



Upgrading to Pentaho Business Analytics 4.5



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Introduction



Danger: 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.

This guide provides procedures and advice for sysadmins who are upgrading from the Pentaho BI Suite Enterprise Edition 4.1.0-GA to Pentaho Business Analytics version 4.5.0-GA. This encompasses the BA Server (formerly "BI Server"), DI Server and any Pentaho client tools that you may have purchased support modules 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.**



Note: 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 4.2 to 4.3 Upgrade Guide* instead of trying to follow only the PDI sections of this larger Business Analytics document.

You will 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, you'll 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.

New Features in Version 4.5

Pentaho Business Analytics 4.5 contains many new features and improvements:

- **Product name changes:** The Pentaho BI Suite has been renamed to Pentaho Business Analytics. The Pentaho BI Server has been renamed to Pentaho BA Server.
 - **Impact:** Other than window titles and other user interface nomenclature, there is no significant impact at this time. However, in a future release, all relevant directory and package names will change to the new naming scheme.
- **Improved documentation content:** Many documents have been updated to address customer feedback submitted through the Pentaho support and pre-sales engineering departments, and to accommodate the new features and capabilities introduced in this release.
 - **Impact:** If you have old PDF copies of Pentaho guides, they will have to be replaced with updated versions.
- **Improved documentation delivery:** The Pentaho Knowledge Base has been replaced with the Pentaho InfoCenter (<http://infocenter.pentaho.com/help/index.jsp>). This is a much more modern, user-friendly, Web-based help framework that has superior search, printing, corrections/feedback, and navigation capabilities. PDF copies of all published documents are also stored in the InfoCenter for more convenient printing and offline reading.
 - **Impact:** Users should be instructed not to cheer too loudly when informed of this significant documentation enhancement, so as not to disturb their co-workers. Links to the old KB will redirect generically to the InfoCenter.
- **Improved support case management and software downloads:** The Pentaho Customer Support Portal has been vastly improved. In addition to providing superior interaction with Pentaho support engineers, the Customer Support Portal also replaces the Enterprise Edition FTP site and Knowledge Base in terms of software downloads.
 - **Impact:** System administrators should be aware that the Customer Support Portal is now the preferred download location for Pentaho Enterprise Edition software. Named support contacts should be aware of the change in workflow from the old Support Portal.
- **Report Designer:** You can now create dynamic queries with Groovy or JavaScript.
 - **Impact:** Report developers who previously used action sequences to change the structure of a query can now use this Report Designer feature to replace their old actions.
- **Pentaho Analyzer improvements:** The new Pentaho Geo Service provides Geo Map visualization support for data that contains location information. Other new visualizations include: heat grid, bubble map, and scatter chart. The layout panel has been completely redesigned to increase usability. You can now filter selections, and charts will highlight the elements that correspond with data grid selections.
 - **Impact:** BI developers may want to include the new visualizations in their Analyzer reports. Refer to the *Pentaho User Console Guide* and/or the *Pentaho Analysis Guide* for more information. The Geo Service requires expanded resources in order to render maps properly; therefore, the minimum hardware requirements have been increased from 1GB to 2GB of RAM for workstations, and from 2GB to 4GB for servers.
- **Interactive Reporting:** A new, customizable Report Viewer with enhanced prompt/parameter capabilities.
 - **Impact:** No user or administrator impact. The Report Viewer is highly customizable at a code level; this may be of interest to software developers.
- **Data Integration 4.3:** A significant bug in the Calculator step has been fixed. Vastly expanded Big Data functionality, including several Hadoop distributions, Cassandra, HBase, and MongoDB. The Hadoop For Pentaho Enterprise Edition license key is no longer required to access the full Big Data capabilities of PDI. See the *Pentaho Data Integration 4.2 to 4.3 Upgrade Guide* for a more complete list of improvements.
 - **Impact:** PDI content developers may need to adjust their jobs and transformations to accommodate for the Calculator bug fix. System administrators should be aware that the Hadoop license key is no longer needed for PDI, Metadata Editor, Report Designer, or the BA Server. See the *Pentaho Data Integration 4.2 to 4.3 Upgrade Guide* for more information.
- **BA Server 4.5:** A new Geo Service plugin is installed by default. This provides necessary functionality for Geo Map visualizations in Pentaho Analyzer, but can be leveraged for other custom visualizations or plugins.
 - **Impact:** The Geo Service plugin is installed and configured by default, so no extra BA Server configuration is necessary.
- **Pentaho Analysis (Mondrian):** The Analysis engine has been upgraded from version 3.3 to 3.4. You can view a complete list of changes here: <https://raw.githubusercontent.com/pentaho/mondrian/3.4.1/RELEASE.txt>. Most of the changes between these two releases has been internal, but there are a few callouts: Support for olap4j 1.0.1 and JDBC 4.1; simplified and improved the SegmentCache SPI; a new Mondrian Monitor API; refactoring of key parts of the engine

into an implementation of the Actor design pattern, providing more effective resource sharing and the elimination of many synchronization blocks; SQL queries for cell data is now fetched by a multi-threaded executor and the tasks are shared among the query threads; more than one SegmentCache implementation can now be used at a time; ability to combine the data of multiple segments for a single query; ability to combine data of an existing segment with data from SQL; support for the DRILLTHROUGH RETURN clause; ability to define non-measure calculated members in a cube under a specific parent; allow aggregate tables to join to middle levels of snowflake dimension.

- **Impact:** The mondrian.properties file has changed some of its default settings; this is covered in the upgrade process later in this guide. In many cases, ROLAP performance should improve in this release without having to do any extra configuration.

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 will need the following:

- A currently running Pentaho BA Server Enterprise Edition version 4.1.0-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. Typical upgrades should take between one and two hours. If you have many custom changes in your Pentaho configuration files, you can expect to spend about two hours on the upgrade.

System Requirements

Hardware requirements have increased for Business Analytics 4.5. Workstations must now have at least 2GB of RAM, and servers must have 4GB or more.

Software requirements have not changed for Business Analytics, so your existing production software environment will probably not need to be upgraded. Virtually any Linux distribution; Solaris 10; OS X; and Windows XP, Vista, Server 2008, or 7 will work, as long as it has a Sun Java Runtime Environment (JRE) or Java Development Kit (JDK -- this is a strict requirement only for manual deployment upgrades) version 1.6. Manual deployment upgrades will also need Apache Ant version 1.7 in order to build a new Pentaho WAR package.

How to Check Your Java Version

Pentaho Business Analytics requires a Java Runtime Environment (JRE) or Java Development Kit (JDK) version 1.6 (sometimes referred to as 6.0). Follow the procedure below to see which version of Java is installed on your system and configured to be the default Java executable.



Note: There may be multiple JREs or JDKs on your system, but only one can be set as the global default. Any of these Java instances can be explicitly used for any Java program; if no specific Java executable is called, 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 will also show in the output.

```
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)
```

Backing Up



Note: 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 (MySQL) Service on Windows

If you installed the BA Server on Windows through the graphical installation utility, the MySQL 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.

Renaming Your Old Pentaho Installation

Before you proceed, ensure that your BA Server, DI Server, and Pentaho Enterprise Console servers are stopped.

Rename your old `/pentaho/server/` directory to **`/pentaho/server_old/`** or some other appropriate name. Alternatively, you can move this directory to a different location.

```
mv /home/pentaho/pentaho/server/ /home/pentaho/pentaho/server_old/
```



Note: None of the software installed to this directory will work while it is renamed. If you need to abort the upgrade and start any servers in the server directory, you must rename it back to **server**.

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 13.
- 2. Archive deployment:** If you deployed Business Analytics from individual archive packages, you'll download 4.5.0-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 21.
- 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 29.

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 4.5.0-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 6.0 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	Verify that you understand that this checklist is NOT the complete instruction set. It is only a checklist. Once you have acknowledged this point, 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 <code>/pentaho/</code> 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 <code>/pentaho/server/</code> directory to <code>/pentaho/server_old/</code> .	
Step 5	Unpack the biserver-manual-ee package to a temporary location.	
Step 6	Remove the BA Server's Xalan JAR from the build materials.	
Step 7	If you are using an Oracle solution repository, copy the quartz-oracle-1.5.2.jar file to the appropriate directory to be included in the WAR build.	
Step 8	If you have made any changes to web.xml , merge your customizations with the <code>/biserver-manual-ee/build-resources/pentaho-webapp/WEB-INF/web.xml</code> file, then copy that merged file to the <code>/biserver-manual-ee/build-resources/WEB-INF/</code> directory.	
Step 9	Copy your old context.xml file (for Tomcat deployments), or your pentahoHibernate-ds.xml and quartz-ds.xml files (for JBoss deployments) to the <code>/biserver-manual-ee/build-resources/custom-pentaho-webapp/META-INF/</code> directory.	

Step	Procedure	Done
Step 10	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 <code>/biserver-manual-ee/build-resources/custom-pentaho-webapp/WEB-INF/lib/</code> directory, and the requisite configuration files to the <code>/biserver-manual-ee/build-resources/custom-pentaho-webapp/WEB-INF/classes/</code> directory.	
Step 11	Build new Pentaho WAR packages with the BA Server 4.5.0 manual deployment materials.	
Step 12	Remove the old pentaho.war and pentaho-style.war files or directories from your application server's webapps or deploy directory.	
Step 13	Delete any old Pentaho-related temporary files or directories created by your application server.	
Step 14	Copy the new WARs to the <code>/server/webapps/</code> directory in Tomcat, or the <code>/server/default/deploy/</code> directory in JBoss.	
Step 15	Create a new <code>/pentaho/server/biserver-ee/</code> directory in the same location as the old one that you renamed earlier, and move the <code>/biserver-manual-ee/build/pentaho-solutions/</code> directory to it.	
Step 16	Unpack any Pentaho User Console plugins you may have licenses for (Analyzer, Dashboard Designer, Interactive Reporting) to the <code>/pentaho/server/biserver-ee/pentaho-solutions/system/</code> directory.	
Step 17	Copy all of your solutions directories from the <code>/pentaho/server_old/biserver-ee/pentaho-solutions/</code> directory to the new one.	
Step 18	Copy the files documented in Merging Your BA Server Configuration Files on page 40 to the new pentaho-solutions directory.	
Step 19	Edit the following files and merge in the changes as instructed: the Hibernate file for JBoss (if applicable) and your database, <code>pentaho.xml</code> , <code>pentahoObjects.spring.xml</code> , <code>applicationContext-spring-security.xml</code> , <code>applicationContext-spring-security-hibernate.xml</code> , <code>analyzer.properties</code> , <code>mondrian.properties</code> , and <code>web.xml</code> .	
Step 20	Perform the documented steps for upgrading single-sign on if you previously used this as your authentication method.	
Step 21	If you're a PDI Enterprise Edition customer, continue on to the section that describes the DI Server upgrade process.	
Step 22	Unpack the new Pentaho Enterprise Console from the archive package to the <code>/pentaho/server/</code> directory.	
Step 23	Copy the following files from the old Pentaho Enterprise Console to the new one: <code>console.xml</code> , <code>console.properties</code> , <code>login.properties</code> , <code>login.conf</code> , <code>log4j.xml</code> ; and the entire <code>/resource/config/hsqldb/</code> directory.	
Step 24	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 25	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 26	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 27	On workstations, unpack applicable client tools to the empty <code>/pentaho/design-tools/</code> directory.	

Step	Procedure	Done
Step 28	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 29	Remove the <code>/pentaho/server_old/</code> directory on each upgraded machine, and any archive packages and temporary directories you used during the upgrade.	

Downloading and Unpacking the Upgrade Materials

This procedure covers BA Server manual deployment only. You can update the Pentaho client tools on your user workstations with the graphical installer, or you can download each client tool as a zip or tar.gz archive and deploy them individually.

Log into the Pentaho Customer Support Portal to download the upgrade packages. The address and login credentials were emailed to you with your new Welcome Kit. If you cannot find or were not sent a Welcome Kit, contact your Pentaho sales or support representative.

These are the files you need:

1. `biserver-manual-ee-4.5.0-GA.zip`
2. `pec-4.5.0-GA.zip` or `pec-4.5.0-GA.tar.gz` for Linux, OS X and Solaris.
3. If you purchased Dashboards, Reporting, or Analysis support entitlements, you will also need the appropriate plugins. **Dashboards:** `pdd-plugin-ee-4.5.0-GA` **Interactive Reporting:** `pir-plugin-ee-1.1.0-GA`; **Analyzer:** `paz-plugin-ee-4.5.0-GA`
4. Optionally, for client tool deployments, download the Business Analytics installer for your platform (Windows, Linux, or OS X).

These files contain the BA Server manual deployment package; the Pentaho Enterprise Console; the Dashboard Designer, Interactive Reporting, and Pentaho Analyzer plugins; and the Business Analytics installer, respectively. The BA Server and Pentaho Enterprise Console packages are required; Dashboard Designer, Interactive Reporting, and Analyzer are only for customers who have a support entitlement for them; and the Business Analytics graphical installer is for client tool deployments and is not required for a server upgrade. If you plan to unpack individual client tool packages on your workstations, download those instead of the graphical installer.

Once the files are downloaded, unpack the `biserver-manual-ee` file first. It doesn't matter where you unpack it to -- it is only a temporary directory that you will use to build a new Pentaho Web application.

Next, if you downloaded any BA Server plugins, unpack them into the newly created `/biserver-manual-ee/build-resources/pentaho-solutions/system/` directory.

You'll unpack the Pentaho Enterprise Console archive later when you're ready to replace the old one. For now, just leave it alone.


Removing the Xalan JAR for JBoss Deployments

JBoss 5.1 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-2.4.5.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-1.5.2.jar` to the newly created `/biserver-manual-ee/build-resources/custom-pentaho-webapp/WEB-INF/lib/` directory.

You are now 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.



Note: This procedure does not cover Pentaho Analyzer installation.



Note: If you are performing a manual WAR build and deployment, and you want to slipstream 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-3.4.0-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 `/WEB-INF/lib/` directory inside of the deployed `pentaho.war`:
 - `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-3.4.0-GA-obf`
 - `river-1.2.3.GA`
5. Copy all of the configuration files from `/pentaho-analysis-ee/config/` to the `/WEB-INF/classes/` directory inside of your deployed `pentaho.war`.
6. 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:
Refer to [Memcached Configuration Options](#) on page 17 for more information on these settings.


```
<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. You must research further Memcached options on your own.

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.

Using an Existing JBoss Instance

Upgrade instructions for JBoss WARs are below.

 **Note:** Support for JBoss versions prior to 5.1 is deprecated. You must use JBoss 5.1 for this upgrade.

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 now updated to version 4.5, though there is much more to do before your upgrade is complete.

Using an Existing Tomcat Instance

Upgrade instructions for Tomcat WARs are below.



Note: Support for Tomcat 5.5 is deprecated. You must use Tomcat 6 for this upgrade.

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/pigibbons/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 4.5.0, though there is much more to do before your upgrade is complete.

Rebuilding the Solutions Directory

Follow the directions below to create a 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 20.

 **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.

There is only one file in this archive: a `wkhtmltoimage` executable.

3. 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/wkhtmltoimage/wkhtmltoimage</html-to-image-tool>
```

4. 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-->
```


5. 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 19.

 **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 path that you found this utility in, then click **Install**. For instance: `C:\pentaho\biserver-ee\third-party-tools\wkhtmltoimage\`.
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 support entitlement for the products you want to install. Skip this process if you do not have the requisite support entitlements.

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

 **Note:** The Pentaho Analysis Enterprise Edition plugin is separate from Analyzer, and requires a different installation process explained in another part of this guide.

1. If you have not already done so, download the plugin packages from the Pentaho Customer Support Portal. The Dashboard Designer package name always begins with **pdd**; the Pentaho Analyzer package always begins with **paz**; the Interactive Reporting plugin always starts with **pir**.
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 register your license files in the Pentaho Enterprise Console, or with the command line license management tool. There are instructions for that process later in this guide. For now, continue on to the next section.

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 <code>/pentaho/</code> directory and hibernate and quartz databases.	
Step 4	Rename the <code>/pentaho/server/</code> directory to <code>/pentaho/server_old/</code> , then create a new, empty <code>/pentaho/server/</code> directory.	
Step 5	Unpack the BA Server archive package to the empty <code>/pentaho/server/</code> directory.	
Step 6	Copy any necessary JDBC drivers for your solution database and data sources to the <code>/pentaho/server/biserver-ee/tomcat/lib/</code> directory.	
Step 7	Copy over your old <code>web.xml</code> to the new <code>/tomcat/webapps/pentaho/WEB-INF/</code> directory.	
Step 8	Copy your old <code>context.xml</code> file from the <code>/server_old/biserver-ee/tomcat/webapps/pentaho/META-INF/</code> directory to the new one.	
Step 9	Copy over your old <code>server.xml</code> to the new <code>/tomcat/conf/</code> directory.	
Step 10	Unpack any Pentaho User Console plugins you may have licenses for (Analyzer, Dashboard Designer, Interactive Reporting) to the <code>/pentaho/server/biserver-ee/pentaho-solutions/system/</code> directory.	
Step 11	If you have a Pentaho Analysis Enterprise Edition license, unpack the <code>pentaho-analysis-ee</code> archive to a temporary location, then copy the requisite JARs to the <code>/pentaho/server/biserver-ee/tomcat/webapps/pentaho/WEB-INF/lib/</code> directory, and the requisite configuration files to the <code>/pentaho/server/biserver-ee/tomcat/webapps/pentaho/WEB-INF/classes/</code> directory.	
Step 12	Remove the Pentaho sample content.	
Step 13	Copy all of your solution directories from the <code>/pentaho/server_old/biserver-ee/pentaho-solutions/</code> directory to the new one.	
Step 14	Copy the files documented in Merging Your BA Server Configuration Files on page 40 to the new <code>pentaho-solutions</code> directory.	
Step 15	Edit the following files and merge in the changes as instructed: the Hibernate file for JBoss (if applicable) and your database, <code>pentaho.xml</code> , <code>pentahoObjects.spring.xml</code> , <code>applicationContext-spring-security.xml</code> , <code>applicationContext-spring-security-hibernate.xml</code> , <code>analyzer.properties</code> , <code>mondrian.properties</code> , and <code>web.xml</code> .	
Step 16	If you're a PDI Enterprise Edition customer, continue on to the section that describes the DI Server upgrade process.	
Step 17	Copy the following files from the old Pentaho Enterprise Console to the new one: <code>console.xml</code> , <code>console.properties</code> , <code>login.properties</code> , <code>login.conf</code> , <code>log4j.xml</code> ; and the entire <code>/resource/config/hsqldb/</code> directory.	

Step	Procedure	Done
Step 18	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 19	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 20	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 21	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 22	On workstations, remove old client tool directories, then unpack applicable client tools to the empty <code>/pentaho/design-tools/</code> directory.	
Step 23	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 24	Remove the <code>/pentaho/server_old/</code> 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 the Enterprise Edition enablement process.

With the exception of Design Studio, which has separate packages for Linux, OS X, and Windows, all of the below-listed files are platform-agnostic, so there is only one download for all operating systems, databases, and application servers. Most Windows servers do not typically have software to unpack a `.tar.gz` file, so it is repackaged in `.zip` format for Windows admins. Other than this archive technology difference, Pentaho Business Analytics packages are identical.

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, and Pentaho Analyzer.

Windows

The packages you will need for a Windows server are:

- **BA Server (includes the Pentaho Enterprise Console):** `biserver-ee-4.5.0-GA.zip`
- **Pentaho Analyzer plugin:** `paz-plugin-ee-4.5.0-GA.zip`
- **Pentaho Dashboard Designer plugin:** `pdd-plugin-ee-4.5.0-GA.zip`
- **Pentaho Interactive Reporting plugin:** `pir-plugin-ee-1.1.0-GA.zip`

The packages you will need for your Windows workstations are:

- **Report Designer:** `prd-ee-3.9.0-GA.zip`
- **Metadata Editor:** `pme-ee-4.5.0-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:** `/4.5.0-GA/client/windows/pad-ee-1.4.0-GA.zip`

- **Data Integration:** pdi-ee-client-4.3.0-GA.zip

Linux and Solaris

The packages you will need for a Linux or Solaris server are:


- **BA Server (includes the Pentaho Enterprise Console):** biserver-ee-4.5.0-GA.tar.gz
- **Pentaho Analyzer plugin:** paz-plugin-ee-4.5.0-GA.tar.gz
- **Pentaho Dashboard Designer plugin:** pdd-plugin-ee-4.5.0-GA.tar.gz
- **Pentaho Interactive Reporting plugin:** pir-plugin-ee-1.1.0-GA.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-4.5.0-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-4.3.0-GA.tar.gz

Deploying the BA Server

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

 **Note: Solaris users:** The default behavior of the tar utility in Solaris 10 is to truncate long file names when unpacking an archive created with GNU tar, as the Pentaho archives are. Therefore, you must use GNU tar instead of Solaris tar for this procedure. The path to GNU tar on Solaris 10 is typically `/usr/sfw/bin/gtar`. If you do not have `gtar` installed on your system, you will need to install it or some other GNU tar-compatible utility (such as `star`).

1. Re-create the `/pentaho/server/` directory that you renamed earlier.

```
mkdir -p /home/pentaho/pentaho/server/
```

2. Untar or unzip the **biserver-ee-4.5.0-GA** archive from wherever you downloaded it to the new location.

```
tar zxvf /home/amenethil/downloads/biserver-ee-4.5.0-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 Solution Database JDBC Drivers

This is only for Pentaho solution databases. You will also need to install JDBC drivers for your data sources at a later time, but 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 is unable to provide 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 now have the necessary driver to communicate with your solution repository database.

Copying context.xml, server.xml, and web.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/` to `/server/biserver-ee/tomcat/webapps/pentaho/WEB-INF/`.
3. Copy your old **server.xml** from `/server_old/biserver-ee/tomcat/conf/` to `/server/biserver-ee/tomcat/conf/`.


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 support entitlement for the products you want to install. Skip this process if you do not have the requisite support entitlements.

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

 **Note:** The Pentaho Analysis Enterprise Edition plugin is separate from Analyzer, and requires a different installation process explained in another part of this guide.


1. If you have not already done so, download the plugin packages from the Pentaho Customer Support Portal. The Dashboard Designer package name always begins with **pdd**; the Pentaho Analyzer package always begins with **paz**; the Interactive Reporting plugin always starts with **pir**.
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 register your license files in the Pentaho Enterprise Console, or with the command line license management tool. There are instructions for that process later in this guide. For now, continue on to the next section.

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.

 **Note:** This procedure does not cover Pentaho Analyzer installation.

 **Note:** If you are performing a manual WAR build and deployment, and you want to slipstream 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-3.4.0-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 `/WEB-INF/lib/` directory inside of the deployed pentaho.war:
 - infinispn-core- 4.2.1.FINAL
 - jboss-transaction-api-1.0.1.GA
 - jcip-annotations-1.0
 - jgroups-2.12.0.CR5
 - marshallng-api-1.2.3.GA
 - memcached-0.0.1-PENTAHO
 - pentaho-analysis-ee-3.4.0-GA-obf
 - river-1.2.3.GA
5. Copy all of the configuration files from `/pentaho-analysis-ee/config/` to the `/WEB-INF/classes/` directory inside of your deployed pentaho.war.
6. Remove the temporary **pentaho-analysis-ee** directory.

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

If you need to switch from Infinispn 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 Infinispn cache framework configuration.



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

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: Refer to [Memcached Configuration Options](#) on page 17 for more information on these settings.

```
<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. You must research further Memcached options on your own.

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 20.

 **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.

There is only one file in this archive: a **wkhtmltoimage** executable.

3. 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/wkhtmltoimage/wkhtmltoimage</html-to-image-tool>
```

4. 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-->
```


5. 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 19.

 **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 path that you found this utility in, then click **Install**. For instance: `C:\pentaho\biserver-ee\third-party-tools\wkhtmltoimage\`.
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 should remove the samples so that they do not get in the way of your BI 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>sampladata@../..../data/hsqldb/sampladata</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.

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	Copy any necessary JDBC drivers for your solution database and data sources to the /pentaho/server/biserver-ee/tomcat/lib/ directory.	
Step 7	Copy your old web.xml and context.xml from the old Pentaho WAR to the new one.	
Step 8	Copy over your old server.xml to the new /tomcat/conf/ directory.	
Step 9	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 10	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 11	Copy over the scripts directories from the old enterprise-console and tomcat directories to the new ones.	
Step 12	For 64-bit Windows systems, copy the Tomcat executables from the old BA Server instance to the new one.	
Step 13	For Windows deployments, copy over the Start Menu icons from the old BA Server instance to the new one.	
Step 14	Remove the Pentaho sample content.	
Step 15	Copy all of your solution directories from the /pentaho/server_old/biserver-ee/pentaho-solutions/ directory to the new one.	
Step 16	Copy the files documented in Merging Your BA Server Configuration Files on page 40 to the new pentaho-solutions directory.	
Step 17	Edit the following files and merge in the changes as instructed: the Hibernate file for JBoss (if applicable) and your database, pentaho.xml, pentahoObjects.spring.xml, applicationContext-spring-security.xml, applicationContext-spring-security-hibernate.xml, analyzer.properties, mondrian.properties, and web.xml.	
Step 18	If you're a PDI Enterprise Edition customer, continue on to the section that describes the DI Server upgrade process.	
Step 19	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 20	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 21	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	Procedure	Done
Step 22	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 23	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 24	On workstations, remove old client tool directories, then unpack applicable client tools to the empty <code>/pentaho/design-tools/</code> directory.	
Step 25	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 26	Remove the <code>/pentaho/server_old/</code> 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 the Enterprise Edition enablement process.

With the exception of Design Studio, which has separate packages for Linux, OS X, and Windows, all of the below-listed files are platform-agnostic, so there is only one download for all operating systems, databases, and application servers. Most Windows servers do not typically have software to unpack a .tar.gz file, so it is repackaged in .zip format for Windows admins. Other than this archive technology difference, Pentaho Business Analytics packages are identical.

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, and Pentaho Analyzer.

Windows

The packages you will need for a Windows server are:

- **BA Server (includes the Pentaho Enterprise Console):** biserver-ee-4.5.0-GA.zip
- **Pentaho Analyzer plugin:** paz-plugin-ee-4.5.0-GA.zip
- **Pentaho Dashboard Designer plugin:** pdd-plugin-ee-4.5.0-GA.zip
- **Pentaho Interactive Reporting plugin:** pir-plugin-ee-1.1.0-GA.zip

The packages you will need for your Windows workstations are:

- **Report Designer:** prd-ee-3.9.0-GA.zip
- **Metadata Editor:** pme-ee-4.5.0-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:** /4.5.0-GA/client/windows/pad-ee-1.4.0-GA.zip
- **Data Integration:** pdi-ee-client-4.3.0-GA.zip

Linux and Solaris

The packages you will need for a Linux or Solaris server are:

- **BA Server (includes the Pentaho Enterprise Console):** biserver-ee-4.5.0-GA.tar.gz
- **Pentaho Analyzer plugin:** paz-plugin-ee-4.5.0-GA.tar.gz
- **Pentaho Dashboard Designer plugin:** pdd-plugin-ee-4.5.0-GA.tar.gz
- **Pentaho Interactive Reporting plugin:** pir-plugin-ee-1.1.0-GA.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-4.5.0-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-4.3.0-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-4.5.0-GA** archive from wherever you downloaded it to the new server directory.

```
tar zxvf /home/amenethil/downloads/biserver-ee-4.5.0-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, and web.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/` to `/server/biserver-ee/tomcat/webapps/pentaho/WEB-INF/`.
3. Copy your old **server.xml** from `/server_old/biserver-ee/tomcat/conf/` to `/server/biserver-ee/tomcat/conf/`.


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 support entitlement for the products you want to install. Skip this process if you do not have the requisite support entitlements.

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


 **Note:** The Pentaho Analysis Enterprise Edition plugin is separate from Analyzer, and requires a different installation process explained in another part of this guide.


1. If you have not already done so, download the plugin packages from the Pentaho Customer Support Portal. The Dashboard Designer package name always begins with **pdd**; the Pentaho Analyzer package always begins with **paz**; the Interactive Reporting plugin always starts with **pir**.
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 register your license files in the Pentaho Enterprise Console, or with the command line license management tool. There are instructions for that process later in this guide. For now, continue on to the next section.

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.

 **Note:** This procedure does not cover Pentaho Analyzer installation.

 **Note:** If you are performing a manual WAR build and deployment, and you want to slipstream 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-3.4.0-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 `/WEB-INF/lib/` directory inside of the deployed `pentaho.war`:
 - `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-3.4.0-GA-obf`
 - `river-1.2.3.GA`
5. Copy all of the configuration files from `/pentaho-analysis-ee/config/` to the `/WEB-INF/classes/` directory inside of your deployed `pentaho.war`.
6. 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: Refer to [Memcached Configuration Options](#) on page 17 for more information on these settings.


```
<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. You must research further Memcached options on your own.

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 20.

 **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.

There is only one file in this archive: a **wkhtmltoimage** executable.

3. 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/wkhtmltoimage/wkhtmltoimage</html-to-image-tool>
```

4. 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-->
```

5. 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 19.

 **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 path that you found this utility in, then click **Install**. For instance: **C:\pentaho\biserver-ee\third-party-tools\wkhtmltoimage**.
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.

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



Note: If you are using a 32-bit version of the BA Server, you do not need to follow this procedure.

If you are upgrading a 64-bit Windows BA Server that was deployed via the graphical installation utility, you will have to copy over the old Tomcat executable files and a batch script. The archive distribution is 32-bit only for Windows deployments; however, the version of Tomcat the Pentaho ships has not changed between BA Server 3.10 and 4.5.0. 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 will be running 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 should remove the samples so that they do not get in the way of your BI 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>sampladata@../../data/hsqldb/sampladata</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 3.10 and 4.5.0:

- pentaho.xml
- pentahoObjects.spring.xml
- applicationContext-spring-security.xml
- applicationContext-spring-security-hibernate.xml
- analyzer.properties
- mondrian.properties
- web.xml

The database-specific Hibernate configuration files have also changed, but only one line has to be added.

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 4.5.0, 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/*`
- `/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/`
- `/system/metadata/`

These directories contain Pentaho samples. If they exist in your current BA Server installation, you should replace them with the new versions. If they do not exist in the old dir, 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 Hibernate

Follow the instructions below to bring your old Hibernate configuration file up to date for the BA Server 4.5.0.

These files are database-specific, and are in the `/pentaho-solutions/hibernate/` directory. Only modify the file that applies to the solution database you're using. If you are deploying to JBoss, also modify the **hibernate-jboss-managed.xml** file. This procedure will never apply to more than two files in this directory, though there is no harm in updating them all.

- `hibernate-jboss-managed.xml`
- `oracle10g.hibernate.cfg.xml`
- `hsql.hibernate.cfg.xml`
- `mysql5.hibernate.cfg.xml`
- `postgresql.hibernate.cfg.xml`

1. Open your database-specific Hibernate file with a text editor.
2. Add the following line directly above the `</session-factory>` tag:

```
<mapping resource="PentahoUserRoleMapping.hbm.xml" />
```

Your Hibernate files are now brought up to modern standards.

Updating pentaho.xml

Follow the instructions below to bring your old pentaho.xml file up to date for the BA Server 4.5.0.

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

```
<!-- location of the wkhtmltoimage tool -->
<html-to-image-tool>wkhtmltoimage</html-to-image-tool>
```

Your pentaho.xml file is now brought up to modern standards.

Updating pentahoObjects.spring.xml

Follow the instructions below to bring your old pentahoObjects.spring.xml file up to date for the BA Server 4.5.0.

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:

```
<bean id="ICacheExpirationRegistry"
class="org.pentaho.platform.plugin.services.cache.CacheExpirationRegistry"
scope="singleton" />
```

3. Save the file and close the text editor.

Your pentahoObjects.spring.xml file is now brought up to modern standards.

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 4.5.0.

1. Open your recently copied `/pentaho-solutions/system/applicationContext-spring-security.xml` file with a text editor.
2. Find this line: `\A/content/common-ui/resources/themes.*\Z=Anonymous,Authenticated` and add the following line directly below it:

```
\A/content/common-ui/resources/web/dojo/djconfig.js.*\Z=Anonymous,Authenticated
\A/content/common-ui/resources/web/cache/cache-service.js.*
\Z=Anonymous,Authenticated
\A/cacheexpiration-service.*\Z=Anonymous,Authenticated
```

3. Save and close the file.

Your applicationContext-spring-security.xml file is now brought up to modern standards.

Updating applicationContext-spring-security-hibernate.xml

Follow the instructions below to bring your old applicationContext-spring-security-hibernate.xml file up to date for the BA Server 4.5.0.

1. Open your recently copied `/pentaho-solutions/system/applicationContext-spring-security-hibernate.xml` file with a text editor.

- Find this line: `<bean class="org.springframework.orm.hibernate3.HibernateTransactionManager">` and replace it with the following example:

```
<bean id="hibernateTransactionManager"
  class="org.springframework.orm.hibernate3.HibernateTransactionManager">
```

- Find this line: `<value>PentahoRole.hbm.xml</value>` and add the following line directly below it:

```
<value>PentahoUserRoleMapping.hbm.xml</value>
```

- Find this line: `<prop key="hibernate.dialect">${hibernate.dialect}</prop>` and add the following line directly above it:

```
<prop key="hibernate.connection.driver_class">${jdbc.driver}</prop>
<prop key="hibernate.connection.url">${jdbc.url}</prop>
<prop key="hibernate.connection.username">${jdbc.username}</prop>
<prop key="hibernate.connection.password">${jdbc.password}</prop>
```

- Find this line: `<prop key="hibernate.hbm2ddl.auto">update</prop>` and add the following line directly below it:


```
<prop key="hibernate.cache.provider_class">org.hibernate.cache.EhCacheProvider</prop>
<prop key="hibernate.generate_statistics">>true</prop>
<prop key="hibernate.cache.use_query_cache">>true</prop>
<prop key="hibernate.show_sql">>false</prop>
<prop key="hibernate.connection.pool_size">10</prop>
```

- Save and close the file.

Your applicationContext-spring-security-hibernate.xml file is now brought up to modern standards.

Updating analyzer.properties

Follow the directions below to add new configuration options to your Pentaho Analysis engine configuration file.

-  **Note:** The order of most of these changes does not particularly matter, so long as they are all in the file. However, future upgrades and support requests will be easier if you maintain the order of these settings.

- Open your recently-copied `/pentaho-solutions/system/analyzer/analyzer.properties` file with a text editor.
- Find this line: `filter.dialog.useTopCount=true` and add the following lines directly below it:

```
# Max number of chart data items that can be selected or highlighted by the user
filter.selection.max.count=500
```

- Find this line: `# Format definitions for supporting relative date filters on time dimensions` and add the following lines directly above it:

```
# Disable all drill through links
# This may also be done on a cube by cube basis by setting
# the annotation AnalyzerDisableDrillLinks under the Cube element in the schema file
report.drill.links.disabled=false

# Disable using parent and all members for calculating totals
# By using parents and all members when possible, the generated MDX
# can result in total calculations that are done in the DB instead of
# calculated in Mondrian. Sometimes this may improve performance for
# large crossjoins. However, this may cause correctness issues
# if there are roles hiding the child members or hidden levels.
report.mdx.total.pushdown.disabled=false
```

- Find this line: `# Chart max domain values - 100, 150, 200, 250` and add the following line directly below it:

```
# Applies to bar, line, area, pie and client side visualization types
```

5. Find this line: **chart.options.maxValues=100** and add the following lines directly below it:

```
# Chart max scatter chart data points
# Applies only to scatter chart type
chart.options.maxScatterValues=10000
```

6. Add these lines at the bottom of the file:

```
# Controls whether auto refresh is checked by default on the Select Data Source page
select.datasource.autoRefresh=true
```

7. Save and close the file.

Your analyzer.properties file is now upgraded to work with the BA Server 4.5.0.

Updating mondrian.properties

Follow the directions below to add new configuration options to your Pentaho Analysis engine configuration file.

1. Open your recently-copied /pentaho-solutions/system/mondrian/mondrian.properties file with a text editor.
2. Change the value of the following line to **false**:

```
mondrian.native.topcount.enable=true
```

3. Change the value of the following line to **false**:

```
mondrian.native.nonempty.enable=true
```

4. Remove the following lines:

```
# enable grouping sets, if the dialect supports it.
mondrian.rolap.groupingsets.enable=true
```

5. Find this line: **# Enable the datasource resolver for the Pentaho BI Platform** and replace it with this:


```
#####
# Property to define which data source resolver class Mondrian should use within
# the BI platform.
#
# This SPI implementation makes it possible for Mondrian to access the data sources
# defined by the EE data sources plugin.
#
# Comment this property to have Mondrian resolve datasources
# using straight JNDI APIs.
```

6. Save and close the file.

Your mondrian.properties file is now upgraded to work with the BA Server 4.5.0.

Updating web.xml

Follow the instructions below to bring your old **web.xml** file up to date for the BA Server 4.5.0.

 **Note:** You may have already completed this task if you performed a manual deployment upgrade and merged your old web.xml with the new one before the build.

1. Inside of your 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. Find this line: **<param-name>TrustedIpAddr</param-name>** and in the <param-value> node that follows it, add an IPv6 address to match your IPv4 address, as in the following example (the example includes a regular expression

that covers a network interface definition, which may not be required in your deployment; consult your system administrator if you are unsure how to proceed):

```
<param-value>127.0.0.1,0\:0\:0\:0\:0\:0\:0\:0\:1(%.*)*$</param-value>
```

3. Find the following **filter mapping** line:`<url-pattern>/SchedulerAdminService</url-pattern>` and add these lines directly above it:

```
    <url-pattern>/admin/*</url-pattern>
</filter-mapping>

<filter-mapping>
    <filter-name>Proxy Trusting Filter</filter-name>
```

4. Find the following line:`<!-- Filter mapping for security. Note that all objects are locked down. We could change this here as desired. -->` and add these lines directly above it:

```
<filter-mapping>
    <filter-name>Proxy Trusting Filter</filter-name>
    <url-pattern>/content/geoprint</url-pattern>
</filter-mapping>
```

5. Add the following lines to the file just before the `<servlet-name>Pivot</servlet-name>` servlet definition (above the `<servlet>` tag):

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

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

6. Find the following line:`<!-- ===== merged servlets ===== -->` and add these lines directly below it:

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

7. Find the following line:`<!-- Pentaho JSPs -->` and add these lines directly above it:

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

<servlet-mapping>
    <servlet-name>LocalizationServlet</servlet-name>
    <url-pattern>/i18n</url-pattern>
</servlet-mapping>
```

8. Find the **AdhocWebService** servlet mapping, add this new servlet mapping directly above it:

```
<servlet-mapping>
    <servlet-name>CacheExpirationService</servlet-name>
    <url-pattern>/CacheExpirationService</url-pattern>
</servlet-mapping>
```

9. Find the `<url-pattern>/public/Diagnostics</url-pattern>` line, and replace **public** with **admin**, as in this example:

```
<url-pattern>/admin/Diagnostics</url-pattern>
```

10. Save the file and close the text editor.

Your web.xml file is now 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-ssso/` 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.	<code>\${cas.base.url}/login</code>
cas.ticket.validator.url	Required. CAS ticket validator URL.	<code>\${cas.base.url}</code>
cas.logout.url	Required. CAS logout URL. A service.logout.url will be appended to this URL.	<code>\${cas.base.url}/logout?url=</code>
cas.base.url	URL under which all CAS services reside.	<code>https://localhost:8443/cas</code>

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.	<code>\${_pentaho.service.base.url}/j_spring_cas_security_check</code>
pentaho.service.logout.url	Required. URL to go to after CAS logout.	<code>\${_pentaho.service.base.url}/Home</code>
pentaho.service.solutions.system.dir	Path to pentaho-solutions/system.	<code>/usr/local/pentaho/server/biserver-ee/pentaho-solutions/system/</code>
pentaho.service.lib.dir	Path to webapp lib directory.	<code>/usr/local/tomcat/common/lib/</code>

Property	Description	Example
pentaho.service.web.xml	Path (including filename) of webapp's web.xml.	/usr/local/tomcat/conf/web.xml
pentaho.service.appctx.cas.xml	Path (including filename) of new applicationContext-spring-security-cas.xml.	/usr/local/pentaho/server/biserver-ee/pentaho-solutions/system/applicationContext-spring-security-cas.xml
pentaho.service.jsp.dir	Path to directory containing webapp's JSPs.	/usr/local/tomcat/webapps/pentaho/jsp/
pentaho.service.spring.beans.xml	Path (including filename) of pentaho-spring-beans.xml.	/usr/local/pentaho/server/biserver-ee/pentaho-solutions/system/pentaho-spring-beans.xml
pentaho.service.base.url	Service base URL.	http://localhost:8080/pentaho
pentaho.service.pentaho.war.dir	Webapp exploded WAR directory.	/usr/local/tomcat/webapps/pentaho/
pentaho.service.webinf.dir	Path to webapp's WEB-INF directory.	/usr/local/tomcat/webapps/pentaho/WEB-INF/

Upgrading the Pentaho Enterprise Console

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

1. If you used the manual deployment process, you must now unpack the `pec-4.5.0-GA` zip or tar.gz file to the `/pentaho/server/` directory.

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


This directory contains PDI-specific settings.

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


The Pentaho Enterprise Console has been upgraded to version 4.5.0.

Moving JDBC Drivers

 **Note:** JDBC driver versions prior to 4 may have issues with Java 6. 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 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** (change **example.com** to your BA Server's hostname, domain name, or IP address). You should see a screen like the picture below:



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

Upgrading the Pentaho client tools on each user's workstation is considerably easier than upgrading the BA Server. You can either download and run the Business Analytics installer, or download and unpack individual client tool archive packages. If you choose the installer option, simply rename or remove the old client tools, then run the installer, uncheck the default options, select the client tools you want to install, and proceed through the rest of the installation. If you choose the archive package option, 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 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.

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

Or any new PDI plugins, then you will have to install the appropriate license keys in the same manner that you previously installed your Business Analytics licenses.



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

Cleanup

Now that your new BA Server version 4.5 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

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. The BA Server installation instructions explain how to add driver JARs to the correct locations; there is also a section titled **Adding a JDBC Driver** in the *Pentaho Business Analytics Administrator's Guide* that explains driver locations for all parts of Pentaho Business Analytics.



Note: Some database vendors (and driver developers) require using JDBC version 4 drivers with a Java 6 environment. 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 yo 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 Re-deploying a WAR

Re-deployment of a WAR or EAR with a custom **context.xml** will, in some cases, cause the original context.xml that you deployed with the original WAR or EAR to become permanently cached. Tomcat in particular will generate a WAR-specific context configuration file, and keep it in place even after the WAR is deleted. 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 re-deploying 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 JDBC 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.