Pentaho Data Integration 4.2 Administrator's Guide

Help and Support Resources

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Contents

Introduction

This guide contains instructions for configuring and managing a production or development Pentaho Data Integration (PDI) 4.2 server. **Installation is not covered here**; for installation procedures, refer to the *Pentaho Data Integration Installation Guide* instead.

Adding a JDBC Driver

Before you can connect to a data source in any Pentaho server or client tool, you must first install the appropriate database driver. Your database administrator, CIO, or IT manager should be able to provide you with the proper driver JAR. If not, you can download a JDBC driver JAR file from your database vendor or driver developer's Web site. Once you have the JAR, follow the instructions below to copy it to the driver directories for all of the BI Suite components that need to connect to this data source.

Note: Microsoft SQL Server users frequently use an alternative, non-vendor-supported driver called JTDS. If you are adding an MSSQL data source, ensure that you are installing the correct driver.

Backing up old drivers

You must also ensure that there are no other versions of the same vendor's JDBC driver installed in these directories. If there are, you may have to back them up and remove them to avoid confusion and potential class loading problems. This is of particular concern when you are installing a driver JAR for a data source that is the same database type as your Pentaho solution repository. If you have any doubts as to how to proceed, contact your Pentaho support representative for guidance.

Installing JDBC drivers

Copy the driver JAR file to the following directories, depending on which servers and client tools you are using (Dashboard Designer, ad hoc reporting, and Analyzer are all part of the BI Server):

Note: For the DI Server: before copying a new JDBC driver, ensure that there is not a different version of the same JAR in the destination directory. If there is, you must remove the old JAR to avoid version conflicts.

- **BI Server:** `/pentaho/server/biserver-ee/tomcat/lib/`
- **Enterprise Console:** `/pentaho/server/enterprise-console/jdbc/`
- **Data Integration Server:** `/pentaho/server/data-integration-server/tomcat/webapps/pentaho-di/WEB-INF/lib/`
- **Data Integration client:** `/pentaho/design-tools/data-integration/libext/JDBC/`
- **Report Designer:** `/pentaho/design-tools/report-designer/lib/jdbc/`
- **Schema Workbench:** `/pentaho/design-tools/schema-workbench/drivers/`
- **Aggregation Designer:** `/pentaho/design-tools/agg-designer/drivers/`
- **Metadata Editor:** `/pentaho/design-tools/metadata-editor/libext/JDBC/`

Note: To establish a data source in the Pentaho Enterprise Console, you must install the driver in both the Enterprise Console and the BI Server or Data Integration Server. If you are just adding a data source through the Pentaho User Console, you do not need to install the driver to Enterprise Console.

Restarting

Once the driver JAR is in place, you must restart the server or client tool that you added it to.

Connecting to a Microsoft SQL Server using Integrated or Windows Authentication

The JDBC driver supports Type 2 integrated authentication on Windows operating systems through the **integratedSecurity** connection string property. To use integrated authentication, copy the **sqljdbc_auth.dll** file to all the directories to which you copied the JDBC files.

The **sqljdbc_auth.dll** files are installed in the following location:

```
<installation directory>\sqljdbc_<version>\<language>\auth\
```

Note: Use the **sqljdbc_auth.dll** file, in the x86 folder, if you are running a 32-bit Java Virtual Machine (JVM) even if the operating system is version x64. Use the **sqljdbc_auth.dll** file in the x64 folder, if you are running a 64-bit JVM on a x64 processor. Use the **sqljdbc_auth.dll** file in the IA64 folder, you are running a 64-bit JVM on an Itanium processor.

Adding a JDBC Driver to Hadoop

You must ensure that your Hadoop nodes have a JDBC driver JAR for every database they will connect to. If you are missing any drivers, copy the JAR files to the `/lib/` subdirectory in your Hadoop home.

Note: The Pentaho Data Integration client tools come with many common JDBC drivers in the `/pentaho/design-tools/data-integration/libext/JDBC/` directory that you can use in Hadoop.

```
cp /tmp/downloads/mysql-connector-java-3.1.14-bin.jar /hadoop-0.20.2/lib/
```

PDI Functions in the Pentaho Enterprise Console

The PDI features of the Pentaho Enterprise Console allow you to monitor all activity on a Data Integration server remotely. You can also register specific jobs and transformations to monitor for more detailed information such as performance trends, execution history, and error logs.

Important: Before you can monitor jobs and transformations, you must first configure logging and monitoring features in Pentaho Data Integration. See *How to Enable Logging* on page 34 for details.

To start viewing jobs and transformations, you must perform at least one of the following tasks:

- Configure the connection to the Data Integration Server you want to monitor
- Register transformations and jobs specific transformations and jobs you want to monitor in detail

Connecting to the Data Integration Server

You must register your Data Integration server to link it to the Pentaho Enterprise Console. After registration you can monitor activity associated with jobs and transformations being processed by the Data Integration server from the PDI dashboard in the Pentaho Enterprise Console.

To register your Data Integration server:

1. Make sure your Data Integration server is up and running.
2. In the Pentaho Enterprise Console home page, click **Pentaho Data Integration**.
3. Click  to open the **Carte Configuration** dialog box.
4. In the **Carte Configuration** dialog box, enter the Data Integration server URL, (for example, http://localhost:9080/pentaho-di/), the server user name, and password.

   Note: You can still configure the Pentaho Enterprise Console to connect to a basic Carte server using the appropriate URL; (for example, http://localhost:80/kettle/).
5. Click **OK** to complete the registration.
   A message appears if the connection to the Data Integration server is successful. If you see an error message, check to make sure your Data Integration server is running and that your access credentials are correct.

Monitoring Current Activity and Alerts

Once your Data Integration or Carte server is running and you have registered jobs and transformations, the **Current Activity** chart on the PDI dashboard displays the total number of jobs and transformations that are waiting, running, or paused on a configured server. Also displayed is a list of alerts associated with registered jobs and transformations. Alerts help you determine if a job or transformation is taking too long to run, has completed too quickly, or has logged errors.

Click **Refresh** to update the dashboard. Click in the **History** list box to view performance history (All History) associated with registered jobs and transformations.

Registering PDI Jobs and Transformations

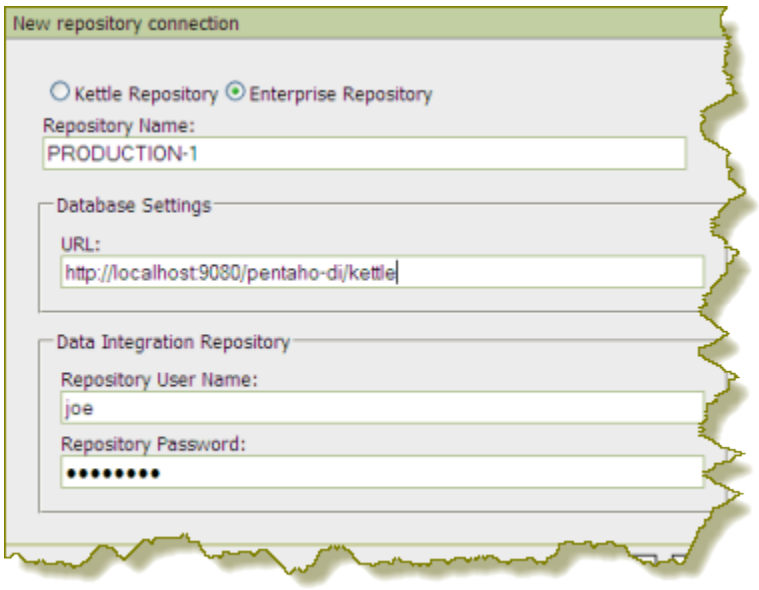
The Pentaho Enterprise Console allows you to register jobs and transformations contained in an enterprise or database repository. Registering a job or transformation allows you to analyze additional related information such as the log history and performance trends.

Registering Transformations and Jobs from the Pentaho Enterprise Repository

To register jobs and transformations stored in a database repository, you must connect to the repository by defining a database connection.

1. Make sure your Data Integration server is running.
2. In the Pentaho Enterprise Console, click the **Pentaho Data Integration** tab.

3. Click (Registration) to view the **Register Jobs and Transformations** page.
4. In the **Register Jobs and Transformations** page, click the plus sign (+) next to **Repository**.
   The **New Repository Connection** dialog box appears.
5. Enter the information about your repository in the appropriate fields and click **OK.**



Note: No fields in the **New Repository Connection** dialog box are allowed to be blank and your port number must be valid.

6. Select the new repository and click **Browse.**
   When you connect to your database repository successfully, a list of all jobs and transformations in the repository appears.
7. Select the jobs and transformations you want to monitor and click **Register**.

Note: Use **CTRL+ CLICK** to select multiple jobs and transformations.

The jobs and transformations you selected appear in the **Registered** list box. Previously registered jobs and transformations are not displayed.

Registering Transformations and Jobs from a Database Repository

To register jobs and transformations stored in a classic Kettle database repository, you must connect to the repository by defining a database connection.

Caution: To avoid database connection errors, be sure you have accurate database connection details. Depending on the database vendor, incorrect entries associated with database connections result in error messages that may not identify issues clearly.

1. Make sure your repository is running.
2. In the Pentaho Enterprise Console, click the **Pentaho Data Integration** tab.
3. Click (Registration) to view the **Register Jobs and Transformations** page.
4. In the **Register Jobs and Transformations** page, click the plus sign (+) next to **Repository**.
   The **New Repository Connection** dialog box appears.
5. Click the **Kettle Repository** radio button.
6. Enter the information about your database in the appropriate fields and click **OK.**

Note: No fields in the **New Repository Connection** dialog box are allowed to be blank and your port number must be valid.

7. Select the new repository and click **Browse.**

When you connect to your database repository successfully, a list of all jobs and transformations in the database repository appears.

8. Select the jobs and transformations you want to monitor and click **Register**.

Note: Use **CTRL+ CLICK** to select multiple jobs and transformations.

The jobs and transformations you selected appear in the **Registered** list box.

Registering Transformations and Jobs from a File System

To register and view jobs and transformations that are stored in a file system, you must browse for the files that contain them.

1. In the Pentaho Enterprise Console, click the **Pentaho Data Integration** tab.
2. Click  (Registration) to view the **Register Jobs and Transformations** page.
3. In the **File** text box type the path name to the file that contains the job or transformation or click **Browse** to locate the file.
4. Click **Register**
   The jobs and transformations you selected appear in the **Registered** list box.

Monitoring Jobs and Transformations

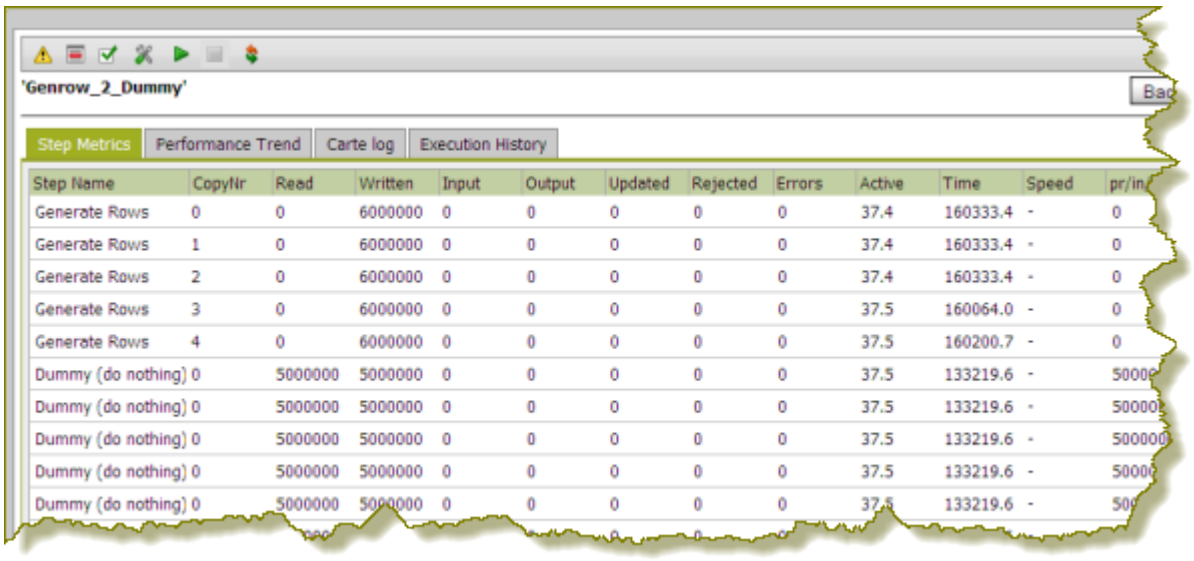
You can monitor the status of all PDI-related jobs and transformations from the Pentaho Enterprise Console. In the console, click the PDI menu item then click  (Monitoring Status) to display all jobs and transformations that are currently running on the Carte server and those which are registered. You will see all registered jobs and transformations and all jobs and transformations that have run on Carte since it was last restarted. Registered jobs and transformations that are registered but which have not been run on Carte since it was last restarted, display a status of "unpublished." Also displayed are runtime thresholds (Alert Min and Max), if specified.

From this page you can start running  pause  , and stop running  jobs and transformations that have been sent to the server since it was last restarted. Click  (Refresh) to refresh the list of jobs and transformations as needed.

Monitoring Performance Trends for Jobs and Transformations

The job and transformation details page associated with the PDI feature of the Pentaho Enterprise Console allows you, among other things, to look a performance trends for a specific job or transformation, to set up alert thresholds, and render results by occurrence or date. In addition, you can view the job or transformation log file (if running on the Data Integration server or Carte) and the step metrics (if running on the Data Integration server or Carte) associated with a specific job or transformation.

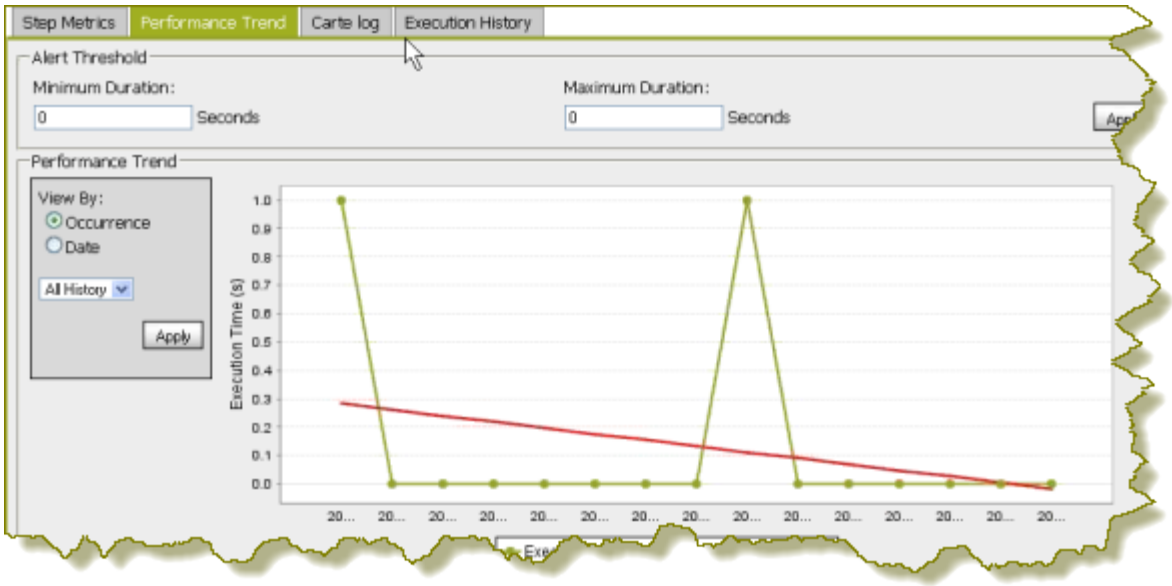
To display the job and transformation details page, click the PDI tab in the console, then click  (Monitoring Status) to open the Monitor Status page. Double-click on a specific job and transformation to display the activity details page. The information available on the details page depends on the settings you configured in the Transformation Settings dialog box in Spoon. See the *Pentaho Data Integration User Guide* for details.



Step Name	CopyNr	Read	Written	Input	Output	Updated	Rejected	Errors	Active	Time	Speed	pr/in
Generate Rows	0	0	6000000	0	0	0	0	0	37.4	160333.4	-	0
Generate Rows	1	0	6000000	0	0	0	0	0	37.4	160333.4	-	0
Generate Rows	2	0	6000000	0	0	0	0	0	37.4	160333.4	-	0
Generate Rows	3	0	6000000	0	0	0	0	0	37.5	160064.0	-	0
Generate Rows	4	0	6000000	0	0	0	0	0	37.5	160200.7	-	0
Dummy (do nothing)	0	5000000	5000000	0	0	0	0	0	37.5	133219.6	-	50000
Dummy (do nothing)	0	5000000	5000000	0	0	0	0	0	37.5	133219.6	-	50000
Dummy (do nothing)	0	5000000	5000000	0	0	0	0	0	37.5	133219.6	-	500000
Dummy (do nothing)	0	5000000	5000000	0	0	0	0	0	37.5	133219.6	-	50000
Dummy (do nothing)	0	5000000	5000000	0	0	0	0	0	37.5	133219.6	-	50

Step Metrics displays metrics at a step level associated with how many rows each step has processed (read, written, input, output.)

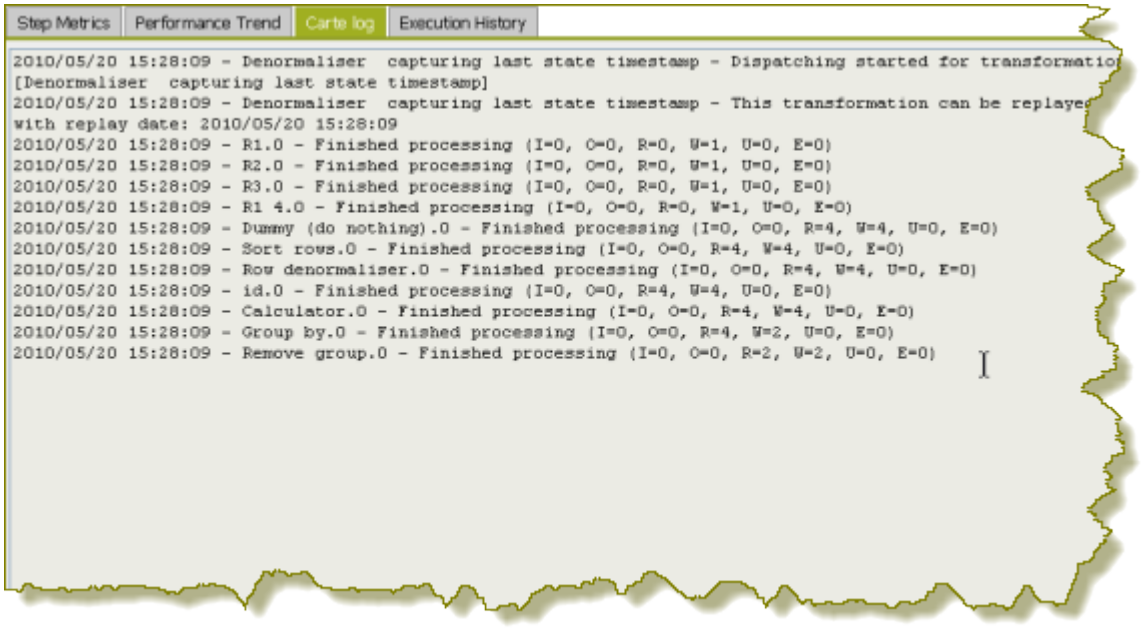
The **Performance Trend** chart displays the performance of a job or transformation over time. Performance history is displayed for registered jobs and transformations that are configured with database logging exclusively.



Note: The Performance Trend is viewable only if you configured the transformation to log to a database in Spoon. See the *Pentaho Data Integration User Guide* for details.

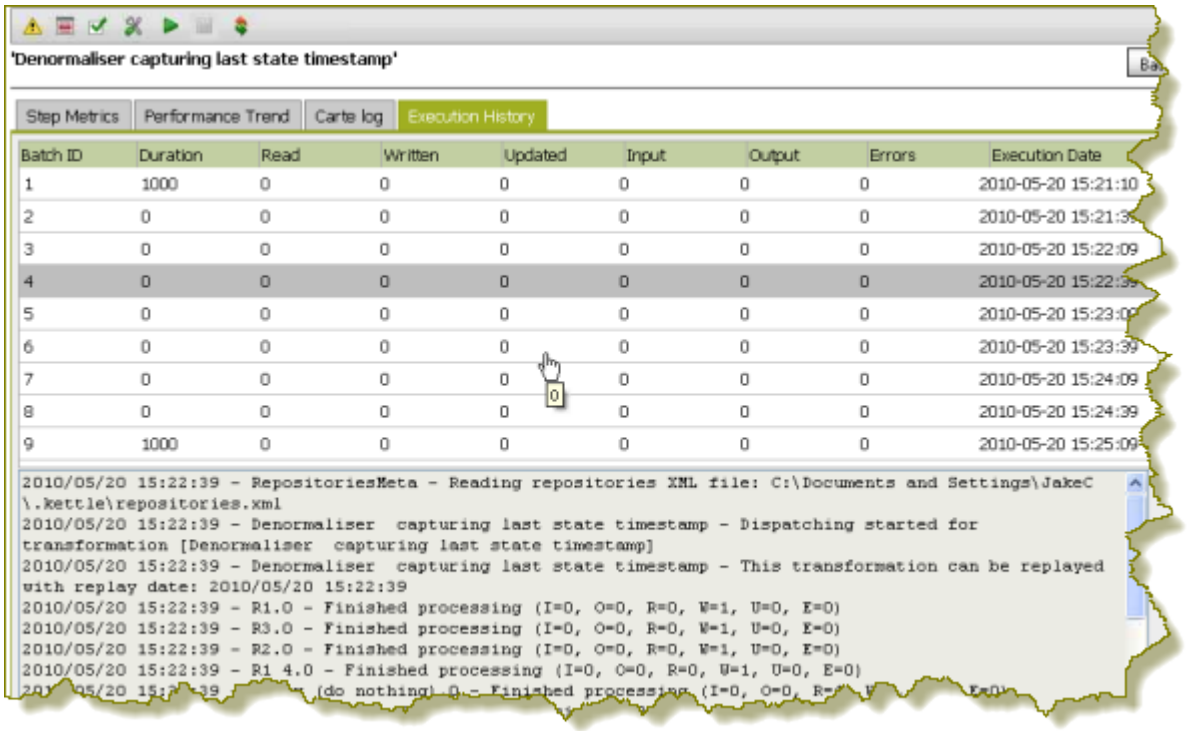
You can configure an **Alert Threshold** by editing the runtime durations in number of seconds. Click **Apply** to have changes take effect. A line appears on the performance chart that displays the minimum and maximum durations. These values are also used on the status page to display warning messages when applicable. The Performance Trend chart can be adjusted to render results by date or by occurrence. For each of these chart types, a filter can be applied to limit the results. Click **Apply** to have changes take effect.

Carte Log displays all relevant logging information associated with the execution of the transformation.



Execution History allows you to view log information from previous executions. This is particularly helpful when you are troubleshooting an error. In the image below, the transformation has run multiple times. The user has selected to display details about the fourth time the transformation ran.

Note: Execution History is viewable only if you configured the transformation to log to a database in Spoon (LOG_FIELD table). See the *Pentaho Data Integration User Guide* for details.



Installing or Updating an Enterprise Edition Key

You must install Pentaho Enterprise Edition keys associated with products for which you have purchased support entitlements. The keys you install determine the layout and capabilities of the Pentaho Enterprise Console, and the functionality of the BI Server and DI Server. Follow the instructions below to install an Enterprise Edition key through the Pentaho Enterprise Console for the first time, or to update an expired or expiring key. If you would prefer to use a command line tool instead, see *Appendix: Working From the Command Line Interface* on page 13.

Note: If your Pentaho Enterprise Console server is running on a different machine than your BI or DI Server, you must use the command line tool to install and update license files; you will not be able to use the Pentaho Enterprise Console for this task.

Note: License installation is a user-specific operation. You must install licenses from the user accounts that will start all affected Pentaho software. If your BI or DI Server starts automatically at boot time, you must install licenses under the user account that is responsible for system services. If you have a Pentaho For Hadoop license, it must be installed under the user account that starts the Hadoop service as well as user accounts that run Pentaho client tools that have Hadoop functionality, and the account that starts the DI Server. There is no harm in installing the licenses under multiple local user accounts, if necessary.

1. If you have not done so already, log into the Pentaho Enterprise Console by opening a Web browser and navigating to `http://server-hostname:8088`, changing **server-hostname** to the hostname or IP address of your BI or DI server.
2. Click the **+** (plus) button in the upper right corner of the Subscriptions section.

   An **Install License** dialog box will appear.
3. Click **Browse**, then navigate to the location you saved your LIC files to, then click **Open**.

   LIC files for each of your supported Pentaho products were emailed to you along with your Pentaho Welcome Kit. If you did not receive this email, or if you have lost these files, contact your Pentaho support representative. If you do not yet have a support representative, contact the Pentaho salesperson you were working with.

   Note: Do not open your LIC files with a text editor; they are binary files, and will become corrupt if they are saved as ASCII.
4. Click **OK**.

   The Setup page changes according to the LIC file you installed.

You can now configure your licensed products through the Pentaho Enterprise Console.

Appendix: Working From the Command Line Interface

Though the Pentaho Enterprise Console is the quickest, easiest, and most comprehensive way to manage PDI and/or the BI Server, some Pentaho customers may be in environments where it is difficult or impossible to deploy or use the console. This appendix lists alternative instructions for command line interface (CLI) configuration.

Installing an Enterprise Edition Key on Windows (CLI)

To install a Pentaho Enterprise Edition Key from the command line interface, follow the below instructions.

Note: Do not open your LIC files with a text editor; they are binary files, and will become corrupt if they are saved as ASCII.

1. Navigate to the `\pentaho\server\enterprise-console\license-installer\` directory, or the `\license-installer\` directory that was part of the archive package you downloaded.
2. Run the **install_license.bat** script with the **install** switch and the location and name of your license file as a parameter.

```
install_license.bat install "C:\Users\pgibbons\Downloads\Pentaho BI Platform
 Enterprise Edition.lic"
```

Upon completing this task, you should see a message that says, "The license has been successfully processed. Thank you."

Installing an Enterprise Edition Key on Linux (CLI)

To install a Pentaho Enterprise Edition Key from the command line interface, follow the below instructions.

Note: Do not open your LIC files with a text editor; they are binary files, and will become corrupt if they are saved as ASCII.

1. Navigate to the `/pentaho/server/enterprise-console/license-installer/` directory, or the `/license-installer/` directory that was part of the archive package you downloaded.
2. Run the **install_license.sh** script with the **install** switch and the location and name of your license file as a parameter. You can specify multiple files, separated by spaces, if you have more than one license key to install.

   Note: Be sure to use backslashes to escape any spaces in the path or file name.

```
install_license.sh install /home/pgibbons/downloads/Pentaho\ BI\ Platform\ Enterprise\
 Edition.lic
```

Upon completing this task, you should see a message that says, "The license has been successfully processed. Thank you."

Security and Authorization Configuration

The information in this section explains how to configure users, roles, and other permissions settings for your PDI enterprise repository.

Changing the Admin Credentials for the Pentaho Enterprise Console

The default user name and password for the Pentaho Enterprise Console are **admin** and **password**, respectively. You must change these credentials if you are deploying the BI Server to a production environment. Follow the instructions below to change the credentials:

1. Stop the Pentaho Enterprise Console.

   ```
   /pentaho/server/enterprise-console/stop-pec.sh
   ```
2. Open a terminal or command prompt window and navigate to the `/pentaho/server/enterprise-console/` directory.
3. Execute the **pec-passwd** script with two parameters: the Enterprise Console username and the new password you want to set.

   This script will make some configuration changes for you, and output an obfuscated password hash to the terminal.

   ```
   ./pec-passwd.sh admin newpass
   ```
4. Copy the hash output to the clipboard, text buffer, or to a temporary text file.
5. Edit the `/pentaho/server/enterprise-console/resource/config/login.properties` file with a text editor.
6. Replace the existing hash string with the new one, leaving all other information in the file intact.

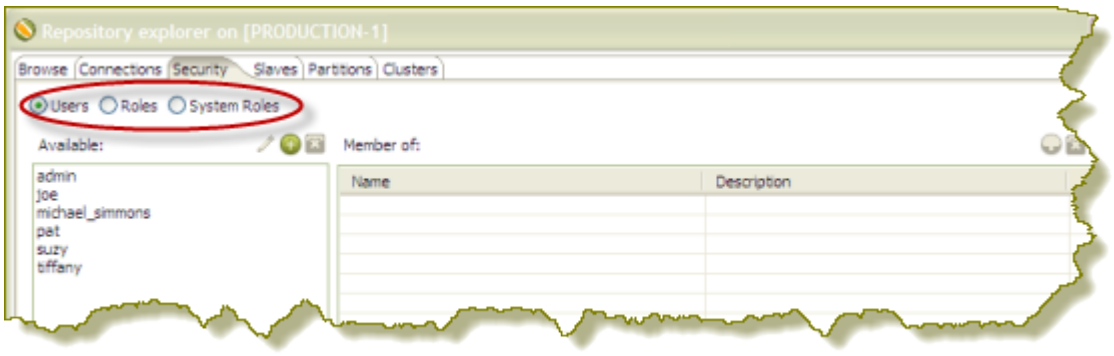
   ```
   admin: OBF:1uo91vn61ymf1yt41v1p1ym71v2p1yti1ylz1vnw1unp,server-administrator,content-administrator,admin
   ```
7. Save and close the file, and restart Enterprise Console.

The Pentaho Enterprise Console password is now changed.

Managing Users and Roles in the Pentaho Enterprise Repository

Pentaho Data Integration comes with a default security provider. If you don't have an existing authentication provider such as LDAP or MSAD, you can use Pentaho Security to define users and roles.

The point-and-click user interface for users and roles in the Pentaho Enterprise Repository similar to the one in the Pentaho Enterprise Console. The users and roles radio buttons allow you to switch between user and role settings. You can add, delete, and edit users and roles from this page.



Adding Users

You must be logged into the Enterprise Repository as an administrative user.

To add users in the Enterprise Repository, follow the directions below.

1. In Spoon, go to **Tools** -> **Repository** -> **Explore**.

The Repository Explorer opens.

2. Click the **Security** tab.

Note: The **Users** radio button is selected by default.

3. Next to **Available**, click (**Add**).
The **Add User** dialog box appears.
4. Enter the **User Name** and **Password** associated with your new user account in the appropriate fields.

Note: An entry in the **Description** field is optional.

5. If you have available roles that can be assigned to the new user, under **Member**, select a role and click (**Add**).

The role you assigned to the user appears in the right pane under **Assigned**.

6. Click **OK** to save your new user account and exit the Add Users dialog box.

The name of the user you added appears in the list of Available users.

Editing User Information

You must be logged into the Enterprise Repository as an administrative user.

Follow the instructions below to edit a user account.

1. In Spoon, go to **Tools** -> **Repository** -> **Explore**.
The Repository Explorer opens.
2. Click the **Security** tab.

Note: The **Users** radio button is selected by default.

3. Select the user whose details you want to edit from the list of available users.
4. Click (Edit)
The **Edit User** dialog box appears.
5. Make the appropriate changes to the user information.
6. Click **OK** to save changes and exit the Edit User dialog box.

Deleting Users

You must be logged into the Enterprise Repository as an administrative user. Refer to *Best Practices for Deleting Users and Roles in the Pentaho Enterprise Repository* before you delete a user or role.

Follow the instructions below to delete a user account:

1. In Spoon, go to **Tools** -> **Repository** -> **Explore**.
   The Repository Explorer opens.
2. Click the **Security** tab.
3. Select the user you want to delete from the list of available users.
4. Next to **Users**, click (**Remove**).
   A confirmation message appears.
5. Click **Yes** to delete the user.

The specified user account is deleted.

Best Practices for Deleting Users and Roles in the Pentaho Enterprise Repository

If a user or role is deleted in the Pentaho Enterprise Repository, (currently used by Pentaho Data Integration), content that refers to the deleted user (either by way of owning the content or having an ACL that mentions the user or role) is left unchanged; therefore, it is possible that you may create a new user or role, at a later date, using an identical name. In this scenario, content ownership and access control entries referring to the deleted user or role now apply to the new user or role.

To avoid this problem, Pentaho recommends that you disable a user or role instead of deleting it. This prevents a user or role with an identical name from ever being created again. The departmental solution (also referred to as Hibernate or the Pentaho Security back-end), does not have disable functionality. For this back-end, Pentaho recommends that you use the following alternatives rather than deleting the user or role:

IF	THEN
You are dealing with a role	Unassign all current members associated with the role
You are dealing with a user	Reset the password to a password that is so cryptic that it is impossible to guess and is unknown to any users

Adding Roles

You must be logged into the Enterprise Repository as an administrative user.

To add roles in the Enterprise Repository, follow the directions below:

1. In Spoon, go to **Tools** -> **Repository** -> **Explore**.
   The Repository Explorer opens.
2. Click the **Security** tab.
3. Click the **Roles** radio button.
   The list of available roles appear.
4. Click (Add)
   The **Add Role** dialog box appears.
5. Enter the **Role Name** in the appropriate field.

   Note: An entry in the **Description** field is optional.

6. If you have users to assign to the new role, select them (using the <**SHIFT**> or <**CTRL**> keys) from the list of available users and click (**Add**).
   The user(s) assigned to your new role appear in the right pane.
7. Click **OK** to save your entries and exit the Add Role dialog box.

The specified role is created and is ready to be assigned to user accounts.

Editing Roles

You must be logged into the Enterprise Repository as an administrative user.

To edit roles in the Enterprise Repository, follow the directions below.

1. In Spoon, go to **Tools** -> **Repository** -> **Explore**.
   The Repository Explorer opens.
2. Click the **Security** tab.

3. Click the **Roles** radio button.
   The list of available roles appear.
4. Select the role you want to edit and click (**Edit**)
   The **Edit Role** dialog box appears.
5. Make the appropriate changes.
6. Click **OK** to save your changes and exit the **Edit Role** dialog box.

Deleting Roles

You must be logged into the Enterprise Repository as an administrative user. Refer to *Best Practices for Deleting Users and Roles in the Pentaho Enterprise Repository* before you delete a user or role.

Follow the instructions below to delete a role:

1. In Spoon, go to **Tools** -> **Repository** -> **Explore**.
   The Repository Explorer opens.
2. Click the **Security** tab.
3. Select the role you want to delete from the list of available roles.
4. Click (**Remove**).
   A confirmation message appears.
5. Click **Yes** to delete the role.

The specified role is deleted.

Assigning Users to Roles

You must be logged into the Enterprise Repository as an administrative user.

You can assign users to roles, (and vice-versa), when you add a new user or role; however, you can also assign users to roles as a separate task.

1. In Spoon, go to **Tools** -> **Repository** -> **Explore**.
   The Repository Explorer opens.
2. Click the **Security** tab.
3. Click the **Roles** radio button.
   The list of available roles appear.
4. Select the role to which you want to assign one or more users.

   Note: If the role has users currently assigned to it, the names of the users appear in the table on the right under **Members**. You can assign or unassign any users to a role. You can select a single item or multiple items from the list of members. Click (Remove) to remove the user assignment.
5. Next to **Members**, click (**Add**).
   The **Add User to Role** dialog box appears.
6. Select the user (or users) you want assigned to the role and click (**Add**).
   The user(s) assigned to the role appear in the right pane.
7. Click **OK** to save your entries and to exit the Add User to Role dialog box.

The specified users are now assigned to the specified role.

Making Changes to the Admin Role

The assigning of task-related permissions, (Read, Create, and Administrate), associated with the Admin role in the Pentaho Enterprise Repository cannot be edited in the user interface. The Admin role is the only role that is assigned the *Administrate* permission; the Administrate permission controls user access to the Security tab.

Deleting the Admin role prevents *all users* from accessing the Security tab, unless another role is assigned the Administrate permission. Below are the scenarios that require a non-UI configuration change:

- You want to delete the Admin role
- You want to unassign the Administrate permission from the Admin role

- You want to setup LDAP

Follow the instructions below to change the Admin role:

1. Shut down the Data Integration server.
2. Open the **repository.spring.xml** file located at `\pentaho\server\data-integration-server\pentaho-solutions\system\`.
3. Locate the element with an ID of **immutableRoleBindingMap**.
4. Replace the entire node with the XML shown below. Make sure you change **yourAdminRole** to the role that will have **Administrate** permission.

```
<util:map id="immutableRoleBindingMap">
    <entry key="yourAdminRole">
      <util:list>
        <value>org.pentaho.di.reader</value>
        <value>org.pentaho.di.creator</value>
        <value>org.pentaho.di.securityAdministrator</value>
      </util:list>
    </entry>
</util:map>
```

5. Restart the Data Integration server.

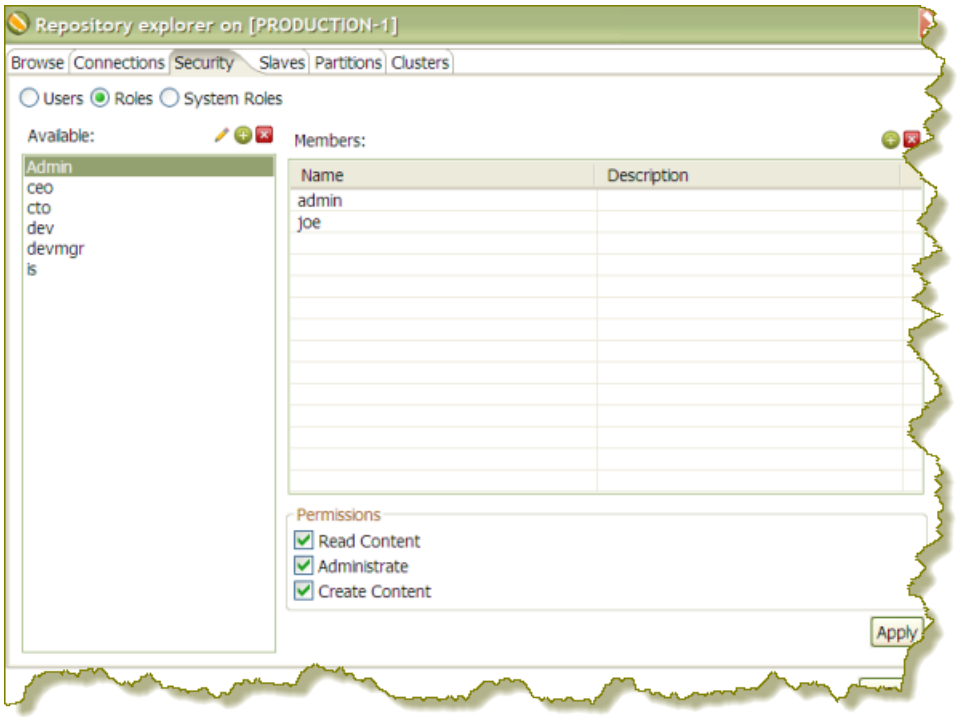
The Admin role is changed according to your requirements.

Assigning Permissions in the Pentaho Enterprise Repository

You must be logged into the Enterprise Repository as an administrative user.

There are "action based" permissions associated with the roles. Roles help you define what users or members of a group have the permission to do. You can create roles that restrict users to reading content exclusively. You can create administrative groups who are allowed to administer security and create new content.

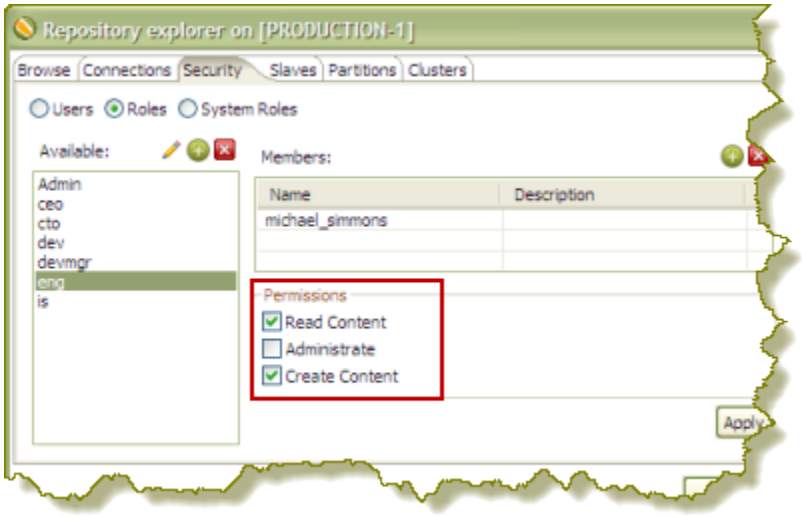
In the example below, user "joe" has an "admin" role. As such, Joe's permissions allow him to **Read Content**, **Administer Security**, and **Create Content**.



To assign permissions in the Enterprise Repository, follow the instructions below.

1. In Spoon, go to **Tools** -> **Repository** -> **Explore**.
   The Repository Explorer opens.

2. Click the **Security** tab.
3. Click the **Roles** radio button.
   The list of available roles appear.
4. Select the role to which you want to assign permissions.
5. Enable the appropriate permissions for your role as shown in the example below.



6. Click **Apply**.

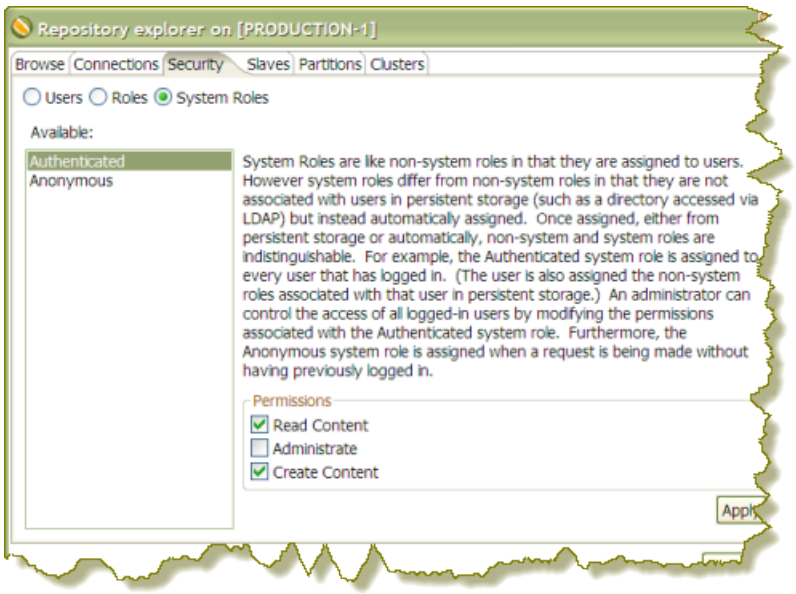
The permissions you enabled for the role will take effect the next time the specified user(s) log into the Pentaho Enterprise Console.

Permissions Settings

Permission	Effect
Read Content	Allows a user or role to examine contents (for example, transformations, jobs, and database connections) in the repository
Administrate	Assigns all permissions to the specified user or role
Create Content	Allows a user or role to create content in the repository

Enabling System Role Permissions in the Pentaho Enterprise Repository

When users log into the Pentaho Enterprise Repository, they are automatically assigned the **Authenticated** system role in addition to the role you assigned to them. Pentaho requires the Authenticated system role for users to log into the Pentaho Enterprise Repository; this includes Admin users. By default, the Authenticated system role provide **Read Content** and **Create Content** permissions to all users who are logged in. You can change these permissions as needed.



Note: Important! The Anonymous system role is not being used at this time.

Follow the steps below to change permissions for the Authenticated system role.

1. In Spoon, go to **Tools** -> **Repository** -> **Explore**.
   The Repository Explorer opens
2. Click the **Security** tab.
3. Click the **System Roles** radio button.
   The list of available system roles appear.

   Note: The Anonymous role is not functional.

4. Select the **Authenticated** role from the list of available roles.
5. Under **Permissions**, enable the appropriate *permissions* for this role.
6. Click **Apply** to save your changes.

The specified permissions are enabled for the Authenticated system role.

Configuring LDAP for the Pentaho Data Integration Server

You must have a working directory server before continuing.

Follow the instructions below if you are using LDAP security for Pentaho Data Integration.

Note: Important! LDAP-related configuration options in the Pentaho Enterprise Console are strictly for BI server support and cannot be used to manage LDAP for the Pentaho Data Integration server.

1. Open the file, **pentaho-spring-beans.xml**, located at `/pentaho/server/data-integration-server/pentaho-solutions/system/`.
2. Locate the following lines:

```
<import resource="applicationContext-spring-security-hibernate.xml" />
<import resource="applicationContext-pentaho-security-hibernate.xml" />
```

3. Edit the lines are follows:

```
<import resource="applicationContext-spring-security-ldap.xml" />
<import resource="applicationContext-pentaho-security-ldap.xml" />
```

4. Save the file.
5. Restart the Data Integration server.

You are now running the Pentaho Data Integration server in LDAP mode..

Clustering

You can set up Carte to operate as a standalone execution engine for a job or transformation. Within Spoon, you can define one or more Carte servers and send jobs and transformations to them on an individual basis. However, in some cases you will want to set up a cluster of Carte servers so that you don't have to manage Carte instance assignments by hand. You may also need to use several servers to improve performance on resource-intensive jobs or transformations. In these scenarios, you will establish a cluster of Carte servers. There are two paradigms for Carte clustering:

A **static cluster** is a Spoon instance managing Carte slave nodes that have been explicitly defined in the user interface.

A **dynamic cluster** is a single master Carte server with a variable number of available Carte slave node registered with it.

Static clusters are a good choice for smaller environments where you don't have a lot of machines (virtual or real) to use for PDI transformations. Dynamic clusters are more appropriate in environments where transformation performance is extremely important, or there can potentially be multiple concurrent transformation executions. Architecturally, the primary difference between a static and dynamic cluster is whether it's Spoon or Carte doing the load balancing.

Configuring Carte to Be a Static Slave Instance

Follow the directions below to set up static Carte slave servers.

Note: If you already have Carte installed on the target machines, you can skip the initial installation steps.

1. Retrieve a **pdi-ee-client** archive package from the Pentaho Enterprise Edition FTP site.
2. On each machine that will act as a Carte server (slave), create a `/pentaho/design-tools/` directory.
3. Unpack the archive to the `/pentaho/design-tools/` directory on each machine.

   Two directories will be created: **data-integration** and **license-installer**.
4. Use the license utility to install the PDI Enterprise Edition and Pentaho Hadoop Enterprise Edition licenses, if applicable.
5. Copy over any required JDBC drivers and PDI plugins from your development instances of PDI to the Carte instances.
6. Run the Carte script with an IP address, hostname, or domain name of this server, and the port number you want it to be available on.

   ```
   ./carte.sh 127.0.0.1 8081
   ```
7. If you will be executing content stored in an enterprise repository, copy the **repositories.xml** file from the `.kettle` directory on your workstation to the same location on your Carte slave.

   Without this file, the Carte slave will be unable to connect to the enterprise repository to retrieve PDI content.
8. Ensure that the Carte service is running as intended, accessible from your primary PDI development machines, and that it can run your jobs and transformations.
9. To start this slave server every time the operating system boots, create a startup or init script to run Carte at boot time with the same options you tested with.

You now have one or more Carte slave servers that you can delegate job and transformation work to in the Repository Explorer.

See the *Pentaho Data Integration User Guide* for more information about assigning slaves and configuring clusters.

Configuring a Dynamic Cluster

Follow the procedures below to set up one or more Carte slave servers and a Carte master server to load-balance them.

Configuring Carte as a Master (Load Balancer)

This procedure is only necessary for **dynamic cluster** scenarios in which one Carte server will load-balance multiple slave Carte instances. If you are implementing a static cluster, which is where Carte slaves are individually declared in the PDI user interface, then skip these instructions.

Follow the process below to establish a dynamic Carte load balancer (master server).

Note: You do not have to use Carte as a load balancer; you can use the DI Server instead. If you decide to use the DI Server, you must enable the proxy trusting filter as explained in *Executing Scheduled Jobs on a Remote Carte Server* on page 27, then set up your dynamic Carte slaves and define the DI Server as the master.

Note: If you already have Carte installed on the target machine, you can skip the initial installation steps.

1. Retrieve a **pdi-ee-client** archive package from the Pentaho Enterprise Edition FTP site.
2. Create a `/pentaho/design-tools/` directory.
3. Unpack the archive to the `/pentaho/design-tools/` directory on each machine.

   Two directories will be created: **data-integration** and **license-installer**.
4. Use the license utility to install the PDI Enterprise Edition and Pentaho Hadoop Enterprise Edition licenses, if applicable.
5. Copy over any required JDBC drivers from your development instances of PDI to the Carte instances.
6. Create a **carte-master-config.xml** configuration file using the following example as a basis:

```
<slave_config>
<!-- on a master server, the slaveserver node contains information about this Carte
 instance -->
 <slaveserver>
  <name>Master</name>
  <hostname>localhost</hostname>
  <port>9001</port>
  <username>cluster</username>
  <password>cluster</password>
  <master>Y</master>
 </slaveserver>
</slave_config>
```

   Note: The **<name>** must be unique among all Carte instances in the cluster.

7. Run the Carte script with the carte-slave-config.xml parameter.

```
./carte.sh carte-master-config.xml
```

8. Ensure that the Carte service is running as intended.
9. To start this slave server every time the operating system boots, create a startup or init script to run Carte at boot time with the same config file option you specified earlier.

You now have a Carte master to use in a dynamic cluster. You must configure one or more Carte slave servers in order for this to be useful.

See the *Pentaho Data Integration User Guide* for more information about configuring clusters in Spoon.

Configuring Carte to Be a Dynamic Slave Instance

Follow the directions below to set up static Carte slave servers.

Note: If you already have Carte installed on the target machines, you can skip the initial installation steps.

1. Retrieve a **pdi-ee-client** archive package from the Pentaho Enterprise Edition FTP site.
2. On each machine that will act as a Carte server (slave), create a `/pentaho/design-tools/` directory.
3. Unpack the archive to the `/pentaho/design-tools/` directory on each machine.

   Two directories will be created: **data-integration** and **license-installer**.

4. Use the license utility to install the PDI Enterprise Edition and Pentaho Hadoop Enterprise Edition licenses, if applicable.
5. Copy over any required JDBC drivers and PDI plugins from your development instances of PDI to the Carte instances.
6. Create a **carte-slave-config.xml** configuration file using the following example as a basis:

```
<slave_config>
<!-- the masters node defines one or more load balancing Carte instances that will
 manage this slave -->
 <masters>
  <slaveserver>
   <name>Master</name>
   <hostname>localhost</hostname>
   <port>9000</port>
<!-- uncomment the next line if you want the DI Server to act as the load balancer -->
<!--     <webAppName>pentaho-di</webAppName> -->
   <username>cluster</username>
   <password>cluster</password>
   <master>Y</master>
  </slaveserver>
 </masters>

 <report_to_masters>Y</report_to_masters>
<!-- the slaveserver node contains information about this Carte slave instance -->
 <slaveserver>
  <name>SlaveOne</name>
  <hostname>localhost</hostname>
  <port>9001</port>
  <username>cluster</username>
  <password>cluster</password>
  <master>N</master>
 </slaveserver>
</slave_config>
```

Note: The slaveserver **<name>** must be unique among all Carte instances in the cluster.

7. Run the Carte script with the carte-slave-config.xml parameter.

```
./carte.sh carte-slave-config.xml
```

8. If you will be executing content stored in an enterprise repository, copy the **repositories.xml** file from the `.kettle` directory on your workstation to the same location on your Carte slave.

   Without this file, the Carte slave will be unable to connect to the enterprise repository to retrieve PDI content.
9. Ensure that the Carte service is running as intended.
10. To start this slave server every time the operating system boots, create a startup or init script to run Carte at boot time with the same config file option you specified earlier.

You now have a Carte slave to use in a dynamic cluster. You must configure a Carte master server or use the DI Server as a load balancer.

See the *Pentaho Data Integration User Guide* for more information about assigning slaves and configuring clusters in Spoon.

Creating a Cluster Schema in Spoon

Clustering allows transformations and transformation steps to be executed in parallel on more than one Carte server. The clustering schema defines which slave servers you want to assign to the cluster and a variety of clustered execution options.

Begin by selecting the **Kettle cluster schemas** node in the Spoon **Explorer View**. Right-click and select **New** to open the **Clustering Schema** dialog box.

Option	Description
Schema name	The name of the clustering schema

Option	Description
Port	Specify the port from which to start numbering ports for the slave servers. Each additional clustered step executing on a slave server will consume an additional port.  **Note:** to avoid networking problems, make sure no other networking protocols are in the same range .
Sockets buffer size	The internal buffer size to use
Sockets flush interval rows	The number of rows after which the internal buffer is sent completely over the network and emptied.
Sockets data compressed?	When enabled, all data is compressed using the Gzip compression algorithm to minimize network traffic
Dynamic cluster	If checked, a master Carte server will perform load-balancing operations, and you must define the master as a slave server in the feild below. If unchecked, Spoon will act as the load balancer, and you must define the available Carte slaves in the field below.
Slave Servers	A list of the servers to be used in the cluster. You must have one master server and any number of slave servers. To add servers to the cluster, click **Select slave servers** to select from the list of available slave servers.

Executing Transformations in a Cluster

To run a transformation on a cluster, access the **Execute a transformation** screen and select **Execute clustered**.

To run a clustered transformation via a job, access the **Transformation** job entry details screen and select the **Advanced** tab, then select **Run this transformation in a clustered mode?**.

To assign a cluster to an individual transformation step, right-click on the step and select **Clusterings** from the context menu. This will bring up the cluster schema list. Select a schema, then click **OK**.

When running transformations in a clustered environment, you have the following options:

- **Post transformation** — Splits the transformation and post it to the different master and slave servers
- **Prepare execution** — Runs the initialization phase of the transformation on the master and slave servers
- **Prepare execution** — Runs the initialization phase of the transformation on the master and slave servers
- **Start execution** — Starts the actual execution of the master and slave transformations.
- **Show transformations** — Displays the generated (converted) transformations that will be executed on the cluster

Initializing Slave Servers in Spoon

Follow the instructions below to configure PDI to work with Carte slave servers.

1. Open a transformation.
2. In the **Explorer View** in Spoon, select **Slave Server**.
3. Right-click and select **New**.
   The **Slave Server** dialog box appears.
4. In the Slave Server dialog box, enter the appropriate connection information for the Data Integration (or Carte) slave server. The image below displays a connection to the Data Integration slave server.

Option	Description
Server name	The name of the slave server
Hostname or IP address	The address of the device to be used as a slave
Port	Defines the port you are for communicating with the remote server
Web App Name	Used for connecting to the DI server and set to pentaho-di by default
User name	Enter the user name for accessing the remote server

Option	Description
Password	Enter the password for accessing the remote server
Is the master	Enables this server as the master server in any clustered executions of the transformation

Note: When executing a transformation or job in a clustered environment, you should have one server set up as the master and all remaining servers in the cluster as slaves.

Below are the proxy tab options:

Option	Description
Proxy server hostname	Sets the host name for the Proxy server you are using
The proxy server port	Sets the port number used for communicating with the proxy
Ignore proxy for hosts: regexp|separated	Specify the server(s) for which the proxy should not be active. This option supports specifying multiple servers using regular expressions. You can also add multiple servers and expressions separated by the ' | ' character.

5. Click **OK** to exit the dialog box. Notice that a plus sign (+) appears next to **Slave Server** in the Explorer View.

Executing Scheduled Jobs on a Remote Carte Server

Follow the instructions below if you need to schedule a job to run on a remote Carte server. Without making these configuration changes, you will be unable to remotely execute scheduled jobs.

Note: This process is also required for using the DI Server as a load balancer in a dynamic Carte cluster.

1. Stop the DI Server and remote Carte server.
2. Open the `/pentaho/server/data-integration-server/tomcat/webapps/pentaho-di/WEB-INF/web.xml` file with a text editor.
3. Find the **Proxy Trusting Filter** filter section, and add your Carte server's IP address to the **param-value** element.

```
<filter>
    <filter-name>Proxy Trusting Filter</filter-name>
    <filter-class>org.pentaho.platform.web.http.filters.ProxyTrustingFilter</filter-
class>
    <init-param>
      <param-name>TrustedIpAddrs</param-name>
      <param-value>127.0.0.1,192.168.0.1</param-value>
      <description>Comma separated list of IP addresses of a trusted hosts.</
description>
    </init-param>
    <init-param>
      <param-name>NewSessionPerRequest</param-name>
      <param-value>true</param-value>
      <description>true to never re-use an existing IPentahoSession in the HTTP
 session; needs to be true to work around code put in for BISERVER-2639</description>
    </init-param>
</filter>
```

4. Uncomment the proxy trusting filter-mappings between the <!-- begin trust --> and <!-- end trust --> markers.

```
  <!-- begin trust -->
  <filter-mapping>
    <filter-name>Proxy Trusting Filter</filter-name>
    <url-pattern>/webservices/authorizationPolicy</url-pattern>
  </filter-mapping>

  <filter-mapping>
    <filter-name>Proxy Trusting Filter</filter-name>
    <url-pattern>/webservices/roleBindingDao</url-pattern>
  </filter-mapping>

  <filter-mapping>
```

```
    <filter-name>Proxy Trusting Filter</filter-name>
    <url-pattern>/webservices/userRoleListService</url-pattern>
  </filter-mapping>

  <filter-mapping>
    <filter-name>Proxy Trusting Filter</filter-name>
    <url-pattern>/webservices/unifiedRepository</url-pattern>
  </filter-mapping>

  <filter-mapping>
    <filter-name>Proxy Trusting Filter</filter-name>
    <url-pattern>/webservices/userRoleService</url-pattern>
  </filter-mapping>

  <filter-mapping>
    <filter-name>Proxy Trusting Filter</filter-name>
    <url-pattern>/webservices/Scheduler</url-pattern>
  </filter-mapping>

  <filter-mapping>
    <filter-name>Proxy Trusting Filter</filter-name>
    <url-pattern>/webservices/repositorySync</url-pattern>
  </filter-mapping>
  <!-- end trust -->
```

5. Save and close the file, then edit the **carte.sh** or **Carte.bat** startup script on the machine that runs your Carte server.
6. Add **-Dpentaho.repository.client.attemptTrust=true** to the **java** line at the bottom of the file.

   ```
   java $OPT -Dpentaho.repository.client.attemptTrust=true org.pentaho.di.www.Carte "${1+
   $@}"
   ```
7. Save and close the file.
8. Start your Carte and DI Server

You can now schedule a job to run on a remote Carte instance.

Impact Analysis

To see what effect your transformation will have on the data sources it includes, go to the **Action** menu and click on **Impact**. PDI will perform an impact analysis to determine how your data sources will be affected by the transformation if it is completed successfully.

List of Server Ports Used by PDI

The port numbers below must be available internally on the machine that runs the DI Server. The only exception is SampleData, which is only for evaluation and demonstration purposes and is not necessary for production systems. If you are unable to open these ports, or if you have port collisions with existing services, refer to *How to Change Service Port Numbers* on page 29 for instructions on how to change them.

Service	Port Number
Enterprise Console	8088
Data Integration Server	9080
H2 (SampleData)	9092
Embedded BI Server (Jetty)	10000

How to Change Service Port Numbers

Enterprise Console (Jetty)

Edit the `/pentaho/server/enterprise-console/resource/config/console.properties` file. The port number entries are in the first section at the top of the file.

```
# Management Server Console's Jetty Server Settings

console.start.port.number=8088
console.stop.port.number=8033
```

DI Server (Tomcat)

Edit the `/pentaho/server/data-integration-server/tomcat/conf/server.xml` file and change the port numbers in the section shown below.

```
<!-- A "Connector" represents an endpoint by which requests are received
         and responses are returned. Documentation at :
         Java HTTP Connector: /docs/config/http.html (blocking & non-blocking)
         Java AJP  Connector: /docs/config/ajp.html
         APR (HTTP/AJP) Connector: /docs/apr.html
         Define a non-SSL HTTP/1.1 Connector on port 9080
    -->
    <Connector URIEncoding="UTF-8" port="9080" protocol="HTTP/1.1"
               connectionTimeout="20000"
               redirectPort="9443" />
    <!-- A "Connector" using the shared thread pool-->
    <!--
    <Connector URIEncoding="UTF-8" executor="tomcatThreadPool"
               port="9080" protocol="HTTP/1.1"
               connectionTimeout="20000"
               redirectPort="9443" />
```

Note: You may also have to change the SSL and SHUTDOWN ports in this file, depending on your configuration.

Next, follow the directions in *How to Change the DI Server URL* on page 30 to accommodate for the new port number.

Embedded BI Server (Jetty)

This server port is hard-coded in Pentaho Data Integration and cannot be changed. If port 10000 is unavailable, the system will increment by 1 until an available port is found.

How to Change the DI Server URL

You can change the DI Server hostname from localhost to a specific IP address, hostname, or domain name by following the instructions below. This procedure is also a requirement if you are changing the DI Server port number.

1. Stop the DI Server through your preferred means.
2. Open the `/pentaho/server/data-integration-server/tomcat/webapps/pentaho-di/WEB-INF/web.xml` file with a text editor.
3. Modify the value of the **fully-qualified-server-url** element appropriately.

```
<context-param>
    <param-name>fully-qualified-server-url</param-name>
    <param-value>http://localhost:9080/pentaho-di/</param-value>
</context-param>
```

4. Save and close the file.
5. Start the DI Server.

The DI Server is now configured to reference itself at the specified URL.

How to Back Up the Enterprise Repository

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

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

1. Stop the DI Server.

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

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

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

3. Copy the backup archive to removable media or an online backup server.
4. Start the DI Server.

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

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

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

Importing and Exporting Content

You can import and export PDI content to and from an enterprise repository by using PDI's built-in functions, explained in the subsections below.

Note: Among other purposes, these procedures are useful for backing up and restoring content in the enterprise repository. However, users, roles, permissions, and schedules will not be included in import/export operations. If you want to back up these things, you should follow the procedure in *How to Back Up the Enterprise Repository* on page 31 instead.

Importing Content Into a Pentaho Enterprise Repository

You must be logged into the Enterprise Repository in Spoon.

Follow the instructions below to import the Enterprise Repository.

1. In Spoon, go to **Tools** -> **Repository** -> **Import Repository**.
2. Locate the export (XML) file that contains the enterprise repository contents.
3. Click **Open**.
   The **Directory Selection** dialog box appears.
4. Select the directory in which you want to import the repository.
5. Click **OK**.
6. Enter a comment, if applicable.
7. Wait for the import process to complete.
8. Click **Close**.

The full contents of the repository are now in the directory you specified.

Using the Import Script From the Command Line

The import script is a command line utility that pulls content into an enterprise or database repository from two kinds of files: Individual KJB or KTR files, or complete repository export XML files.

You must also declare a rules file that defines certain parameters for the PDI content you're importing. Pentaho provides a sample file called **import-rules.xml**, included with the standard PDI client tool distribution. It contains all of the potential rules with comments that describe what each rule does. You can either modify this file, or copy its contents to another file; regardless, you must declare the rules file as a command line parameter.

Options

The table below defines command line options for the import script. Options are declared with a dash: **-** followed by the option, then the **=** (equals) sign and the value.

Parameter	Definition/value
rep	The name of the enterprise or database repository to import into.
user	The repository username you will use for authentication.
pass	The password for the username you specified with **user**.
dir	The directory in the repository that you want to copy the content to.
limitdir	**Optional.** A list of comma-separated source directories to include (excluding those directories not explicitly declared).
file	The path to the repository export file that you will import from.

Parameter	Definition/value
rules	The path to the rules file, as explained above.
comment	The comment that will be set for the new revisions of the imported transformations and jobs.
replace	Set to **Y** to replace existing transformations and jobs in the repository. Default value is **N**.
coe	Continue on error, ignoring all validation errors.
version	Shows the version, revision, and build date of the PDI instance that the import script interfaces with.

```
sh import.sh -rep=PRODUCTION -user=admin -pass=12345 -dir=/ -file=import-
rules.xml -rules=import-rules.xml -coe=false -replace=true -comment="New
 version upload from UAT"
```

Exporting Content From a Pentaho Enterprise Repository

You must be logged into the Enterprise Repository through Spoon.

Follow the instructions below to export the Enterprise Repository.

1. In Spoon, go to **Tools** -> **Repository** -> **Export Repository**.
2. In the **Save As** dialog box, browse to the location where you want to save the export file.
3. Type a name for your export file in the **File Name** text box..

Note: The export file will be saved in XML format regardless of the file extension used.

4. Click **Save**.

The export file is created in the location you specified. This XML file is a concatenation of all of the PDI content you selected. It is possible to break it up into individual KTR and KJB files by hand or through a transformation.

Logging and Monitoring

This section contains information on DI Server and PDI client tool logging and status monitoring.

How to Enable Logging

The logging functionality in PDI enables you to more easily track down complex errors and failures, and measure performance. To turn on logging in PDI, follow the below procedure.

1. Create a database or table space called **pdi_logging**.

   If you don't have a database set aside specifically for logging and other administrative tasks, you can use the SampleData H2 database service included with PDI. H2 does not require you to create a database or table space; if you specify one that does not exist, H2 silently creates it.
2. Start Spoon, and open a transformation or job that you want to enable logging for.
3. Go to the **Edit** menu and select **Settings...**

   The Settings dialogue will appear.
4. Select the **Logging** tab.
5. In the list on the left, select the function you want to log.
6. Click the **New** button next to the **Log Connection** field.

   The **Database Connection** dialogue will appear.
7. Enter in your database connection details, then click **Test** to ensure that they are correct. Click **OK** when you're done.

   If you are using the included H2 instance, it is running on **localhost** on port **9092**. Use the **hibuser** username with the **password** password.
8. Look through the list of fields to log, and ensure that only the fields you are interested in are checked.

   Logging can negatively impact system performance, so don't record any information that you aren't going to use.

Logging is now enabled for the job or transformation in question.

When you run a job or transformation that has logging enabled, you have the option of choosing the log verbosity level in the execution dialogue:

- **Nothing** Don't record any output
- **Error** Only show errors
- **Minimal** Only use minimal logging
- **Basic** This is the default level
- **Detailed** Give detailed logging output
- **Debug** For debugging purposes, very detailed output
- **Row level** Logging at a row level. This will generate a lot of log data

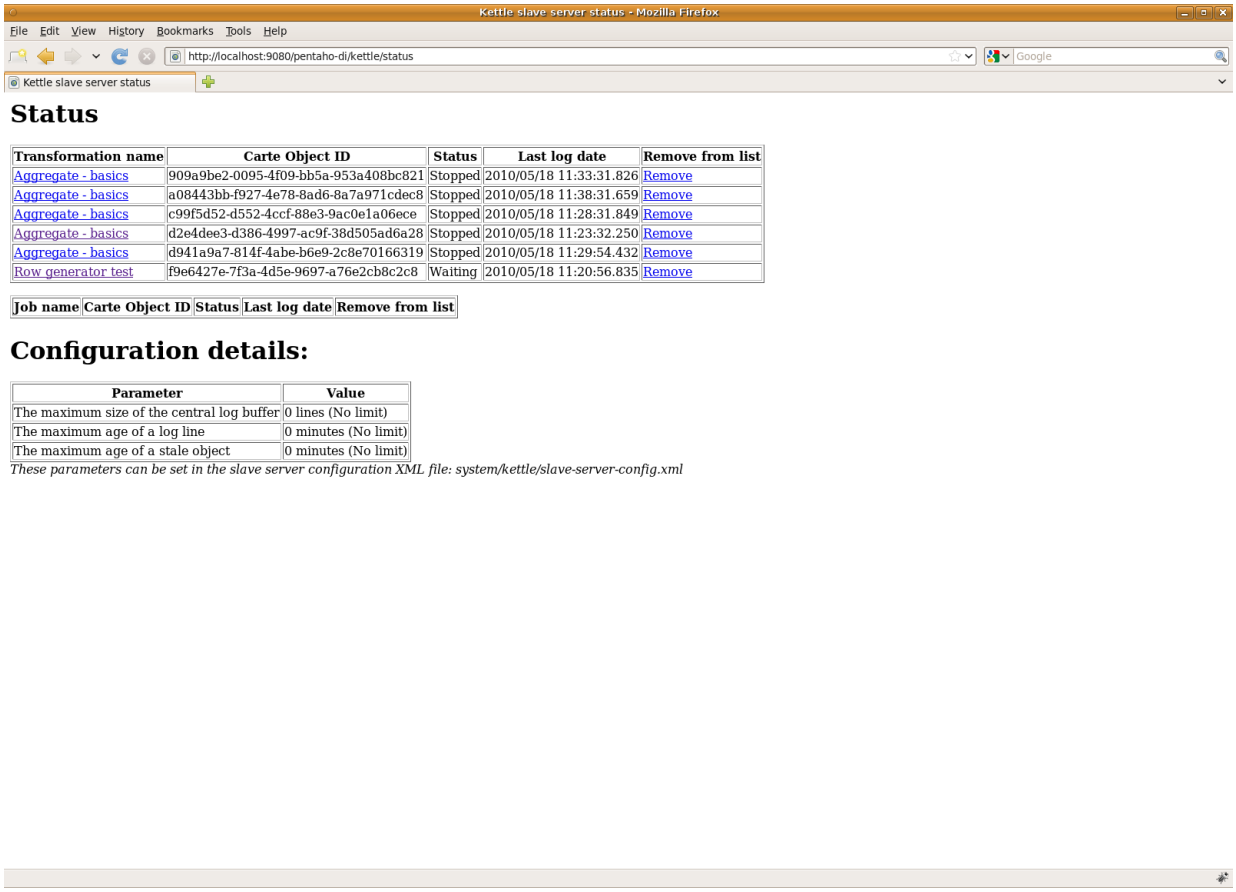
If the **Enable time** option is enabled, all lines in the logging will be preceded by the time of day.

Monitoring Job and Transformation Results

You can view remotely executed and scheduled job and transformation details, including the date and time that they were run, and their status and results, through the **Kettle Status** page. To view it, navigate to the `/pentaho-di/kettle/status` page on your DI Server (change the hostname and port to match your configuration):

```
http://internal-di-server:9080/pentaho-di/kettle/status
```

If you aren't yet logged into the DI Server, you'll be redirected to the login page before you can continue. Once logged in, the Kettle Status page should look something like this:



You can get to a similar page in Spoon by using the **Monitor** function of a slave server.

Notice the **Configuration details** table at the bottom of the screen. This shows the three configurable settings for schedule and remote execution logging. See *slave-server-config.xml* on page 35 for more information on what these settings do and how you can modify them.

Note: This page is cleared when the server is restarted, or at the interval specified by the **object_timeout_minutes** setting.

slave-server-config.xml

Remote execution and logging -- any action done through the Carte server embedded in the Data Integration Server -- is controlled through the `/pentaho/server/data-integration-server/pentaho-solutions/system/kettle/slave-server-config.xml` file. The three configurable options are explained below.

Note: Your DI Server must be stopped in order to make modifications to slave-server-config.xml.

Property	Values	Description
max_log_lines	Any value of 0 (zero) or greater. 0 indicates that there is no limit.	Truncates the execution log when it goes beyond this many lines.
max_log_timeout_minutes	Any value of 0 (zero) or greater. 0 indicates that there is no timeout.	Removes lines from each log entry if it is older than this many minutes.
object_timeout_minutes	Any value of 0 (zero) or greater. 0 indicates that there is no timeout.	Removes entries from the list if they are older than this many minutes.

```
<slave_config>
  <max_log_lines>0</max_log_lines>
  <max_log_timeout_minutes>0</max_log_timeout_minutes>
  <object_timeout_minutes>0</object_timeout_minutes>
</slave_config>
```

Log Rotation

This procedure assumes that you do not have or do not want to use an operating system-level log rotation service. If you are using such a service on your Pentaho server, you should probably connect it to the Enterprise Console, BI Server, and DI Server and use that instead of implementing the solution below.

Enterprise Console and the BI and DI servers use the Apache log4j Java logging framework to store server feedback. The default settings in the log4j.xml configuration file may be too verbose and grow too large for some production environments. Follow the instructions below to modify the settings so that Pentaho server log files are rotated and compressed.

1. Stop all relevant Pentaho servers -- BI Server, DI Server, Pentaho Enterprise Console.
2. Download a Zip archive of the Apache Extras Companion for log4j package: *http://logging.apache.org/log4j/companions/extras/*.
3. Unpack the **apache-log4j-extras** JAR file from the Zip archive, and copy it to the following locations:
   - **BI Server:** `/tomcat/webapps/pentaho/WEB-INF/lib/`
   - **DI Server:** `/tomcat/webapps/pentaho-di/WEB-INF/lib/`
   - **Enterprise Console:** `/enterprise-console/lib/`
4. Edit the **log4j.xml** settings file for each server that you are configuring. The files are in the following locations:
   - **BI Server:** `/tomcat/webapps/pentaho/WEB-INF/classes/`
   - **DI Server:** `/tomcat/webapps/pentaho-di/WEB-INF/classes/`
   - **Enterprise Console:** `/enterprise-console/resource/config/`
5. Remove all **PENTAHOCONSOLE** appenders from the configuration.
6. Modify the **PENTAHOFILE** appenders to match the log rotation conditions that you prefer.

   You may need to consult the log4j documentation to learn more about configuration options. Two examples that many Pentaho customers find useful are listed below:

   Daily (date-based) log rotation with compression:

```
<appender name="PENTAHOFILE" class="org.apache.log4j.rolling.RollingFileAppender">
    <!-- The active file to log to; this example is for BI/DI Server.
         Enterprise console would be "server.log" -->
    <param name="File" value="../logs/pentaho.log" />
    <param name="Append" value="false" />
    <rollingPolicy class="org.apache.log4j.rolling.TimeBasedRollingPolicy">
        <!-- See javadoc for TimeBasedRollingPolicy -->
        <!-- Change this value to "server.%d.log.gz" for PEC -->
        <param name="FileNamePattern" value="../logs/pentaho.%d.log.gz" />
    </rollingPolicy>
    <layout class="org.apache.log4j.PatternLayout">
        <param name="ConversionPattern" value="%d %-5p [%c] %m%n"/>
    </layout>
</appender>
```

   Size-based log rotation with compression:

```
<appender name="PENTAHOFILE" class="org.apache.log4j.rolling.RollingFileAppender">
    <!-- The active file to log to; this example is for BI/DI Server.
         Enterprise console would be "server.log" -->
    <param name="File" value="../logs/pentaho.log" />
    <param name="Append" value="false" />
    <rollingPolicy class="org.apache.log4j.rolling.FixedWindowRollingPolicy">
        <!-- Change this value to "server.%i.log.gz" for PEC -->
        <param name="FileNamePattern" value="../logs/pentaho.%i.log.gz" />
        <param name="maxIndex" value="10" />
        <param name="minIndex" value="1" />
    </rollingPolicy>
    <triggeringPolicy class="org.apache.log4j.rolling.SizeBasedTriggeringPolicy">
        <!-- size in bytes -->
        <param name="MaxFileSize" value="10000000" />
    </triggeringPolicy>
    <layout class="org.apache.log4j.PatternLayout">
```

```
        <param name="ConversionPattern" value="%d %-5p [%c] %m%n" />
    </layout>
</appender>
```

7. Save and close the file, then start all affected servers to test the configuration.

You now have an independent log rotation system in place for all modified Pentaho servers.

Using PDI Data Sources in Action Sequences

If you have any action sequences that rely on Pentaho Data Integration (PDI) data sources that are stored in an enterprise repository, you must make a configuration change in order to run them.

Create a `.kettle` directory in the home directory of the user account that runs the BI Server, and copy the **repositories.xml** file from your local PDI configuration directory to the new one you just created on the BI Server machine.

You must also edit the `/pentaho-solutions/system/kettle/settings.xml` file and put in your PDI enterprise repository information.

Once these changes have been made, restart the BI Server. When it comes back up, the **Use Kettle Repository** function in Pentaho Design Studio should properly connect to the DI Server.

Troubleshooting

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

I don't know what the default login is for the DI Server, Enterprise Console, and/or Carte

For the DI Server administrator, it's username **admin** and password **secret**.

For Enterprise Console administrator, it's username **admin** and password **password**.

For Carte, it's username **cluster** and password **cluster**.

Be sure to change these to new values in your production environment.

Note: DI Server users are not the same as BI Server users.

Jobs scheduled on the DI Server cannot execute a transformation on a remote Carte server

You may see an error lie this one when trying to schedule a job to run on a remote Carte server:

```
ERROR 11-05 09:33:06,031 - !
UserRoleListDelegate.ERROR_0001_UNABLE_TO_INITIALIZE_USER_ROLE_LIST_WEBSVC!
                com.sun.xml.ws.client.ClientTransportException: The server sent HTTP
 status code 401: Unauthorized
```

To fix this, follow the instructions in *Executing Scheduled Jobs on a Remote Carte Server* on page 27