.
4. Open a terminal window and navigate to the `/biserver-manual-ee/` directory.
5. Run the following Ant command, changing the database to whichever one you're currently using for your solution repository: `ant -Darchive.target=war-pentaho-tomcat -Ddb=mysql5`

   This builds an application server- and database-specific WAR. Supported database values are:

   - mysql5
   - postgresql
   - oracle10g
6. Copy the newly-built `pentaho.war` from the `/biserver-manual-ee/build/pentaho-wars/tomcat/` directory to your existing `/tomcat/webapps/` directory.

   All of the WARs you deploy will automatically unpack when Tomcat starts, and create new directories to replace the ones you deleted previously.
7. Copy the `pentaho-style.war` file from the `/biserver-manual-ee/build/pentaho-wars/` directory to your existing `/tomcat/webapps/` directory.

Your instance of the Pentaho BA Server is now updated to version 4.8.0, though there is much more to do before your upgrade is complete.

Rebuilding the Solutions Directory

A new pentaho-solutions directory was created by the WAR build script that you just executed. Follow these directions to use the new pentaho-solutions directory. Modify the paths in the examples to match your scenario.

1. Create a new `/pentaho/server/biserver-ee/` directory in the exact location of the old one, which you earlier renamed to `/pentaho/server_old/biserver-ee/`.

   ```
   mkdir -p /home/pentaho/pentaho/server/biserver-ee/
   ```
2. Copy the newly-built pentaho-solutions directory from `/biserver-manual-ee/build/` to the `/pentaho/server/` directory you just created.

   ```
   cp -r /home/amenethil/downloads/biserver-manual-ee/build/pentaho-solutions/ /home/pentaho/pentaho/server/biserver-ee/
   ```

You now have a fresh solutions directory. You can now install the latest plugins, and migrate your settings and solutions to it according to the instructions later in this guide.

Adding Linux and OS X Support for Printing Analyzer Geo Maps

There is an experimental function in Analyzer that enables you to print Geo Map visualizations. Follow the directions below to enable support on Linux and OS X. Windows configuration is covered in *Adding Windows Support for Printing Analyzer Geo Maps* on page 22.

Note: Pentaho requires a specific version of **wkhtmltoimage** in order for this print function to work correctly. Even if you have wkhtmltoimage installed on your machine, install the Pentaho-supplied version as explained below. It will be explicitly called by Analyzer, and will not interfere with your existing wkhtmltoimage instance.

Note: If you used the Business Analytics graphical installer, **skip all steps except the last two.**

1. Navigate to the **wkhtmltoimage** directory in your Pentaho installation. For archive installations, this is `/pentaho/biserver-ee/third-party-tools/wkhtmltoimage/`, and for manual deployments it is `/biserver-manual-ee/build-resources/third-party-tools/wkhtmltoimage/`.
2. For OS X, unpack the **wkhtmltoimage_mac.tar.bz2** package; for 32-bit Linux, unpack the **wkhtmltoimage_linux_i386.tar.bz2** package; for 64-bit Linux, unpack the **wkhtmltoimage_linux_amd64.tar.bz2** package.
3. There is only one file in this archive: the executable **wkhtmltoimage**. If the executable has an extension, such as **i386** or **amd64**, rename the file to **wkhtmltoimage**.
4. Move the executable to: `/home/pentaho/pentaho/server/biserver-ee/wkhtmltoimage` directory.

5. Edit the `/pentaho-solutions/system/pentaho.xml` file and set the value of **<html-to-image-tool>** to the full path to the **wkhtmltoimage** executable that you just unpacked.

```
<html-to-image-tool>/home/pentaho/pentaho/server/biserver-ee/third-party-tools/
wkhtmltoimage/wkhtmltoimage</html-to-image-tool>
```

6. Save and close the file, then edit the `/pentaho-solutions/system/analyzer/settings.xml` file and uncomment the following line:

```
<!--open_layers>geomapexport</open_layers-->
```

7. Save and close the settings.xml file.

You have enabled the experimental print feature for Analyzer Geo Map visualizations.

Adding Windows Support for Printing Analyzer Geo Maps

There is an experimental function in Analyzer that enables you to print Geo Map visualizations. Follow the below directions to enable support on Windows. Linux and OS X configuration are covered in *Adding Linux and OS X Support for Printing Analyzer Geo Maps* on page 21.

Note: Pentaho requires a specific version of **wkhtmltoimage** in order for this print function to work correctly. Even if you have wkhtmltoimage installed on your machine, install the Pentaho-supplied version as explained below. It will be explicitly called by Analyzer, and will not interfere with your existing wkhtmltoimage instance.

Note: If you used the Business Analytics graphical installer, **skip all steps except the last two.**

1. Navigate to the **wkhtmltoimage** directory in your Pentaho installation. For archive installations, this is `\pentaho\biserver-ee\third-party-tools\wkhtmltoimage\`, and for manual deployments it is `\biserver-manual-ee\build-resources\third-party-tools\wkhtmltoimage\`.
2. Run the **wkhtmltoimage_windows_installer.exe** executable.
3. Accept the license agreement to continue.
4. Uncheck the **wkhtmltopdf** option, then click **Next**.
5. For the **Destination folder**, type in or navigate to the following path, creating the directories if they do not exist: `C:\pentaho\biserver-ee\third-party-tools\wkhtmltoimage\`. Once you have navigated to the path, click **Install**.
6. When the installation is complete, click **Close**, then edit the `\pentaho-solutions\system\pentaho.xml` file and set the value of **<html-to-image-tool>** to the full path to the **wkhtmltoimage** executable that you specified in the installer, including the executable name of the package, which is **wkhtmltoimage**.

```
<html-to-image-tool>C:\pentaho\biserver-ee\third-party-tools\wkhtmltoimage
\wkhtmltoimage</html-to-image-tool>
```

7. Close that file, then edit the `\pentaho-solutions\system\analyzer\settings.xml` file and uncomment the following line:

```
<!--open_layers>geomapexport</open_layers-->
```

8. Save and close the settings.xml file.

You have enabled the experimental print feature for Analyzer Geo Map visualizations.

Installing Pentaho User Console Plugins

In order to proceed with this task, you must have already purchased an Enterprise Edition license for the products you want to install. Skip this process if you do not have the requisite license.

The Pentaho User Console is built with a plugin architecture that enables you to expand its functionality with new client tools and functions. Follow the directions below to install any of the following plugins:

- Pentaho Analyzer
- Pentaho Dashboard Designer
- Pentaho Interactive Reporting
- Pentaho Mobile

Note: The Pentaho Analysis Enterprise Edition plugin is separate from Analyzer, and requires a different installation process. That process is found in *Installing the Analysis Enterprise Edition Plugin*.

1. If you have not already done so, download the plugin packages from the Pentaho Customer Support Portal. The installation materials list are defined in *Obtaining the Installation Matrials*.
2. Unpack the plugin packages to the `/pentaho/server/biserver-ee/pentaho-solutions/system/` directory.

   This will create a subdirectory for each plugin that you unpack.

The plugins you downloaded are now installed, though you will still need to merge your solution files and register your licenses.

Continuing the Manual Upgrade Process

To continue the upgrade process for a manual installation, see *Migrating Your Solutions* on page 42.

Archive-Based Deployment

To upgrade the BA Server via archive packages, you'll simply download new packages, unpack them, and merge your BA Server configuration and solutions by hand. Step-by-step instructions are below.

Archive Deployment 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 upgrade materials from the Pentaho Customer Support Portal.	
Step 2	Stop all Pentaho programs and services, including the solution repository database.	
Step 3	Back up your /pentaho/ directory and hibernate and quartz databases.	
Step 4	Rename the `/pentaho/server/` directory to `/pentaho/server_old/`, then create a new, empty `/pentaho/server/` directory.	
Step 5	Unpack the BA Server archive package to the empty `/pentaho/server/` directory.	
Step 6	Upgrade the Quartz schema in the existing solution database.	
Step 7	Copy any necessary JDBC drivers for your solution database and data sources to the `/pentaho/server/biserver-ee/tomcat/lib/` directory.	
Step 8	Copy over your old web.xml to the new `/tomcat/webapps/pentaho/WEB-INF/` directory.	
Step 9	Copy your old context.xml file from the `/server_old/biserver-ee/tomcat/webapps/pentaho/META-INF/` directory to the new one.	
Step 10	Copy over your old server.xml to the new `/tomcat/conf/` directory.	
Step 11	Unpack any Pentaho User Console plugins you may have licenses for (Analyzer, Dashboard Designer, Interactive Reporting) to the `/pentaho/server/biserver-ee/pentaho-solutions/system/` directory.	
Step 12	If you have a Pentaho Analysis Enterprise Edition license, unpack the pentaho-analysis-ee archive to a temporary location, then copy the requisite JARs to the `/pentaho/server/biserver-ee/tomcat/webapps/pentaho/WEB-INF/lib/` directory, and the requisite configuration files to the `/pentaho/server/biserver-ee/tomcat/webapps/pentaho/WEB-INF/classes/` directory.	
Step 13	Remove the Pentaho sample content.	

Step	Procedure	Done
Step 14	Copy all of your solution directories from the `/pentaho/server_old/biserver-ee/pentaho-solutions/` directory to the new one.	
Step 15	Copy the files documented in *Merging Your BA Server Configuration Files* on page 43 to the new pentaho-solutions directory.	
Step 16	Edit the following files and merge in the changes as instructed: pentahoObjects.spring.xml, applicationContext-spring-security.xml, and web.xml.	
Step 17	If you're a PDI Enterprise Edition customer, continue on to the section that describes the DI Server upgrade process.	
Step 18	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 19	Update any Enterprise Edition license keys if necessary.	
Step 20	If you installed the Interactive Reporting plugin, use the license installer utility (or start the BA Server and Enterprise Console and use the license interface in Enterprise Console) to install the Pentaho Reporting Enterprise Edition license key.	
Step 21	Start the solution database, BA Server, and Pentaho Enterprise Console and check for any obvious errors or failures in the console output and log file.	
Step 22	**Check that all of your content is accessible.** Log into the Pentaho User Console and verify that your product licenses work. Run a new report in Interactive Reporting to ensure that it is ready for production. Verify at least two existing analysis views or Analyzer reports for each data source. Verify that any previously created dashboards are functioning properly. Run all reports that have been published from Report Designer. Lastly, check all of your schedules to ensure that they are still properly configured and operational.	
Step 23	On workstations, remove old client tool directories, then unpack applicable client tools to the empty `/pentaho/design-tools/` directory.	
Step 24	Verify that all client tools can access old content and publish to the BA Server. Verify that PDI can connect to the DI Server, if applicable.	
Step 25	Remove the `/pentaho/server_old/` directory on each upgraded machine, and any archive packages and temporary directories you used for the upgrade.	

Obtaining the Installation Materials

As an Enterprise Edition customer, you can obtain the BA Server and client tool pre-configured packages from the Pentaho Customer Support Portal by using your Pentaho account login credentials. If you are unfamiliar with these details, consult the Welcome Kit provided to you by Pentaho customer support as part of enabling the Enterprise Edition of Pentaho Business Analytics.

The Pentaho Enterprise Console is included in the Pentaho Business Analytics package, so you do not need to download it separately.

The **Pentaho User Console plugins** items below refer to add-ons for the Pentaho User Console, such as Dashboard Designer, Interactive Reporting, Pentaho Mobile, and Pentaho Analyzer.

Windows

The packages you will need for a Windows server are:

- **BA Server (includes the Pentaho Enterprise Console):** biserver-ee-4.8.0-GA.zip
- **Pentaho Analyzer plugin:** paz-plugin-ee-4.8.0-GA.zip
- **Pentaho Dashboard Designer plugin:** pdd-plugin-ee-4.8.0-GA.zip
- **Pentaho Interactive Reporting plugin:** pir-plugin-ee-1.1.0-GA.zip
- **Pentaho Mobile:** pentaho-mobile-package-name.zip

The packages you will need for your Windows workstations are:

- **Report Designer:** prd-ee-3.9.0-GA.zip
- **Metadata Editor:** pme-ee-4.8.0-GA.zip
- **Schema Workbench:** psw-ee-3.4.1.zip
- **Design Studio for 32-bit Windows:** pds-ee-win-32-4.0.0-GA.zip
- **Design Studio for 64-bit Windows:** pds-ee-win-64-4.0.0-GA.zip
- **Design Studio plugins for existing Eclipse installations:** org.pentaho.designstudio.editors.actionsequence_4.0.0.GA.zip
- **Aggregation Designer:** /4.8.0-GA/client/windows/pad-ee-1.4.0-GA.zip
- **Data Integration:** pdi-ee-client-4.4.0-GA.zip

Supported Operating Systems Other Than Windows

The packages you will need for a Unix and Linux-based servers are:

- **BA Server (includes the Pentaho Enterprise Console):** biserver-ee-4.8.0-GA.tar.gz
- **Pentaho Analyzer plugin:** paz-plugin-ee-4.8.0-GA.tar.gz
- **Pentaho Dashboard Designer plugin:** pdd-plugin-ee-4.8.0-GA.tar.gz
- **Pentaho Interactive Reporting plugin:** pir-plugin-ee-1.1.0-GA.tar.gz
- **Pentaho Mobile:** pentaho-mobile-package-name.tar.gz

The packages you will need for your Linux or Solaris workstations are:

- **Report Designer:** prd-ee-3.9.0-GA.tar.gz
- **Metadata Editor:** pme-ee-4.8.0-GA.tar.gz
- **Schema Workbench:** psw-ee-3.4.1.tar.gz
- **Design Studio for 32-bit Linux:** pds-ee-linux-32-4.0.0-GA.tar.gz
- **Design Studio for 64-bit Linux:** pds-ee-linux-64-4.0.0-GA.tar.gz
- **Design Studio plugins for existing Eclipse installations:** org.pentaho.designstudio.editors.actionsequence_4.0.0.GA.zip
- **Aggregation Designer:** pad-ee-1.4.0-GA.tar.gz
- **Data Integration:** pdi-ee-client-4.4.0-GA.tar.gz

Deploying the BA Server

Follow these instructions to install the new BA Server and Pentaho Enterprise Console.

Caution: Solaris users: Because Pentaho archives are created with a GNU tar, Solaris may truncate long file names. Use GNU tar instead of Solaris tar for this procedure.

1. Rename the `/pentaho/server/` directory to `pentaho/server_old`.
2. Create a new `/pentaho/server/` directory.
3. Untar or unzip the **biserver-ee-4.8.0-GA** archive to the new location.
   This creates new **biserver-ee** and **enterprise-console** subdirectories.

The BA Server and Pentaho Enterprise Console extract into the proper directories.

Changes to the Solution Database

The default solution database engine for the 4.5.0-GA release of the Pentaho BA Server was MySQL. The default solution database engine for the 4.8.0-GA release of the Pentaho BA Server is PostgreSQL. If you are accustomed to using the default solution database or just wish to keep your existing solution database, Pentaho's recommendation for migrating from 4.5.0-GA to 4.8.0-GA is to configure your 4.8.0-GA BA Server to use your existing 4.5.0-GA solution database instance. There is no technical reason that you need to switch to the default PostgreSQL technology. The proper configuration copies over as part of the exercise in the section *Merging Your BA Server Configuration Files*. Because it is not necessary, the process of migrating from MySQL to PostgreSQL is not included in our instruction set. No additional instructions are necessary to make this change.

The Solution Database: Upgrading the Quartz Schema

The Quartz scheduling engine has been upgraded in the Pentaho BA Server 4.8.0-GA. As part of the upgrade, several columns were changed or added to the Quartz tables. Follow these instructions to upgrade the Quartz schema that is part of your existing solution database. This upgrade process does not affect your data.

1. Navigate to /pentaho/server/biserver-ee/data/<RDBMS>, where <RDBMS> is the type of solution database RDBMS that your 4.5.0-GA installation is configured to use (oracle10g, postgresql, or mysql5).
2. Execute the migrate_quartz_<rdbms>.sql script using your preferred utility. For example, to upgrade the Quartz schema for a MySQL solution database, you would execute the following:

```
mysql -u root -p <migrate_quartz_mysql.sql
```

Your solution database Quartz schema is up-to-date.

Copying Solution Database JDBC Drivers

In order for your BA Server to connect to the system databases (referred to as the solution database, or solution repository) in the RDBMS of your choice, you need to add the RDBMS's JDBC driver library to the BA Server's and Enterprise Console's `lib` directory. The instructions in this section are focused solely on solution database configuration and connectivity with the BA Server.

Follow the below process to enable the BA Server to connect to an Oracle, MySQL, or PostgreSQL solution database.

1. Find or retrieve a JDBC driver JAR from your database vendor or third-party driver developer.

   Due to licensing restrictions, Pentaho does not distribute the necessary JDBC driver JARs. You can retrieve a JDBC driver from your database vendor. To that end, you may find these links helpful:

   - **Oracle:** *http://www.oracle.com/technetwork/topics/index.html*
   - **MySQL:** *http://www.mysql.com/downloads/connector/j/*
   - **PostgreSQL:** *http://jdbc.postgresql.org/download.html*
2. For the BA Server, copy the appropriate JDBC driver JAR file to the `/tomcat/lib/` directory for Tomcat, or the `/jboss/server/default/lib/` directory for JBoss.
3. For Enterprise Console, copy the driver JAR to the `/pentaho/server/enterprise-console/lib/` directory.

The BA Server and Enterprise Console have the necessary driver to communicate with your solution database.

Copying context.xml, server.xml, web.xml, and log4j.xml

The context.xml, server.xml, and web.xml files contain important configuration information that must be transferred to your new BA Server instance. Some of these files may need to be changed later in the upgrade process, but for right now, you must copy them to the new deployment.

1. Copy your old **context.xml** from `server_old/biserver-ee/tomcat/webapps/pentaho/META-INF/` to `/server/biserver-ee/tomcat/webapps/pentaho/META-INF/`.
2. Copy your old **web.xml** from `server_old/biserver-ee/tomcat/webapps/pentaho/WEB-INF/classes` to `/server/biserver-ee/tomcat/webapps/pentaho/WEB-INF/classes`.
3. Copy your old **server.xml** from `server_old/biserver-ee/tomcat/conf/` to `/server/biserver-ee/tomcat/conf/`.
4. Copy your old **log4j.xml** from `server_old/biserver-ee/tomcat/webapps/pentaho/WEB-INF` to `/server/biserver-ee/tomcat/webapps/pentaho/WEB-INF`.

Your core BA Server configuration files have been transferred to your new BA Server.

Installing Pentaho User Console Plugins

In order to proceed with this task, you must have already purchased an Enterprise Edition license for the products you want to install. Skip this process if you do not have the requisite license.

The Pentaho User Console is built with a plugin architecture that enables you to expand its functionality with new client tools and functions. Follow the directions below to install any of the following plugins:

- Pentaho Analyzer
- Pentaho Dashboard Designer
- Pentaho Interactive Reporting

- Pentaho Mobile

Note: The Pentaho Analysis Enterprise Edition plugin is separate from Analyzer, and requires a different installation process. That process is found in *Installing the Analysis Enterprise Edition Plugin*.

1. If you have not already done so, download the plugin packages from the Pentaho Customer Support Portal. The installation materials list are defined in *Obtaining the Installation Matrials*.
2. Unpack the plugin packages to the `/pentaho/server/biserver-ee/pentaho-solutions/system/` directory.

   This will create a subdirectory for each plugin that you unpack.

The plugins you downloaded are now installed, though you will still need to merge your solution files and register your licenses.

Installing the Analysis Enterprise Edition Plugin

Follow the instructions below to install the Pentaho Analysis Enterprise Edition package, which contains Analysis engine enhancements for large ROLAP deployments. This procedure does not cover Pentaho Analyzer installation.

Note: If you are performing a manual WAR build and deployment, and you want to add the Pentaho Analysis Enterprise Edition JARs into the WAR pre-build, you can substitute `/biserver-manual-ee/build-resources/custom-pentaho-webapp/WEB-INF/` for `/WEB-INF/` references below.

1. If you have not already done so, retrieve the **pentaho-analysis-ee-4.8.0-GA** package from the Pentaho Customer Support Portal (login credentials were emailed to you with your Welcome Kit).
2. Unpack the archive to a temporary location.
3. If it is currently running, shut down the BA Server.
4. Copy only the following JARs from the `/pentaho-analysis-ee/lib/` directory to the `/tomcat/webapps/pentaho/WEB-INF/lib/` directory.
   - infinispan-core- 4.2.1.FINAL
   - jboss-transaction-api-1.0.1.GA
   - jcip-annotations-1.0
   - jgroups-2.12.0.CR5
   - marshalling-api-1.2.3.GA
   - memcached-0.0.1-PENTAHO
   - pentaho-analysis-ee-3.5.0-GA-obf
   - river-1.2.3.GA
5. Copy all of the configuration files from `/pentaho-analysis-ee/config/` to the `/tomcat/webapps/pentaho/WEB-INF/classes/ directory`.
6. Depending on the installation type; there would not be a **pentaho.war** (in archive based installations and executable based installations the **pentaho.war** is already deployed and the application will show as: `/tomcat/webapps/pentaho/`.
7. Remove the temporary **pentaho-analysis-ee** directory.

Pentaho Analysis Enterprise Edition is now installed with the default Infinispan configuration.

If you need to switch from Infinispan to Memcached, continue to the next section.

Switching to Memcached

In order to complete this procedure, you must have your own pre-configured Memcached instance. You should have also installed the Analysis Enterprise Edition package to your BA Server or standalone Mondrian engine.

If you already use the Memcached cache framework in your organization and would like to hook it up to the Pentaho Analysis ROLAP engine, follow the directions below to switch from the default Infinispan cache framework configuration.

Caution: Pentaho and Mondrian developers recommend against using Memcached. You are almost certain to have better performance with Infinispan.

1. If the BA Server or standalone Mondrian engine are running, shut them down now.
2. If you performed a default install of the Pentaho Analysis Enterprise Edition package, then you should have all of the required JARs installed to the BA or Mondrian server. If you aren't sure, verify now that the following JARs are present in the `/WEB-INF/lib/` directory inside of your deployed pentaho.war or Mondrian engine:

- pentaho-analysis-ee
- commons-lang
- commons-io
- commons-codec
- pentaho-ee-dsc-core
- memcached

3. Edit the **pentaho-analysis-config.xml** in the `/WEB-INF/classes/` directory inside the deployed pentaho.war or Mondrian engine, and change the value of **SEGMENT_CACHE_IMPL** to match the class name referenced below:

```
<entry key="SEGMENT_CACHE_IMPL">com.pentaho.analysis.segmentcache.impl.memcached.
MemcachedSegmentCache</entry>
```

4. Edit the **memcached-config.xml** in the `/WEB-INF/classes/` directory inside the deployed pentaho.war or Mondrian engine, and change the values of **SALT**, **SERVERS**, and **WEIGHT** to match your preference:

```
<entry key="SALT">YOUR SECRET SALT VALUE HERE</entry>
<entry key="SERVERS">192.168.0.1:1642,192.168.0.2:1642</entry>
<entry key="WEIGHTS">1,1</entry>
```

Your Pentaho Analysis Enterprise Edition instance is now configured to use Memcached for ROLAP segment caching.
Memcached Configuration Options

These properties control Memcached settings, and are set in the **memcached-config.xml** file in the `/WEB-INF/classes/` directory inside of your deployed pentaho.war or Mondrian engine.

Note: This is not a comprehensive list of the potential Memcached settings; the options explained below are the ones most critical to Memcached configuration for Pentaho Analysis.

Property	Purpose
SERVERS	A comma-separated list of servers and port numbers representing the Memcached nodes usable by the plugin.
WEIGHTS	A comma-separated list of numbers representing the relative caching capacity of the servers defined in the SERVERS property. There must be exactly as many values of WEIGHTS as there are values of SERVERS. As an example, if the first server has a capacity of 128 megabytes, and the second has a capacity of 256 megabytes, the correct values for the WEIGHTS property should be "1,2", indicating that the first server has a relative size of half of the second one.
SALT	A secret key prefix to be used when saving and loading segment data from the Memcached nodes. This property must be the same for all Mondrian nodes that share their caches. If the SALT value is different from one node to the next, the nodes will not be able to share their cache data.

Adding Linux and OS X Support for Printing Analyzer Geo Maps

There is an experimental function in Analyzer that enables you to print Geo Map visualizations. Follow the directions below to enable support on Linux and OS X. Windows configuration is covered in *Adding Windows Support for Printing Analyzer Geo Maps* on page 22.

Note: Pentaho requires a specific version of **wkhtmltoimage** in order for this print function to work correctly. Even if you have wkhtmltoimage installed on your machine, install the Pentaho-supplied version as explained below. It will be explicitly called by Analyzer, and will not interfere with your existing wkhtmltoimage instance.

Note: If you used the Business Analytics graphical installer, **skip all steps except the last two.**

1. Navigate to the **wkhtmltoimage** directory in your Pentaho installation. For archive installations, this is `/pentaho/biserver-ee/third-party-tools/wkhtmltoimage/`, and for manual deployments it is `/biserver-manual-ee/build-resources/third-party-tools/wkhtmltoimage/`.
2. For OS X, unpack the **wkhtmltoimage_mac.tar.bz2** package; for 32-bit Linux, unpack the **wkhtmltoimage_linux_i386.tar.bz2** package; for 64-bit Linux, unpack the **wkhtmltoimage_linux_amd64.tar.bz2** package.
3. There is only one file in this archive: the executable **wkhtmltoimage**. If the executable has an extension, such as **i386** or **amd64**, rename the file to **wkhtmltoimage**.
4. Move the executable to: `/home/pentaho/pentaho/server/biserver-ee/wkhtmltoimage` directory.
5. Edit the `/pentaho-solutions/system/pentaho.xml` file and set the value of **<html-to-image-tool>** to the full path to the **wkhtmltoimage** executable that you just unpacked.

```
<html-to-image-tool>/home/pentaho/pentaho/server/biserver-ee/third-party-tools/
wkhtmltoimage/wkhtmltoimage</html-to-image-tool>
```

6. Save and close the file, then edit the `/pentaho-solutions/system/analyzer/settings.xml` file and uncomment the following line:

```
<!--open_layers>geomapexport</open_layers-->
```

7. Save and close the settings.xml file.

You have enabled the experimental print feature for Analyzer Geo Map visualizations.

Adding Windows Support for Printing Analyzer Geo Maps

There is an experimental function in Analyzer that enables you to print Geo Map visualizations. Follow the below directions to enable support on Windows. Linux and OS X configuration are covered in *Adding Linux and OS X Support for Printing Analyzer Geo Maps* on page 21.

Note: Pentaho requires a specific version of **wkhtmltoimage** in order for this print function to work correctly. Even if you have wkhtmltoimage installed on your machine, install the Pentaho-supplied version as explained below. It will be explicitly called by Analyzer, and will not interfere with your existing wkhtmltoimage instance.

Note: If you used the Business Analytics graphical installer, **skip all steps except the last two.**

1. Navigate to the **wkhtmltoimage** directory in your Pentaho installation. For archive installations, this is `\pentaho\biserver-ee\third-party-tools\wkhtmltoimage\`, and for manual deployments it is `\biserver-manual-ee\build-resources\third-party-tools\wkhtmltoimage\`.
2. Run the **wkhtmltoimage_windows_installer.exe** executable.
3. Accept the license agreement to continue.
4. Uncheck the **wkhtmltopdf** option, then click **Next**.
5. For the **Destination folder**, type in or navigate to the following path, creating the directories if they do not exist: `C:\pentaho\biserver-ee\third-party-tools\wkhtmltoimage\`. Once you have navigated to the path, click **Install**.
6. When the installation is complete, click **Close**, then edit the `\pentaho-solutions\system\pentaho.xml` file and set the value of **<html-to-image-tool>** to the full path to the **wkhtmltoimage** executable that you specified in the installer, including the executable name of the package, which is **wkhtmltoimage**.

```
<html-to-image-tool>C:\pentaho\biserver-ee\third-party-tools\wkhtmltoimage
\wkhtmltoimage</html-to-image-tool>
```

7. Close that file, then edit the `\pentaho-solutions\system\analyzer\settings.xml` file and uncomment the following line:

```
<!--open_layers>geomapexport</open_layers-->
```

8. Save and close the settings.xml file.

You have enabled the experimental print feature for Analyzer Geo Map visualizations.

Removing Pentaho Sample Data and Solutions

By default, Pentaho provides a sample data source and a solution directory filled with example content. These samples are provided for evaluation and testing. Once you are ready to move from an evaluation or testing scenario to development or production, you can remove the sample content. Follow the instructions below to completely remove the Pentaho sample data and solutions.

1. Stop the BA Server.
2. If they exist, delete the `/pentaho/server/biserver-ee/pentaho-solutions/steel-wheels/` and `/pentaho/server/biserver-ee/pentaho-solutions/bi-developers/` directories.

   These directories contain sample content for CDF and BA Server plugins. They are not present in typical manual deployment scenarios.
3. Edit the `/pentaho/WEB-INF/web.xml` file inside of the deployed pentaho.war.

   As laid down by the Pentaho graphical installer and archive packages, this path should be `/pentaho/server/biserver-ee/tomcat/webapps/pentaho/WEB-INF/web.xml`. If you performed a manual WAR build and deployment, then you must adjust the path to fit your configuration.
4. Remove the sample servlets by commenting them out or removing them from the file:

```
<!-- [BEGIN SAMPLE SERVLETS] -->
 <servlet>
  <servlet-name>UpdateSampleEmails</servlet-name>
  <jsp-file>/jsp/UpdateSampleEmails.jsp</jsp-file>
 </servlet>

 <servlet>
  <servlet-name>Widgets</servlet-name>
  <jsp-file>/jsp/Widgets.jsp</jsp-file>
 </servlet>

 <servlet>
  <servlet-name>SampleDashboard</servlet-name>
  <jsp-file>/jsp/SampleDashboard.jsp</jsp-file>
 </servlet>

 <servlet>
  <servlet-name>ChartSamplesDashboard</servlet-name>
  <jsp-file>/jsp/ChartSamplesDashboard.jsp</jsp-file>
 </servlet>

 <servlet>
  <servlet-name>SampleDrill</servlet-name>
  <jsp-file>/jsp/SampleDrill.jsp</jsp-file>
 </servlet>

 <servlet>
  <servlet-name>SWDashboard</servlet-name>
  <jsp-file>/jsp/SWDashboard.jsp</jsp-file>
 </servlet>

 <servlet>
  <servlet-name>Map</servlet-name>
  <jsp-file>/jsp/Map.jsp</jsp-file>
 </servlet>

 <servlet>
  <servlet-name>SampleFlashDashboard</servlet-name>
  <jsp-file>/jsp/SampleFlashDashboard.jsp</jsp-file>
 </servlet>
<!-- [END SAMPLE SERVLETS] -->
```

5. Remove the sample servlet mappings in the same fashion:

```
<!-- [BEGIN SAMPLE SERVLET MAPPINGS] -->
 <servlet-mapping>
  <servlet-name>UpdateSampleEmails</servlet-name>
  <url-pattern>/UpdateSampleEmails</url-pattern>
```

```
 </servlet-mapping>

 <servlet-mapping>
  <servlet-name>Widgets</servlet-name>
  <url-pattern>/Widgets</url-pattern>
 </servlet-mapping>

 <servlet-mapping>
  <servlet-name>SampleDashboard</servlet-name>
  <url-pattern>/SampleDashboard</url-pattern>
 </servlet-mapping>

 <servlet-mapping>
  <servlet-name>ChartSamplesDashboard</servlet-name>
  <url-pattern>/ChartSamplesDashboard</url-pattern>
 </servlet-mapping>

 <servlet-mapping>
  <servlet-name>SampleDrill</servlet-name>
  <url-pattern>/SampleDrill</url-pattern>
 </servlet-mapping>

 <servlet-mapping>
  <servlet-name>SWDashboard</servlet-name>
  <url-pattern>/SWDashboard</url-pattern>
 </servlet-mapping>

 <servlet-mapping>
  <servlet-name>Map</servlet-name>
  <url-pattern>/Map</url-pattern>
 </servlet-mapping>

 <servlet-mapping>
  <servlet-name>SampleFlashDashboard</servlet-name>
  <url-pattern>/SampleFlashDashboard</url-pattern>
 </servlet-mapping>
<!-- [END SAMPLE SERVLET MAPPINGS] -->
```

6. Remove the **SampleDataStartupListener**:

```
<listener>
    <listener-class>org.pentaho.platform.web.http.context.HsqldbStartupListener</
listener-class>
</listener>
```

7. Remove the **hsqldb-databases** section:

```
<!-- [BEGIN HSQLDB DATABASES] -->
    <context-param>
        <param-name>hsqldb-databases</param-name>
        <param-value>sampledata@../../data/hsqldb/sampledata</param-value>
    </context-param>
<!-- [END HSQLDB DATABASES] -->
```

8. Remove the **SystemStatusFilter** filter:

Note: This is not part of the Pentaho samples; it provides error status messages that are only useful for development and testing purposes, and should be removed from a production system.

```
<filter>
    <filter-name>SystemStatusFilter</filter-name>
    <filter-class>com.pentaho.ui.servlet.SystemStatusFilter</filter-class>
    <init-param>
        <param-name>initFailurePage</param-name>
        <param-value>InitFailure</param-value>
        <description>This page is displayed if the PentahoSystem fails to properly
 initialize.</description>
    </init-param>
```

```
</filter>
```

9. Remove the filter mapping for the **SystemStatusFilter**:

```
<filter-mapping>
    <filter-name>SystemStatusFilter</filter-name>
    <url-pattern>/*</url-pattern>
</filter-mapping>
```

10. Save and close the web.xml file.
11. Delete the `/pentaho/server/biserver-ee/data/` directory.

    This directory contains a sample database, control scripts for that database and the environment settings it needs to run, and SQL scripts to initialize a new Pentaho solution repository.

Your BA Server instance is now cleaned of samples and development/testing pieces, and is streamlined for production.

Continuing the Archive-Based Upgrade Process

To continue the upgrade process for an archive-based upgrade process, see *Migrating Your Solutions*.

Business Analytics Graphical Installer Deployment

If you used the graphical installation utility previously, it's easiest to use archive packages to replace certain parts of Business Analytics that have changed. **There is no simple way to upgrade by using the latest Business Analytics installation utility**, and presently Pentaho does not have the ability to automatically upgrade an existing installation. Therefore you will have to merge your old settings and solutions by hand. All of the necessary instructions for this process are below.

Note: If you are concerned about the complexity of this upgrade process and do not feel that you can complete it on your own, you can hire a consultant to perform it for you. Contact Pentaho Services through your sales or support representative to learn more.

Graphical Installer Deployment 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 upgrade materials from the Customer Support Portal.	
Step 2	Stop all Pentaho programs and services, including the solution repository database.	
Step 3	Back up your /pentaho/server/ directory and hibernate and quartz databases.	
Step 4	Rename the /pentaho/server/ directory to /pentaho/server_old/, and create a new empty `/pentaho/server/` directory to replace it.	
Step 5	Unpack the BA Server archive package to the empty `/pentaho/server/` directory.	
Step 6	Upgrade the Quartz schema in the existing solution database.	
Step 7	Copy any necessary JDBC drivers for your solution database and data sources to the `/pentaho/server/biserver-ee/tomcat/lib/` directory.	
Step 8	Copy your old web.xml and context.xml from the old Pentaho WAR to the new one.	
Step 9	Copy over your old server.xml to the new `/tomcat/conf/` directory.	
Step 10	Unpack any Pentaho User Console plugins you have licenses for (Analyzer, Dashboard Designer, Interactive Reporting) to the `/pentaho/server/biserver-ee/pentaho-solutions/system/` directory.	
Step 11	If you have a Pentaho Analysis Enterprise Edition license, unpack the pentaho-analysis-ee archive to a temporary location, then copy the requisite JARs to the `/pentaho/`	

Step	Procedure	Done
	`server/biserver-ee/tomcat/webapps/pentaho/WEB-INF/lib/` directory, and the requisite configuration files to the `/pentaho/server/biserver-ee/tomcat/webapps/pentaho/WEB-INF/classes/` directory.	
Step 12	Copy over the **scripts** directories from the old `enterprise-console` and `tomcat` directories to the new ones.	
Step 13	For 64-bit Windows systems, copy the Tomcat executables from the old BA Server instance to the new one.	
Step 14	For Windows deployments, copy over the Start Menu icons from the old BA Server instance to the new one.	
Step 15	Remove the Pentaho sample content.	
Step 16	Copy all of your solution directories from the `/pentaho/server_old/biserver-ee/pentaho-solutions/` directory to the new one.	
Step 17	Copy the files documented in *Merging Your BA Server Configuration Files* on page 43 to the new pentaho-solutions directory.	
Step 18	Edit the following files and merge in the changes as instructed: pentahoObjects.spring.xml, applicationContext-spring-security.xml, and web.xml.	
Step 19	If you're a PDI Enterprise Edition customer, continue on to the section that describes the DI Server upgrade process.	
Step 20	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 21	If you have not already done so, move data source JDBC driver JARs from the old directories to the new ones. This includes the BA Server and Enterprise Console.	
Step 22	Update any Enterprise Edition licenses if necessary.	
Step 23	Start the solution database, BA Server, and Pentaho Enterprise Console and check for any obvious errors or failures in the console output and log file.	
Step 24	**Check that all of your content is accessible.** Log into the Pentaho User Console and verify that your product licenses work. Run a new report in Interactive Reporting to ensure that it is ready for production. Verify at least two existing analysis views or Analyzer reports for each data source. Verify that any previously created dashboards are functioning properly. Run all reports that have been published from Report Designer. Lastly, check all of your schedules to ensure that they are still properly configured and operational.	
Step 25	On workstations, remove old client tool directories, then unpack applicable client tools to the empty `/pentaho/design-tools/` directory.	
Step 26	Verify that all client tools can access old content and publish to the BA Server. Verify that PDI can connect to the DI Server, if applicable.	
Step 27	Remove the `/pentaho/server_old/` directory, and any archive packages and temporary directories you used for the upgrade.	

Obtaining the Installation Materials

As an Enterprise Edition customer, you can obtain the BA Server and client tool pre-configured packages from the Pentaho Customer Support Portal by using your Pentaho account login credentials. If you are unfamiliar with these details, consult the Welcome Kit provided to you by Pentaho customer support as part of enabling the Enterprise Edition of Pentaho Business Analytics.

The Pentaho Enterprise Console is included in the Pentaho Business Analytics package, so you do not need to download it separately.

The **Pentaho User Console plugins** items below refer to add-ons for the Pentaho User Console, such as Dashboard Designer, Interactive Reporting, Pentaho Mobile, and Pentaho Analyzer.

Windows

The packages you will need for a Windows server are:

- **BA Server (includes the Pentaho Enterprise Console):** biserver-ee-4.8.0-GA.zip
- **Pentaho Analyzer plugin:** paz-plugin-ee-4.8.0-GA.zip
- **Pentaho Dashboard Designer plugin:** pdd-plugin-ee-4.8.0-GA.zip
- **Pentaho Interactive Reporting plugin:** pir-plugin-ee-1.1.0-GA.zip
- **Pentaho Mobile:** pentaho-mobile-package-name.zip

The packages you will need for your Windows workstations are:

- **Report Designer:** prd-ee-3.9.0-GA.zip
- **Metadata Editor:** pme-ee-4.8.0-GA.zip
- **Schema Workbench:** psw-ee-3.4.1.zip
- **Design Studio for 32-bit Windows:** pds-ee-win-32-4.0.0-GA.zip
- **Design Studio for 64-bit Windows:** pds-ee-win-64-4.0.0-GA.zip
- **Design Studio plugins for existing Eclipse installations:** org.pentaho.designstudio.editors.actionsequence_4.0.0.GA.zip
- **Aggregation Designer:** /4.8.0-GA/client/windows/pad-ee-1.4.0-GA.zip
- **Data Integration:** pdi-ee-client-4.4.0-GA.zip

Supported Operating Systems Other Than Windows

The packages you will need for a Unix and Linux-based servers are:

- **BA Server (includes the Pentaho Enterprise Console):** biserver-ee-4.8.0-GA.tar.gz
- **Pentaho Analyzer plugin:** paz-plugin-ee-4.8.0-GA.tar.gz
- **Pentaho Dashboard Designer plugin:** pdd-plugin-ee-4.8.0-GA.tar.gz
- **Pentaho Interactive Reporting plugin:** pir-plugin-ee-1.1.0-GA.tar.gz
- **Pentaho Mobile:** pentaho-mobile-package-name.tar.gz

The packages you will need for your Linux or Solaris workstations are:

- **Report Designer:** prd-ee-3.9.0-GA.tar.gz
- **Metadata Editor:** pme-ee-4.8.0-GA.tar.gz
- **Schema Workbench:** psw-ee-3.4.1.tar.gz
- **Design Studio for 32-bit Linux:** pds-ee-linux-32-4.0.0-GA.tar.gz
- **Design Studio for 64-bit Linux:** pds-ee-linux-64-4.0.0-GA.tar.gz
- **Design Studio plugins for existing Eclipse installations:** org.pentaho.designstudio.editors.actionsequence_4.0.0.GA.zip
- **Aggregation Designer:** pad-ee-1.4.0-GA.tar.gz
- **Data Integration:** pdi-ee-client-4.4.0-GA.tar.gz

Deploying the BA Server

Follow the directions below to install a new BA Server and the Pentaho Enterprise Console onto your server. The examples assume a Linux environment; adjust the paths accordingly for Windows-based machines.

1. Create a new server directory to replace the one you renamed earlier.

   ```
   mkdir /home/pentaho/pentaho/server/
   ```

2. Untar or unzip the **biserver-ee-4.8.0-GA** archive from wherever you downloaded it to the new server directory.

   ```
   tar zxvf /home/amenethil/downloads/biserver-ee-4.8.0-GA.tar.gz -C /home/pentaho/
   pentaho/server/
   ```

   This will create new **biserver-ee** and **enterprise-console** subdirectories.

The BA Server and Pentaho Enterprise Console are now extracted into the proper directories. Continue on to the next several sections to install drivers, change the hostname and port if necessary, and install any plugins that you have support entitlements for.

Copying context.xml, server.xml, web.xml, and log4j.xml

The context.xml, server.xml, and web.xml files contain important configuration information that must be transferred to your new BA Server instance. Some of these files may need to be changed later in the upgrade process, but for right now, you must copy them to the new deployment.

1. Copy your old **context.xml** from `server_old/biserver-ee/tomcat/webapps/pentaho/META-INF/` to `/server/biserver-ee/tomcat/webapps/pentaho/META-INF/`.
2. Copy your old **web.xml** from `server_old/biserver-ee/tomcat/webapps/pentaho/WEB-INF/classes` to `/server/biserver-ee/tomcat/webapps/pentaho/WEB-INF/classes`.
3. Copy your old **server.xml** from `server_old/biserver-ee/tomcat/conf/` to `/server/biserver-ee/tomcat/conf/`.
4. Copy your old **log4j.xml** from `server_old/biserver-ee/tomcat/webapps/pentaho/WEB-INF` to `/server/biserver-ee/tomcat/webapps/pentaho/WEB-INF`.

Your core BA Server configuration files have been transferred to your new BA Server.

Changes to the Solution Database

The default solution database engine for the 4.5.0-GA release of the Pentaho BA Server was MySQL. The default solution database engine for the 4.8.0-GA release of the Pentaho BA Server is PostgreSQL. If you are accustomed to using the default solution database or just wish to keep your existing solution database, Pentaho's recommendation for migrating from 4.5.0-GA to 4.8.0-GA is to configure your 4.8.0-GA BA Server to use your existing 4.5.0-GA solution database instance. There is no technical reason that you need to switch to the default PostgreSQL technology. The proper configuration copies over as part of the exercise in the section *Merging Your BA Server Configuration Files*. Because it is not necessary, the process of migrating from MySQL to PostgreSQL is not included in our instruction set. No additional instructions are necessary to make this change.

The Solution Database: Upgrading the Quartz Schema

The Quartz scheduling engine has been upgraded in the Pentaho BA Server 4.8.0-GA. As part of the upgrade, several columns were changed or added to the Quartz tables. Follow these instructions to upgrade the Quartz schema that is part of your existing solution database. This upgrade process does not affect your data.

1. Navigate to /pentaho/server/biserver-ee/data/<RDBMS>, where <RDBMS> is the type of solution database RDBMS that your 4.5.0-GA installation is configured to use (oracle10g, postgresql, or mysql5).
2. Execute the migrate_quartz_<rdbms>.sql script using your preferred utility. For example, to upgrade the Quartz schema for a MySQL solution database, you would execute the following:

```
mysql -u root -p <migrate_quartz_mysql.sql
```

Your solution database Quartz schema is up-to-date.

Installing Pentaho User Console Plugins

In order to proceed with this task, you must have already purchased an Enterprise Edition license for the products you want to install. Skip this process if you do not have the requisite license.

The Pentaho User Console is built with a plugin architecture that enables you to expand its functionality with new client tools and functions. Follow the directions below to install any of the following plugins:

- Pentaho Analyzer
- Pentaho Dashboard Designer
- Pentaho Interactive Reporting
- Pentaho Mobile

Note: The Pentaho Analysis Enterprise Edition plugin is separate from Analyzer, and requires a different installation process. That process is found in *Installing the Analysis Enterprise Edition Plugin*.

1. If you have not already done so, download the plugin packages from the Pentaho Customer Support Portal. The installation materials list are defined in *Obtaining the Installation Matrials*.

2. Unpack the plugin packages to the `/pentaho/server/biserver-ee/pentaho-solutions/system/` directory.

   This will create a subdirectory for each plugin that you unpack.

The plugins you downloaded are now installed, though you will still need to merge your solution files and register your licenses.

Installing the Analysis Enterprise Edition Plugin

Follow the instructions below to install the Pentaho Analysis Enterprise Edition package, which contains Analysis engine enhancements for large ROLAP deployments. This procedure does not cover Pentaho Analyzer installation.

Note: If you are performing a manual WAR build and deployment, and you want to add the Pentaho Analysis Enterprise Edition JARs into the WAR pre-build, you can substitute `/biserver-manual-ee/build-resources/custom-pentaho-webapp/WEB-INF/` for `/WEB-INF/` references below.

1. If you have not already done so, retrieve the **pentaho-analysis-ee-4.8.0-GA** package from the Pentaho Customer Support Portal (login credentials were emailed to you with your Welcome Kit).
2. Unpack the archive to a temporary location.
3. If it is currently running, shut down the BA Server.
4. Copy only the following JARs from the `/pentaho-analysis-ee/lib/` directory to the `/tomcat/webapps/pentaho/WEB-INF/lib/` directory.
   - infinispan-core- 4.2.1.FINAL
   - jboss-transaction-api-1.0.1.GA
   - jcip-annotations-1.0
   - jgroups-2.12.0.CR5
   - marshalling-api-1.2.3.GA
   - memcached-0.0.1-PENTAHO
   - pentaho-analysis-ee-3.5.0-GA-obf
   - river-1.2.3.GA
5. Copy all of the configuration files from `/pentaho-analysis-ee/config/` to the `/tomcat/webapps/pentaho/WEB-INF/classes/ directory`.
6. Depending on the installation type; there would not be a **pentaho.war** (in archive based installations and executable based installations the **pentaho.war** is already deployed and the application will show as: `/tomcat/webapps/pentaho/`.
7. Remove the temporary **pentaho-analysis-ee** directory.

Pentaho Analysis Enterprise Edition is now installed with the default Infinispan configuration.

If you need to switch from Infinispan to Memcached, continue to the next section.

Switching to Memcached

In order to complete this procedure, you must have your own pre-configured Memcached instance. You should have also installed the Analysis Enterprise Edition package to your BA Server or standalone Mondrian engine.

If you already use the Memcached cache framework in your organization and would like to hook it up to the Pentaho Analysis ROLAP engine, follow the directions below to switch from the default Infinispan cache framework configuration.

Caution: Pentaho and Mondrian developers recommend against using Memcached. You are almost certain to have better performance with Infinispan.

1. If the BA Server or standalone Mondrian engine are running, shut them down now.
2. If you performed a default install of the Pentaho Analysis Enterprise Edition package, then you should have all of the required JARs installed to the BA or Mondrian server. If you aren't sure, verify now that the following JARs are present in the `/WEB-INF/lib/` directory inside of your deployed pentaho.war or Mondrian engine:
   - pentaho-analysis-ee
   - commons-lang
   - commons-io
   - commons-codec
   - pentaho-ee-dsc-core
   - memcached

3. Edit the **pentaho-analysis-config.xml** in the `/WEB-INF/classes/` directory inside the deployed pentaho.war or Mondrian engine, and change the value of **SEGMENT_CACHE_IMPL** to match the class name referenced below:

```
<entry key="SEGMENT_CACHE_IMPL">com.pentaho.analysis.segmentcache.impl.memcached.
MemcachedSegmentCache</entry>
```

4. Edit the **memcached-config.xml** in the `/WEB-INF/classes/` directory inside the deployed pentaho.war or Mondrian engine, and change the values of **SALT**, **SERVERS**, and **WEIGHT** to match your preference:

```
<entry key="SALT">YOUR SECRET SALT VALUE HERE</entry>
<entry key="SERVERS">192.168.0.1:1642,192.168.0.2:1642</entry>
<entry key="WEIGHTS">1,1</entry>
```

Your Pentaho Analysis Enterprise Edition instance is now configured to use Memcached for ROLAP segment caching.
Memcached Configuration Options

These properties control Memcached settings, and are set in the **memcached-config.xml** file in the `/WEB-INF/classes/` directory inside of your deployed pentaho.war or Mondrian engine.

Note: This is not a comprehensive list of the potential Memcached settings; the options explained below are the ones most critical to Memcached configuration for Pentaho Analysis.

Property	Purpose
SERVERS	A comma-separated list of servers and port numbers representing the Memcached nodes usable by the plugin.
WEIGHTS	A comma-separated list of numbers representing the relative caching capacity of the servers defined in the SERVERS property. There must be exactly as many values of WEIGHTS as there are values of SERVERS. As an example, if the first server has a capacity of 128 megabytes, and the second has a capacity of 256 megabytes, the correct values for the WEIGHTS property should be "1,2", indicating that the first server has a relative size of half of the second one.
SALT	A secret key prefix to be used when saving and loading segment data from the Memcached nodes. This property must be the same for all Mondrian nodes that share their caches. If the SALT value is different from one node to the next, the nodes will not be able to share their cache data.

Adding Linux and OS X Support for Printing Analyzer Geo Maps

There is an experimental function in Analyzer that enables you to print Geo Map visualizations. Follow the directions below to enable support on Linux and OS X. Windows configuration is covered in *Adding Windows Support for Printing Analyzer Geo Maps* on page 22.

Note: Pentaho requires a specific version of **wkhtmltoimage** in order for this print function to work correctly. Even if you have wkhtmltoimage installed on your machine, install the Pentaho-supplied version as explained below. It will be explicitly called by Analyzer, and will not interfere with your existing wkhtmltoimage instance.

Note: If you used the Business Analytics graphical installer, **skip all steps except the last two.**

1. Navigate to the **wkhtmltoimage** directory in your Pentaho installation. For archive installations, this is `/pentaho/biserver-ee/third-party-tools/wkhtmltoimage/`, and for manual deployments it is `/biserver-manual-ee/build-resources/third-party-tools/wkhtmltoimage/`.
2. For OS X, unpack the **wkhtmltoimage_mac.tar.bz2** package; for 32-bit Linux, unpack the **wkhtmltoimage_linux_i386.tar.bz2** package; for 64-bit Linux, unpack the **wkhtmltoimage_linux_amd64.tar.bz2** package.
3. There is only one file in this archive: the executable **wkhtmltoimage**. If the executable has an extension, such as **i386** or **amd64**, rename the file to **wkhtmltoimage**.

4. Move the executable to: `/home/pentaho/pentaho/server/biserver-ee/wkhtmltoimage` directory.
5. Edit the `/pentaho-solutions/system/pentaho.xml` file and set the value of **<html-to-image-tool>** to the full path to the **wkhtmltoimage** executable that you just unpacked.

```
<html-to-image-tool>/home/pentaho/pentaho/server/biserver-ee/third-party-tools/
wkhtmltoimage/wkhtmltoimage</html-to-image-tool>
```

6. Save and close the file, then edit the `/pentaho-solutions/system/analyzer/settings.xml` file and uncomment the following line:

```
<!--open_layers>geomapexport</open_layers-->
```

7. Save and close the settings.xml file.

You have enabled the experimental print feature for Analyzer Geo Map visualizations.

Adding Windows Support for Printing Analyzer Geo Maps

There is an experimental function in Analyzer that enables you to print Geo Map visualizations. Follow the below directions to enable support on Windows. Linux and OS X configuration are covered in *Adding Linux and OS X Support for Printing Analyzer Geo Maps* on page 21.

Note: Pentaho requires a specific version of **wkhtmltoimage** in order for this print function to work correctly. Even if you have wkhtmltoimage installed on your machine, install the Pentaho-supplied version as explained below. It will be explicitly called by Analyzer, and will not interfere with your existing wkhtmltoimage instance.

Note: If you used the Business Analytics graphical installer, **skip all steps except the last two.**

1. Navigate to the **wkhtmltoimage** directory in your Pentaho installation. For archive installations, this is `\pentaho\biserver-ee\third-party-tools\wkhtmltoimage\`, and for manual deployments it is `\biserver-manual-ee\build-resources\third-party-tools\wkhtmltoimage\`.
2. Run the **wkhtmltoimage_windows_installer.exe** executable.
3. Accept the license agreement to continue.
4. Uncheck the **wkhtmltopdf** option, then click **Next**.
5. For the **Destination folder**, type in or navigate to the following path, creating the directories if they do not exist: `C:\pentaho\biserver-ee\third-party-tools\wkhtmltoimage\`. Once you have navigated to the path, click **Install**.
6. When the installation is complete, click **Close**, then edit the `\pentaho-solutions\system\pentaho.xml` file and set the value of **<html-to-image-tool>** to the full path to the **wkhtmltoimage** executable that you specified in the installer, including the executable name of the package, which is **wkhtmltoimage**.

```
<html-to-image-tool>C:\pentaho\biserver-ee\third-party-tools\wkhtmltoimage
\wkhtmltoimage</html-to-image-tool>
```

7. Close that file, then edit the `\pentaho-solutions\system\analyzer\settings.xml` file and uncomment the following line:

```
<!--open_layers>geomapexport</open_layers-->
```

8. Save and close the settings.xml file.

You have enabled the experimental print feature for Analyzer Geo Map visualizations.

Copying Startup Scripts

The Business Analytics installer includes a series of scripts that start and stop Pentaho services. These are different between Linux and Windows, but the directories have the same names. These scripts are not included in the archive packages, so you must copy them over from various directories in your old Pentaho instance.

1. Copy your old `/server_old/biserver-ee/tomcat/scripts/` directory to the new tomcat directory.
2. Copy your old `/server_old/enterprise-console/scripts/` directory to the new enterprise-console directory.
3. Copy your old `/server_old/biserver-ee/logs` directory to the new biserver-ee log directory.

All of the necessary BA Server startup scripts have been copied. However, if you installed the DI Server, its scripts will be copied later as part of the DI Server upgrade procedure.

Copying Windows 64-bit Tomcat Executables

If you are upgrading a 64-bit Windows BA Server that was deployed via the graphical installation utility, you must copy the old Tomcat executable files and a batch script.

The archive distribution is 32-bit only for Windows deployments; however, the version of Tomcat that Pentaho ships has not changed between BA Server 3.10 and 4.8. Therefore, you can simply copy these three files from `\pentaho\server_old\biserver-ee\tomcat\bin\` to the new bin directory:

1. tomcat6.exe
2. tomcat6w.exe
3. service.bat

If you do not copy these files, the resulting BA Server instance runs on a 32-bit application server.

Copying Windows Start Menu Icons

Note: This procedure applies only to Windows users.

Copy all of the **.ico** files from `\pentaho\server_old\biserver-ee\` to the new biserver-ee directory. These are the icon graphics for the Windows Start menu.

Removing Pentaho Sample Data and Solutions

By default, Pentaho provides a sample data source and a solution directory filled with example content. These samples are provided for evaluation and testing. Once you are ready to move from an evaluation or testing scenario to development or production, you can remove the sample content. Follow the instructions below to completely remove the Pentaho sample data and solutions.

1. Stop the BA Server.
2. If they exist, delete the `/pentaho/server/biserver-ee/pentaho-solutions/steel-wheels/` and `/pentaho/server/biserver-ee/pentaho-solutions/bi-developers/` directories.

   These directories contain sample content for CDF and BA Server plugins. They are not present in typical manual deployment scenarios.
3. Edit the `/pentaho/WEB-INF/web.xml` file inside of the deployed pentaho.war.

   As laid down by the Pentaho graphical installer and archive packages, this path should be `/pentaho/server/biserver-ee/tomcat/webapps/pentaho/WEB-INF/web.xml`. If you performed a manual WAR build and deployment, then you must adjust the path to fit your configuration.
4. Remove the sample servlets by commenting them out or removing them from the file:

```
<!-- [BEGIN SAMPLE SERVLETS] -->
 <servlet>
  <servlet-name>UpdateSampleEmails</servlet-name>
  <jsp-file>/jsp/UpdateSampleEmails.jsp</jsp-file>
 </servlet>

 <servlet>
  <servlet-name>Widgets</servlet-name>
  <jsp-file>/jsp/Widgets.jsp</jsp-file>
 </servlet>

 <servlet>
  <servlet-name>SampleDashboard</servlet-name>
  <jsp-file>/jsp/SampleDashboard.jsp</jsp-file>
 </servlet>

 <servlet>
  <servlet-name>ChartSamplesDashboard</servlet-name>
  <jsp-file>/jsp/ChartSamplesDashboard.jsp</jsp-file>
 </servlet>

 <servlet>
```

```
  <servlet-name>SampleDrill</servlet-name>
  <jsp-file>/jsp/SampleDrill.jsp</jsp-file>
 </servlet>

 <servlet>
  <servlet-name>SWDashboard</servlet-name>
  <jsp-file>/jsp/SWDashboard.jsp</jsp-file>
 </servlet>

 <servlet>
  <servlet-name>Map</servlet-name>
  <jsp-file>/jsp/Map.jsp</jsp-file>
 </servlet>

 <servlet>
  <servlet-name>SampleFlashDashboard</servlet-name>
  <jsp-file>/jsp/SampleFlashDashboard.jsp</jsp-file>
 </servlet>
<!-- [END SAMPLE SERVLETS] -->
```

5. Remove the sample servlet mappings in the same fashion:

```
<!-- [BEGIN SAMPLE SERVLET MAPPINGS] -->
 <servlet-mapping>
  <servlet-name>UpdateSampleEmails</servlet-name>
  <url-pattern>/UpdateSampleEmails</url-pattern>
 </servlet-mapping>

 <servlet-mapping>
  <servlet-name>Widgets</servlet-name>
  <url-pattern>/Widgets</url-pattern>
 </servlet-mapping>

 <servlet-mapping>
  <servlet-name>SampleDashboard</servlet-name>
  <url-pattern>/SampleDashboard</url-pattern>
 </servlet-mapping>

 <servlet-mapping>
  <servlet-name>ChartSamplesDashboard</servlet-name>
  <url-pattern>/ChartSamplesDashboard</url-pattern>
 </servlet-mapping>

 <servlet-mapping>
  <servlet-name>SampleDrill</servlet-name>
  <url-pattern>/SampleDrill</url-pattern>
 </servlet-mapping>

 <servlet-mapping>
  <servlet-name>SWDashboard</servlet-name>
  <url-pattern>/SWDashboard</url-pattern>
 </servlet-mapping>

 <servlet-mapping>
  <servlet-name>Map</servlet-name>
  <url-pattern>/Map</url-pattern>
 </servlet-mapping>

 <servlet-mapping>
  <servlet-name>SampleFlashDashboard</servlet-name>
  <url-pattern>/SampleFlashDashboard</url-pattern>
 </servlet-mapping>
<!-- [END SAMPLE SERVLET MAPPINGS] -->
```

6. Remove the **SampleDataStartupListener**:

```
<listener>
    <listener-class>org.pentaho.platform.web.http.context.HsqldbStartupListener</
listener-class>
```

```
</listener>
```

7. Remove the **hsqldb-databases** section:

```
<!-- [BEGIN HSQLDB DATABASES] -->
    <context-param>
        <param-name>hsqldb-databases</param-name>
        <param-value>sampledata@../../data/hsqldb/sampledata</param-value>
    </context-param>
<!-- [END HSQLDB DATABASES] -->
```

8. Remove the **SystemStatusFilter** filter:

Note: This is not part of the Pentaho samples; it provides error status messages that are only useful for development and testing purposes, and should be removed from a production system.

```
<filter>
    <filter-name>SystemStatusFilter</filter-name>
    <filter-class>com.pentaho.ui.servlet.SystemStatusFilter</filter-class>
    <init-param>
        <param-name>initFailurePage</param-name>
        <param-value>InitFailure</param-value>
        <description>This page is displayed if the PentahoSystem fails to properly
 initialize.</description>
    </init-param>
</filter>
```

9. Remove the filter mapping for the **SystemStatusFilter**:

```
<filter-mapping>
    <filter-name>SystemStatusFilter</filter-name>
    <url-pattern>/*</url-pattern>
</filter-mapping>
```

10. Save and close the web.xml file.
11. Delete the `/pentaho/server/biserver-ee/data/` directory.

    This directory contains a sample database, control scripts for that database and the environment settings it needs to run, and SQL scripts to initialize a new Pentaho solution repository.

Your BA Server instance is now cleaned of samples and development/testing pieces, and is streamlined for production.

Migrating Your Solutions

BA Server content is stored in the /pentaho/server_old/biserver-ee/pentaho-solutions/ directory. However, this is also where the BA Server's configuration files are stored, as well as Pentaho-supplied sample content. You must move your BI content from your old solutions directory to the new one. Copying the settings and other configuration information will happen in the next section.

Note: You must use the archive flag or option when you copy if you want a minimal impact on your solution database. If you copy without the archive option, all of the dates on your solution files and directories will reset to today's date, which will force the solution repository to refresh.

When you copy your solution directories, which are stored in `/pentaho/server_old/biserver-ee/pentaho-solutions/`, this should include all reports, data sources, metadata definitions, dashboards, charts, and action sequences you've created and published. **Do not copy** any other directories at this time.

Danger: Be sure that you transfer **all** of the solution directories that you've created. Some people may only have one solution directory, and some may have many directories to segregate content for different departments or data sources. If you fail to copy over a solution directory, the content it contains will not be carried over to your new Pentaho instance.

After you have copied your solutions to your new solutions directory, proceed to the next section to learn how to migrate your settings.

Merging Your BA Server Configuration Files

The following configuration files have changed between version 4.5.0 and 4.8.0:

- pentahoObjects.spring.xml
- applicationContext-spring-security.xml
- web.xml

Instructions for merging changes into all of the above-listed files are in the next subsection. Before you get to that point, however, there are a few customized configuration files that you must copy over from your old pentaho-solutions directory to the new one. These files cover security, solution repository, and audit log configuration. While they have not changed in version 4.8.0, they are customized according to your BA Server settings.

Copy the following **files** -- **but not any subdirectories** -- from your old BA Server `/pentaho-solutions/` directory to the new one:

- /admin/audit/*
- /admin/resources/metadata/*
- /system/*
- /system/olap/datasources.xml
- /system/mondrian/mondrian.properties
- /system/analyzer/analyzer.properties
- /system/google/googlesettings.xml (if you are using your own Google Maps API key)

Copy the following **directories** and all of the files and subdirectories therein from your old BA Server `/pentaho-solutions/` directory to the new one:

- /system/content/
- /system/dialects/
- /system/hibernate/
- /system/quartz/
-

These directories contain Pentaho samples. If they exist in your current BA Server installation, you should keep the new versions. If they do not exist in the old installation, you can safely delete them from the new pentaho-solutions directory:

- /bi-developers/
- /steel-wheels/

After you've copied all of these files to the proper locations in your new pentaho-solutions directory, continue on to the next subsection to learn how to merge the other files.

Updating pentahoObjects.spring.xml

Follow the instructions below to bring your old pentahoObjects.spring.xml file up to date for the BA Server 4.8.0.

1. Open your recently copied `/pentaho-solutions/system/pentahoObjects.spring.xml` file with a text editor.
2. Find the **</beans>** tag at the end of the file, and add the following line directly above it:

```
<!--
Used by Dashboard Printing to authenticate the printing process for a given user.
-->
<bean id="PreAuthenticatedSessionHolder"
class="org.pentaho.platform.web.http.PreAuthenticatedSessionHolder">
    <!-- TTL in seconds -->
    <constructor-arg value="600"/>
    <!-- eviction schedule in seconds -->
    <constructor-arg value="60"/>
</bean>
```

3. Save the file and close the text editor.

Your `pentahoObjects.spring.xml` file is current for the 4.8.0 installation.

Updating applicationContext-spring-security.xml

Follow the instructions below to bring your old applicationContext-spring-security.xml file up to date for the BA Server 4.8.0.

1. Open your recently copied `/pentaho-solutions/system/applicationContext-spring-security.xml` file with a text editor.
2.  **Caution:** You must ensure that there are no line breaks when you paste in this code block. The BA Server will not start if you paste this code block with line breaks.

   Find this line: `PATTERN_TYPE_APACHE_ANT` and add the following line directly below it, making certain the string is all on one line with no linebreaks.

   ```
   /content/dashboards/print=securityContextHolderAwareRequestFilter,httpSess
   ionContextIntegrationFilter,preAuthenticatedSecurityFilter,httpSessionReus
   eDetectionFilter,logoutFilter,authenticationProcessingFilter,basicProcessi
   ngFilter,requestParameterProcessingFilter,anonymousProcessingFilter,pentah
   oSecurityStartupFilter,exceptionTranslationFilter,filterInvocationIntercep
   tor
   ```
3. Find this line: `CONVERT_URL_TO_LOWERCASE_BEFORE_COMPARISON` and add the following line directly below it:

   ```
   \A/.*require-js-cfg.js\Z=Anonymous,Authenticated
   ```
4. Find the following lines and move them just below `\A/webcontext.js.*\Z=Anonymous,Authenticated`:

   ```
   \A/content/common-ui/resources/web/cache/cache-service.js.*
   \Z=Anonymous,Authenticated
                       \A/cacheexpirationservice.*\Z=Anonymous,Authenticated
   ```
5. Find the line `\A/content/common-ui/resources/web/dojo/djconfig.js.*\Z=Anonymous,Authenticated` and add the following line just below it:

   ```
   \A/content/pentaho-mobile/resources/.*\Z=Anonymous,Authenticated
   ```
6. Find the closing `</beans>` node. Add the following XML just above this node.

   ```
   <bean id="preAuthenticatedSecurityFilter"
   class="org.pentaho.platform.web.http.security.PreAuthenticatedFilter">
   <constructor-arg ref="PreAuthenticatedSessionHolder"/>
   </bean>
   ```
7. Save and close the file.

Your applicationContext-spring-security.xml file is current for the 4.8 installation.

Updating web.xml

Follow the instructions below to bring your old **web.xml** file up-to-date for the BA Server 4.8.0. Ensure your BA Server is stopped before making these changes; if it is running, your **web.xml** file may be deleted.

1. Inside of the deployed **pentaho.war** file, open the `/WEB-INF/web.xml` file with a text editor.

   With an archive or graphical deployment, the path is: `/pentaho/server/biserver-ee/tomcat/webapps/pentaho/WEB-INF/`.
2. Search for this string: `RequireJSServlet`. If you do not find it, then it has already been removed, and you do not need to make any changes. If you do find this string, remove it.

   ```
   <servlet>
   ```

```
      <servlet-name>RequireJSServlet</servlet-name>
      <servlet-class>org.pentaho.platform.web.servlet.RequireJSServlet</servlet-
class>
</servlet>
```

3. Search for RequireJSServlet again, and remove the servlet mapping string.

```
<servlet-mapping>
   <servlet-name>RequireJSServlet</servlet-name>
   <url-pattern>/js/require-cfg.js</url-pattern>
</servlet-mapping>
```

4. Save the file and close the text editor.

Your web.xml file is up-to-date.

Upgrading Your Single-Sign On Configuration

This only applies to people who have modified the BA Server to work with a Central Authentication Service.

Follow the directions below to enable single sign-on in your newly upgraded BA Server.

1. Unpack your deployed Pentaho WAR file in place.

   Tomcat will typically do this automatically when you start it. JBoss will not typically unpack the WAR on its own, but if you unpack it by hand, the directory must have a .war extension.
2. Open a terminal or command prompt window and navigate to the `/biserver-manual-ee/build-resources/pentaho-sso/` directory.
3. Edit the **sso-replacements.properties** file and change the default options to match your CAS configuration.

   Refer to the CAS properties reference below if you have any trouble figuring out what each property does. If you have the sso-replacements.properties file that you used to enable CAS support in BA Server 4.1, you can reuse it for this process, but you must ensure that the **cas.ticket.validator.url** property is updated according to the property reference below.
4. Use Ant to run the **sso-replacements** script with the **sso-pentaho** switch, as in the following example:

```
ant -f sso-replacements.xml sso-pentaho
```

Your upgraded SSO files are now in place.

CAS Property Reference

CAS Properties

These properties mostly refer to CAS services:

Property	Description	Example
cas.authn.provider	**Required.** Security back-end that CAS should use. Valid values are memory, jdbc, or ldap	ldap
cas.login.url	**Required.** CAS login URL.	${cas.base.url}/login
cas.ticket.validator.url	**Required.** CAS ticket validator URL.	${cas.base.url}
cas.logout.url	**Required.** CAS logout URL. A service.logout.url will be appended to this URL.	${cas.base.url}/logout?url=
cas.base.url	URL under which all CAS services reside.	https://localhost:8443/cas

Pentaho Properties

These are service URLs that serve as callbacks from the CAS server into the BI Platform:

Property	Description	Example
pentaho.service.url	**Required.** Processes CAS callback.	${_per j_sprin
pentaho.service.logout.url	**Required.** URL to go to after CAS logout.	${_per Home
pentaho.service.solutions.system.dir	Path to pentaho-solutions/system.	/ usr/ local/ pentah server biserv ee/ pentah solutio systen
pentaho.service.lib.dir	Path to webapp lib directory.	/ usr/ local/ tomca comm lib/
pentaho.service.web.xml	Path (including filename) of webapp's web.xml.	/ usr/ local/ tomca conf/ web.x
pentaho.service.appctx.cas.xml	Path (including filename) of new applicationContext-spring-security-cas.xml.	/ usr/ local/ pentah server biserv ee/ pentah solutio systen applic spring securi cas.xm
pentaho.service.jsp.dir	Path to directory containing webapp's JSPs.	/ usr/ local/ tomca webap pentah jsp/
pentaho.service.spring.beans.xml	Path (including filename) of pentaho-spring-beans.xml.	/ usr/ local/ pentah server

Property	Description	Example
		biserv ee/ pentah solutio systen pentah sping- beans
pentaho.service.base.url	Service base URL.	http:// localh pentah
pentaho.service.pentaho.war.dir	Webapp exploded WAR directory.	/ usr/ local/ tomca webap pentah
pentaho.service.webinf.dir	Path to webapp's WEB-INF directory.	/ usr/ local/ tomca webap pentah WEB- INF/

Upgrading the Pentaho Enterprise Console

You must upgrade the Pentaho Enterprise console so that the new BA Server can work. To upgrade, follow the below process.

1. If you used the manual deployment process, you must now unpack the `pec-4.8.0-GA` zip or tar.gz file to the /pentaho/server/ directory.

   This creates a new **enterprise-console** directory with default settings.

   

   Note: If you took the archive-based or graphical installer upgrade paths, you do not need to retrieve a new Enterprise Console package; it was included in the BA Server archive package. This step is only for people who have performed a manual WAR deployment.

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

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

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

3. Copy 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_old/enterprise-console/resource/config/hsqldb/ /
   home/pentaho/pentaho/server/enterprise-console/resource/config/
   ```

The Pentaho Enterprise Console has been upgraded to version 4.8.0.

Moving JDBC Drivers

Note: JDBC driver versions may have issues with Java. Read your database vendor's compatibility notes carefully before moving or downloading driver JARs.

Note: Microsoft SQL Server customers frequently use an alternative, non-vendor-supported driver called JTDS. Ensure that you are downloading the expected driver before installing it.

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. The relevant driver directories for Tomcat are below:

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 may have to remove them to avoid confusion and potential 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. If you have any doubts as to how to proceed, contact your Pentaho support representative for guidance.

- **BA Server:** `/pentaho/server/biserver-ee/tomcat/lib/`
- **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/`
- **Report Designer:** `/pentaho/design-tools/report-designer/lib/jdbc/`
- **Schema Workbench:** `/pentaho/design-tools/schema-workbench/drivers/`
- **Aggregation Designer:** `/pentaho/design-tools/agg-designer/drivers/`
- **Metadata Editor:** `/pentaho/design-tools/metadata-editor/libext/JDBC/`

Testing Your New BA Server

Your server is now ready to test. From an end-user workstation, start a Web browser and navigate to **http://example.com:8080/pentaho**, changing **example.com** to your BA Server's hostname, domain name, or IP address. A login screen appears.

Click the **Login** button, log in normally with an existing user account, and verify that you can run all of your old BI content. Also verify that your schedules are still in place and functional. Specifically, Pentaho recommends that you verify the following actions if they apply to your Enterprise Edition scenario:

1. Open a report that requires no user prompts.
2. Open a report that requires user prompting (a parameterized report).
3. If you are a Pentaho Reporting Enterprise Edition customer, create a report using Interactive Reporting.
4. If you are a Pentaho Analysis Enterprise Edition customer, create a new Analyzer report.
5. If you are a Pentaho Reporting Enterprise Edition customer, create a new report through Interactive Reporting.
6. Open a dashboard if you have a Dashboard Designer support entitlement.
7. Create a new chart using Chart Designer if you have a Dashboard Designer support entitlement.
8. Publish a report from Report Designer.
9. Publish an analysis schema from Spoon.
10. After all other tests have been performed, check your server status in the Pentaho Enterprise Console.
11. Check your application server log for any errors.

Upgrading the Pentaho Client Tools

To upgrade the Pentaho client tools on user workstations, download and run the Business Analytics installer or install the individual client tool archive packages.

If you use the installer, you must

- Rename or remove the old client tools
- Run the installer
- Deslect the default options
- Select the client tools you want to install
- Proceed through the rest of the installation

If you prefer the archive package installation process, simply remove or rename the old client tool's directory, then unpack the new archive to the original location.

The only Pentaho client tools that store user settings are Report Designer and Pentaho Data Integration (Spoon). When upgrading these programs, the new instance will detect the custom settings from the old instance and use them automatically. These settings for Report Designer are stored in the **/.pentaho** directory, and the settings for Pentaho Data Integration (Spoon) are stored in the **/.kettle** directory, both in each user's home or user directory. No settings or content files are stored in the `/pentaho/design-tools/report-designer/` or `/pentaho/design-tools/data-integration/` directories (or the subdirectories for any other client tools). This means that you can safely remove the old Report Designer and Data Integration instances without harming the custom user settings.

The Client Tool file names are

- **Aggregation Designer:** pad-ee-1.5.0-GA
- **Data Integration:** pdi-ee-client-4.4.0-GA
- **Design Studio:** pds-ee-win-64-4.0.0-GA.zip or pds-ee-win-32-4.0.0-GA
- **Metadata Editor:** pme-ee-4.8.0-GA
- **Report Designer:** prd-ee-3.9.1-GA.zip or prd-ee-3.9.0-GA
- **Schema WorkBench:** psw-ee-3.4.1.1.zip

Post-Upgrade Configuration

Once your upgrade is complete, the only configuration you have to do is in regards to any new software you have installed. If you installed any new BA Server plugins that you did not have before, such as:

- Dashboard Designer
- Analyzer or Pentaho Analysis Enterprise Edition
- Interactive Reporting
- Mobile

Or any new PDI plugins, then you must install the appropriate license keys in the same manner that you previously installed Pentaho Business Analytics licenses.

Note: You do not need to reinstall any extant valid license keys.

Cleanup

Now that your new BA Server version 4.8 is built, deployed, and tested, you can clean up some old or temporary files. Typically this would include:

- The temporary **biserver-manual-ee** or **biserver-ee** (from the archive package) directory
- Your **server_old** directory
- Archive packages for client tools, servers, and plugins
- 4.1 backup artifacts, though you may want to keep these for a while, in case you need to roll back

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

Troubleshooting

This section contains known problems and solutions relating to the procedures covered in this guide.

File Names and Paths

Note: This is the most common installation problem.

Many of the configuration files and paths in this guide are similar, and it is easy to confuse them, which could result in modifying the wrong files or copying to the wrong locations. Double-check your file names and paths and ensure that you've copied all of the right files to all of the correct directories.

Trailing slashes are important; both their inclusion and their absence, depending on the file and parameter or element you are modifying. Follow the examples in this guide exactly unless otherwise directed.

Examining Log Files

If the BA Server fails to start or work properly, the log file you should consult is **pentaho.log** in the `/pentaho/server/biserver-ee/tomcat/bin/` directory. The contents of this file will assist you in tracking down the problem.

JDBC Driver Problems

First, ensure that the correct JDBC driver JARs are installed to the correct locations, then check to make sure that there aren't conflicting driver versions. See the *Pentaho Business Analytics Administrator's Guide* for explanations of how to create JDBC Database connections and driver locations for all parts of Pentaho Business Analytics. Check with your database or driver vendor if you suspect you have having JDBC driver compatibility issues.

Unable to Use the Database Init Scripts for PostgreSQL

The **pg_hba.conf** file contains host-based authentication information. If you can't run the SQL scripts that generate the Hibernate and Quartz databases, it's probably because the default user accounts for each database don't have the right permissions. To change this, edit the file to ensure that connections from local users created by the Pentaho sql scripts (**hibuser** and **pentaho_user**) will be able to connect. The default on Debian-based systems is for local connections you use **ident** authentication, which means that database users must have local user accounts. In other words, to continue using **ident**, you would have to create local **hibuser** and **pentaho_user** accounts. It's easier to just change the authentication method to something less restrictive, if your IT manager permits you to do so.

context.xml Changes Do Not Take Effect After Deploying a WAR

With a manual installation, if you deploy a WAR with a custom **context.xml**, the context.xml file may not be overwritten.

The location and naming convention for this file are: **$CATALINA_HOME/conf/Catalina/<host>/<war name>.xml**. Typically this will be something like: **/tomcat/conf/Catalina/localhost/pentaho.xml**. If this file exists, you will have to delete it prior to deploying the `pentaho.war` if you have made any changes to `context.xml`.

Tomcat Logs Report Memory Leaks

When shutting down Tomcat, you may see some SEVERE-level warnings in the log file similar to these:

```
Dec 17, 2010 10:18:19 AM org.apache.catalina.loader.WebappClassLoader
 clearReferencesJdbc
SEVERE: The web application [/pentaho] registered the JBDC driver
 [mondrian.olap4j.MondrianOlap4jDriver] but failed to unregister it when the web
 application was stopped. To prevent a memory leak, the JDBC Driver has been forcibly
 unregistered.
```

```
Dec 17, 2010 10:18:19 AM org.apache.catalina.loader.WebappClassLoader
 clearReferencesThreads
SEVERE: The web application [/pentaho] appears to have started a thread named [HSQLDB
 Timer @49cf9f] but has failed to stop it. This is very likely to create a memory
 leak.
Dec 17, 2010 10:18:19 AM org.apache.catalina.loader.WebappClassLoader
 clearReferencesThreads
SEVERE: The web application [/pentaho] appears to have started a thread named [MySQL
 Statement Cancellation Timer] but has failed to stop it. This is very likely to
 create a memory leak.
Dec 17, 2010 10:18:19 AM org.apache.catalina.loader.WebappClassLoader
 clearThreadLocalMap
SEVERE: The web application [/pentaho] created a ThreadLocal
 with key of type [java.lang.InheritableThreadLocal] (value
 [java.lang.InheritableThreadLocal@a1320e]) and a value of type
 [org.pentaho.platform.engine.security.session.TrustedSystemStartupSession] (value
 [org.pentaho.platform.engine.security.session.TrustedSystemStartupSession@111089b])
 but failed to remove it when the web application was stopped. This is very likely to
 create a memory leak.
```

These warnings are nothing to be concerned about when shutting down the Tomcat server, since they report problems with processes that are immanently being killed. However, they can have significance if you are only restarting or redeploying the Pentaho BA Server or DI Server Web applications. To avoid any memory leak problems in redeployment, you should restart Tomcat instead of redeploying or restarting the Web application with a live server.

User Console Themes Render Improperly After Upgrade

If you are seeing strange rendering problems in the Pentaho User Console shortly after performing a BA Server upgrade, the problem may be related to old JavaScript files being held in the browser cache. To fix this problem, clear your Web browser's cache, then reload the Pentaho User Console.