Use Manual BA Server Installation

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Introduction

This section explains how to manually install the Pentaho Business Analytics (BA) Server and configure it to run on the database and web application server of your choice. With this installation option you can choose to house the BA Repository on a PostgreSQL, MySQL, or Oracle database. The BA Repository contains solution content, scheduling, and audit tables needed for the BA Server to operate. You can also choose to deploy the BA Server on either the JBoss or Tomcat web application servers. With this installation option, you must supply, install, and configure your chosen database and web application server yourself.

Prerequisites

Read *Select BA Installation Option* to make sure that this is the best installation option for you. Also, before you begin, check the *Supported Technologies* tables to make sure that your server computer, BA Repository database, and web browser meet Pentaho's requirements for the current version of the software.

Expertise

The topics in this section are written for IT administrators who know where data is stored, how to connect to it, details about the computing environment, and how to use the command line to issue commands for Microsoft Windows or Linux. You should also know how to install a database and a web application server.

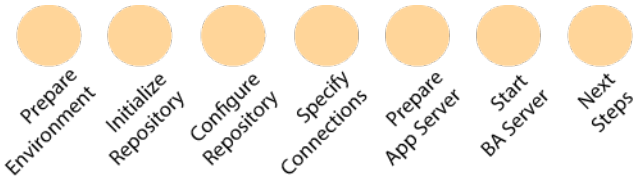
Tools

You must supply a workstation that meets the hardware requirements indicated in the *support technologies* section, as well as a supported operating system and JRE or JDK.

Login Credentials

You must be logged onto an account that has administrative privileges to perform the tasks in this guide. Additionally, Linux users need to use the **root** account for some tasks.

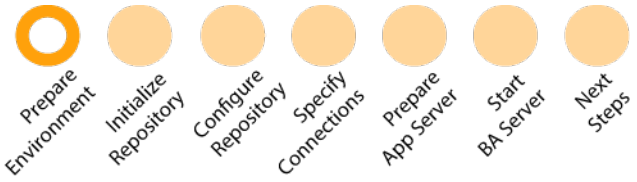
Overview of the Installation Process



To install the BA Server, perform the tasks indicated in the *Guide Post*.

- ***Prepare Environment*:** Explains how to create a pentaho user account, create the directory structure, download BA Server files from our web site, install your selected Web Application Server and BA Repository database, and set up system environment variables.
- ***Initialize Repository*:** Provides information about how to run DDL scripts that create tables for the BA Repository.
- ***Configure Repository*:** Provides information about how to configure the BA Repositories on your selected database.
- ***Specify Connections*:** Explains how to specify the JNDI and JDBC connections to the BA Repository.
- ***Prepare Web App Server*:** Provides instructions about how to disable unnecessary scans, allot additional memory and time for BA Server deployment, and reference the required Oracle JDK packages.
- ***Start BA Server*:** Explains how to modify startup files and deploy the BA Server WAR files.
- ***Next Steps*:** Indicates what to do after the BA Server has been installed.

Prepare Environment



To prepare the computer on which you plan to install the BA Server, complete these tasks.

- *Create a pentaho user account if you plan to install the BA Server on a Linux machine*.
- *Download and install the Tomcat or JBoss web application server.* If you plan to install the BA Server on a web application server that has already been installed, skip this task.
- *Install the BA Repository database*. If you already have a database installed, skip this task.
- *Download and unpack the installation files*.
- *Set environment variables*.

Create User Account

Create Windows User Account

If you plan to install on a server that runs Windows, you do not need to create a special user account on the server. However, you should use an account that has administrator privileges to complete the tasks in this guide.

Create Linux User Account

If you plan to install the BA Server in a Linux environment you must create a user account named **pentaho** on the server computer. By default, license information for Pentaho products is stored in the home directory for this account. Use this account to perform installation tasks that do not require root access. Also, use this account to run start and stop server scripts.

1. Open a **Terminal** window on the server. If you plan to install the BA Server on a remote computer, establish an OpenSSH session to the remote server.
2. In the **Terminal** window, log in as the **root** user by typing this command.

   ```
   su root
   ```

3. When prompted, type the password in the **Terminal** window.
4. In the **Terminal** window, create a new user account called **pentaho**, along with the `pentaho` home directory, by typing this line.

   ```
   sudo useradd -s /bin/bash -m pentaho
   ```

   Note: `/bin/bash` indicates that the user account should be created using the Bash shell. In many Linux distributions, the default new user shell is `/bin/sh` or some equivalent, such as Dash, that might not use the `~/.bashrc` configuration file by default. If you don't have or want to use Bash, adjust the instructions throughout this guide accordingly.
5. In the **Terminal** window, assign a password for the **pentaho** user by typing this line.

   ```
   sudo passwd pentaho
   ```

6. Verify that you can log in using the newly-created **pentaho** user account.
   a) In the **Terminal** window, attempt to log in by typing this line.

      ```
      su pentaho -
      ```

   b) Type the password for the **pentaho** user account if you are prompted.
   c) Use the **Terminal** window to navigate to the pentaho directory to verify that it has been created. By default, it is in the `/home` directory.

d) Close the **Terminal** window.

Create Directory Structure

Create Windows Directory Structure

1. Log into the machine on which you will run the BA Server.
2. Create this directory path.

```
pentaho/server/biserver-ee
```

3. Verify that you have the appropriate permissions to read, write, and execute commands in the directories you created.
   a) Open **Windows Explorer** and right-click the `pentaho` directory.
   b) Select the **Properties** option in the security tab to verify that you have read, write, and execute permissions.
   c) In **Windows Explorer** navigate to `server` directory, then right-click.
   d) Select the **Properties** option in the security tab to verify that you have read, write, and execute permissions.
   e) In **Windows Explorer** and navigate to the `biserver-ee` directory and right-click it.
   f) Select the **properties** option in the security tab to verify that you have read, write, and execute permissions.

Create Linux Directory Structure

1. Log into the machine on which you will run the BA Server. Make sure that you are logged in as the **pentaho** user.
2. Create this directory path from home directory (`pentaho`).

```
pentaho/server/biserver-ee
```

3. Verify that you have the appropriate permissions to read, write, and execute commands in the directories you created.
   a) In Linux check the permissions of the `pentaho`, `server`, and `biserver-ee` directories by opening a **Terminal** window, navigating to the `pentaho` directory, then typing this command.

```
ls -ld ../pentaho ../pentaho/server ../pentaho/server/biserver-ee
```

   b) Make sure that permissions for the directories allow you to read, write, and execute in those directories.

Install the Web Application Server

The BA Server can be deployed on either the Tomcat or JBoss web application server. By default, BA Server software is configured for Tomcat. This means that if you choose to use Tomcat, you will need to make fewer configuration changes than you would if you choose to use JBoss.

You must install the web application server yourself. If you already have a Tomcat or JBoss web application server installed and you want to deploy the BA Server on it, please skip this step.

1. To download and install the web application software, use the instructions in the documentation for the web application server of your choice. We recommend that you install the web application server in the `pentaho/server/biserver-ee` directory.
2. Verify the web application server is installed correctly by starting it and viewing the default page. If the web application server does not start, troubleshoot it using the web application server's documentation before you continue with the BA Server installation process.
3. Stop the web application server.

Install the BA Repository Database

The BA Repository houses data needed for Pentaho tools to provide scheduling and security functions, as well as metadata and models for reports that you create.

You can choose to host the BA Repository on the PostgreSQL, MySQL, or Oracle database. By default, Pentaho software is configured to use the PostgreSQL Database. If you already have a BA Repository database installed, you can skip this step.

1. To download and install the BA Repository database, use the instructions in the documentation for the database of your choice. It does not matter where you install the database.
2. Verify that the BA Repository database is installed correctly. You can do this by connecting to your database and viewing the contents of any default databases that might have been created upon installation. Consult the user documentation for the database that you installed for further details.

   Note: If you are not familiar with SQL, consider using a visual database design tool to connect to the database and view its contents.

   - PGAdminIII is bundled with PostgreSQL.
   - MySQL Workbench can be used with MySQL. It is available as a separate download. Check the MySQL site for details on how to obtain this design tool.
   - Oracle SQL Developer can be used with Oracle. It is available as a separate download. Check the Oracle site for details on how to obtain this design tool.

Download and Unpack Installation Files

If you want to install specific Pentaho software, obtain the installation packages from the Pentaho Customer Support Portal. Consult your Welcome Kit if you need more information about the portal. The Pentaho BA Server software, data files, and examples are stored in pre-packaged `.war` and `.zip` files. Manually copy these files to correct directories.

1. Make sure the web application server on which you plan to deploy the BA Server has been stopped.
2. Download the `biserver-manual-ee-5.0.0-GA-dist.zip`.
3. Unpack the file by completing these steps.
   a) Use a zip tool to extract the `biserver-manual-ee-5.0.0-GA-dist.zip` file you just downloaded.
   b) Open a **Command Prompt** or **Terminal** window and navigate to the folder that contains the files you just extracted.
   c) Enter one of the following at the prompt.

      Windows:

      ```
      install.bat
      ```

      Linux:

      ```
      ./install.sh
      ```

   d) Read the license agreement that appears. Select **I accept the terms of this license agreement**, then click **Next**.

      Note: If you are unpacking the file in a non-graphical environment, open a **Terminal** or **Command Prompt** window and type `java -jar install.jar -console` and follow the instructions presented in the window.
   e) Indicate where you want the file to be unpacked. It doesn't matter where because you will be manually placing the files in the appropriate directories later in these instructions.
   f) Click the **Next** button.
   g) The **Installation Progress** window appears. Progress bars indicate the status of the installation. When the installation progress is complete, click **Quit** to exit the Unpack Wizard.
4. Navigate to the directory where you unpacked the files. Copy the `pentaho.war` and `pentaho-style.war` files to the appropriate directory. The directory you choose is determined by the web application server installed.
   - **Tomcat:** `pentaho/server/biserver-ee/tomcat/webapps`
   - **JBoss:** `pentaho/server/biserver-ee/jboss/standalone/deployments`
5. Extract the `pentaho-solutions.zip` file to the `pentaho/server/biserver-ee` subdirectory. After you've extracted the zip file, the `pentaho-solutions` directory appears in the `pentaho/server/biserver-ee` directory.
6. Extract the `pentaho-data.zip` file to the `pentaho/server/biserver-ee subdirectory`. After you've extracted the zip file, a `pentaho-data` directory appears in the `biserver-ee` directory.
7. Extract the samples.zip file to the `pentaho/server/biserver-ee/pentaho-solutions/system` subdirectory. After you have extracted the zip file, a `default-content` directory appears in the `system` directory.

8. Verify that the files have been placed in the following places by comparing the following directory structure with yours.

   - **Tomcat File Locations:**
   - `pentaho/server/biserver-ee/tomcat/webapps/pentaho.war`
   - `pentaho/server/biserver-ee/tomcat/webapps/pentaho-style.war`
   - `pentaho/server/biserver-ee/data`
   - `pentaho/server/biserver-ee/pentaho-solutions`
   - `pentaho/server/biserver-ee/pentaho-solutions/systems/default-content`
   - **JBoss File Locations:**
   - `pentaho/server/biserver-ee/jboss/standalone/deployments/pentaho.war`
   - `pentaho/server/biserver-ee/jboss/standalone/deployments/pentaho-style.war`
   - `pentaho/server/biserver-ee/data`
   - `pentaho/server/biserver-ee/pentaho-solutions`
   - `pentaho/server/biserver-ee/pentaho-solutions/systems/default-content`

   Note: If your web application server is not in the `pentaho/server/biserver-ee` directory, the `pentaho.war` and `pentaho-style.war` files appear where you've chosen to install your web application server.

Set Environment Variables

Set the `PENTAHO_JAVA_HOME` variable to indicate the path to the Java JRE or JDK that Pentaho should use. If you do not set this variable, then Pentaho will not start correctly.

To set environment variables, you should be logged into an account that has administrator-level privileges. For Linux systems, you must be logged into the **root** user account.

Set Windows PENTAHO_JAVA_HOME Variable

1. From the **Start** menu, right-click **Computer**, then select **Properties** from context menu.
2. Click **Advanced System Settings**. The **System Properties** window appears.
3. In the **System Properties** window, click the **Advanced** tab, then click **Environment Variables**.
4. To set the `PENTAHO_JAVA_HOME` variable do this.
   a) In the **System Variable** section, click **New**.
   b) In the window that appears, type `PENTAHO_JAVA_HOME` in the **name** field.
   c) In the **value** field, enter the directory where your Oracle JDK or Oracle JRE is stored. For example your Java JRE is in the `Program Files\Java\jre7` directory, type this.

      ```
      C:\Program Files\Java\jre7
      ```

   d) Click **OK**.
5. Click **Apply Changes**.
6. Log out, then log back in.
7. To verify that the variables have been properly set, open a **Command** window and type this.

   ```
   echo %PENTAHO_JAVA_HOME%
   ```

Set Linux PENTAHO_JAVA_HOME Variable

1. Open a **terminal** window and log in as **root**.
2. Open the `/etc/environment` file with a text editor.

   Note: The vi and gedit text editors are available on most Linux machines. For example, to open the `/etc/environment` file with gedit, type this.

   ```
   gedit /etc/environment
   ```

3. Indicate where you installed Java in your `/etc/environment` file by typing this.

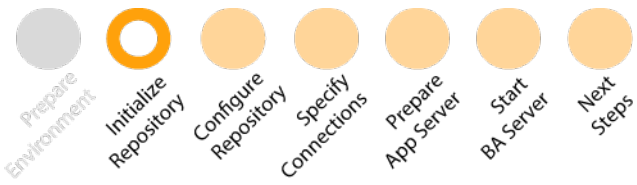
Note: Substitute `/usr/lib/jvm/java-7-sun` with the location of the JRE or JDK you installed on your system.

```
export PENTAHO_JAVA_HOME=/usr/lib/jvm/java-7-sun
```

4. Save and close the file.
5. Log out, then log back in for the change to take effect.
6. Verify that the variables are properly set by opening a **Terminal** window and typing this.

```
env | grep PENTAHO_JAVA_HOME
```

Initialize Repository



Before you prepare the BA Repository complete the tasks in *Prepare Environment*.

Pentaho stores content about reports that you create, examples we provide, report scheduling data, and audit data in the BA Repository. The BA Repository resides on the database that you installed during the Prepare Environment step. The BA Repository consists of three repositories: *Jackrabbit*, *Quartz*, and *Hibernate*.

- *Jackrabbit* contains the solution respository, examples, security data, and content data from reports that you use Pentaho software to create.
- *Quartz* holds data that is related to scheduling reports and jobs.
- *Hibernate* holds data that is related to audit logging.

This step only consists of one task: Initialize the database. In this task you run DDLs that contain SQL commands that create the Jackrabbit, Quartz, and Hibernate databases, as well as the Operations Mart schema.

- *Initialize PostgreSQL*
- *Initialize MySQL*
- *Initialize Oracle*

Initialize PostgreSQL BA Repository Database

To initialize PostgreSQL so that it serves as the BA Repository, run SQL scripts to create the Hibernate, Quartz and Jackrabbit (also known as the JCR) databases.

Note: Your PostgreSQL configuration must support logins from all users. This is not always the default configuration, so you may have to edit your `pg_hba.conf` file to support this option. If you do need to make changes to pg_hba.conf, you must restart the PostgreSQL server before proceeding.

1. To make the databases that you create more secure, Pentaho recommends that you change the default passwords in the SQL script files to ones that you specify.
   a) Use the text editor of your choice to open the `pentaho/server/biserver-ee/pentaho-data/data/postgresql/create_jcr_postgresql.sql` file.
   b) In the line where the SQL script creates the JCR user and assigns the password, change the password to one of your choice.

      ```
      CREATE USER jcr_user PASSWORD 'myNewPassword'
      ```

   c) Save and close the file.
   d) Use the text editor to open `pentaho/server/biserver-ee/data/postgresql/create_quartz_postgresql.sql`.
   e) In the line where the SQL script creates the Pentaho user and assigns the password, change the password to one of your choice.

      ```
      CREATE USER pentaho_user PASSWORD 'myNewPassword';
      ```

   f) Save and close the file.
   g) Use the text editor to open `pentaho/server/biserver-ee/data/postgresql/create_repository_postgresql.sql`.
   h) In the line where the SQL script creates the Hibernate user and assigns the password, change the password to one of your choice.

      ```
      CREATE USER hibuser PASSWORD 'myNewPassword';
      ```

   i) Save and close the file.

2. The commands you use to run the SQL scripts depends on your operating system. For windows, do this.
   a) Open a **SQL Shell** window. The **SQL Shell** window is installed with PostgreSQL.
   b) When prompted for the server enter the name of the server if you are not using the default (localhost). If you are using the default, do not type anything and press Enter.
   c) When prompted for the database enter the name of the database if you are not using the default (postgres) If you are using the default, do not type anything and press Enter.
   d) When prompted for the port enter the name of the port if you are not using the default (5432). If you are using the default port, do not type anything and press Enter.
   e) When prompted for the username, accept the default, then press Enter.
   f) When prompted for the password, enter the password that you indicated when you installed PostgreSQL.
   g) Run the script to create the Jackrabbit database by typing this.

      ```
      \i /pentaho/server/biserver-ee/data/postgresql/create_jcr_postgresql.sql
      ```

      Note: If necessary, change the `\pentaho\server\biserver-ee` to the place where you unpacked your pentaho files.
   h) Run the script to create the hibernate database by typing this.

      ```
      \i /pentaho/server/biserver-ee/data/postgresql/create_repository_postgresql.sql
      ```

   i) Run the script to create the Quartz database by typing this.

      ```
      \i /pentaho/server/biserver-ee/data/postgresql/create_quartz_postgresql.sql
      ```

   j) To switch to the Hibernate database, type this.

      ```
      \c hibernate
      ```

   k) Run the script to create the Operations Mart database by typing this.

      ```
      \i /pentaho/server/biserver-ee/data/postgresql/pentaho_mart_postgresql.sql
      ```

   l) Exit from the window by pressing the **CTRL** + **C** keys.
3. To run the SQL scripts on a Linux system, do this.
   a) Open a **Terminal** window. You should be logged in as the **pentaho** user.
   b) Sign into PostgreSQL by typing `psql -U postgres -h localhost` at the prompt.
   c) Run the script to create the Jackrabbit database by typing this.

      ```
      \i ~/pentaho/server/biserver-ee/data/postgresql/create_jcr_postgresql.sql
      ```

      Note: If necessary, change the `~/pentaho/server/biserver-ee` directory path to the place where you unpacked your pentaho files.
   d) Run the script to create the hibernate database by typing this.

      ```
      \i ~/pentaho/server/biserver-ee/data/postgresql/create_repository_postgresql.sql
      ```

      Note: If necessary, change the `~/pentaho/server/biserver-ee` to the place where you unpacked your pentaho files.
   e) Run the script to create the Quartz database by typing this.

      ```
      \i ~/pentaho/server/biserver-ee/data/postgresql/create_quartz_postgresql.sql
      ```

      Note: If necessary, change the `~/pentaho/server/biserver-ee` directory path to the place where you unpacked your pentaho files.
   f) To switch to the Hibernate database, type this.

      ```
      \c hibernate
      ```

   g) Run the script to create the Operations Mart database by typing this.

      ```
      \i ~/pentaho/server/biserver-ee/data/postgresql/pentaho_mart_postgresql.sql
      ```

   h) Exit from the window by pressing the **CTRL** + **C** keys.

4. To verify that databases and user roles have been created, do this.
   a) Open the pgAdminIII tool. pgAdminIII is bundled with both the Windows and Linux versions of PostgreSQL.
   b) To view the contents of PostgreSQL, click the PostgreSQL folder in the **Object Browser**, then enter the password when prompted.
   c) In the **Object Browser**, click the **Databases** folder. The Jackrabbit, Postgres, Hibernate and Quartz databases appear.
   d) In the **Object Browser**, click the **Login Roles** folder. The jcr_user, pentaho_user, hibuser, and postgres user accounts appear.
   e) If the databases and login roles do not appear, go to the beginning of these instructions and try running the scripts again.
   f) Select **File > Exit** to exit from pgAdminIII.

Initialize MySQL BA Repository Database

To initialize MySQL so that it serves as the BA Repository, run SQL scripts to create the Hibernate, Quartz and Jackrabbit (also known as the JCR) databases.

Note: Use the ASCII character set when you run these scripts. Do not use UTF-8 because there are text string length limitations that might cause the scripts to fail.

1. To make the databases that you create more secure, Pentaho recommends that you change the default passwords in the SQL script files to ones that you specify.
   a) Use the text editor of your choice to open the `pentaho/server/biserver-ee/data/create_jcr_mysql.sql` file.
   b) In the line where the SQL script creates the JCR user and assigns the password, change the password to one of your choice.
   ```
   grant all on jackrabbit.* to 'jcr_user'@'localhost' identified by 'myNewPassword';
   ```
   c) Save and close the file.
   d) Use the text editor of your choice to open the `pentaho/server/biserver-ee/data/create_repository_mysql.sql` file.
   e) In the line where the SQL script creates the hibernate user and assigns the password, change the password to one of your choice.
   ```
   GRANT ALL on hibernate.* TO 'hibuser'@'localhost' identified by 'myNewPassword';
   ```
   f) Save and close the file.
   g) Save and close the file.
   h) Open `pentaho/server/biserver-ee/data/create_quartz_mysql.sql` in the text editor.
   i) In the line where the SQL script creates the Pentaho user and assigns the password, change the password to one of your choice .
   ```
   grant all on quartz.* to 'pentaho_user'@'localhost' identified by 'myNewPassword';
   ```
   j) Save and close the file.
2. The process for running the SQL scripts against MySQL are the same for both Windows and Linux machines.
   a) Run the `create_quartz_mysql.sql` script in the **Terminal** or **Command Prompt** window by typing: `mysql -u root -p < create_quartz_mysql.sql.`
   b) Run the `create_repository_quartz_mysql.sql` script in the **Terminal** or **Command Prompt** window by typing: `mysql -u root -p < create_repository_mysql.sql.`
   c) Run the `create_jcr_mysql.sql` script in the **Terminal** or **Command Prompt** window by typing: `mysql -u root -p < create_jcr_mysql.sql.`
   d) Run the `pentaho_mart_mysql.sql` script in the **Terminal** or **Command Prompt** window by typing: `mysql -u root -p hibernate < pentaho_mart_mysql.sql.`
3. To verify that databases and user roles have been created, do this.
   a) Open the **MySQL Workbench** tool. **MySQL Workbench** is freely available at the MySQL development site.
   b) Make sure that the Jackrabbit (JCR), Hibernate, and Quartz databases are present.
   c) Make sure that the jcr_user, hibuser, and pentaho_user user accounts are present.
   d) If the databases and login roles do not appear, go to the beginning of these instructions and try running the scripts again.
   e) Exit from the **MySQL Workbench**.

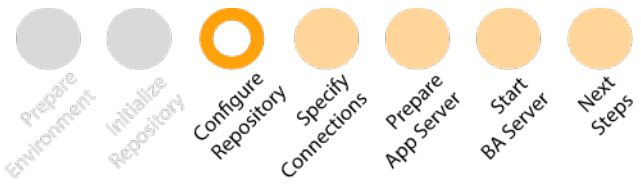
Initialize Oracle BA Repository Database

To initialize Oracle so it serves as the BA Repository, run SQL scripts to create the Hibernate, Quartz and Jackrabbit (also known as the JCR) databases.

1. To make the databases that you create more secure, Pentaho recommends that you change the default passwords in the SQL script files to ones that you specify.
   a) Use the text editor of your choice to open the `pentaho/server/biserver-ee/data/oracle10g/create_jcr_ora.sql` file.
   b) In the lines where the SQL script creates JCR user and assigns the password, as well as the line where the admin password is assigned, change the passwords to one (or ones) of your choice.
   ```
   --conn admin/myNewPassword@pentaho
   create user jcr_user identified by "myNewPassword" default tablespace
   pentaho_tablespace quota unlimited on pentaho_tablespace temporary tablespace temp
   quota 5M on system;
   ```
   c) Edit the **datafile** path with the path to your Oracle installation.
   d) Save and close the file.
   e) Open `create_repository_ora.sql`.
   f) In the lines where the SQL script creates the Hibernate user and assigns the password, and where the admin password is set change the passwords to ones (or one) of your choice .
   ```
   -- conn admin/myNewPassword@pentaho
   create user hibuser identified by "myNewPassword" default tablespace
   pentaho_tablespace quota unlimited on pentaho_tablespace temporary tablespace temp
   quota 5M on system;
   ```
   g) Edit the **datafile** path with the path to your Oracle installation.
   h) Save and close the file.
   i) Open `create_quartz_ora.sql`.
   j) In the lines where the SQL script creates the Quartz user and assigns the password, and where the admin password is set change the passwords to ones (or one) of your choice .
   ```
   -- conn admin/myNewPassword@pentaho
   create user quartz identified by "myNewPassword" default tablespace
   pentaho_tablespace quota unlimited on pentaho_tablespace temporary tablespace temp
   quota 5M on system;
   ```
   k) Edit the **datafile** path with the path to your Oracle installation.
   l) Save and close the file.
2. Although there are several different methods for running SQL scripts, these instructions explain how to run SQL*Plus from a Terminal or Command Prompt window. These instructions are the same for both Windows and Linux. If you prefer to run SQL scripts using another method, modify instructions accordingly.
   a) Open a **Terminal** or **Command Prompt** window, start the **SQL*Plus** and log in.
   b) Run the script to create the Jackrabbit database by typing `START create_jcr_ora`. If necessary, append the path to the `create_jcr_ora.sql` path in the command.
   c) Run the script to create the repository database by typing `START create_repository_ora`. If necessary, append the path to the `create_repository_ora.sql` path in the command.
   d) Run the script to create the Quartz database and users by typing `START create_quartz_ora`. If necessary, append the path to the `create_quartz_ora.sql` path in the command.
   e) Run the script to create the Operations Mart database and users by typing `START pentaho_mart_ora hibernate`. If necessary, append the path to the `pentaho_mart_ora.sql` path in the command.
3. To verify that databases and user roles have been created, do this.
   a) In the **Terminal** or **Command Prompt** window that is running **SQL*Plus**, make sure that the Jackrabbit database has been created by typing DESCRIBE JACKRABBIT;. The column definitions should appear when you press **Enter**.
   b) Make sure the Quartz database has been created by typing DESCRIBE QUARTZ;. The column definitions for the Quartz table should appear when you press **Enter**.
   c) To see the users that have been created, type SELECT USERNAME FROM DBA_USERS.
   d) If the databases and login roles do not appear, go to the beginning of these instructions and try running the scripts again.

e) Exit from **SQL*Plus**.

Configure Repository



Before you configure the BA Repository complete the tasks in *Initialize Repository*.

Tasks performed during this step include configuring Audit, Quartz, and Hibernate properties. Tasks are grouped by the BA Repository database you have.

- *PostgreSQL Configuration Tasks*
- *MySQL Configuration Tasks*
- *Oracle Configuration Tasks*

Configure PostgreSQL BA Repository Database

These instructions explain how to configure Quartz, Hibernate, Jackrabbit, and Pentaho Security for use with the PostgreSQL database. By default, the files edited in this section are configured for a PostgreSQL database that runs on port 5432. The default password is also in these files. If you have a different port, different password, or if had the system configured using a different database and now you want to change it back to PostgreSQL, complete all of the instructions in these steps.

Configure Quartz on PostgreSQL BA Repository Database

When you use Pentaho to schedule an event, such as a report to be run every Sunday at 1:00 a.m. EST, event information is stored in the Quartz JobStore. During the installation process, you must indicate where the JobStore is located. To do this, modify the `quartz.properties` file.

1. Open the `pentaho/server/biserver-ee/pentaho-solutions/system/quartz/quartz.properties` file in the text editor of your choice.
2. Make sure that in the `#_replace_jobstore_properties` section of the file, the `org.quartz.jobStore.driverDelegateClass` is set to `org.quartz.impl.jdbcjobstore.PostgreSQLDelegate`.
3. Save the file and close the text editor.

Configure Hibernate Settings for PostgreSQL BA Repository Database

Modify the hibernate settings file to specify where Pentaho will find the BA Repository's hibernate configuration file. The hibernate configuration file specifies driver and connection information, as well as dialects and how to handle connection closes and timeouts.

1. Open `pentaho/server/biserver-ee/pentaho-solutions/system/hibernate/hibernate.settings.xml` in a text editor.
2. Verify that the location of the PostgreSQL hibernate configuration file appears. Make changes if necessary.

```
<config-file>system/hibernate/postgresql.hibernate.cfg.xml</config-file>
```

3. Save the file if you had to make changes, then close it. Otherwise, just close it.
4. Open `pentaho/server/biserver-ee/pentaho-solutions/system/hibernate/postgresql.hibernate.cfg.xml` in a text editor.
5. Make sure that the password and port number match the ones you specified in your configuration. Make changes as necessary, then save and close the file.

Modify Jackrabbit BA Repository Information for PostgreSQL

Indicate which database houses the BA Repository as well as the port, url, username, and password. All of the information needed to configure the repository for the PostgreSQL, MySQL, and Oracle BA Repository databases

appear. By default, the PostgreSQL sections are not commented out, but the MySQL and Oracle sections are. To modify this file so that it works for your BA Repository, you will need to make sure that the sections that refer to your BA Repository database are not commented out, and the sections refer to other BA Repository databases are commented out.

When code is commented out, it appears between the `<! --` and `-->` tags. The information in between the tags is commented out, and is therefore not executed by the software. In this example, the code `<! <FileSystem class=”org.apache.jackrabbit.core.fs.db.OracleFileSystem”>` is commented out.

```
<!--
<FileSystem class=”org.apache.jackrabbit.core.fs.db.OracleFileSystem”>
-->
```

To make sure that the Jackrabbit repository is set so that PostgreSQL is the default database, do this.

1. Use a text editor to open the `pentaho/server/biserver-ee/pentaho-solutions/system/jackrabbit/repository.xml` file.
2. In the Repository part of the code, make sure that the PostgreSQL lines of code are not commented out, but the Oracle and MySQL lines are. The code should look like this.

```
<!--
  <FileSystem class="org.apache.jackrabbit.core.fs.db.DbFileSystem">
    <param name="driver" value="com.mysql.jdbc.Driver"/>
    ...
    <param name="schemaObjectPrefix" value="fs_repos_"/>
  </FileSystem>
  <FileSystem class="org.apache.jackrabbit.core.fs.db.OracleFileSystem">
    <param name="url" value="jdbc:oracle:thin:@localhost:1521/XE"/>
    ...
    <param name="schemaObjectPrefix" value="fs_repos_"/>
    <param name="tablespace" value="jackrabbit"/>
  </FileSystem>
-->
  <FileSystem class="org.apache.jackrabbit.core.fs.db.DbFileSystem">
    <param name="driver" value="org.postgresql.Driver"/>
    <param name="url" value="jdbc:postgresql://localhost:5432/jackrabbit"/>
    <param name="user" value="jcr_user"/>
    <param name="password" value="password"/>
    <param name="schema" value="postgresql"/>
    <param name="schemaObjectPrefix" value="fs_repos_"/>
  </FileSystem>
```

   Note: If you changed your password when you initialized the database during the Prepare Environment step, or if your database is on a different port, edit the url and password parameters accordingly.

3. In the DataStore section of the code, verify that the PostgreSQL lines of code are not commented out, but the Oracle and MySQL lines are. The code should look like this.

```
<!--
  <DataStore class="org.apache.jackrabbit.core.data.db.DbDataStore">
    <param name="url" value="jdbc:mysql://localhost:3306/jackrabbit"/>
   ...
    <param name="schemaObjectPrefix" value="ds_repos_"/>
  </DataStore>
  <DataStore class="org.apache.jackrabbit.core.data.db.DbDataStore">
    <param name="url" value="jdbc:oracle:thin:@localhost:1521/XE"/>
   ...
    <param name="schemaObjectPrefix" value="ds_repos_"/>
  </DataStore>
  -->
  <DataStore class="org.apache.jackrabbit.core.data.db.DbDataStore">
    <param name="url" value="jdbc:postgresql://localhost:5432/jackrabbit"/>
    <param name="driver" value="org.postgresql.Driver"/>
    <param name="user" value="jcr_user"/>
    <param name="password" value="password"/>
    <param name="databaseType" value="postgresql"/>
    <param name="minRecordLength" value="1024"/>
```

```
    <param name="maxConnections" value="3"/>
    <param name="copyWhenReading" value="true"/>
    <param name="tablePrefix" value=""/>
    <param name="schemaObjectPrefix" value="ds_repos_"/>
  </DataStore>
```

Note: If you changed your password when you initialized the database during the Prepare Environment step, or if your database is on a different port, edit the url and password parameters accordingly.

4. In the Workspaces section of the code, make sure that the PostgreSQL lines of code are not commented out, but the Oracle and MySQL lines are. This code should look like this.

```
<!--
    <FileSystem class="org.apache.jackrabbit.core.fs.db.DbFileSystem">
      <param name="driver" value="com.mysql.jdbc.Driver"/>
      ...
      <param name="schemaObjectPrefix" value="fs_ws_"/>
    </FileSystem>
    <FileSystem class="org.apache.jackrabbit.core.fs.db.OracleFileSystem">
      <param name="url" value="jdbc:oracle:thin:@localhost:1521/XE"/>
      ...
      <param name="schemaObjectPrefix" value="fs_ws_"/>
      <param name="tablespace" value="jcr_user"/>
    </FileSystem>
-->
    <FileSystem class="org.apache.jackrabbit.core.fs.db.DbFileSystem">
      <param name="driver" value="org.postgresql.Driver"/>
      <param name="url" value="jdbc:postgresql://localhost:5432/jackrabbit"/>
      <param name="user" value="jcr_user"/>
      <param name="password" value="password"/>
      <param name="schema" value="postgresql"/>
      <param name="schemaObjectPrefix" value="fs_ws_"/>
    </FileSystem>
```

Note: If you changed your password when you initialized the database during the Prepare Environment step, or if your database is on a different port, edit the url and password parameters accordingly.

5. In the Persistence Manager section of the code, verify that the PostgreSQL lines of code are not commented out, but the Oracle and MySQL lines are. The code should look like this.

```
<!--
    <PersistenceManager
 class="org.apache.jackrabbit.core.persistence.bundle.MySqlPersistenceManager">
      <param name="url" value="jdbc:mysql://localhost:3306/jackrabbit"/>
      ...
      <param name="schemaObjectPrefix" value="${wsp.name}_pm_ws_"/>
    </PersistenceManager>
    <PersistenceManager
 class="org.apache.jackrabbit.core.persistence.bundle.OraclePersistenceManager">
      <param name="url" value="jdbc:oracle:thin:@localhost:1521/XE"/>
      ...
      <param name="schemaObjectPrefix" value="${wsp.name}_pm_ws_"/>
      <param name="tablespace" value="jackrabbit"/>
    </PersistenceManager>
   -->
    <PersistenceManager
 class="org.apache.jackrabbit.core.persistence.bundle.PostgreSQLPersistenceManager">
      <param name="url" value="jdbc:postgresql://localhost:5432/jackrabbit"/>
      <param name="driver" value="org.postgresql.Driver"/>
      <param name="user" value="jcr_user"/>
      <param name="password" value="password"/>
      <param name="schema" value="postgresql"/>
      <param name="schemaObjectPrefix" value="${wsp.name}_pm_ws_"/>
    </PersistenceManager>
```

Note: If you changed your password when you initialized the database during the Prepare Environment step, or if your database is on a different port, edit the url and password parameters accordingly.

6. In the Versioning section of the code, verify that the PostgreSQL lines of code are not commented out, but the MySQL and Oracle lines are. The code should look like this.

```
<!--
    <FileSystem class="org.apache.jackrabbit.core.fs.db.DbFileSystem">
      <param name="driver" value="com.mysql.jdbc.Driver"/>
     ...
      <param name="schemaObjectPrefix" value="fs_ver_"/>
    </FileSystem>
    <FileSystem class="org.apache.jackrabbit.core.fs.db.OracleFileSystem">
      <param name="url" value="jdbc:oracle:thin:@localhost:1521/XE"/>
     ...
      <param name="schemaObjectPrefix" value="fs_ver_"/>
      <param name="tablespace" value="jackrabbit"/>
    </FileSystem>
    -->
    <FileSystem class="org.apache.jackrabbit.core.fs.db.DbFileSystem">
      <param name="driver" value="org.postgresql.Driver"/>
      <param name="url" value="jdbc:postgresql://localhost:5432/jackrabbit"/>
      <param name="user" value="jcr_user"/>
      <param name="password" value="password"/>
      <param name="schema" value="postgresql"/>
      <param name="schemaObjectPrefix" value="fs_ver_"/>
    </FileSystem>
```

Note: If you changed your password when you initialized the database during the Prepare Environment step, or if your database is on a different port, edit the url and password parameters accordingly.

7. In the Persistence Manager section of the code that is near the end of the file, verify that PostgreSQL lines of code are not commented out, but the MySQL and Oracle lines are. The codes should look like this.

```
<!--
    <PersistenceManager
 class="org.apache.jackrabbit.core.persistence.bundle.MySqlPersistenceManager">
      <param name="url" value="jdbc:mysql://localhost:3306/jackrabbit"/>
     ...
      <param name="schemaObjectPrefix" value="pm_ver_"/>
    </PersistenceManager>

    <PersistenceManager
 class="org.apache.jackrabbit.core.persistence.bundle.OraclePersistenceManager">
      <param name="url" value="jdbc:oracle:thin:@localhost:1521/XE"/>
     ...
      <param name="schemaObjectPrefix" value="pm_ver_"/>
      <param name="tablespace" value="jackrabbit"/>
    </PersistenceManager>
    -->
    <PersistenceManager
 class="org.apache.jackrabbit.core.persistence.bundle.PostgreSQLPersistenceManager">
      <param name="url" value="jdbc:postgresql://localhost:5432/jackrabbit"/>
      <param name="driver" value="org.postgresql.Driver"/>
      <param name="user" value="jcr_user"/>
      <param name="password" value="password"/>
      <param name="schema" value="postgresql"/>
      <param name="schemaObjectPrefix" value="pm_ver_"/>
    </PersistenceManager>
```

Note: If you changed your password when you initialized the database during the Prepare Environment step, or if your database is on a different port, edit the url and password parameters accordingly.

8. Close and save the file.

Configure Hibernate to Use Built-In User Management

At this point you have installed the BA Server, and set up the data with the solution repository needed for the BA Server to run. The next steps configure the BA Server to use that repository. Follow these instructions to configure the BA Server to use Postgres as a solution repository with the default Pentaho security data access object. Even if you will

end up using some other authentication method, follow all of these directions so that you can verify that the BA Server works with a basic configuration.

1. Open the `/pentaho/server/biserver-ee/pentaho-solutions/system/dialect/postgres/applicationContext-spring-security-hibernate.properties` file in a text editor.
2. Make sure that the values in this example appear in the file, but modify the post number and password as necessary for your specific Postgres configuration.

```
jdbc.driver=org.postgresql.Driver
jdbc.url=jdbc:postgresql://localhost:5432/hibernate
jdbc.username=hibuser
jdbc.password=password
hibernate.dialect=org.hibernate.dialect.PostgreSQLDialect
```

3. Save and close the file.

Prepare MySQL BA Repository Database

These instructions explain how to configure Quartz, Hibernate, Jackrabbit, and Pentaho Security for a MySQL database. By default, the examples in this section are for a MySQL database that runs on port 3306. The default password is also in these examples. If you have a different port, different password complete all of the instructions in these steps.

Configure Quartz on MySQL BA Repository Database

When you use Pentaho to schedule an event, such as a report to be run every Sunday at 1:00 a.m. EST, event information is stored in the Quartz JobStore. During the installation process, you must indicate where the JobStore is located. To do this, modify the `quartz.properties` file.

1. Open the `pentaho/server/biserver-ee/pentaho-solutions/system/quartz/quartz.properties` file in the text editor of your choice.
2. In the `#_replace_jobstore_properties` section of the file, set the `org.quartz.jobStore.driverDelegateClass` equal to `org.quartz.impl.jdbcjobstore.StdJDBCDelegate`.
`org.quartz.jobStore.driverDelegateClass = org.quartz.impl.jdbcjobstore.StdJDBCDelegate`
3. Save the file and close the text editor.

Configure Hibernate Settings for MySQL

Modify the hibernate settings file to specify where Pentaho will find the BA Repository's hibernate configuration file. The hibernate configuration file specifies driver and connection information, as well as dialects and how to handle connection closes and timeouts.

1. Open `pentaho/server/biserver-ee/pentaho-solutions/system/hibernate/hibernate.settings.xml` in a text editor. By default, system indicates the location of the PostgreSQL hibernate configuration file.

```
<config-file>system/hibernate/postgresql.hibernate.cfg.xml</config-file>
```

2. Change the default reference to the MySQL configuration file.

```
<config-file>system/hibernate/mysql5.hibernate.cfg.xml</config-file>
```

3. Save and close the file.
4. Open `pentaho/biserver-ee/systems/hibernate/mysql5.hibernate.cfg.xml` in a text editor.
5. Make sure that the password and port number match the ones you specified in your configuration. Make changes as necessary, then save and close the file.

Modify Jackrabbit Repository Information for MySQL

You must indicate which database is used as the BA Repository as well as the port, url, username, and password. All of the information needed to configure the repository for the PostgreSQL, MySQL, and Oracle BA Repository databases appear. By default, the PostgreSQL sections are not commented out, but the MySQL and Oracle sections are. To

modify this file so that it works for your BA Repository, you will need to make sure that the sections that refer to your BA Repository Database are not commented out, and the sections refer to other BA Repository databases are commented out.

When code is commented out, it appears between the `<! --` and `-->` tags. The information in between the tags is commented out, and is therefore not executed by the software. In this example, the code `<! <FileSystem class=”org.apache.jackrabbit.core.fs.db.OracleFileSystem”>` is commented out.

```
<!--
<FileSystem class=”org.apache.jackrabbit.core.fs.db.OracleFileSystem”>
-->
```

To modify the Jackrabbit repository so that MySQL is the default database, do this.

1. Use a text editor to open the `pentaho/server/biserver-ee/pentaho-solutions/system/jackrabbit/repository.xml` file.
2. In the Repository part of the code, change the code so that the MySQL lines of code are not commented out, but the PostgreSQL and Oracle lines are, like this.

```
<FileSystem class="org.apache.jackrabbit.core.fs.db.DbFileSystem">
    <param name="driver" value="com.mysql.jdbc.Driver"/>
    <param name="url" value="jdbc:mysql://localhost:3306/jackrabbit"/>
    <param name="user" value="jcr_user"/>
    <param name="password" value="password"/>
    <param name="schema" value="mysql"/>
    <param name="schemaObjectPrefix" value="fs_repos_"/>
  </FileSystem>
<!--
<FileSystem class="org.apache.jackrabbit.core.fs.db.OracleFileSystem">
    <param name="url" value="jdbc:oracle:thin:@localhost:1521/XE"/>
    ...
    <param name="schemaObjectPrefix" value="fs_repos_"/>
    <param name="tablespace" value="jackrabbit"/>
  </FileSystem>

  <FileSystem class="org.apache.jackrabbit.core.fs.db.DbFileSystem">
    <param name="driver" value="org.postgresql.Driver"/>
   ...
    <param name="schemaObjectPrefix" value="fs_repos_"/>
  </FileSystem>
-->
```

Note: If you changed your password when you initialized the database during the Prepare Environment step, or if your database is on a different port, edit the url and password parameters accordingly.

3. In the DataStore section of the code, change the code so that the MySQL lines of code are not commented out, but the PostgreSQL and Oracle lines are, like this.

```
<DataStore class="org.apache.jackrabbit.core.data.db.DbDataStore">
    <param name="url" value="jdbc:mysql://localhost:3306/jackrabbit"/>
    <param name="user" value="jcr_user"/>
    <param name="password" value="password"/>
    <param name="databaseType" value="mysql"/>
    <param name="driver" value="com.mysql.jdbc.Driver"/>
    <param name="minRecordLength" value="1024"/>
    <param name="maxConnections" value="3"/>
    <param name="copyWhenReading" value="true"/>
    <param name="tablePrefix" value=""/>
    <param name="schemaObjectPrefix" value="ds_repos_"/>
  </DataStore>
 <!--
 <DataStore class="org.apache.jackrabbit.core.data.db.DbDataStore">
    <param name="url" value="jdbc:oracle:thin:@localhost:1521/XE"/>
   ...
    <param name="schemaObjectPrefix" value="ds_repos_"/>
  </DataStore>
  <DataStore class="org.apache.jackrabbit.core.data.db.DbDataStore">
    <param name="url" value="jdbc:postgresql://localhost:5432/jackrabbit"/>
```

```
  ...
    <param name="schemaObjectPrefix" value="ds_repos_"/>
  </DataStore>
  -->
```

4. In the Workspaces section of the code, change the code so that the MySQL lines of code are not commented out, but the PostgreSQL and Oracle lines are, like this.

```
<FileSystem class="org.apache.jackrabbit.core.fs.db.DbFileSystem">
      <param name="driver" value="com.mysql.jdbc.Driver"/>
      <param name="url" value="jdbc:mysql://localhost:3306/jackrabbit"/>
      <param name="user" value="jcr_user"/>
      <param name="password" value="password"/>
      <param name="schema" value="mysql"/>
      <param name="schemaObjectPrefix" value="fs_ws_"/>
    </FileSystem>
<!--
    <FileSystem class="org.apache.jackrabbit.core.fs.db.OracleFileSystem">
      <param name="url" value="jdbc:oracle:thin:@localhost:1521/XE"/>
     ...
      <param name="schemaObjectPrefix" value="fs_ws_"/>
      <param name="tablespace" value="jcr_user"/>
    </FileSystem>
    <FileSystem class="org.apache.jackrabbit.core.fs.db.DbFileSystem">
      <param name="driver" value="org.postgresql.Driver"/>
   ...
      <param name="schemaObjectPrefix" value="fs_ws_"/>
    </FileSystem>
-->
```

Note: If you changed your password when you initialized the database during the Prepare Environment step, or if your database is on a different port, edit the url and password parameters accordingly.

5. In the Persistence Manager section of the code, change the code so that the MySQL lines of code are not commented out, but the PostgreSQL and Oracle lines are, like this.

```
<PersistenceManager
 class="org.apache.jackrabbit.core.persistence.bundle.MySqlPersistenceManager">
      <param name="url" value="jdbc:mysql://localhost:3306/jackrabbit"/>
      <param name="user" value="jcr_user" />
      <param name="password" value="password" />
      <param name="schema" value="mysql"/>
      <param name="schemaObjectPrefix" value="${wsp.name}_pm_ws_"/>
    </PersistenceManager>
 <!--
    <PersistenceManager
 class="org.apache.jackrabbit.core.persistence.bundle.OraclePersistenceManager">
      <param name="url" value="jdbc:oracle:thin:@localhost:1521/XE"/>
     ...
      <param name="schemaObjectPrefix" value="${wsp.name}_pm_ws_"/>
      <param name="tablespace" value="jackrabbit"/>
    </PersistenceManager>
    <PersistenceManager
 class="org.apache.jackrabbit.core.persistence.bundle.PostgreSQLPersistenceManager">
      <param name="url" value="jdbc:postgresql://localhost:5432/jackrabbit"/>
     ...
      <param name="schemaObjectPrefix" value="${wsp.name}_pm_ws_"/>
    </PersistenceManager>
 -->
```

Note: If you changed your password when you initialized the database during the Prepare Environment step, or if your database is on a different port, edit the url and password parameters accordingly.

6. In the Versioning section of the code, change the code so that the MySQL lines of code are not commented out, but the PostgreSQL and Oracle lines are, like his.

```
<FileSystem class="org.apache.jackrabbit.core.fs.db.DbFileSystem">
      <param name="driver" value="com.mysql.jdbc.Driver"/>
      <param name="url" value="jdbc:mysql://localhost:3306/jackrabbit"/>
```

```
      <param name="user" value="jcr_user"/>
      <param name="password" value="password"/>
      <param name="schema" value="mysql"/>
      <param name="schemaObjectPrefix" value="fs_ver_"/>
    </FileSystem>
<!--
    <FileSystem class="org.apache.jackrabbit.core.fs.db.OracleFileSystem">
      <param name="url" value="jdbc:oracle:thin:@localhost:1521/XE"/>
    ...
      <param name="schemaObjectPrefix" value="fs_ver_"/>
      <param name="tablespace" value="jackrabbit"/>
    </FileSystem>
    <FileSystem class="org.apache.jackrabbit.core.fs.db.DbFileSystem">
      <param name="driver" value="org.postgresql.Driver"/>
      ...
      <param name="schemaObjectPrefix" value="fs_ver_"/>
    </FileSystem>
-->
```

Note: If you changed your password when you initialized the database during the Prepare Environment step, or if your database is on a different port, edit the url and password parameters accordingly.

7. In the Persistence Manager section of the code that is near the end of the file, change the code so that the MySQL lines of code are not commented out, but the PostgreSQL and Oracle lines are, like this.

```
<PersistenceManager
 class="org.apache.jackrabbit.core.persistence.bundle.MySqlPersistenceManager">
      <param name="url" value="jdbc:mysql://localhost:3306/jackrabbit"/>
      <param name="user" value="jcr_user" />
      <param name="password" value="password" />
      <param name="schema" value="mysql"/>
      <param name="schemaObjectPrefix" value="pm_ver_"/>
    </PersistenceManager>
<!--
    <PersistenceManager
 class="org.apache.jackrabbit.core.persistence.bundle.OraclePersistenceManager">
      <param name="url" value="jdbc:oracle:thin:@localhost:1521/XE"/>
     ...
      <param name="schemaObjectPrefix" value="pm_ver_"/>
      <param name="tablespace" value="jackrabbit"/>
    </PersistenceManager>
    <PersistenceManager
 class="org.apache.jackrabbit.core.persistence.bundle.PostgreSQLPersistenceManager">
      <param name="url" value="jdbc:postgresql://localhost:5432/jackrabbit"/>
     ...
      <param name="schemaObjectPrefix" value="pm_ver_"/>
    </PersistenceManager>
-->
```

Note: If you changed your password when you initialized the database during the Prepare Environment step, or if your database is on a different port, edit the url and password parameters accordingly.

Configure Hibernate to Use Built-In User Management

At this point you have installed the BA Server, and set up the data with the solution repository needed for the BA Server to run. The next steps configure the BA Server to use that repository. Follow these instructions to configure the BA Server to use MySQL as a solution repository with the default Pentaho security data access object. Even if you will end up using some other authentication method, follow all of these directions so that you can verify that the BA Server works with a basic configuration.

1. Open the `/pentaho/server/biserver-ee/pentaho-solutions/system/applicationContext-spring-security-hibernate.properties` file in a text editor.
2. Edit the file and change the following values to those in this example, modifying the details for your specific MySQL configuration.

```
jdbc.driver=com.mysql.jdbc.Driver
 jdbc.url=jdbc:mysql://localhost:3306/hibernate
```

```
jdbc.username=hibuser
jdbc.password=password
hibernate.dialect=org.hibernate.dialect.MySQL5Dialect
```

3. Save and close the file.

Prepare Oracle BA Repository Database

These instructions explain how to configure Quartz, Hibernate, Jackrabbit, and Pentaho Security. By default, the examples in this section are for a Oracle database that runs on port 1521. The default password is also in these examples. If you have a different port, different password complete all of the instructions in these steps.

Configure Quartz on Oracle BA Repository Database

When you use Pentaho to schedule an event, such as a report to be run every Sunday at 1:00 a.m. EST, event information is stored in the Quartz JobStore. During the installation process, you must indicate where the JobStore is located. To do this, modify the `quartz.properties` file.

1. Open the `pentaho/server/biserver-ee/pentaho-solutions/system/quartz/quartz.properties` file in the text editor of your choice.
2. In the `#_replace_jobstore_properties` section of the file, set the `org.quartz.jobStore.driverDelegateClass` equal to `org.quartz.impl.jdbcjobstore.oracle.OracleDelegate`.
   `org.quartz.jobStore.driverDelegateClass = org.quartz.impl.jdbcjobstore.oracle.OracleDelegate`
3. Save the file and close the text editor.

Configure Hibernate Settings for Oracle

Modify the hibernate settings file to specify where Pentaho will find the BA Repository's hibernate configuration file. The hibernate configuration file specifies driver and connection information, as well as dialects and how to handle connection closes and timeouts.

1. Open `pentaho/biserver-ee/pentaho-solutions/systems/hibernate/hibernate.settings.xml` in a text editor. By default, system indicates the location of the PostgreSQL hibernate configuration file.

   ```
   <config-file>system/hibernate/postgresql.hibernate.cfg.xml</config-file>
   ```

2. Change the default to this to point to the MySQL configuration file.

   ```
   <config-file>system/hibernate/oracle.hibernate.cfg.xml</config-file>
   ```

3. Save and close the file.
4. Open `pentaho/biserver-ee/systems/hibernate/oracle.hibernate.cfg.xml` in a text editor.
5. Make sure that the password and port number match the ones you specified in your configuration. Make changes as necessary, then save and close the file.

Modify Jackrabbit Repository Information for Oracle

You must indicate which database is used as the BA Repository as well as the port, url, username, and password. All of the information needed to configure the repository for the PostgreSQL, MySQL, and Oracle BA Repository databases appear. By default, the PostgreSQL sections are not commented out, but the MySQL and Oracle sections are. To modify this file so that it works for your BA Repository, you will need to make sure that the sections that refer to your BA Repository Database are not commented out, and the sections refer to other BA Repository databases are commented out.

When code is commented out, it appears between the `<! --` and `-->` tags. The information in between the tags is commented out, and is therefore not executed by the software. In this example, the code `<! <FileSystem class="org.apache.jackrabbit.core.fs.db.OracleFileSystem">` is commented out.

```
<!--
<FileSystem class="org.apache.jackrabbit.core.fs.db.OracleFileSystem">
-->
```

To modify the Jackrabbit repository so that Oracle is the default database, do this.

1. Use a text editor to open the `pentaho/server/biserver-ee/pentaho-solutions/system/jackrabbit/repository.xml` file.
2. In the Repository part of the code, change the code so that the Oracle lines of code are not commented out, but the PostgreSQL and MySQL lines are, like this.

```
<!--
<FileSystem class="org.apache.jackrabbit.core.fs.db.DbFileSystem">
    <param name="driver" value="com.mysql.jdbc.Driver"/>
    <param name="url" value="jdbc:mysql://localhost:3306/jackrabbit"/>
   ...
    <param name="schemaObjectPrefix" value="fs_repos_"/>
  </FileSystem>
-->
<FileSystem class="org.apache.jackrabbit.core.fs.db.OracleFileSystem">
    <param name="url" value="jdbc:oracle:thin:@localhost:1521/XE"/>
    <param name="user" value="jcr_user"/>
    <param name="password" value="password"/>
    <param name="schemaObjectPrefix" value="fs_repos_"/>
    <param name="tablespace" value="jackrabbit"/>
  </FileSystem>
<!--
  <FileSystem class="org.apache.jackrabbit.core.fs.db.DbFileSystem">
    <param name="driver" value="org.postgresql.Driver"/>
    <param name="url" value="jdbc:postgresql://localhost:5432/jackrabbit"/>
    ...
    <param name="schemaObjectPrefix" value="fs_repos_"/>
  </FileSystem>
-->
```

Note: If you changed your password when you initialized the database during the Prepare Environment step, or if your database is on a different port, edit the url and password parameters accordingly.

3. In the DataStore section of the code, change the code so that the Oracle lines of code are not commented out, but the PostgreSQL and MySQL lines are, like this.

```
<!--
<DataStore class="org.apache.jackrabbit.core.data.db.DbDataStore">
    <param name="url" value="jdbc:mysql://localhost:3306/jackrabbit"/>
    ...
    <param name="schemaObjectPrefix" value="ds_repos_"/>
  </DataStore>
  -->
 <DataStore class="org.apache.jackrabbit.core.data.db.DbDataStore">
    <param name="url" value="jdbc:oracle:thin:@localhost:1521/XE"/>
    <param name="driver" value="oracle.jdbc.OracleDriver"/>
    <param name="user" value="jcr_user"/>
    <param name="password" value="password"/>
    <param name="databaseType" value="oracle"/>
    <param name="minRecordLength" value="1024"/>
    <param name="maxConnections" value="3"/>
    <param name="copyWhenReading" value="true"/>
    <param name="tablePrefix" value=""/>
    <param name="schemaObjectPrefix" value="ds_repos_"/>
  </DataStore>
 <!--
 <DataStore class="org.apache.jackrabbit.core.data.db.DbDataStore">
    <param name="url" value="jdbc:postgresql://localhost:5432/jackrabbit"/>
    ...
    <param name="schemaObjectPrefix" value="ds_repos_"/>
  </DataStore>
```

Note: If you changed your password when you initialized the database during the Prepare Environment step, or if your database is on a different port, edit the url and password parameters accordingly.

4. In the Workspaces section of the code, change the code so that the Oracle lines of code are not commented out, but the PostgreSQL and MySQL lines are, like this.

```
<!--
<FileSystem class="org.apache.jackrabbit.core.fs.db.DbFileSystem">
      <param name="driver" value="com.mysql.jdbc.Driver"/>
      <param name="url" value="jdbc:mysql://localhost:3306/jackrabbit"/>
     ...
      <param name="schemaObjectPrefix" value="fs_ws_"/>
    </FileSystem>
-->
    <FileSystem class="org.apache.jackrabbit.core.fs.db.OracleFileSystem">
      <param name="url" value="jdbc:oracle:thin:@localhost:1521/XE"/>
      <param name="user" value="jcr_user"/>
      <param name="password" value="password"/>
      <param name="schemaObjectPrefix" value="fs_ws_"/>
      <param name="tablespace" value="jcr_user"/>
    </FileSystem>
<!--
    <FileSystem class="org.apache.jackrabbit.core.fs.db.DbFileSystem">
      <param name="driver" value="org.postgresql.Driver"/>
      <param name="url" value="jdbc:postgresql://localhost:5432/jackrabbit"/>
      ...
      <param name="schemaObjectPrefix" value="fs_ws_"/>
    </FileSystem>
-->
```

Note: If you changed your password when you initialized the database during the Prepare Environment step, or if your database is on a different port, edit the url and password parameters accordingly.

5. In the Persistence Manager section of the code, change the code so that the Oracle lines of code are not commented out, but the PostgreSQL and MySQL lines are, like this.

```
<!--
<PersistenceManager
 class="org.apache.jackrabbit.core.persistence.bundle.MySqlPersistenceManager">
      <param name="url" value="jdbc:mysql://localhost:3306/jackrabbit"/>
     ...
      <param name="schemaObjectPrefix" value="${wsp.name}_pm_ws_"/>
    </PersistenceManager>
 -->
    <PersistenceManager
 class="org.apache.jackrabbit.core.persistence.bundle.OraclePersistenceManager">
      <param name="url" value="jdbc:oracle:thin:@localhost:1521/XE"/>
      <param name="driver" value="oracle.jdbc.OracleDriver"/>
      <param name="user" value="jcr_user"/>
      <param name="password" value="password"/>
      <param name="schema" value="oracle"/>
      <param name="schemaObjectPrefix" value="${wsp.name}_pm_ws_"/>
      <param name="tablespace" value="jackrabbit"/>
    </PersistenceManager>
 <!--
   <PersistenceManager
 class="org.apache.jackrabbit.core.persistence.bundle.PostgreSQLPersistenceManager">
      <param name="url" value="jdbc:postgresql://localhost:5432/jackrabbit"/>
      ...
      <param name="schemaObjectPrefix" value="${wsp.name}_pm_ws_"/>
    </PersistenceManager>
 -->
```

Note: If you changed your password when you initialized the database during the Prepare Environment step, or if your database is on a different port, edit the url and password parameters accordingly.

6. In the Versioning section of the code, change the code so that the Oracle lines of code are not commented out, but the PostgreSQL and MySQL lines are, like his.

```
<!--
<FileSystem class="org.apache.jackrabbit.core.fs.db.DbFileSystem">
      <param name="driver" value="com.mysql.jdbc.Driver"/>
```

```
      <param name="url" value="jdbc:mysql://localhost:3306/jackrabbit"/>
      ...
      <param name="schemaObjectPrefix" value="fs_ver_"/>
    </FileSystem>
-->
    <FileSystem class="org.apache.jackrabbit.core.fs.db.OracleFileSystem">
      <param name="url" value="jdbc:oracle:thin:@localhost:1521/XE"/>
      <param name="user" value="jcr_user"/>
      <param name="password" value="password"/>
      <param name="schemaObjectPrefix" value="fs_ver_"/>
      <param name="tablespace" value="jackrabbit"/>
    </FileSystem>
 <!--
   <FileSystem class="org.apache.jackrabbit.core.fs.db.DbFileSystem">
      <param name="driver" value="org.postgresql.Driver"/>
      <param name="url" value="jdbc:postgresql://localhost:5432/jackrabbit"/>
      ...
      <param name="schemaObjectPrefix" value="fs_ver_"/>
    </FileSystem>
-->
```

Note: If you changed your password when you initialized the database during the Prepare Environment step, or if your database is on a different port, edit the url and password parameters accordingly.

7. In the Persistence Manager section of the code that is near the end of the file, change the code so that the Oracle lines of code are not commented out, but the PostgreSQL and MySQL lines are, like this.

```
<!--
<PersistenceManager
 class="org.apache.jackrabbit.core.persistence.bundle.MySqlPersistenceManager">
      <param name="url" value="jdbc:mysql://localhost:3306/jackrabbit"/>
      ...
      <param name="schemaObjectPrefix" value="pm_ver_"/>
    </PersistenceManager>
-->
    <PersistenceManager
 class="org.apache.jackrabbit.core.persistence.bundle.OraclePersistenceManager">
      <param name="url" value="jdbc:oracle:thin:@localhost:1521/XE"/>
      <param name="driver" value="oracle.jdbc.OracleDriver"/>
      <param name="user" value="jcr_user"/>
      <param name="password" value="password"/>
      <param name="schema" value="oracle"/>
      <param name="schemaObjectPrefix" value="pm_ver_"/>
      <param name="tablespace" value="jackrabbit"/>
    </PersistenceManager>
 <!--
   <PersistenceManager
 class="org.apache.jackrabbit.core.persistence.bundle.PostgreSQLPersistenceManager">
      <param name="url" value="jdbc:postgresql://localhost:5432/jackrabbit"/>
     ...
      <param name="schemaObjectPrefix" value="pm_ver_"/>
    </PersistenceManager>
-->
```

Note: If you changed your password when you initialized the database during the Prepare Environment step, or if your database is on a different port, edit the url and password parameters accordingly.

Configure Hibernate to Use Built-In User Management

At this point you have installed the BA Server, and set up the data with the solution repository needed for the BA Server to run. The next steps configure the BA Server to use that repository. Follow these instructions to configure the BA Server to use Oracle as a solution repository with the default Pentaho security data access object. Even if you will end up using some other authentication method, follow all of these directions so that you can verify that the BA Server works with a basic configuration.

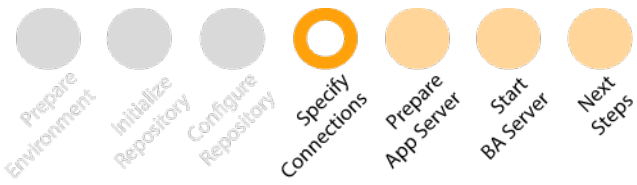
1. Open the `/pentaho/server/biserver-ee/pentaho-solutions/system/dialects/oracle/applicationContext-spring-security-hibernate.properties` file in a text editor.

2. Edit the file and change the following values to those in this example, modifying the details for your specific Oracle configuration.

```
jdbc.driver=oracle.jdbc.driver.OracleDriver
jdbc.url=jdbc:oracle:thin:@localhost:1521:XE
jdbc.username=hibuser
jdbc.password=password
hibernate.dialect=org.hibernate.dialect.Oracle10gDialect
```

3. Save and close the file.

Specify Connections



After your *repository has been configured*, you must configure the web application servers to connect to the BA Repository. In this step, JDBC and JNDI connections are made to the Hibernate, Jackrabbit, and Quartz databases. These databases were installed on your BA Repository database during the Initialize Repository and Configure Repository sections of these instructions.

By default, the BA Server software is configured to be deployed and run on the Tomcat server. As such, connections have already been specified and only the Tomcat context.xml file must be modified. For JBoss, both JDBC and JNDI connection information must be specified. Since what must be completed varies according to web server, tasks in this section are grouped according to the web application server you have installed.

***If you have Tomcat, complete the following tasks*.**

- Copy JDBC Drivers
- Modify JDBC Connection Information

***If you have JBoss, complete the following tasks*.**

- Define JNDI Connection Information
- Remove JNDI Resource References
- Update JNDI Data Source References to Conform with JBoss Standards
- Install JDBC Driver as a Module

Perform Tomcat-Specific Connection Tasks

If you plan to run the BA Server on Tomcat, you must modify JDBC Connection information.

Copy Solution Database JDBC Drivers

For the BA Server to connect to the BA Repository database of your choice, add the BA Repository's database JDBC driver library to the appropriate place in the web application server on which the BA Server will be deployed. The default web application server for the archive installation process is Tomcat.

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

   Due to licensing restrictions, Pentaho does not distribute the necessary JDBC driver JARs.
2. Copy the JDBC driver JAR you just downloaded to the `/tomcat/lib/` directory.

Modify JDBC Connection Information in the Tomcat context.xml File

Database connection and network information, such as the username, password, driver class information, IP address or domain name, and port numbers for your BA Repository database are stored in the `context.xml` file. The `context.xml` file is located inside of the `pentaho.war` file. Modify this file to reflect the database connection and network information to reflect your operating environment. You also modify the values for the `validationQuery` parameters in this file if you have choosen to use an BA Repository database other than PostgreSQL.

1. Consult your database documentation to determine the JDBC class name and connection string for your BA Repository database.
2. View the contents of the `pentaho.war` file with a zip utility, such as 7-Zip, WinZip, or Archive. Do not unzip the file.
3. Use a text editor of your choice to open the `context.xml` file that is in the `META-INF/` directory.
4. Modify the username, password, driver class information, IP address (or domain name), and port numbers so they reflect the correct values for your environment.
5. Make sure that the `validationQuery` variable for your database is set to one of these.

- **PostgreSQL**`validationQuery="select 1"`
- **MySQL:**`validationQuery="/* ping */ select 1"/`
- **Oracle:**`validationQuery="select 1"`

6. Save the `context.xml`file, then close it.
7. If you are prompted by your zip utility to update the `pentaho.war`, do so.
8. To verify that the changes have been made and saved, do this.
   a) Open `pentaho.war` with a zip tool again.
   b) View the `context.xml` file. Make sure that the changes that you made to the file in these instructions have been saved.
   c) Close the file.
9. Navigate to the `pentaho\server\biserver-ee\tomcat\conf\Catalina` directory. If you have gone through these instructions before and you started the BA Server, a `pentaho.xml` file that contains connection settings was generated. If you see the `pentaho.xml` file in the directory, delete it. It will be generated again when you start the BA Server, but will contain the changes that you just made in the `context.xml` file.

Perform JBoss-Specific Connection Tasks

To define JDBC and JNDI connections, several JBoss-specific tasks are required.

Install JDBC Driver as a Module in JBoss

In JBoss, JDBC driver information is stored in a module, which is an XML file that you create. You must download the JDBC driver software component to the correct directory, then create the `module.xml` file.

1. Navigate to the `pentaho/server/biserver-ee/jboss/modules/org` folder and create the appropriate subdirectory path.
   - **PostgreSQL:** `postgres/main`
   - **MySQL:** `mysql/main`
   - **Oracle:** `oracle/main`
2. Download the latest JDBC driver for your BA Repository database to the `postgres/main`, `mysql/main` or `oracle/main` directories.
3. In the `postgres/main`, `mysql/main` or `oracle/main` directores, use an editor of your choice to create a text file named `module.xml`.
4. Modify the `module.xml` file so the name of the correct JDBC driver appears. How this is done depends on the BA Repository database you have.
   - **postgreSQL:** Copy this in the `module.xml` file. Replace the name of the `resource-root path` parameter with the name of the JDBC driver.

```
<?xml version="1.0" encoding="UTF-8"?>
<module xmlns="urn:jboss:module:1.0" name="org.postgresql">
    <resources>
        <resource-root path="[Name of JDBC Jar You Downloaded Here]"/>
    </resources>
    <dependencies><module name="javax.api"/></dependencies>
</module>
```

   - **MySQL:** Copy this in the `module.xml` file. Replace the name of the `resource-root path` parameter with the name of the JDBC driver.

```
<?xml version="1.0" encoding="UTF-8"?>
<module xmlns="urn:jboss:module:1.0" name="org.mysql">
    <resources>
        <resource-root path="[Name of JDBC Jar You Downloaded Here]"/>
    </resources>
    <dependencies><module name="javax.api"/></dependencies>
</module>
```

- **Oracle:** Copy the following data in the `module.xml` file. Replace the name of the `resource-root path` parameter with the name of the JDBC driver.

```
<?xml version="1.0" encoding="UTF-8"?>
<module xmlns="urn:jboss:module:1.0" name="org.oracle">
    <resources>
        <resource-root path="[Name of JDBC Jar You Downloaded Here]"/>
    </resources>
    <dependencies><module name="javax.api"/></dependencies>
</module>
```

5. Save the `module.xml`file and close it.

Define JNDI Database Connection Information in JBoss

JNDI is used to specify port, driver, user name, and password information for the Audit and Quartz databases that are housed on your BA Repository database. JNDI provides a common interface for different naming services, such as DNS, LDAP, and Microsoft Active Directory. Instead of having to remember the details for how to connect or interact with the data for many different naming services, you need to only use an XML to specify the information you want to pass to the naming service.

1. Use a text editor to open the `pentaho/server/biserver-ee/jboss/standalone/configuration/standalone.xml` file.
2. Insert these lines after the definition of `ExampleDS` data source.

```
                <datasource jndi-name="java:jboss/datasources/Hibernate" pool-
name="hibpool" enabled="true" jta="true" use-java-context="true" use-ccm="true">
                        <connection-url>
                            jdbc:postgresql://localhost:5432/hibernate
                        </connection-url>
                        <driver-class>
                            org.postgresql.Driver
                        </driver-class>
                        <driver>
                            org.postgresql
                        </driver>
                        <pool>
                            <prefill>
                                false
                            </prefill>
                            <use-strict-min>
                                false
                            </use-strict-min>
                            <flush-strategy>
                                FailingConnectionOnly
                            </flush-strategy>
                        </pool>
                        <security>
                            <user-name>
                                hibuser
                            </user-name>
                            <password>
                                password
                            </password>
                        </security>
                    </datasource>
                    <datasource jndi-name="java:jboss/datasources/Quartz" pool-
name="quartzpool" enabled="true" jta="true" use-java-context="true" use-ccm="true">
                        <connection-url>
                            jdbc:postgresql://localhost:5432/quartz
                        </connection-url>
                        <driver-class>
                            org.postgresql.Driver
                        </driver-class>
                        <driver>
                            org.postgresql
                        </driver>
```

```
                        <pool>
                            <prefill>
                                false
                            </prefill>
                            <use-strict-min>
                                false
                            </use-strict-min>
                            <flush-strategy>
                                FailingConnectionOnly
                            </flush-strategy>
                        </pool>
                        <security>
                            <user-name>
                                pentaho_user
                            </user-name>
                            <password>
                                password
                            </password>
                        </security>
                    </datasource>
                    <datasource jndi-name="java:jboss/datasources/Audit" pool-
name="auditpool" enabled="true" jta="true" use-java-context="true" use-ccm="true">
                        <connection-url>
                            jdbc:postgresql://localhost:5432/hibernate
                        </connection-url>
                        <driver-class>
                            org.postgresql.Driver
                        </driver-class>
                        <driver>
                            org.postgresql
                        </driver>
                        <pool>
                            <prefill>
                                false
                            </prefill>
                            <use-strict-min>
                                false
                            </use-strict-min>
                            <flush-strategy>
                                FailingConnectionOnly
                            </flush-strategy>
                        </pool>
                        <security>
                            <user-name>
                                pentaho_user
                            </user-name>
                            <password>
                                password
                            </password>
                        </security>
                    </datasource>
 <datasource jndi-name="java:jboss/datasources/Operations_Mart" pool-
name="Operations_Mart" enabled="true" jta="true" use-java-context="true" use-
ccm="true">
                        <connection-url>
                            jdbc:postgresql://localhost:5432/hibernate
                        </connection-url>
                        <driver-class>
                            org.postgresql.Driver
                        </driver-class>
                        <driver>
                            org.postgresql
                        </driver>
                        <pool>
                            <prefill>
                                false
                            </prefill>
                            <use-strict-min>
                                false
```

```
                            </use-strict-min>
                            <flush-strategy>
                                FailingConnectionOnly
                            </flush-strategy>
                        </pool>
                        <security>
                            <user-name>
                                pentaho_user
                            </user-name>
                            <password>
                                password
                            </password>
                        </security>
                    </datasource>
```

3. If your environment (e.g. port numbers, IP address), solution repository, or database password and username information differs from the code you added in the previous step, modify it to match your specifications.
4. Add the driver definition in the driver section of the file. Here is an example of the PostgreSQL driver definition. If you are using MySQL or Oracle, modify the driver name, module, and data source class accordingly.

```
<driver name="org.postgresql" module="org.postgresql">
 <xa-datasource-class>
     org.postgresql.xa.PGXADataSource
     </xa-datasource-class>
 </driver>
```

5. Close and save the `standalone.xml`file.
6. Open the `pentaho/server/biserver-ee/pentaho-solutions/system/applicationContext-spring-security-jdbc.xml` file. Change the port number, driver class name, user name, and password to reflect your environment's settings, if necessary. When complete, save and close the file.

Remove JNDI Resource References in JBoss

Because JBoss has its own mechanism for referencing JNDI data sources, the resource-references in the `web.xml` file located in the `pentaho.war` are not needed. You must remove these resource-references for the BA Server to operate properly.

1. Navigate to the `pentaho/server/biserver-ee/jboss/standalone/deployments` directory.
2. Use a zip extraction utility (such as 7-Zip, Winzip, or Archive) to view the contents of the `pentaho.war` file. Do not unzip or extract the contents of the file.
3. Navigate to the `WEB-INF` directory and open the `web.xml` file in a text editor.
4. Delete all `<resource-ref>` tagged entries including everything between the `<resource-ref>` and `</resource ref>` tags.
5. Save and close the file.
6. The zip extraction utility that you used might show a prompt that asks whether you would like to update the file in the **pentaho.war** archive. If this happens, confirm that you would like to do this.

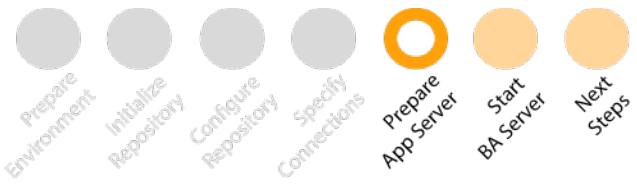
Update JNDI Data Source Reference to Conform to JBoss Standards

Update these files so that referenced JNDI datasources conform to JBoss standards.

1. Use a text editor to open the `pentaho/server/biserver-ee/pentaho-solutions/system/quartz/quartz.properties` file.
2. Change the `org.quartz.dataSource.myDS.jndiURL` value to `jboss/datasources/Quartz`, then save and close the file.
3. Use a text editor to open the `pentaho/server/biserver-ee/pentaho-solutions/system/audit_sql.xml` file.
4. Change the JNDI value to `jboss/datasources/Hibernate`, then save and close the file.
5. Use a text editor to open the `pentaho/server/biserver-ee/pentaho-solutions/system/data-access/settings.xml` file.
6. Change the `data-access-staging-jndi` value to `jboss/datasources/Hibernate`, then save and close the file.

7. Open the `pentaho/server/biserver-ee/pentaho-solutions/system/audit/dialects/h2` folder. Use the text editor to open each file and make the following changes:
   - Change `<database>Audit</database>` to `<database>jboss/datasources/Audit</database>`.
   - Change `<database>Hibernate</database>` to `<database>jboss/datasources/Hibernate</database>`.

Prepare Web Application Servers



After you have completed the tasks in the *Specify Connections* step, you must determine whether your web application server must be configured before the BA Server is deployed on it.

Tomcat: No additional configuration is required. Proceed to the *Start BA Server* step.

JBoss: If you have installed the JBoss web application server, you must manually complete several configuration tasks.

- *Add the list of Oracle JDK packages that JBoss loads by default*
- *Increase the amount of time JBoss allows for BA Server deployment*
- *Disable the JBoss RESTEasy Scan*
- *Increase Default Memory Settings*

Add to the List of Oracle JDK Packages that JBoss Loads by Default

By default, JBoss loads a subset of packages from the Oracle Java Development Kit (JDK). Deployed web applications leverage code in JDK packages to perform basic tasks. For example, JBoss automatically loads packages that web application code can access to perform LDAP single-sign on authentication.

The list of Oracle JDK packages that JBoss loads are located the `module.xml` file. Pentaho requires JDK packages that are not included in the JBoss default. You must manually add these files to the list so that JBoss loads them, in addition to those loaded by JBoss, when the `pentaho.war` file is deployed.

1. Use a text editor to open the `pentaho/server/biserver-ee/jboss/modules/sun/jdk/main/standalone.xml` file.
2. Open the `module.xml` file in a text editor, and add these packages to the list right above the `META-INF/Services` entry.

```
<path name="sun/net/www/protocol/jar"/>
 <path name="sun/net/www/protocol/jar/JarURLConnection"/>
```

When complete the file should look similar to this.

```
    <path name="com/sun/script/javascript"/>
     <path name="com/sun/jndi/dns"/>
     <path name="com/sun/jndi/ldap"/>
     <path name="com/sun/security/auth"/>
     <path name="com/sun/security/auth/module"/>
     <path name="sun/misc"/>
     <path name="sun/nio"/>
     <path name="sun/nio/ch"/>
     <path name="sun/util"/>
     <path name="sun/util/calendar"/>
     <path name="sun/net/www/protocol/jar"/>
     <path name="sun/net/www/protocol/jar/JarURLConnection"/>
     <path name="META-INF/services"/>
```

3. Save and close the file.

Increase the Amount of Time JBoss Allows for BA Server Deployment

By default, JBoss allows up to one minute for a web application to be deployed. If the web application is not deployed within that timeframe, an error occurs.

Because the BA Server deployment requires more than one minute, manually edit the `standalone.xml` file to increase the deployment time.

1. Use a text editor to open the `pentaho/server/biserver-ee/jboss/standalone/configuration/standalone.xml` file.
2. Find the `<deployment-scanner>` tag, add the `deployment-timeout` attribute, then set the attribute equal to `120`.
   `<deployment-scanner scan-interval="5000" relative-to="jboss.server.base.dir" path="deployments" scan-enabled="true" deployment-timeout="120"/>`
3. Save and close the file.

Disable the JBoss RESTEasy Scan

To load pentaho REST services correctly, the RESTEasy scan in JBoss must be disabled. These instructions explain how to do this.

1. Use a zip extraction utility such as 7-Zip, Winzip, or Archive to view the contents of the `pentaho/server/biserver-ee/server/jboss/standalone/deployments/pentaho.war` file. Do not unzip the `pentaho.war` file, just view its contents.
2. Navigate to the `WEB-INF` directory in the `pentaho.war` file and open the `web.xml` file in a text editor.
3. At the end of the <context-param> tags, add this code.

```
<context-param>
             <param-name>resteasy.scan</param-name>
             <param-value>false</param-value>
        </context-param>
        <context-param>
             <param-name>resteasy.scan.resources</param-name>
             <param-value>false</param-value>
        </context-param>
        <context-param>
             <param-name>resteasy.scan.providers</param-name>
             <param-value>false</param-value>
</context-param>
```

4. Save the changes and close the file.
5. The zip extraction utility that you used might show a prompt that asks whether you would like to update the file in the `pentaho.war` archive. If this happens, confirm that you would like to do this.

Increase JBoss Default Memory Settings

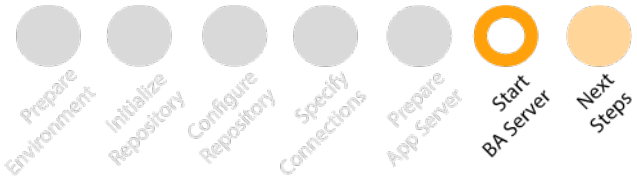
Before you deploy the BA Server, modify the JBoss startup script to match the BA Server's memory resource requirements. If this step is not performed, the BA Server will not start.

1. Use a text editor to open the standalone configuration file. The file you open depends on your operating system.
   - **Microsoft Windows:** `pentaho/server/biserver-ee/jboss/bin/standalone-conf.bat`
   - **Linux:** `pentaho/server/biserver-ee/jboss/bin/standalone.conf`
2. Change the following code from `-Xms64m -Xmx512m -XX:MaxPermSize=256m` to this:

```
-Xms4096m -Xmx6144m -XX:MaxPermSize=256m
```

3. Save the changes and close the file.

Start BA Server



After you've complete the tasks in the *Prepare Environment*, *Initialize Repository*, *Specify Connections*, and *Prepare Web Server* steps, the BA Server's `pentaho.war` file is ready to be deployed. The way that tasks for deployment are performed vary slightly depending on whether you deploy the `pentaho.war` file on the Tomcat or JBoss web application servers.

Tomcat

- *Install License Keys*
- *Modify Tomcat Startup Script* (Windows or Linux)
- *Start BA Server*

Boss

- *Install License Keys*
- *Modify JBoss Startup Script* (Windows or Linux)
- *Start BA Server*

Once the `pentaho.war` file has been deployed, manually *start the BA Server application*.

Install BA Server License Keys

1. Download the .lic file you want to install.
2. Copy your .lic files to the BA Server.
3. Navigate to the `/license-installer/` directory.
4. Run the license installation script.
   a) **For Linux:** Run `install_license.sh` with the install switch and the location and name of your .lic file as a parameter. You can specify multiple .lic files separated by spaces. Be sure to use backslashes to escape any spaces in the path or file name.
   ```
   install_license.sh install /home/dvader/downloads/Pentaho/BI/Platform/Enterprise/Edition.lic
   ```
   b) **For Windows:** Run `install_license.bat` with the install switch and the location and name of your license file as a parameter.
   ```
   install_license.bat install "C:\Users\dvader\Downloads\Pentaho BA Platform Enterprise Edition.lic"
   ```

Modify Tomcat Startup Script

The Tomcat startup script must be modified to include the `CATALINA_OPTS` variable. `CATALINA_OPTS` indicates the amount of memory to allocate. It also indicates where Pentaho licenses are installed. Specific instructions on how to modify the startup script depend on your operating system.

Modify the Tomcat Windows Startup Script

1. Make sure the Tomcat web application server is not running by starting the Windows **Task Manager** and looking for **Tomcat** in the **Applications** tab. If the server is running, stop it.
2. Use a text editor to open the `startup.bat` file, which is in the `bin` subdirectory of the Tomcat home directory.
3. Add this line directly before the `call "%EXECUTABLE%" start %CMD_LINE_ARGS%` line, which is located near the end of the file.

```
set CATALINA_OPTS=-Xms4096m -Xmx6144m -XX:MaxPermSize=256m -
Dsun.rmi.dgc.client.gcInterval=3600000 -Dsun.rmi.dgc.server.gcInterval=3600000 -
Dpentaho.installed.licenses.file=%PENTAHO_INSTALLED_LICENSE_PATH%
```

4. Save and close the file.

Modifying the Tomcat Linux Startup Script

1. Make sure the Tomcat web application server is not running by opening a **Terminal** window and typing `ps -A` at the prompt. If the server is running, stop it.
2. Use a text editor to open the `startup.bat` file, which is in the `bin` subdirectory of the Tomcat home directory.
3. Add this line directly before the `exec "$PRGDIR"/"$EXECUTABLE" start "$@"` line near the end of the file.
   ```
   export CATALINA_OPTS="-Xms4096m -Xmx6144m -XX:MaxPermSize=256m -
   Dsun.rmi.dgc.client.gcInterval=3600000 -Dsun.rmi.dgc.server.gcInterval=3600000 -
   Dpentaho.installed.licenses.file=$PENTAHO_INSTALLED_LICENSE_PATH"
   ```
4. Save and close the file.

Modify JBoss Startup Script

The JBoss startup script must be modified to include the `JAVA_OPTS` variable. `JAVA_OPTS` indicates the amount of memory to allocate. It also indicates where Pentaho licenses are installed. Specific instructions on how to modify the startup script depend on your operating system.

Modify the JBoss Windows Startup Script

1. Make sure the JBoss web application server is not running by starting the Windows **Task Manager** and looking for **JBoss** in the **Applications** tab. If the server is running, stop it.
2. Use a text editor to open the `standalone.bat` file, which is located in the JBoss `bin` directory.
3. Add this line below the `JAVA_OPTS IF` statement. It should be outside of the brackets and not part of the `IF` statement.

   ```
   set JAVA_OPTS=%JAVA_OPTS% -Xms4096m -Xmx6144m -XX:MaxPermSize=256m -
   Dpentaho.installed.licenses.file=%PENTAHO_INSTALLED_LICENSE_PATH%
   ```
4. Save and close the file.

Modifying the JBoss Linux Startup Script

1. Make sure the JBoss web application server is not running by opening a **Terminal** window and typing `ps -A` at the prompt. If the server is running, stop it.
2. Use a text editor to open the `standalone.conf` file. The file is located in the `bin` subdirectory of your JBoss home directory.
3. Modify the `Xms` memory settings in the `JAVA_OPTS` line to be at least 4096 MB or more, if you have the resources and are concerned with performance. Change the `Xmx` value to at least 6144 MB.
4. Add the following options to the `JAVA_OPTS` line:

   `-Djava.awt.headless=true -Djava.io.tmpdir=/tmp/ -Dpentaho.installed.licenses.file= $PENTAHO_INSTALLED_LICENSE_PATH`

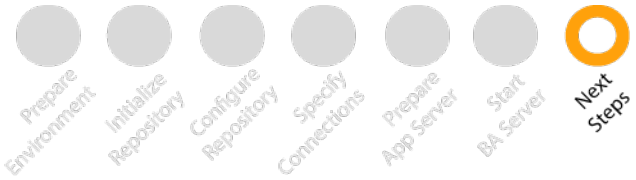
   ```
   # Specify options to pass to the Java VM.
       if [ "x$JAVA_OPTS" = "x" ]; then
           JAVA_OPTS="-Xms4096m \
           -Xmx6144m \
           -XX:MaxPermSize=256m \
           -Dsun.rmi.dgc.client.gcInterval=3600000 \
           -Dsun.rmi.dgc.server.gcInterval=3600000 \
           <b>-Djava.awt.headless=true \
           -Djava.io.tmpdir=/tmp/ \
           -Dpentaho.installed.licenses.file=$PENTAHO_INSTALLED_LICENSE_PATH
   ```

   You may need to adjust these settings for your environment. For instance, if you do not have a `/tmp/` directory, you may want to change that setting to `/var/tmp/` or some other location.
5. Save and close the file.

Start BA Server

1. Run the startup script for your web application server by launching one these files.
   - **Windows Tomcat:** Launch the `startup.bat` file. The startup.bat file is in the Tomcat `bin` directory.
   - **Linux Tomcat:** Launch the `startup.bat` file. The startup.sh file is in the Tomcat `bin` directory.
   - **Windows JBoss:** Launch the `standalone.bat` file. The startup.bat file is in the JBoss `bin` directory.
   - **Linux JBoss:** Launch the `standalone.sh` file. The startup.bat file is in the JBoss `bin` directory.
2. Open a web browser and enter this URL: `http://localhost:8080/pentaho`. The **User Console Log On** window appears.

Next Steps



Now that you've installed the BA Server, do two things.

- *Install the BA design tools*, so you can generate models and reports.
- *Configure the BA Server and design tools* so you can install licenses, set up datasources, and choose a security method, and more. You must install the license to log into the BA Server.

Note: If you have installed the BA Server so that you can migrate content from the old system to this one, make sure that your license keys have been installed, then view the *Upgrade BA System instructions*.

Learn More

- *Web-Based Data Analysis, Reports, and Dashboards Tutorial using the User Console*